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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-20) Supplementary Examinations, May-2026

IRRIGATION ENGINEERING AND HYDRAULIC STRUCTURES

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

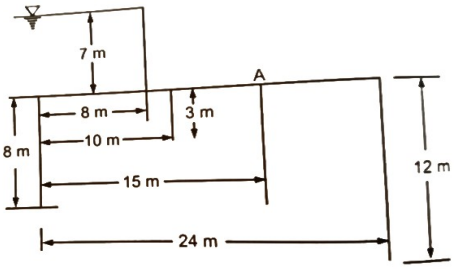
1.	a)	Define irrigation and explain its necessity in a tropical country like India.	7 Marks	L2	CO1	PO1 PO7
	b)	The left branch canal carrying a discharge of 20 cumecs has culturable commanded area of 20,000 hectares. The intensity of Rabi crop is 80 percent and the base period is 120 days. The right branch canal carrying discharge of 8 cumecs has culturable commanded area of 12,000 hectares, intensity of irrigation of Rabi crop is 50 percent and the base period is 120 days. Compare the efficiencies of the two canal systems.	7 Marks	L4	CO1	PO1 PO2 PO6 PO7

(OR)

2.	a)	What is the classification of irrigation water having the following characteristics: Concentration of Na, Ca & Mg are 22.2, 3.2 & 1.5 milli-equvalent per litter respectively and the electrical conductivity is 190 micro mhos per cm at 25^0 C.	7 Marks	L4	CO1	PO1 PO2 PO5 PO8
	b)	Explain the terms duty and delta. Derive the relationship between Duty, Delta and Base period.	7 Marks	L4	CO1	PO1 PO2

UNIT-II

3.	a)	Explain the Bligh's creep theory for seepage flow below a weir.	7 Marks	L4	CO2	PO1
	b)	For the section of hydraulic structure given below, Determine i) average hydraulic gradient, ii) residual seepage head at point 'A', iii) Uplift pressure at Point 'A' & iv) Bligh's coefficient of creep.	7 Marks	L4	CO2	PO1 PO2 PO4 PO5 PO6 PO7



(OR)

4.	a)	Sketch and explain different components of diversion headwork.	7 Marks	L4	CO2	PO1
	b)	Explain the design principles of vertical drop weir.	7 Marks	L2	CO2	PO1

UNIT-III

5.	a)	Derive an expression for elementary profile of a gravity dam.	6 Marks	L4	CO3	PO1
	b)	Design the practice profile of a gravity dam of stone masonry given the following data: RL of base of dam = 1480 m RL of FRL = 1500.5 m Specific gravity of the masonry = 2.3 Safe compressive stress for masonry = 1200 kN/m^2 Height of waves = 1.2 m.	8 Marks	L6	CO3	PO1 PO2 PO3 PO4 PO5 PO6 PO7

(OR)

6.	a)	Explain the different failures of earth dam.	6 Marks	L2	CO3	PO1
	b)	Design a suitable section for the overflow portion of a concrete gravity dam having the downstream face sloping 0.75 H:1V. the design discharge for the spillway is 8600 cumecs. The height of the spillway crest is kept at RL 205.0 m. the spillway length consists of 6 spans having clear width of 10 m each. Thickness of each pier may be taken as 2.6 m.	8 Marks	L6	CO3	PO1 PO2 PO3 PO4 PO6

UNIT-IV

7.	a)	Explain canal regulation works.	6 Marks	L2	CO4	PO1
	b)	Design a 1.6 m Sarda type fall for a canal having a discharge of 15 cumecs with following data: Bed level upstream = 103.0 m Side slope of channel = 1:1 Bed level downstream = 101.5 m Full supply level = 104.5 Bed level with u/s and d/s soil = 1.0 m Assume Bligh's Coefficient = 6	8 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO5 PO6 PO7

(OR)

8.	a)	Discuss canal outlets and its classification?	6 Marks	L4	CO4	PO1
	b)	Using Kennedy's theory, design an irrigation canal for a discharge of5 cumecs, assume N = 0.0225, m = 1.0 and B/D = 3.24. Also find the bed slope of the channel.	8 Marks	L6	CO4	PO1 PO2

UNIT-V

9.	a)	Differentiate between aqueduct and super passage with a neat sketch.	6 Marks	L4	CO5	PO1
	b)	Design a drainage waterway, canal waterway and bed levels at any two sections for a cross drainage work with given the following data: Full supply discharge = 35 cumecs Full supply level = R.L. 215.5 m Canal bed level = R.L. 213.0 m Canal bed width = 21.5 Trapezoidal canal section with 1½ H: 1V slope Canal water depth = 1.5 m Drainage High flood discharge = 300 cumecs High flood level = 210.0 m High flood depth = 2.5 m General ground level = 212.5 m.	8 Marks	L6	CO5	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO10

(OR)

10.	a)	What are the various factors for selection of site for aqueducts?	6 Marks	L2	CO5	PO1
	b)	Design waterways and bed levels at any two sections for a Syphon aqueduct if the following data at the crossing of a canal and a drainage are given: Discharge of canal = 40 cumecs Bed width of canal= 30 Full supply depth of canal = 1.6 m Bed level of canal = 206.4 m Side slope of canal = 1½ H:1V High flood discharge of drainage = 450 cumecs High flood level of drainage = 207.0 m Bed level of drainage = 204.5 m General ground level = 206 .5 m.	8 Marks	L6	CO5	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO10

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Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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III B.Tech II Semester (SVEC-20) Supplementary Examinations, May-2026

STEEL STRUCTURES

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Determine the shear strength of M20 bolt of grade 4.6 under the following conditions. i) Lap joint ii) Double cover Butt joint	6 Marks	L4	CO1	PO1 PO2 PO5 PO8
	b)	Calculate the strength of a 20 mm diameter bolt of grade 4.6 in single cover butt joint. The thickness of cover plate is 10 mm and the main plates to be joined are 12 mm thick.	8 Marks	L4	CO1	PO1 PO2 PO5 PO8 PO10

(OR)

2.	A 75 mm x 8 mm tie member is to transmit a factored load of 145 kN. Design fillet welds and necessary overlaps for the cases shown in Fig.1. The steel is used is of grade E250. Assume gusset plate to be 12 mm thick.	14 Marks	L6	CO1	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10

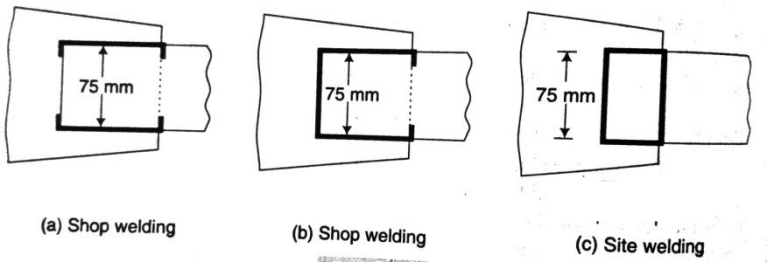

Fig.1

UNIT-II

3.	Design a rolled steel beam using I-section for simply supported beam of span 6 m, carries a UDL of 15 kN/m excluding self-weight. The compression flange of beam is laterally supported. f_y is 250 MPa, E is $2x10^5$ MPa.	14 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10

(OR)

4.	Design a simply supported beam of effective span 9 m to carry a load of 40 kN/m. The depth of the beam should not exceed 450 mm. Stiff end bearing is 80 mm and the compression flange of the beam is laterally supported. Draw the details.	14 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10

UNIT-III

5.		Design a bridge truss diagonal subjected to a factored tensile load of 300 kN. The length of the diagonal is 3.0 m. The tension member is connected to a gusset plate of 16 mm thick with one line of 20 mm diameter bolts of grade 8.8.	14 Marks	L6	CO3	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10
		(OR)				
6.		A single angle section ISA 60 x 60 x 8 mm, 2.55 m long, is used as strut. The ends are welded to the gusset plates. Determine the design compressive strength and the service load that can be applied.	14 Marks	L4	CO3	PO1 PO2 PO6 PO8 PO10

UNIT-IV

7.		Design a laced column 10 m long with two channels placed back-to-back to carry an axial factored load of 1400 kN. The column may be assumed to have restrained in position but not in direction at both ends. Assume steel of grade E 250 and bolts of grade 4.6.	14 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10
		(OR)				
8.		Design a suitable slab base for a column section ISHB 200 @ 365.9 N/m supporting an axial load of 400 kN. The base plate is to rest on a concrete pedestal of M20 grade.	14 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10

UNIT-V

9.	a)	Why are the Pratt trusses structurally better than Howe trusses?	7 Marks	L2	CO5	PO1
	b)	A Power plant structure having maximum dimension more than 60 m is proposed to be built on downhill side near Dehradun. The height of hill is 400 m with a slope of 1 in 3. If the location is 250 m from the crest of the hill on downward slope, and its eve board is at a height of 9 m, determine the design wind pressure.	7 Marks	L4	CO5	PO1 PO2 PO4 PO6 PO8
		(OR)				
10.	a)	State advantages & disadvantages of tubular sections in steel structure	4 Marks	L2	CO5	PO1
	b)	A tie member in a roof truss is connected to the principal rafter at an angle of 90^0. Design the members and the connections for the following data. Use grade Yst=240 tubes	10 Marks	L6	CO5	PO1 PO2 PO3 PO4 PO6 PO8 PO10

S.No.	Member	Length	Force
1	Principal rafter panel	2.6 m	85 kN
2	Tie member	2.2 m	35 kN

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Roll No. | | | | | | | | | | |

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III B.Tech II Semester (SVEC-20) Supplementary Examinations, May-2026

GROUND IMPROVEMENT TECHNIQUES

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss the practical situations which necessitate the ground modification and what are the objectives of ground modification.	7 Marks	L2	CO1	PO1
	b)	How the performance of black cotton soil can be improved. Discuss. Also write a brief note on latest ground improvement techniques.	7 Marks	L4	CO1	PO1 PO2
		(OR)				
2.	a)	Discuss the role of ground improvement in foundation engineering, in detail. Explain how ground improvement ensures stability and safety of different geotechnical structures.	7 Marks	L2	CO1	PO1
	b)	Soils from different locations have the following properties. Identify the problems and suggest proper ground improvement methods and justify the same. i) Site1: Liquid limit = 65 %, Plastic limit =32 %; Shrinkage limit = 14 %. FSI =110%. LIG houses are to be built. ii) Site 2: SPT N increases from 3 at 1.5 m depth to 12 at 12.0 m depth in an alluvial soil. The site is in Assam where a refinery is to be built in the site.	7 Marks	L4	CO1	PO1 PO2 PO4 PO5 PO6 PO7 PO8

UNIT-II

3.	a)	How for 'dewatering technique' will improve the soil conditions? Explain with neat sketches dewatering using sumps and interceptor ditches.	7 Marks	L2	CO2	PO1 PO5
	b)	It is proposed to construct large oil tanks for storage of oil at Vizag port in the water area by filling with soft reclaimed soil. From the SPT data available at the reclaimed soil site, it is noticed that the top 12 m soil is soft clay (SPT "N' = 2 to 4) and below this up to a depth of 20 m there is a dense soil (SPT "N' = 22 to 28). For the above soil conditions, suggest whether soil improvement is required or not. If required what extent the soil is required to improve? Explain any one of the suitable ground improvement techniques with neat sketches. The required safe bearing capacity is 175 kPa.	7 Marks	L4	CO2	PO1 PO2 PO4 PO5 PO6 PO7 PO8 PO10
		(OR)				
4.	a)	Write a short notes on i) Well point system ii) Dewatering after construction	7 Marks	L2	CO2	PO1 PO5
	b)	State the working principle of vacuum well point system? Explain with neat sketch the process of dewatering carried out in-situ by vacuum well point system.	7 Marks	L2	CO2	PO1 PO5

UNIT-III

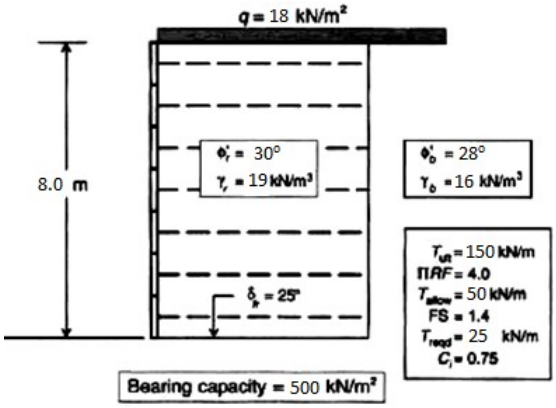
5.	a)	What are the merits and demerits of granular piles? Explain the working principle and method of construction of granular pile with a neat sketch.	7 Marks	L4	CO3	PO1 PO2 PO5 PO6 PO7 PO8 PO10
	b)	Compare the methods of dynamic compaction of cohesionless soils and dynamic consolidation of cohesive soils.	7 Marks	L4	CO3	PO1 PO2
		(OR)				
6.	a)	Write short notes on the following in-situ densification methods of cohesive soils. i) Geodrains ii) Thermal methods	7 Marks	L2	CO3	PO1 PO5 PO10
	b)	In Gudur, a site chosen for the construction of a multistoried industrial complex has a 10 m depth of saturated clay of high plasticity (Liquid Limit = 85%, Plastic Limit = 28%, Shrinkage Limit = 20%) with a free swell index of 120%. Infer, suggest and explain a suitable in-situ densification method in order to consolidate and improve the soil prior to the construction.	7 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO6 PO7

UNIT-IV

7.	a)	How effective is lime stabilization in stabilizing the clay soils? Discuss the chemical reactions that take place in lime treated soils. Is this method environmental friendly? Comment.	7 Marks	L4	CO4	PO1 PO2 PO5
	b)	What is grouting? List the methods of grouting. Compare compaction grouting and jet grouting, in detail.	7 Marks	L4	CO4	PO1 PO2
		(OR)				
8.	a)	Compare suspension and solution grouting techniques and their effectiveness in improving the in-situ soil conditions.	7 Marks	L4	CO4	PO1 PO2
	b)	Write a short notes on: i) Fly Ash Stabilization ii) Grout Monitoring iii) Shortcreting	7 Marks	L2	CO4	PO1 PO5

UNIT-V

9.	a)	Explain the factors governing the design of reinforced soil walls. Write the construction sequence of a reinforced earth wall with vertical faces. Also, briefly discuss the latest developments in earth reinforcement techniques.	6 Marks	L2	CO5	PO1 PO5 PO12
	b)	Design a 8 m high geogrid-reinforced wall where the reinforcement spacing must be at 1.0 m spacings, since the wall facing is of the articulated precast concrete type of this same dimension. The coverage ratio is 0.8 (i.e., geogrids do not cover the entire ground surface at each lift: they are slightly separated). The length-to-height ratio or the reinforced soil wall should not be less than 0.7 (i.e., $L \geq 4.9$ m). Additional details of the problem including soil and geogrid data are shown in the diagram below.	8 Marks	L6	CO6	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO10



(OR)

10.	a)	List the factors affecting the behaviour and performance of reinforced soil. Also, explain the different stability checks that are to be applied on reinforced earth walls, in detail.	6 Marks	L2	CO5	PO1 PO6
	b)	Design a 8 m high wrap-around type of geotextile wall that is to carry a storage area of equivalent dead load of 15 kPa. The wall is backfilled with a granular soil (SP) having the properties of γ = 19 kN/m^3, ϕ = 32º, c_a = 0. A woven slit film geotextile with wrap (machine) direction ultimate wide-width tensile strength of 60 kN/m and friction angle with granular soil of δ = 20º is intended to be used in its construction. The orientation of the geotextile is perpendicular to the wall face and the edges are to be overlapped or sewn to handle the weft (cross machine) direction. A factor of safety of 1.4 is to be used along with its site specific reduction factors.	8 Marks	L6	CO6	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO10

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III B.Tech II Semester (SVEC-20) Supplementary Examinations, May-2026

SOLID AND HAZARDOUS WASTE MANAGEMENT

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Investigate the importance of public awareness and role of NGOs in effective solid waste management.	7 Marks	L4	CO1	PO1 PO2 PO4 PO6 PO7
	b)	Mention the occupational hazards of municipal solid waste management.	7 Marks	L2	CO1	PO1 PO6 PO7

(OR)

2.	a)	Describe the methods of sampling and characterization of solid waste.	7 Marks	L2	CO1	PO1 PO5 PO6 PO7
	b)	"Improper disposal of solid waste have adverse health and environmental impacts". Justify.	7 Marks	L4	CO1	PO1 PO2 PO4 PO6 PO7

UNIT-II

3.	a)	Investigate the various on-site process techniques applied for Indian environmental conditions.	7 Marks	L4	CO2	PO1 PO2 PO5 PO6 PO7
	b)	Compose the impacts of public health and economic aspects of on-site solid waste storage system.	7 Marks	L4	CO2	PO1 PO2 PO6 PO7

(OR)

4.	a)	Compare the storage of municipal solid waste management in residential areas and commercial areas.	7 Marks	L4	C02	PO1 PO2 PO6 PO7
	b)	Evaluate the different materials used as containers for on-site storage in order to protect health and safety of people.	7 Marks	L2	CO2	PO1 PO2 PO6 PO7

UNIT-III

5.	a)	Distinguish the operation of hauled container system and stationary container system of waste collection.	7 Marks	L4	CO3	PO1 PO2 PO10
	b)	Explain different types of transfer stations.	7 Marks	L2	CO3	PO1

(OR)

6.	a)	Explain the factors to be considered in deciding collection frequency in a solid waste management system to achieve environmental sustainability.	7 Marks	L2	C03	PO1 PO6 PO7
	b)	Analyze the issues involved in selecting a site for a solid waste transfer facility.	7 Marks	L4	C03	PO1 PO2 PO6 PO7

UNIT-IV

7.	a)	Explain the factors influencing the process of composting. Appraise various practical problems associated with it.	7 Marks	L4	C04	PO1 PO2 PO5 PO6 PO7
	b)	Assume you were engineer responsible for disposal of municipal solid waste of 100 tons per day. Discuss in brief the design considerations for constructing a sanitary landfill considering environmental safety and sustainability.	7 Marks	L6	C05	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO10

(OR)

8.	a)	Examine the factors that to be considered for environmental safety and sustainability for site selection of a sanitary landfill.	7 Marks	L4	C05	PO1 PO2 PO6 PO7
	b)	Explain composting process of bio-degradable municipal solid waste.	7 Marks	L2	CO4	PO1 PO6 PO7

UNIT-V

9.	a)	Describe the occupational hazards and safety measures in Bio-medical waste management.	7 Marks	L2	C05	PO1 PO6 PO7
	b)	Analyze the problems associated with disposal of hazardous waste. Also suggest feasible methods as per the legislation.	7 Marks	L4	C05	PO1 PO2 PO5 PO6 PO7 PO8

(OR)

10.	a)	Define Bio-medical waste? Illustrate the need for color coding in Bio-medical waste management.	7 Marks	L2	CO5	PO1 PO6 PO7
	b)	Examine the importance of recycling of plastic waste considering environmental sustainability.	7 Marks	L4	CO6	PO1 PO2 PO6 PO7

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Roll No. | | | | | | | | | | |

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III B.Tech II Semester (SVEC-20) Supplementary Examinations, May-2026

POWER ELECTRONICS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Enumerate the differences between various power transistors and justify the advantages of power transistor over thyristors.	7 Marks	L2	CO1	PO1
	b)	Design a suitable snubber circuit for the protection of BJT, which is used as a switching device in AC to DC conversion circuit.	7 Marks	L4	CO1	PO3

(OR)

2.	a)	Discuss the consequences of increasing the voltage rating of a string formed by the combination of several SCRs and propose appropriate remedies to sustain the voltage rating.	7 Marks	L2	CO1	PO7
	b)	Determine the number of SCRs to be connected in a: i) Series string with total voltage of 5 KV. ii) Parallel string with a total current of 1.5 KV. Consider the voltage and current rating of each SCR as 800V and 100A respectively and de-rating factor of 0.15.	7 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Analyze the operation of 1-Ø semi converter with RL load with delay angle of 120^0 and sketch the associated waveforms.	7 Marks	L4	CO3	PO2
	b)	Considering the effect of source inductance on the performance of 1-Ø bridge type fully controlled rectifier with RL load and derive an expression for load current.	7 Marks	L3	CO3	PO1

(OR)

4.	a)	Compare single-pulse, three-pulse and six-pulse converters and identify the converter configuration that can produce both three pulse and six pulse output voltage and justify.	7 Marks	L2	CO3	PO5
	b)	A three phase fully controlled bridge converter is connected to a 230 V, 50 Hz supply. Determine the values of average load voltage and rms load voltage, if it is operating at a firing angle delay of 30^0. Neglect source resistance.	7 Marks	L3	CO3	PO4

UNIT-III

5.	a)	Discuss the difference between natural and forced commutation techniques.	6 Marks	L2	CO2	PO1
	b)	With the help of neat diagram and associated waveforms, explain the principle of Class-D commutation technique.	8 Marks	L2	CO2	PO1

(OR)

6.	a)	Derive the expression for chopping period of a step-down chopper with current limit control strategy.	7 Marks	L3	CO2	PO1
	b)	A step-down chopper operating at a frequency of 500 Hz supplies a load of 3 Ω and an inductance of 9 mH from a 60 V battery. Assume that a free-wheeling diode is connected across the load. Calculate the average load voltage and current for ON/OFF ratio of 1:1.	7 Marks	L3	CO2	PO2

UNIT-IV

7.		With the help of neat circuit schemes and necessary waveforms, explain the circulating and non-circulating current modes of operation of a single-phase dual converter with R-Load.	14 Marks	L2	CO3	PO1
		(OR)				
8.	a)	Write short notes on the following single-phase converters. i) Four quadrant converter. ii) Fixed frequency AC to AC converter. iii) Variable frequency AC to AC converter.	7 Marks	L2	CO3	PO1
	b)	A 20 Ω resistive load is connected through anti-parallel combination of two SCRs to a 230 V, 50 Hz supply. If the firing of the SCR in every positive half cycle is 600, determine the average load voltage and current.	7 Marks	L3	CO3	PO2

UNIT-V

9.	a)	Explain the operation of basic series inverter with relevant waveforms and state its limitations.	8 Marks	L2	CO4	PO1
	b)	Calculate the output frequency of basic series inverter with the following parameters L= 10 mH, C=0.4 μF, R=300 Ω and T_{off} = 0.2 ms.	6 Marks	L3	CO4	PO2
		(OR)				
10.	a)	With relevant circuit and waveforms, explain the operation of single phase full bridge inverter with R, RL and RLC load.	7 Marks	L2	CO4	PO1
	b)	How does inverter operate with PWM techniques? Explain in detail about any one the PWM technique.	7 Marks	L3	CO4	PO5

Roll No. | | | | | | | | | | |

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III B.Tech II Semester (SVEC-20) Supplementary Examinations, May-2026

SPECIAL ELECTRICAL MACHINES

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	With a neat diagram, explain the working principle hybrid stepper motor.	7 Marks	L2	CO1	PO1
	b)	With a neat diagram, explain the construction of permanent magnet stepper motor.	7 Marks	L2	CO1	PO1
		(OR)				
2.	a)	A four phase stepper motor has four stator poles and six rotor poles. Calculate its step angle and its resolution.	7 Marks	L3	CO1	PO2
	b)	With neat diagram, explain the bifilar winding technique associate with stepper motor. Also mention its advantages and demerits.	7 Marks	L2	CO1	PO5

UNIT-II

3.	a)	With neat diagram, explain the converters technique related to two switches per phase and C-dump for switched reluctance motor and also mention its merits and demerits	7 Marks	L2	CO2	PO1
	b)	Derive the torque equation of switched reluctance motor and mention its significance.	7 Marks	L3	CO2	PO1
		(OR)				
4.	a)	With neat diagram, explain the concepts of microprocessor based control technique of switched reluctance motor and also mention the function of controllers.	7 Marks	L2	CO2	PO5
	b)	Draw a suitable zone for stator and rotor pole arcs and design a suitable pole arc and rotor tooth arc for a three-phase SRM with six stator poles and eight rotor tooth. Draw the inductance and rotor angle profile.	7 Marks	L3	CO2	PO3

UNIT-III

5.	a)	With neat diagram and necessary equation, derive the torque equation and also obtain its optimum torque angle for synchronous reluctance motor.	7 Marks	L2	CO3	PO7
	b)	With neat diagram, explain the construction of line start synchronous reluctance motor and also explain its principle of operation.	7 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Draw the speed-torque characteristics of synchronous reluctance motor and also indicate the applications related to industrial needs.	7 Marks	L2	CO3	PO5
	b)	A 3-phase, 4 pole, 60 Hz, 230 V, star connected synchronous reluctance motor has direct axis and quadrature axis synchronous reactance's of 22.5 ohm and 3.5 ohm respectively. For a load torque of 12.5 Nm. The voltage to frequency ratio is maintained constant at rated value. Find torque angle, line current and power factor. Neglect armature resistance and mechanical losses.	7 Marks	L3	CO3	PO4

UNIT-IV

7.	a)	A three-phase, four pole star connected synchronous motor has 72 slots with 20 conductors per slot. The flux/slot is 0.05 Wb and the speed is 1500 RPM. Assuming the full pitched coil, find the line and phase voltage.	7 Marks	L3	CO4	PO2
	b)	With neat diagram and necessary equations, explain the magnetic circuits of PM motors and derive the EMF equation for sine wave motor with practical windings.	7 Marks	L3	CO4	PO1

(OR)

8.	a)	Derive the voltage equation of PMBLDC motor. Also analyze it under starting, no load and on load condition.	7 Marks	L3	CO4	PO1
	b)	A BLDC motor has no load speed of 6000 RPM when connected to 120 V DC source. Armature resistance is 2.5 ohm. Find the speed when it is supplied with 60 V and developing a torque of 0.5 Nm. Neglect constant losses. The no load current is 1 A.	7 Marks	L3	CO4	PO4

UNIT-V

9.	a)	Develop an equivalent circuit for linear induction motor. Also draw its performance characteristics.	7 Marks	L3	CO5	PO1
	b)	With necessary equation, derive the force equation of linear induction motor.	7 Marks	L3	CO5	PO1

(OR)

10.	a)	A vehicle is propelled by a Linear induction motor. The motor has 100 poles with a pole pitch of 0.5 m. Find the vehicle speed in kmph when the vehicle is running with a slip of 0.25 at a frequency of 50 Hz.	7 Marks	L3	CO5	PO4
	b)	With neat diagram, explain the construction of single sided slotted tubular linear synchronous motor and transverse flux permanent magnet linear synchronous motor.	7 Marks	L2	CO5	PO1

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-20) Supplementary Examinations, May-2026

HEAT TRANSFER

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is Thermal Diffusivity? Explain its significance.	6 Marks	L2	CO1	PO1
	b)	An immersion water heater of surface area 0.1 m^2 and rating 1 KW is designed to operate fully submerged in water. Estimate the surface temperature of the heater when the water is at 40^0C and the heat transfer coefficient is 300 W/m^2K. If this heater is by mistake used in air at 400C with h= 9 W/m^2K, what will be its surface temperature?	8 Marks	L2	CO1	PO1 PO2 PO3
		(OR)				
2.		A surface having an area of 1.5 m^2 and maintained at 300^0C exchanges heat by radiation with another surface at 40^0C. The value of factor due to the geometric location and emissivity is 0.52. Determine: i) Heat lost by radiation ii) The value of Thermal Resistance and iii) The value of equivalent convection coefficient.	14 Marks	L2	CO1	PO1 PO2 PO3 PO4

UNIT-II

3.		A metallic sphere of radius 10mm is initially at a uniform temperature of 400^0C. It is heat treated by first cooling it in air (h=10 W/m^2K) at 20^0C until its central temperature reaches 335^0C. It is then quenched in a water bath at 20^0C with h= 600 W/m^2K until the center of the sphere cools from 335^0C to 50^0C. Compute the time required for cooling in air and water for the following physical properties of the sphere. P= 3000 kg/m3, Cp = 1000 J/kg-K, K=20W/m K, œ =6.66 X 10^{-6} m2/s. Also calculate the surface temperature at the end of cooling in water.	14 Marks	L2	CO2	PO1 PO2 PO3 PO4
		(OR)				
4.	a)	What are Heisler Charts? Explain their significance in solving transient conduction problems?	7 Marks	L2	CO2	PO1 PO2
	b)	An Aluminium sphere weighing 7 kg and initially at a temperature of 260^0C is suddenly immersed in a fluid at 10^0 C. If h = 50 W/m^2K, compute the time required to cool the sphere to 90^0 C. For aluminium: ρ=2707 kg/m^3, C=9000 J/kg^0C and k= 204 W/m^0C.	7 Marks	L2	CO2	PO1 PO2 PO3

UNIT-III

5.	a)	A 50cm long glass plate is hung vertically in air at 35^0C while the temperature is maintained at 85^0C. Calculate the boundary layer thickness at the leading edge of the plate. If a similar plate is placed in a wind tunnel and air is blown over it, at a velocity of 4m/s. Estimate the boundary layer thickness at its leading edge.	7 Marks	L1	CO3	PO1 PO2 PO3
	b)	Water at 60^0C enters a tube of 2.54 cm diameter at a mean velocity of 2 cm/s. Calculate the exit water temperature if the tube is 3.0 m long and wall temperature is constant at 80^0C.	7 Marks	L3	CO3	PO1 PO2 PO3
		(OR)				
6.	a)	Develop an expression for convective heat transfer for natural convection using dimensional analysis.	7 Marks	L3	CO3	PO1 PO2 PO3
	b)	A plate of length 750mm and width 250mm has been placed longitudinally in a stream of crude oil which flows with a velocity of 5m/s. If the oil has specific gravity 0.8 and kinematic viscosity 1 stoke, calculate: i) Boundary layer thickness at the middle of plate. ii) Shear stress at the middle of the plate. iii) Friction drag on one side of plate.	7 Marks	L3	CO3	PO1 PO2 PO3 PO4

UNIT-IV

7.	a)	What are the common causes of fouling in a heat exchanger? How does fouling affect heat transfer and pressure drop?	7 Marks	L3	CO4	PO1 PO2
	b)	Saturated steam, at 120^0C condenses on a 2cm OD vertical tube which is 20cm long. The tube wall is maintained at a temperature of 119^0C. Calculate the average heat transfer coefficient and the thickness of the condensate film at the base of the tube. Assume Nusselt solution is valid.	7 Marks	L3	CO4	PO1 PO2 PO3
		(OR)				
8.	a)	Draw a 1-shell-pass and 6-tube-passes shell-and-tube heat exchanger. What are the advantages and disadvantages of using 6 tube passes instead of just 2 of the same diameters?	7 Marks	L3	CO4	PO1 PO2
	b)	Distinguish between film wise and drop wise condensation. Which of the two does give a higher heat transfer coefficient? Why?	7 Marks	L3	CO4	PO1 PO2

UNIT-V

9.	a)	Distinguish between a black body and grey body.	7 Marks	L3	CO5	PO1
	b)	Two parallel grey planes with emissivity's of 0.8 and 0.7 are maintained at 800^0C and 1500^0C. What is the net radiant energy exchange? What would be the reduction in heat transfer if a radiation shield of polished aluminum (Emissivity = 0.04) is placed between them?	7 Marks	L3	CO5	PO1 PO2 PO3
		(OR)				
10.	a)	State and explain Kirchoff's identity. What are the conditions under which it is applicable?	7 Marks	L3	CO5	PO1 PO2
	b)	Estimate the solar radiation on a plate normal to the sun rays. Assume the sun to be a black body at a temperature of 55200C. The diameter of the sun is 1.39 x 10^6Km and its distance from the earth is 1.5 x 10^8km.	7 Marks	L3	CO5	PO1 PO2 PO3

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Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-20) Supplementary Examinations, May-2026

INDUSTRIAL ENGINEERING AND MANAGEMENT

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	Explain the importance and Approaches of management in detail.	14 Marks	L2	CO1	PO1
	(OR)				
2.	Describe in detail corporate Governance.	14 Marks	L2	CO1	PO1 PO6

UNIT-II

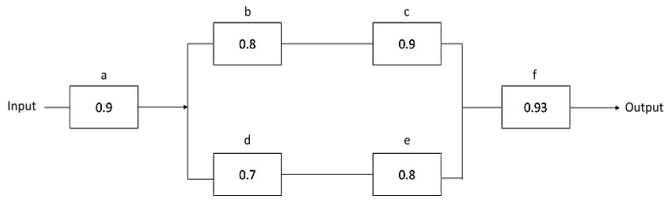
3.	Explain in detail about leadership and management.	14 Marks	L2	CO2	PO1 PO2
	(OR)				
4.	List out the types of motivation theories and explain anyone of them.	14 Marks	L2	CO2	PO1 PO2

UNIT-III

5.	Describe in detail the procedure of method study.	14 Marks	L2	CO3	PO1 PO2 PO3
	(OR)				
6.	The following information were obtained by conducting a study work study man: i) maintenance time: - Get out & put away tools – 12 min/day - cleaning of machines - 5 min/day - oiling of machines - 5 min/day - replenish coolant supply - 3 min/day ii) Interruption time: - Interruption by foremen – 5 min/day - Interruption by porter - 4 min/day - Delay time due to power failure, etc., - 6 min/day - Persona time - 20 min/day Calculate total allowances, time available cycle time productive hours considering a shift in the working day of 8 hours	14 Marks	L3	CO3	PO1 PO2 PO3

UNIT-IV

7.	What are the types of production? Explain in detail	14 Marks	L2	CO4	PO1 PO2
	(OR)				
8.	Determine the reliability of the logic diagram shown below. Assume that each component is statistically independent.	14 Marks	L3	CO4	PO1 PO2 PO3



UNIT-V

9.	Define the term sampling. Explain the types of sampling plans in detail.	14 Marks	L2	CO5	PO1 PO2 PO3
	(OR)				
10.	An inspection has been performed for 8 samples of 100 items and the results are shown below:	14 Marks	L4	CO5	PO1 PO2 P03

Sample No.	1	2	3	4	5	6	7	8
Defectives	5	3	6	2	7	0	1	2

Compute the control limits and plot the chart for fraction defective (p - chart)

Roll No. | | | | | | | | | | |

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III B.Tech II Semester (SVEC-20) Supplementary Examinations, May-2026

OPTIMIZATION TECHNIQUES

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	State the characteristics and functionalities of objective function in Optimization Technique with suitable example.	8 Marks	L2	CO1	PO1
	b)	Classify the Optimization problem based on the existence of constraints.	6 Marks	L2	CO1	PO1

(OR)

2.	Consider the problem: Minimize $f(x_1, x_2) = (x_1 - 1)^2 + x_2^2$ subject to $g_1(x_1,x_2) = x_1^3 - 2x_2 \leq 0$ $g_2(x_1,x_2) = x_1^3 + 2x_2 \leq 0$ Determine whether the constraint qualification and the Kuhn-Tucker conditions are satisfied at the optimum point.	14 Marks	L3	CO1	PO1 PO2

UNIT-II

3.	Solve the following LPP using Simplex method Maximize $Z = 5x_1 + 3x_2 + 7x_3$ Subject to $x_1 + x_2 + 2x_3 \leq 26$, $3x_1 + 2x_2 + x_3 \leq 26$, $x_1 + x_2 + x_3 \leq 18$, Where $x_1, x_2, x_3 \geq 0$	14 Marks	L3	CO2	PO2 PO3

(OR)

4.	A company wants to produce three products A, B and C for which the mathematical model is given below. The profit/ unit is Rs.4, Rs.6 and Rs. 2 for the product A, B and C respectively under the optimal product mix. Find the optimal solution if the objective function revised to $Z = 2x_1 + 8x_2 + 4x_3$ on the current optimal product mix. Mathematical Model Maximize $Z = 4x_1 + 6x_2 + 2x_3$ Subject to $x_1 + x_2 + x_3 \leq 3$, (Manpower) $x_1 + 4x_2 + 7x_3 \leq 9$, (Material) Where $x_1, x_2, x_3 \geq 0$	14 Marks	L3	CO2	PO2 PO3

UNIT-III

5.	a)	What is a one-dimensional minimization problem? state the limitations of classical methods in solving a one-dimensional minimization problem.	8 Marks	L3	CO3	PO1 PO2 PO3
	b)	Define Fibonacci numbers.	6 Marks	L3	CO3	PO1 PO2 PO3

(OR)

6.	Using **Powel's method,** Minimize $f(X_1, X_2) = X_1 - X_2 + 2X_1^2 + \ + 2X_1X_2 + X_2^2$ with starting point $X_1 = \begin{pmatrix} 0 \\ 0 \end{pmatrix}$.	14 Marks	L3	CO3	PO1 PO2

UNIT-IV

7.	Use Dynamic Programing to solve the following LPP. Maximize $f(x_1,x_2) = 10X_1+8X_2$ Subject to $2X_1 + X_2 \leq 25$ $3X_1 + 2X_2 \leq 45$ $X_2 \leq 10$ $X_1, X_2 \geq 0$	14 Marks	L2	CO4	PO1 PO2

(OR)

8.	Define the following terms. i) Principle of optimality ii) Boundary value problem iii) Monotonic function iv) Separable function	14 Marks	L4	CO4	PO1 PO2 PO3 PO4

UNIT-V

9.	a)	State the significanct importance of Genetic Algorithm.	7 Marks	L2	CO5	PO1
	b)	Explain the Markov Models of Genetic Algorithm in detail.	7 Marks	L2	CO5	PO1 PO2

(OR)

10.	a)	Describe the Basic Differential Evolution algorithm.	7 Marks	L2	CO5	PO1 PO2
	b)	Validate the Ant Colony Optimization algorithm against other evolutionary optimization algorithms.	7 Marks	L2	CO5	PO1 PO2

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-20) Supplementary Examinations, May-2026

REFRIGERATION AND AIR CONDITIONING

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	A simple air cooled system is used for an aeroplane to take a load of 10 tons. Atmospheric temperature and pressure is 25°C and 0.9 atm respectively. Due to ramming the pressure of air is increased from 0.9 atm, to 1 atm. The pressure of air leaving the main compressor is 3.5 atm and its 50% heat is removed in the air-cooled heat exchanger and then it is passed through a evaporator for future cooling. The temperature of air is reduced by 10°C in the evaporator. Lastly the air is passed through cooling turbine and is supplied to the cooling cabin where the pressure is 1.03 atm. Assuming isentropic efficiency of the compressor and turbine are 75% and 70%, find i) Power required to take the load in the cooling cabin ii) COP of the system. The temperature of air leaving the cabin should not exceed 25°C.	7 Marks	L3	CO1	PO1 PO2 PO3
	b)	Define energy efficiency ratio of refrigeration system. How it is applicable for the refrigeration systems.	7 Marks	L2	CO1	PO1 PO2

(OR)

2.	a)	An air refrigerator working on the principle of Bell-Coleman cycle. The air into the compressor is at 1 atm at -10ºC. It is compressed to 10 atm and cooled to 40ºC at the same pressure. It is then expanded to 1 atm and discharged to take cooling load. The air circulation is 1 kg/s. The isentropic efficiency of the compressor = 80% The isentropic efficiency of the expander = 90% Find the following: i) Refrigeration capacity of the system ii) C.O.P of the system Take $\gamma = 1.4$, $C_p = 1.00$ kJ/kg ºC	7 Marks	L3	CO1	PO1 PO2 PO3
	b)	Illustrate the effect of liquid super heating on performance of the Vapor compression Refrigeration system.	7 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Discuss the working principle of tube in tube evaporator with a brief sketch.	7 Marks	L2	CO2	PO1
	b)	Explain construction and working of water cooled condenser with neat sketch.	7 Marks	L2	CO2	PO1

(OR)

4.	a)	Discuss the impact of refrigerants on environmental aspects.	7 Marks	L2	CO2	PO1 PO2 PO3 PO6 PO7
	b)	Illustrate the hydrocarbon refrigerants with some examples.	7 Marks	L2	CO2	PO1

UNIT-III

5.	a)	Illustrate the working principle of ammonia, water, and hydrogen refrigeration system with a neat sketch.	7 Marks	L2	CO3	PO1
	b)	Explain the principle of operation of four shell Li-Br vapor absorption refrigeration systems with a neat sketch.	7 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Discuss the applications of steam jet refrigeration system.	7 Marks	L2	CO3	PO1
	b)	Illustrate the merits and demerits of thermoacoustic Refrigeration system.	7 Marks	L2	CO3	PO1

UNIT-IV

7.		An auditorium of 100 seating capacity of conditioned for the given specifications: Outdoor conditions – 35 ^{o} C and 65% RH Required air inlet conditions – 15 ^{o} C and 40 RH. The required condition is achieved first by cooling and dehumidifying and then by heating. Find the following (a) The capacity of the cooling coil in tons of refrigeration (b) Capacity of the heating coil in kW (c) By-pass factor of the heating coil if the surface temp of the coil is 22 ^{o} C	14 Marks	L4	CO4	PO1 PO2 PO3
		(OR)				
8.	a)	Explain the procedure to draw a grand sensible heat factor line on a psychrometric chart. What do you understand by effective room sensible heat factor?	7 Marks	L2	CO4	PO1
	b)	Give the important characteristic features of adiabatic cooling and humidification process.	7 Marks	L2	CO4	PO1

UNIT-V

9.	a)	Discuss importance of comfort chart to design air conditioning system.	7 Marks	L2	CO5	PO1
	b)	What are the functions of a fan in an air conditioning system?	7 Marks	L2	CO5	PO1
		(OR)				
10.	a)	Describe the different methods of air conditioning duct design.	7 Marks	L2	CO5	PO1
	b)	Discuss the applications air – water heat pump circuits.	7 Marks	L2	CO5	PO1

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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III B.Tech II Semester (SVEC-20) Supplementary Examinations, May-2026

ARTIFICIAL INTELLIGENCE AND ROBOTICS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Discuss in detail about defining AI in the context of the following: i) Thinking humanly ii) Acting humanly iii) Thinking rationally iv) Acting rationally	14 Marks	L2	CO1	PO1 PO2
		(OR)				
2.	a)	Explain the characteristics of model based reflex agents with schematic diagram and suitable examples.	7 Marks	L2	CO1	PO1
	b)	Is AI a science, or is it engineering? Or neither or both? Explain.	7 Marks	L2	CO1	PO1

UNIT-II

3.		Explain the work envelope for different robotic configurations with suitable sketches.	14 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Discuss in detail about Magnetic gripper with neat sketch.	7 Marks	L2	CO2	PO1
	b)	Explain different types of joints with neat sketches.	7 Marks	L2	CO2	PO1

UNIT-III

5.	a)	Write homogenous transformation matrices for rotation in 3D.	7 Marks	L2	CO3	PO1
	b)	Explain the implementation of DH notation for a links coordinate system and joint parameters.	7 Marks	L1	CO3	PO1
		(OR)				
6.		Explain why accurate control of a manipulator requires precise control of each joint. Also, discuss any one approach to compute the dynamics of a robot arm with suitable examples.	14 Marks	L2	CO3	PO1

UNIT-IV

7.	a)	Discuss in detail about joint integrated motion in motion planning.	7 Marks	L1	CO4	PO1 PO2
	b)	Explain the applications of sensors in part inspection with suitable examples and illustrations.	7 Marks	L1	CO4	PO1 PO2
		(OR)				
8.		Discuss the following with suitable sketches: i) Proximity and range sensors ii) Fail safe hazard sensor systems.	14 Marks	L2	CO4	PO1

UNIT-V

9.		Explain the following with suitable illustrations Robot in assembly operations. Robot in arc welding.	14 Marks	L2	CO5	PO1
		(OR)				
10.	a)	Explain briefly about different robotic programming languages.	7 Marks	L2	CO5	PO1

					PO5
b)	Describe the various considerations taken into account for material handling.	7 Marks	L2	CO5	PO1

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Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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III B.Tech II Semester (SVEC-20) Supplementary Examinations, May-2026

NON-CONVENTIONAL ENERGY SOURCES

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the need for energy conversion in detail.	7 Marks	L2	CO1	PO1
	b)	Define Solar Constant and explain the terms Beam and Diffuse Solar radiation.	7 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Write the classification of the energy resources and compare Conventional and Non Conventional energy sources	7 Marks	L2	CO1	PO1
	b)	Discuss Pyrheliometer.	7 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Explain the working of a flat plate collector with their thermal analysis.	7 Marks	L2	CO2	PO1 PO2 PO3
	b)	Discuss the different types of losses in flat plate collector	7 Marks	L2	CO2	PO1 PO2 PO3
		(OR)				
4.	a)	Explain the main components of an Air collector with a neat diagram.	7 Marks	L2	CO2	PO1
	b)	Write the Characteristic Features of aCollector System	7 Marks	L2	CO2	PO1

UNIT-III

5.	a)	Explain the working of solar thermal hot water systems.	10 Marks	L2	CO3	PO1
	b)	What are the methods of storing solar energy?	4 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Explain the working of magneto hydrodynamics system.	7 Marks	L2	CO3	PO1
	b)	Explain Solar Refrigeration	7 Marks	L2	CO3	PO1

UNIT-IV

7.	a)	Discuss the terms, Effect of density, frequency variances, angle of attack, and wind speed	7 Marks	L3	CO4	PO1 PO2 PO3
	b)	Discuss the salient features of Horizontal axis wind turbines and Vertical axis wind turbines.	7 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Classify biogas plants and explain anyone type of biogas plant with neat sketch.	10 Marks	L2	CO4	PO1
	b)	Explain Pyrolysis of Biomass to produce solid, liquid and gaseous fuels	4 Marks	L2	CO4	PO1

UNIT-V

9.	a)	Describe with necessary diagrams, the principle of working of a geothermal power plant.	7 Marks	L2	CO5	PO1
	b)	What are the possible sources of geothermal pollution? How these are avoided?	7 Marks	L2	CO5	PO1 PO7
		(OR)				

10.	a)	Explain Lambert's law, Claude cycle and Anderson cycle	7 Marks	L3	CO5	PO1 PO2 PO3
	b)	Discuss the basic concepts of tidal power.	7 Marks	L2	CO5	PO1

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Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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III B.Tech II Semester (SVEC-20) Supplementary Examinations, May-2026

MICROELECTROMECHANICAL SYSTEMS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Elaborate the working od various sensors used in MEMS.	7 Marks	L2	CO1	PO1
	b)	"Miniaturizations due to MEMS has reduced the size of the devices" Justify the statement with necessary requirements.	7 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Illustrate different materials used in MEMS and also list its mechanical properties.	7 Marks	L2	CO1	PO1
	b)	Differentiate microsystems and MEMS with respect to working and design.	7 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Develop an intelligent sensor system using three sensor and explain its working in detail.	7 Marks	L2	CO1	PO1
	b)	Describe the working of microvalves with neat construction.	7 Marks	L4	CO1	PO3
		(OR)				
4.	a)	Explain the mechanical concepts involved in the design of micro pumps.	7 Marks	L4	CO1	PO3
	b)	With a neat sketch explain the working of micro flow sensors with its applications.	7 Marks	L3	CO1	PO2

UNIT-III

5.	a)	Illustrate the instrumentation involved in the design of piezoelectric accelerometers and explain the need of each component in detail.	7 Marks	L3	CO2	PO3
	b)	Interpret the effects of temperature and damping on the performance of the accelerometer with necessary derivations.	7 Marks	L2	CO2	PO2
		(OR)				
6.	a)	Develop a capacitive micro accelerometer and explain the need of each component in detail with neat sketch.	7 Marks	L3	CO2	PO3
	b)	Construct a piezoresistive micro accelerometer and explain its working in detail with neat sketch.	7 Marks	L4	CO2	PO2

UNIT-IV

7.	a)	Elaborate the step-by-step Czochralski process to prepare silicon substrate for MEMS applications with neat sketch.	7 Marks	L2	CO3	PO5
	b)	Discuss the necessity of packaging techniques in MEMS and describe the objectives and goals of packaging techniques.	7 Marks	L2	CO3	PO2
		(OR)				
8.	a)	"IC technology provides basement for fabrication of MEMS devices" justify the statement with required proofs.	7 Marks	L3	CO3	PO1
	b)	Interpret the step-by-step process of surface micromachining in detail with neat sketch.	7 Marks	L2	CO3	PO1

UNIT-V

9.	a)	Illustrate the applications of MEMS sensors in space with neat sketch.	7 Marks	L3	CO4	PO1
	b)	Describe the implementation of Bio MEMS with its applications with neat construction.	7 Marks	L2	CO4	PO1
		(OR)				
10.	a)	Discuss the importance of RF MEMS in real time applications.	7 Marks	L2	CO4	PO1
	b)	Describe working of optical MEMS in detail with neat sketch.	7 Marks	L2	CO4	PO1

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Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-20) Supplementary Examinations, May-2026

SENSORS AND SIGNAL CONDITIONING

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Differentiate Primary and secondary transducers.	7 Marks	L2	CO1	PO2
	b)	Describe the materials used for RTD's, along with their properties. Sketch their typical characteristics.	7 Marks	L2	CO1	PO2

(OR)

2.	a)	Explain the construction of wire wound strain gauges and derive the expression for the gauge factor.	7 Marks	L2	CO1	PO2
	b)	What are thermistors? Explain their different forms of construction.	7 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Derive the expressions for voltages in the three phases of a synchro transmitter.	7 Marks	L2	CO1	PO2
	b)	Derive the relationship between linear displacement and change in overlapping area of parallel plates of capacitor and prove that sensitivity of the sensor is constant.	7 Marks	L2	CO1	PO6

(OR)

4.	a)	Explain principle and working of Eddy current sensor with neat sketch.	7 Marks	L2	CO1	PO1
	b)	Elaborate the measurement of linear displacement with a reluctance sensor with neat sketch .	7 Marks	L2	CO1	PO6

UNIT-III

5.	a)	Describe the properties of materials used for piezo-electric transducers. Derive expressions for voltage and charge sensitivities.	7 Marks	L2	CO2	PO2
	b)	Select a suitable sensor used for measurement of temperature range of 1200ºC to 3500ºC and explain its working.	7 Marks	L2	CO2	PO2

(OR)

6.	a)	Explain the principle of working and constructional details of a photo-voltaic cell. Explain, why is it useful for space applications.	7 Marks	L3	CO2	PO3
	b)	Distinguish infrared and radiation pyrometers with respect to construction and working principles.	7 Marks	L2	CO2	PO2

UNIT-IV

7.	a)	Select an appropriate non contact sensor to measure liquid level. Justify your sensor selection and explain its principle using a neat sketch.	7 Marks	L2	CO3	PO5
	b)	Describe how fibre optic transducers are used for measurement of liquid level.	7 Marks	L2	CO3	PO2

(OR)

8.	a)	Select a suitable transducer for measurement of speed and explain its operation.	7 Marks	L2	CO3	PO5
	b)	Demonstrate how smart sensors are used for measurement of physical parameters using suitable example.	7 Marks	L2	CO3	PO6

UNIT-V

9.	a)	Derive the expressions for bridge sensitivity factor for Blumlein bridge having inductors in push pull configuration.	7 Marks	L3	CO4	PO2
	b)	Describe the functioning of a carrier amplifier using an operational amplifier. Sketch the relevant waveforms.	7 Marks	L2	CO4	PO1

(OR)

10.	a)	Write short notes on A.C bridges using Push-pull transducers.	7 Marks	L2	CO4	PO2
	b)	Derive the expressions for output voltage of a instrumentation amplifier in terms of the two input voltages.	7 Marks	L3	CO4	PO2

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-20) Supplementary Examinations, May-2026

IOT ARCHITECTURE AND PROTOCOLS

[Computer Science and Systems Engineering, Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	With neat sketch, explain ETSI M2M Functional Architecture.	7 Marks	L3	CO1	PO2
	b)	Explain two or three communications technologies used in distributed M2M applications and the IoT.	7 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Explain in detail of the following: i) Bluetooth Low Energy ii) 6LoWPAN iii) RPL	7 Marks	L1	CO1	PO1
	b)	Illustrate the key characteristics of M2M data management.	7 Marks	L4	CO1	PO2

UNIT-II

3.	a)	Illustrate how Security Functional Group ensures the security and privacy of an IoT system.	7 Marks	L4	CO2	PO2
	b)	With an example, explain the how information handling is carried in an IoT system.	7 Marks	L4	CO2	PO2
		(OR)				
4.	a)	Apply deployment and operational view features, explain the functioning of parking lot application.	7 Marks	L3	CO2	PO2
	b)	Explain about nonfunctional requirements that need to be satisfied for every application.	7 Marks	L2	CO2	PO1

UNIT-III

5.	a)	Illustrate LoRaWAN layers.	7 Marks	L4	CO3	PO2
	b)	Explain in detail about LoRaWAN MAC frame format.	7 Marks	L2	CO3	PO1
		(OR)				
6.	a)	With a neat sketch explain functioning of LoRaWAN architecture.	7 Marks	L3	CO3	PO2
	b)	Explain security measures in LoRaWAN.	7 Marks	L2	CO3	PO1

UNIT-IV

7.	a)	Explain MQTT publish/subscribe framework.	7 Marks	L2	CO4	PO1
	b)	Explain categories of MQTT message types.	7 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Explain MQTT QoS flows.	7 Marks	L1	CO4	PO1
	b)	Compare CoAP and MQTT.	7 Marks	L2	CO4	PO1

UNIT-V

9.	a)	With a neat sketch, explain the infrastructure delivering metering data for billing purposes in smart metering.	7 Marks	L3	CO5	PO2
	b)	With a neat diagram, explain energy management system in smart house application.	7 Marks	L3	CO5	PO2
		(OR)				
10.	a)	Explain about functioning of Smart House integration with enterprise services.	7 Marks	L2	CO5	PO2
	b)	Explain IEEE 802.15.4 Networks security considerations.	7 Marks	L2	CO5	PO3

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-20) Supplementary Examinations, May-2026

INFORMATION SECURITY

[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	List and explain the security services provided by X.800.	7 Marks	L2	CO1	PO5
	b)	Explain the operation of Proactive Worm Containment (PWC) scheme in addressing the threat of worms that spread rapidly.	7 Marks	L2	CO2	PO5
		(OR)				
2.	a)	List and briefly define categories of security mechanisms.	7 Marks	L2	CO1	PO2
	b)	Explain the network based worm defense with an example.	7 Marks	L2	CO2	PO2

UNIT-II

3.	a)	Discuss the services provided by the SSL Record Protocol for SSL connections.	7 Marks	L3	CO3	PO2
	b)	Explain the security protocols and algorithms that support IEEE 802.11i services	7 Marks	L2	CO3	PO5
		(OR)				
4.	a)	List and explain the TLS Alert Codes defined in SSLv3 with the exception of no_certificate.	7 Marks	L4	CO3	PO2
	b)	Explain the IEEE 802.11i keys for Data Confidentiality and Integrity Protocols.	7 Marks	L2	CO3	PO2

UNIT-III

5.	a)	List the Multipurpose Internet Mail Extension (MIME) content types specified in RFC 2046.	7 Marks	L2	CO4	PO2
	b)	Describe the IPsec Architecture for IP Security Association (SA) with a neat diagram.	7 Marks	L3	CO4	PO5
		(OR)				
6.	a)	Explain the functional flow of the elements in DKIM strategy.	7 Marks	L2	CO4	PO1
	b)	Discuss the features of Internet Key Exchange (IKE) key determination algorithm.	7 Marks	L2	CO4	PO1

UNIT-IV

7.	a)	Discuss the Intrusion techniques for learning passwords.	7 Marks	L3	CO5	PO5
	b)	Explain the virtual private network (VPN) Security Scenario in a distributed computing environment.	7 Marks	L4	CO5	PO2
		(OR)				
8.	a)	Explain the measures that are used for intrusion detection.	7 Marks	L2	CO5	PO3
	b)	Write short notes on the following: Packet filtering firewall and Stateful inspection firewall.	7 Marks	L2	CO5	PO2

UNIT-V

9.	a)	Explain the procedure to encrypt a file using True Crypt.	7 Marks	L2	CO6	PO1
	b)	Discuss the procedure to encrypt an email in MAC OS X.	7 Marks	L4	CO6	PO2
		(OR)				
10.	a)	Explain the procedure to protect users from phishing attacks by deploying Spoof Guard?	7 Marks	L2	CO6	PO1
	b)	Illustrate the steps involved in the installation of GPG Mail.	7 Marks	L4	CO6	PO2

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, May – 2026

PULSE AND DIGITAL CIRCUITS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	In an RC low pass circuit R=2 kΩ and C=1 μF. A square with half period of 5 μSec. is applied as input to this circuit. Determine the output waveform.	CO2	7 Marks
	b)	What is the function of an attenuator and explain any one application of it?	CO4	7 Marks
		(OR)		
2	a)	Prove that an RC circuit behaves as a good integrator if RC >> 15T. Where T is the period of an input ' $E_m \sin\omega t$ '.	CO2	6 Marks
	b)	A symmetrical square wave peak-to-peak amplitude 10 V and frequency 10 KHz is applied to a High pass RC circuit. Sketch the input and output waveforms to scale and derive the necessary output voltage expressions.	CO4	8 Marks

UNIT-II

3	a)	Derive the steady state response of clamping circuit for a square wave input in which the response of the signal source is taken into account.	CO2	6 Marks
	b)	Draw a typical circuit for clipping at two independent levels. Explain its operation and sketch the transfer characteristics.	CO1	8 Marks
		(OR)		
4	a)	Design a Clipper circuit for a sinusoidal input of 50V(P-P) which produces an output with double sided clipper with VR_1 = +7V and VR_2 = -10V and assume diodes are ideal.	CO3	8 Marks
	b)	Draw the basic circuit diagram of positive peak clamper circuit and explain its operation.	CO2	6 Marks

UNIT-III

5	a)	Design a transistor switch with the following data: V_{CC} = 12 V, V_{BB} = 6 V; Ic(sat) = 10mA; h_{FE}(min) = 40. Assume the junction voltages as V_{CE}(sat) = 0.3 V and V_{BE}(sat) = 0.7 V.	CO3	7 Marks
	b)	With the help of a neat circuit diagram and waveforms explain the working of Collector-coupled astable multivibrator.	CO2	7 Marks
		(OR)		
6	a)	Derive the expressions for UTP and LTP for Schmitt trigger circuit with equivalent circuit diagrams and waveforms.	CO2	8 Marks
	b)	Find the ratio V_{CC} / V, if a voltage-to-frequency converter generates oscillations of frequency twice of that when V=V_{CC}.	CO5	6 Marks

UNIT-IV

7	a)	Explain the basic principles of Miller and bootstrap time – base generators.	CO1	7 Marks
	b)	Write important applications of time-base circuits. With reference to time base circuits define the following terms: i) Fly back time. ii) Transmission error.	CO2	7 Marks
		(OR)		
8	a)	A transistor bootstrap ramp generator is to produce a 15 V, 5 msec output	CO4	10 Marks

		to a 2 KΩ load resistor. The ramp is to be linear within 2%. Design a suitable circuit using Vcc = 22V, $-V_{EE}$ = -22 V and transistor with $h_{fe(min)}$ = 25. The input pulse has an amplitude of -5V, pulse width = 5 msec and space width= 2.5 msec.		
	b)	What are the advantages of Miller integrator over bootstrap sweet circuit?	CO1	4 Marks

UNIT-V

9	a)	Consider the four-diode sampling gate circuit with $R_L = R_C$ = 100 KΩ, R_2 = 2 KΩ and R_f = 50 Ω. For Vs = 25 V, compute A, V_{min}, and $(V_C)_{min}$. Also compute $(V_n)_{min}$ for $V = V_{min}$.	CO4	8 Marks
	b)	Draw the circuit diagram of two-input Schottky TTL NAND gate and explain its operation.	CO1	6 Marks
		(OR)		
10	a)	Draw and explain Six-diode Bidirectional sampling gate.	CO1	7 Marks
	b)	Draw and explain CMOS Inverter.	CO1	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, May– 2026

DATABASE MANAGEMENT SYSTEMS

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Differentiate logical and physical data independence.	CO1	7 Marks
	b)	What are the different levels of abstraction of a DBMS? Briefly explain each of them.	CO1	7 Marks
		(OR)		
2	a)	What is an entity type and an entity set? Explain the difference between a relationship instance and a relationship type.	CO1	7 Marks
	b)	Draw an E-R diagram for banking system. Assume your own entities (Minimum of 5 entities), attributes and relations, mention cardinality ratio.	CO3	7 Marks

UNIT-II

3	a)	With an example, explain clearly JOIN and UNION operations in relational algebra. Bring out the difference between NATURAL JOIN and OUTER JOIN.	CO1	7 Marks
	b)	Explain the aggregate functions used in relational algebra.	CO1	7 Marks
		(OR)		
4	a)	Discuss the various update operations on relations and the types of integrity constraints that must be checked for each update operation.	CO1	7 Marks
	b)	What are Integrity Constraints? When Integrity Constraints are enforced by a DBMS? Discuss.	CO1	7 Marks

UNIT-III

5	a)	Why is accessing a disk block expensive? Discuss the time components involved in accessing a disk block.	CO5	7 Marks
	b)	Show the steps necessary to compile an embedded SQL program.	CO5	7 Marks
		(OR)		
6	a)	Describe domain relational calculus and Tuple relational calculus with suitable examples	CO2	7 Marks
	b)	Solve the following queries in SQL. i) To fetch ALTERNATE records from a table. ii) Find the 3rd MAX salary in the emp table. iii) How to delete duplicate rows in a table? iv) Count MGR and their salary in emp table.	CO5	7 Marks

UNIT-IV

7	a)	What is Normalization? Explain 1NF, 2NF, 3NF and BCNF with suitable example.	CO2	7 Marks
	b)	Discuss under what conditions is it less expensive to avoid deadlock than to allow deadlocks to occur and then to detect them.	CO4	7 Marks
		(OR)		
8	a)	Differentiate functional dependency and multi valued dependency with example.	CO3	7 Marks
	b)	Differentiate two phase commit and three phase commit protocol.	CO2	7 Marks

UNIT-V

9	a)	In detail summarize three kinds of database tuning. i) Recovery interval. ii) Assigning parallelism. iii) Network protocols to communicate with database consumers.	CO3	7 Marks
	b)	Demonstrate on: i) Spatial and multimedia databases. ii) Mobile and web databases.	CO3	7 Marks

(OR)

10	a)	Illustrate indexing and hashing techniques with suitable examples.	CO5	7 Marks
	b)	Briefly explain ACID property with an example.	CO1	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, May– 2026

JAVA PROGRAMMING

[Computer Science and Engineering, Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the OOP paradigm.	CO1	7 Marks
	b)	Develop a Java program that read an integer between 0 and 1000 and adds all the digits in the integer.	CO3	7 Marks
		(OR)		
2	a)	Explain the access control defined in Java.	CO1	7 Marks
	b)	Develop a Java program using command line arguments and explain.	CO3	7 Marks

UNIT-II

3	a)	What is an interface? In what way it is different from class? Explain the similarities between classes and interfaces.	CO1	7 Marks
	b)	Assume a class MotorVehicle as described below: ***Data members***: i) modelName ii) modelNumber iii) modelPrice. ***Methods***: i)display() method to display the name, price and model number. Define another class named Car that inherits the class MotorVehicle and has the following: ***Data members***: i) discountRate. ***Methods***: i) display() method to display the Car name, Car model number, Car price and the discount rate. ii) discount method to compute discount. Create the classes MotorVehicle and Car with suitable Constructors and implement them.	CO6	7 Marks
		(OR)		
4		Design an interface with a method reversal. This method takes a string as its input and returns the reversed string. Create a class StringReversal and implement the method.	CO3	14 Marks

UNIT-III

5	a)	Summarize the concepts of exception handling.	CO1	7 Marks
	b)	Discuss Termination model and Presumptive models of exception handling.	CO4	7 Marks
		(OR)		
6		What is multithreading? Give an example of an application that needs multithreading.	CO1	14 Marks

UNIT-IV

7	a)	Create an Applet which gains focus shows “focus gained” in the status bar.	CO5	7 Marks
	b)	Summarize the following. i) Limitations of AWT. ii) Adapter classes. iii) Lists and choice.	CO4	7 Marks
		(OR)		
8	a)	Explain in detail about Java Collection Framework.	CO1	11 Marks
	b)	Explain Hash table with syntax.	CO1	3 Marks

UNIT-V

9	a)	List and explain the different situations in which the item Event is generated? Develop the event handler for the item Event.	CO2, CO4	7 Marks
	b)	What are the Servlet Context and ServletConfig objects? What are Servlet environment objects?	CO1	7 Marks

(OR)

10	List the different methods of Java Servlet. What are the functions of Servlet container?	CO2	14 Marks

CODE No.: 16BT41203 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, May – 2026

SOFTWARE ENGINEERING
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Explain the Nature of Software by defining the software and its application domains.	CO4	14 Marks
		(OR)		
2	a)	Explain briefly about scrum process model.	CO1	7 Marks
	b)	Explain in detail about software myths.	CO1	7 Marks

UNIT-II

3		Define Requirement Engineering. Categorize seven distinction tasks to fulfill the needs of the project.	CO2	14 Marks
		(OR)		
4	a)	Discuss about: i) Elicitation. ii) Validation. iii) Management. iv) Documents.	CO5	10 Marks
	b)	Explain different types of checks should be carried out on the requirements in the requirements document.	CO4	4 Marks

UNIT-III

5		Compare the design steps involved in the transform mapping and transaction mapping.	CO4	14 Marks
		(OR)		
6	a)	Write about size-oriented and function-oriented metrics.	CO3	7 Marks
	b)	Explain in detail about the Design Model.	CO3	7 Marks

UNIT-IV

7		What is black box testing? Explain the different types of black box testing strategies with suitable examples.	CO1	14 Marks
		(OR)		
8	a)	Explain about test strategies for conventional software.	CO5	7 Marks
	b)	What is cyclomatic complexity? How to construct a flow graph for a program and compute cyclomatic complexity?	CO5	7 Marks

UNIT-V

9	a)	Explain about software reliability.	CO6	7 Marks
	b)	Distinguish between forward engineering and reverse engineering.	CO6	7 Marks
		(OR)		
10	a)	List out the targeted quality factors in software quality factors.	CO1	4 Marks
	b)	Discuss the ten guidelines for conducting formal technical Reviews.	CO5	10 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, May-2026

DIGITAL SIGNAL PROCESSING

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Consider a discrete – time system with input $x(n)$ and output $y(n)$ related by $y(n) = \sum_{k=n-n_0}^{n+n_0} x(k)$. Where n_0 is a finite positive integer. CO4 7 Marks
   i) Is this system linear?
   ii) Is this system time-invariant?
   iii) If x(n) is known to be bounded by a finite integer B_x, it can be shown that y(n) is bounded by a finite number C. We conclude that the given system is stable. Express C interms of B_x and n_0.

   b) Find the response of a system described by the difference equation $y(n) + 2\,y(n-1) + y(n-2) = x(n) + x(n-1)$ for input $x(n) = (0.5)^n\, u(n)$ with initial conditions $y(-1) = y(-2) = 1$. CO2 7 Marks

(OR)

2. a) Given the sequence x(n)=(6-n)[u(n)-u(n-6)] make a sketch of CO4 7 Marks
   i) $Y(n) = x(4-n)$.
   ii) $Y(n) = x(n^2 - 2n + 1)$.

   b) Find the DTFT of the sequence $\boldsymbol{x(n) = \cos(n\pi/3)u(n)}$. CO2 7 Marks

UNIT-II

3. Using FFT algorithm compute the output of a linear filter described by $h(n) = \{1, 2, 3, 2, 1\}$ and $x(n) = \{1, 1, 1, 1\}$. CO2 14 Marks

(OR)

4. a) Compute the N-point DFT of the length N-sequence CO2 7 Marks
   $x(n) = \cos\left(\frac{2\pi rn}{N}\right)$; $0 \le n \le N-1$; $0 \le r \le N-1$.

   b) Explain the inverse FFT algorithm using DIF algorithm to compute inverse DFT for $N = 8$. Draw the signal flow graph for the same. CO2 7 Marks

UNIT-III

5. a) Derive the relation between analog and digital frequency in bilinear transformation. CO2 7 Marks

   b) Convert the following analog filter transfer function using backward difference method, Impulse invariant method and Bilinear Transformation method. $H(s) = 1/(s + 0.2)$, consider $T = 1$ Sec. CO5 7 Marks

(OR)

6. a) Design an analog Butterworth filter that has a -2db pass band attenuation at a frequency of 20 rad/sec and at least -10dB stop band attenuation at 30 rad/sec (assume $\Omega c = 21.3868$ rad/sec). CO3 8 Marks

   b) Derive an expression for order of the Chebyshev analog prototype filter. CO2 6 Marks

UNIT-IV

7.	a)	Derive the frequency response of linear phase FIR filters when impulse response is symmetric with centre of symmetry at $(N - 1)/2$ and N is odd.	CO2	7 Marks
	b)	Explain cascade-form structure and obtain the cascade-form realization of the given FIR filter system function. $H(Z) = 1 + \frac{6}{5}Z^{-1} + \frac{7}{5}Z^{-2} + \frac{26}{25}Z^{-3} + \frac{1}{5}Z^{-4}$.	CO5	7 Marks

(OR)

8.	a)	Using a rectangular window, design LPF with a pass-band gain of unity, cut-off frequency of 1000Hz and working at a sampling frequency of 5KHz. Take the length of the impulse response as 7.	CO3	8 Marks
	b)	Compare IIR and FIR filters.	CO1	6 Marks

UNIT-V

9.	a)	List the relative merits and demerits of RISC and CISC processors.	CO1	7 Marks
	b)	Explain about special addressing modes in detail.	CO1	7 Marks

(OR)

10.	a)	Write a short note on Memory Access schemes in P-DSPs.	CO1	7 Marks
	b)	Write the salient features of TMS320C6X family of digital signal processor.	CO1	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, May-2026

LIGHT WAVE COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What are the various elements of an optical communication system? Explain each element in brief.	CO1	7 Marks
	b)	What are the different fiber materials used in optical communication? Explain.	CO1	7 Marks

(OR)

2.	a)	Discuss briefly the advantages of optical fiber communication.	CO1	7 Marks
	b)	Discuss the total internal reflection in OFC using Snell's law.	CO2	7 Marks

UNIT-II

3.	a)	What are different types of bending losses in optical fiber?	CO2	8 Marks
	b)	An 8km optical link consists of multimode step index fiber with a core refractive index of 1.45 and relative refractive index difference of 1.2%. Estimate: i) The delay difference between the slowest and fastest modes at the fiber output. ii) The rms pulse broadening due to inter modal dispersion.	CO2	6 Marks

(OR)

4.	a)	Explain the pulse broadening due to inter model dispersion in different types of optical fiber.	CO3	7 Marks
	b)	Explain the intra modal dispersion effect in optical fiber.	CO2	7 Marks

UNIT-III

5.	a)	Explain the various measures of efficiency in PIN photodiode and briefly explain the working principle of PIN diode.	CO3	7 Marks
	b)	The quantum efficiency of an In GaAs PIN diode is 80% in the wave length range between 1300nm and 1600nm. Compute the range of responsivity of the PIN diode in the specified wavelength range.	CO3	7 Marks

(OR)

6.	a)	Explain the working of Avalanche photodiode.	CO4	7 Marks
	b)	Draw and explain the output patterns of source to fiber power launching of LED.	CO5	7 Marks

UNIT-IV

7.	a)	What is meant by equilibrium Numerical aperture? Explain.	CO5	7 Marks
	b)	Explain LED Coupling to single mode fibers.	CO6	7 Marks

(OR)

8.	a)	Describe lensing mechanisms to improve coupling efficiency between a source and a fiber.	CO4	7 Marks
	b)	Write about laser diode to fiber coupling.	CO5	7 Marks

UNIT-V

9.	a)	Describe the eye pattern analysis for assessing the performance of a digital fiber optical link.	CO4	7 Marks
	b)	Discuss various line codes which are used in optical links.	CO5	7 Marks
		(OR)		
10.	a)	What are the advantages of the WDM?	CO6	7 Marks
	b)	Explain the technique of insertion –loss method to measure attenuation.	CO5	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations, May – 2026

DIGITAL LOGIC DESIGN

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Obtain complement of the Boolean Expression A′ B + A′BC′ + A′BCD.	6 Marks	L3	CO1	PO2
	b)	Convert the following numbers with the indicated bases to decimal: i) $(435)_8$ ii) $(345)_6$ iii) $(10110110)_2$	6 Marks	L3	CO1	PO1
		(OR)				
2.	a)	Each of the following arithmetic operations is correct in at least one number system. Determine the bases in each operation: i) 41/3 = 13 ii) 23 + 44 + 14 + 32 = 223	6 Marks	L3	CO1	PO1
	b)	Prove the following Boolean theorems: i) AB+A′C = (A+C)(A′+B) . ii) AB+A′C+BC = AB+A′C.	6 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Simplify the following Boolean function using K-Map method. F (w, x, y, z) = Σ (0, 2, 4, 5, 6, 7, 8, 10, 13, 15).	6 Marks	L4	CO1	PO2
	b)	Implement AND, OR, NOT gates using Universal gates.	6 Marks	L3	CO1	PO2
		(OR)				
4.	a)	Find the minterms of the following Boolean expressions by first plotting each function ina map: $xy + yz + xy'z$.	6 Marks	L4	CO1	PO2
	b)	Minimize the expression using K-map and realize using only NOR gates. F (A, B, C, D) = Π (1, 4, 5, 11, 12, 14) and don't care conditions d (A, B, C, D) = (6, 7, 15)	6 Marks	L4	CO1	PO3

UNIT-III

5.	a)	With the help of a circuit diagram, explain the operation of series full adder and compare its performance with parallel adder.	6 Marks	L4	CO2	PO2
	b)	What is a multiplexer? Use a 4:1 multiplexer and a minimum number of external gates to realize the following Boolean function. F (w, x, y, z) = ∑ m (3, 4, 5, 7, 10, 14) + ∑ d (1, 6, 15)	6 Marks	L4	CO2	PO5
		(OR)				
6.	a)	Realize a full subtract or using MUX.	4 Marks	L4	CO2	PO4
	b)	Draw and explain 4-bit shift register with an example.	8 Marks	L2	CO2	PO1

UNIT-IV

7.	a)	Explain about the realization of SR flip-flop, JK flip-flop using D flip-flop.	6 Marks	L2	CO2	PO1
	b)	Design a 2-bit x 3-bit Binary Multiplier.	6 Marks	L4	CO2	PO3
		(OR)				

8.	a)	Design decade Johnson counter and explain its operation.	6 Marks	L4	CO2	PO3
	b)	Define excitation table. Explain D flip-flop and obtain the state equation, the state diagram, state table and excitation table of the same.	6 Marks	L2	CO2	PO1

UNIT-V

9.		A combinational circuit is defined by the functions F_1 (A, B, C) = Σ(3, 5, 6, 7) F_2 (A, B, C) = Σ(0, 2, 4, 7) Implement the circuit with a PLA having 3-inputs, four product terms and two outputs.	12 Marks	L4	CO2	PO4

(OR)

10	a)	Implement F (a, b, c, d) = Σ m(0, 1, 2, 3, 6, 9, 11) using PAL.	9 Marks	L4	CO2	PO4
.	b)	Write short notes on combinational PLDs.	3 Marks	L2	CO2	PO1

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Supplementary Examinations, May – 2026

TRANSFORMATION TECHNIQUES AND LINEAR ALGEBRA

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Business Systems, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Science), Computer Science and Engineering (Artificial Intelligence and Machine Learning), Computer Science and Engineering (Internet of Things), Computer Science and Engineering (Cyber Security) Computer Science and Design]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Find the Fourier series of the function $f(x) = (\pi - x)^2$ in $(0, 2\pi)$.	7 Marks	L1	CO1	PO1
	b)	Establish the Fourier cosine transform for $f(x) = \frac{1}{\sqrt{x}}$.	7 Marks	L1	CO1	PO2
		(OR)				
2.		Show that $x = \frac{\pi}{2} - \frac{4}{\pi}\left[\frac{\cos x}{1^2} + \frac{\cos 3x}{3^2} + \frac{\cos 5x}{5^2} + \ldots\right]$ in the interval $(0, \pi)$.	14 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Find the Laplace transform of $f(t)$, $where$ $f(t) = \left(\sqrt{t} + \frac{1}{\sqrt{t}}\right)^3$.	7 Marks	L1	CO2	PO1
	b)	Determine the Laplace transform of $\int_0^t t e^{-t} \sin 4t$.	7 Marks	L3	CO2	PO1
		(OR)				
4.	a)	Using Laplace transforms, evaluate $\int_0^\infty \frac{\cos at - \cos bt}{t}\, dt$.	7 Marks	L3	CO2	PO2
	b)	Evaluate $L\{t \sin 3t \cos 2t\}$.	7 Marks	L5	CO2	PO1

UNIT-III

5.		Solve the differential equation $\frac{d^2x}{dt^2} + 2\frac{dx}{dt} + 2x = 5\sin t$, given that $x(0) = 0$, $x'(0) = 0$ using Laplace transforms.	14 Marks	L3	CO2	PO2
		(OR)				
6.	a)	Find the inverse Laplace transform of $\log\left(\frac{s^2+4}{s^2+9}\right)$.	7 Marks	L1	CO2	PO1
	b)	Evaluate $L^{-1}\left[\frac{1}{s^2(s+1)^2}\right]$ using convolution theorem.	7 Marks	L5	CO2	PO2

UNIT-IV

7.		Determine diagonal matrix orthogonally similar to the real symmetric matrix $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 6 \\ 3 & 6 & 9 \end{bmatrix}$.	14 Marks	L3	CO2	PO2

(OR)

8.	a)	Find the rank of matrix $A = \begin{pmatrix} 2 & -2 & 0 & 6 \\ 4 & 2 & 0 & 2 \\ 1 & -1 & 0 & 3 \\ 1 & -2 & 1 & 2 \end{pmatrix}$ by reducing it into echelon form.	7 Marks	L1	CO3	PO1
	b)	Determine the Eigen values and Eigen vectors of the matrix $A = \begin{bmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & 1 & -3 \end{bmatrix}$.	7 Marks	L3	CO3	PO2

UNIT-V

9.	a)	Check whether the set of vectors $\begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 1 \\ 1 \\ 0 \end{bmatrix}$ *and* $\begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$ is linearly independent or not.	7 Marks	L2	CO4	PO1
	b)	Show that the transformation $T: R^2 \to R^3$ *defined by* $T\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -y \\ x+2y \\ 3x-4y \end{bmatrix}$ is linear.	7 Marks	L2	CO4	PO1

(OR)

10.	a)	Examine whether $S = \left\{ \begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix}, \begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}, \begin{bmatrix} 1 & 1 \\ 0 & -1 \end{bmatrix} \right\}$ forms a basis for the vector space for M_{22} or not.	7 Marks	L4	CO4	PO2
	b)	Show that the linear transformation $T: R^2 \to P_1$ defined by $T\begin{bmatrix} a \\ b \end{bmatrix} = a + (a+b)x$ is one-to-one and onto, where P_1 is a vector space of all linear polynomial over real field.	7 Marks	L2	CO4	PO1

CODE No.: 20BT5HS01 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-20) Supplementary Examinations, May-2026

ORGANIZATIONAL BEHAVIOUR

[Civil Engineering, Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	Explain the Organizational Behavior in detail.	14 Marks	L2	CO1	PO1
	(OR)				
2.	Discuss the challenges of OB.	14 Marks	L2	CO1	PO1

UNIT-II

3.	Describe the values and attitudes in individual behavior.	14 Marks	L2	CO2	PO1
	(OR)				
4.	Examine the importance of personality theories.	14 Marks	L3	CO1	PO1

UNIT-III

5.	Evaluate the importance of interpersonal perception.	14 Marks	L5	CO3	PO9
	(OR)				
6.	Interpret the stages of group formation.	14 Marks	L2	CO3	PO3

UNIT-IV

7.	Contrast between behavioral and modern theories.	14 Marks	L2	CO4	PO2
	(OR)				
8.	Describe the characteristics of good leader.	14 Marks	L2	CO4	PO12

UNIT-V

9.	Summarize the nature of work change.	14 Marks	L2	CO5	PO2
	(OR)				
10.	Determine the organizational development interventions.	14 Marks	L3	CO5	PO1

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Supplementary Examinations, May – 2026

ELECTRICAL CIRCUITS

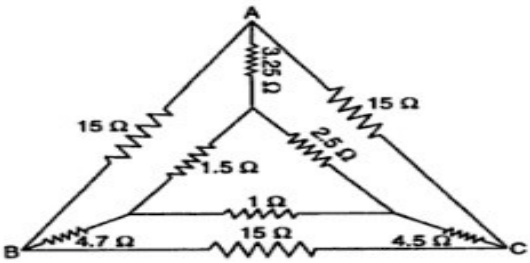
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

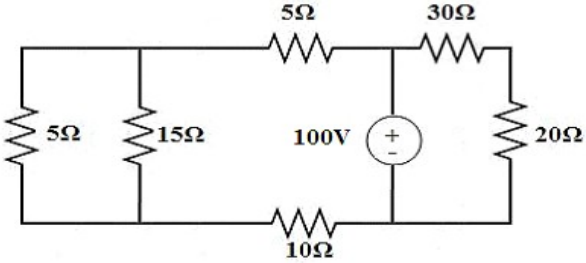
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Find the resistance between the points B and C of the circuit shown in figure. 7 Marks L3 CO1 PO5

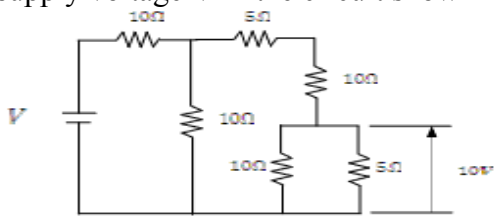


b) Find the current in each branch of the circuit shown in figure using current division method. 7 Marks L3 CO1 PO2

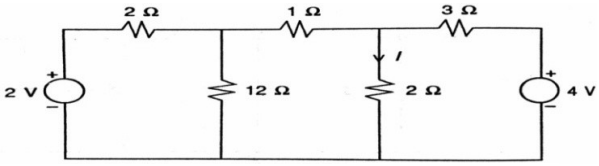


(OR)

2. a) Calculate the supply voltage V in the circuit shown in figure. 7 Marks L3 CO1 PO2

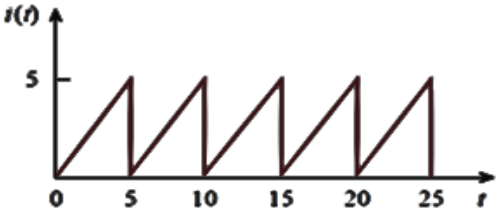


b) Determine the current I of the circuit shown in figure using mesh analysis. 7 Marks L3 CO1 PO4

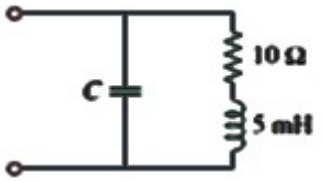


UNIT-II

3. a) Determine the effective value of the wave form shown in figure. 7 Marks L3 CO2 PO2

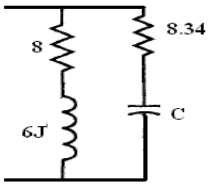


b) An industrial load is modeled as a series combination of an inductor and a resistance as shown in figure. Calculate the value of a capacitor C across the series combination so that the net impedance is resistive at a frequency of 2 kHz. 7 Marks L3 CO2 PO6

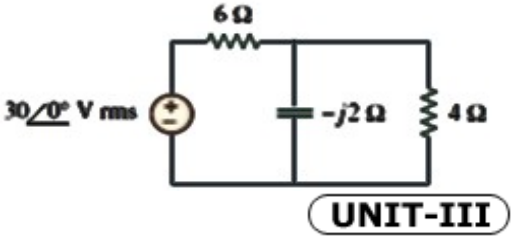


(OR)

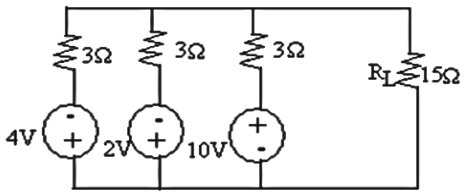
4. a) Design the capacitance C, which results in resonance at 5000 rad/sec for the circuit shown in figure. 7 Marks L3 CO2 PO3



b) Determine the power delivered by the source and power factor of the entire circuit shown in figure. 7 Marks L3 CO2 PO2



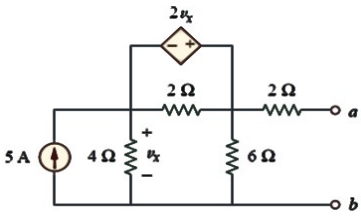
5. a) Find the current through load resistance R_L of the circuit shown in figure and also find the voltage drop across load using Millman's theorem. 7 Marks L3 CO3 PO5



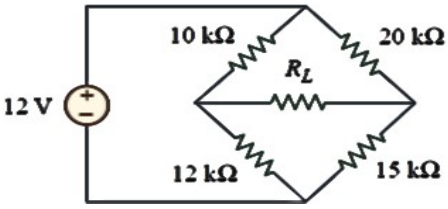
b) State and explain Maximum power transfer theorem and derive the necessary conditions for maximum power transfer for a DC excitations. 7 Marks L3 CO3 PO1

(OR)

6. a) Find the Thevenin's equivalent circuit of the network shown in figure. 7 Marks L4 CO3 PO5



b) Consider the circuit shown in figure, verify the reciprocity theorem if resistor R_L replaced by a zero resistance ammeter and determine the ammeter reading. 7 Marks L3 CO3 PO2

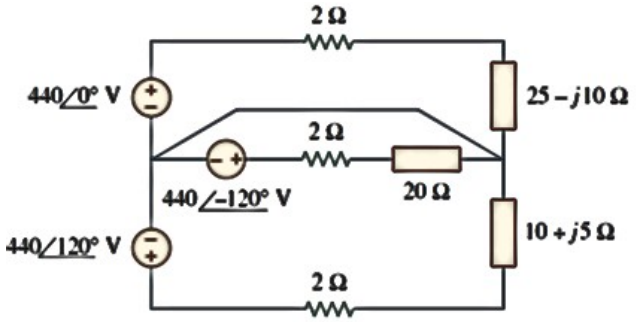


UNIT-IV

7.	a)	The unbalanced Y-load having impedances Z_A = 15 Ω, Z_B = (10+j5) Ω and Z_C = (6-j8) Ω respectively supplied with balanced voltages of 100 V. Calculate the line currents and the neutral current. Take acb sequence.	7 Marks	L3	CO4	PO2
	b)	Prove that two watt meters are sufficient to measure three phase power in unbalanced system.	7 Marks	L2	CO4	PO2

(OR)

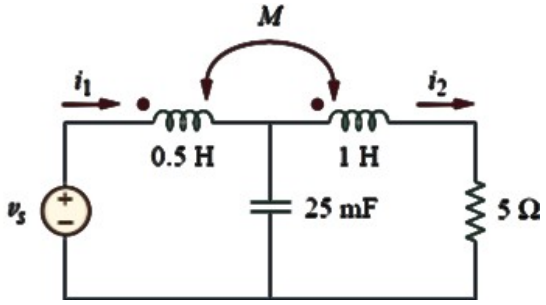
8.	a)	Determine the current in the neutral line of the circuit shown in figure.	7 Marks	L3	CO4	PO2



	b)	Three-phase balanced system with a line voltage of 202 V rms feeds a delta-connected load with each phase impedance is $25\angle 60^0$ Ω . i) Find the line current. ii) Determine the total power supplied to the load using two wattmeters connected to the A and C lines.	7 Marks	L3	CO4	PO2

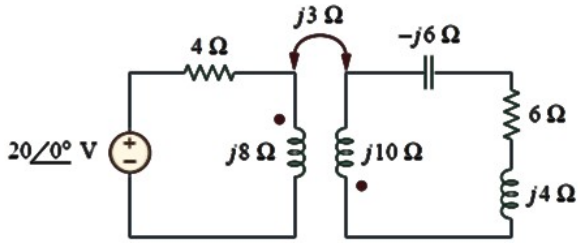
UNIT-V

9.	a)	Derive the expression for co-efficient of coupling in coupled circuit.	7 Marks	L2	CO5	PO1
	b)	If M=0.2 H and v= 120 cos 10t V in the circuit shown in figure, find i_1 and i_2. Calculate the energy stored in the coupled coils at t =15 ms.	7 Marks	L3	CO5	PO2



(OR)

10.	a)	Prove that M12=M21 in coupled coils and derive the expression of the co-efficient of coupling in two coupled coils.	7 Marks	L2	CO5	PO2
	b)	Find the input impedance of the circuit shown in figure and the current from the voltage source.	7 Marks	L3	CO5	PO2



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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-20) Supplementary Examinations, May– 2026

OPERATING SYSTEMS

[Computer Science and Engineering, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Science]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Draw a neat sketch of Process control block and explain the significance of each block. 7 Marks L2 CO1 PO1

b) Consider the following set of processes that arrive at time 0 with the length of the CPU burst time given in milliseconds. 7 Marks L3 CO1 PO3

Process	Burst Time
P1	12
P2	8
P3	3
P4	2

Draw the Gantt chart using FCFS, SJF and Round Robin Scheduling Algorithm. Calculate the average waiting time in both cases.
Note: Take time quantum = 3ms.

(OR)

2. a) Explain Shared Memory approach of Inter process Communication with an example. 7 Marks L2 CO1 PO2

b) Enumerate the significance of System calls in Operating System with its types. 7 Marks L2 CO1 PO1

UNIT-II

3. a) With pseudo code, present the Peterson's solution for critical section problem. 7 Marks L4 CO2 PO3

b) Explain how Dinning philosopher problem can be solved without deadlock using semaphores. 7 Marks L2 CO2 PO5

(OR)

4. Consider the following snapshot of a system: 14 Marks L3 CO3 PO3

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P_0	0	0	1	2	0	0	1	2	1	5	2	0
P_1	1	0	0	0	1	7	5	0				
P_2	1	3	5	4	2	3	5	6				
P_3	0	6	3	2	0	6	5	2				
P_4	0	0	1	4	0	6	5	6				

By using Bankers Algorithm,

i) Check whether the system is in safe state or not.

ii) If a request from process P_1 arrives for (0,4,2,0), can the request be granted immediately?

UNIT-III

5.	a)	Explain about Contiguous page allocation and enumerate its advantages.	7 Marks	L2	CO4	PO1
	b)	State the cause of Thrashing and explain how does a system detect & eliminate the problem of Thrashing.	7 Marks	L2	CO4	PO2
		(OR)				
6.	a)	Analyse the scenario when Segmentation and Paging are combined into one scheme and explain it in detail with an example.	7 Marks	L4	CO4	PO2
	b)	Suppose the head of a moving head disk with 200 tracks, numbered 0 to 199, is currently serving a request at track 143 and has just finished a request at track 125.If the queue of requests is kept in FIFO order: 86, 147, 91, 177, 94, 150, 102, 175, 130. What is the total head movement to satisfy these requests for the following disk scheduling algorithms i) FCFS ii) SSTF.	7 Marks	L3	CO4	PO3

UNIT-IV

7.	a)	With proper diagrams, briefly explain single level, two level, and Tree structured directories.	7 Marks	L2	CO5	PO2
	b)	Write in detail about the on-disk and in-memory structures used to implement a file system.	7 Marks	L1	CO5	PO2
		(OR)				
8.	a)	Differentiate Interrupt driven I/O and DMA.	7 Marks	L2	CO6	PO1
	b)	Explain how I/O related components of the kernel are structured in software layer.	7 Marks	L2	CO6	PO1

UNIT-V

9.	a)	Explain the process of revocation of access rights in file protection.	7 Marks	L2	CO6	PO2
	b)	Encryption can ensure secrecy, privacy and integrity of data Justify.	7 Marks	L4	CO6	PO4
		(OR)				
10	a)	Explain the various kinds of program threats and system threats.	7 Marks	L2	CO6	PO2
.	b)	Password protection is the most common authentication scheme in use today - Justify and discuss the weakness inherent in the password protection scheme.	7 Marks	L4	CO6	PO4

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Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-20) Supplementary Examinations, May– 2026

ENGINEERING HYDROLOGY

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What are the various precautions must strictly observe while selecting site for a rain gauge? Describe how the rainfall data can be analyzed and interpreted.	7 Marks	L2	CO1	PO1 PO10
	b)	There are four rain gauge stations existing in the catchment of a river. The annual rainfall values at these stations are 900, 720, 300 and 640 mm respectively. Determine the optimum number of raingauges if it is desired to limit the error in the mean value of rainfall in the catchment to 15%. How many more gauges will then be required to be installed.	7 Marks	L4	CO1	PO1 PO2 PO4 PO5 PO7 PO10

(OR)

2.	a)	List out the possible errors in measurement of rainfall. Explain the various methods used in estimating the missing data of precipitation.	7 Marks	L2	CO1	PO1 PO5 PO10
	b)	For a drainage basin of 600 sq km, isohyets for a given storm having the following data. Calculate the average depth of precipitation over a area.	7 Marks	L4	CO1	PO1 PO2 PO4 PO5 PO7

Isohyets (cm)	15-12	12-9	9-6	6-3	3-1
Area (sq km)	92	128	120	175	85

UNIT-II

3.	a)	Describe analytical methods used to estimate rate of evaporation.	7 Marks	L2	CO2	PO1
	b)	The rainfall rates for successive 30 minutes intervals upto 4 hours are giv en below. If the surface runoff is 3.6 cm, determine h index and W index.	7 Marks	L4	CO2	PO1 PO2 PO4 PO5 PO7 PO10

Time (min)	0	30	60	90	120	150	180	210	240
Rainfall intensity (cm/h)	0	1.3	2.8	4.1	3.9	2.8	2.0	1.8	0.9

(OR)

4.	a)	Classify runoff and explain various factors affecting runoff.	7 Marks	L4	CO2	PO1
	b)	Explain various methods used to estimate stream flow with a neat sketch.	7 Marks	L2	CO2	PO1 PO5

UNIT-III

5.	a)	Derive an expression to determine the rate of flow through unconfined aquifer using Dupuit's equation.	7 Marks	L4	CO3	PO1 PO2
	b)	A well of 0.5 m diameter penetrates fully into a confined aquifer of thickness 20 m and hydraulic conductivity 8.2 x 10^{-4} m/s. What is the maximum yield expected from this well if the drawdown in the well is no to exceed 3 m. The radius of influence may be taken as 260 m.	7 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO6

(OR)

6.	a)	Define conjunctive use and describe any two methods used to increase the groundwater level using artificial recharge methods.	7 Marks	L4	CO3	PO1 PO5
	b)	Explain saline water intrusion with a case study.	7 Marks	L2	CO3	PO1

UNIT-IV

7.	Flood frequency computations for the river Godavari at Andhra Pradesh by using Gumbel's method yielded the following results: Estimate the flood magnitude in this river with a return period of 500 years.	14 Marks	L6	CO5	PO1 PO2 PO3 PO4 PO5 PO6 PO7

Return Period T (Years)	Peak Flood (cumec)
50	40809
100	46300

(OR)

8.	Find the ordinates of a storm hydrograph resulting from a 3 hour storm with rainfall of 2, 6.75 and 3.75 c, during subsequent 3 hours intervals. The ordinates of unit 3 hour hydrograph are given below.	14 Marks	L4	CO4	PO1 PO2 PO4 PO5 PO6 PO7 PO10

Hours	3	6	9	12	15	18	21	24
Ordinates of unit hydrograph (cumec)	0	110	365	500	390	310	250	0

UNIT-V

9.	How do you analyze trap efficiency and mention various factors affecting trap efficiency.	14 Marks	L4	CO6	PO1 PO2

(OR)

10.	Classify reservoirs and mention the methods for predicting sediment distribution.	14 Marks	L4	CO6	PO1 PO2

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-20) Supplementary Examinations, May– 2026

STRUCTURAL ANALYSIS

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Derive the expression for slope and deflection of a cantilever beam of length 'l' subjected to a concentrated load 'W' at the free end.	7 Marks	L4	CO1	PO1 PO2 PO10
	b)	A girder of uniform cross section and constant depth is freely supported over a span of 3 m. If the point load at the mid-span is 20 kN and moment of inertia is 15.614×10^{-6} m^4. Calculate the central deflection and the slopes at the ends of the beam. Take E = 200 GN/m^2.	7 Marks	L4	CO1	PO1 PO2 PO4 PO10

(OR)

2.	A steel girder of uniform section, 10 m long is simply supported at its ends. It carries concentrated loads 50 kN and 30 kN at two points 2 m and 3 m from the two ends respectively. Calculate the deflection of the girder at the points under the two loads and the maximum deflection. Take E = 200 GN/m^2.	14 Marks	L4	CO1	PO1 PO2 PO4 PO10

UNIT-II

3.	A simply supported beam of span 12 m shown in Fig.1 is loaded with 40 kN loads at C, D and E. Determine the vertical deflection at D. Take EI= 20000 kNm^2.	14 Marks	L4	CO1	PO1 PO2 PO4 PO10

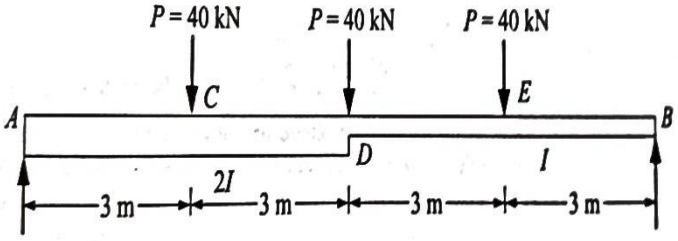

Fig.1

(OR)

4.	A fixed beam of 5 m span carries a point load of 150 kN at 3 m from the left end. If the right end sinks by 10.5 mm, find the fixing moments as well as reactions at the supports. Take E = 2×10^8 kN/m^2 and I = 10000 cm^4.	14 Marks	L4	CO2	PO1 PO2 PO4 PO10

UNIT-III

5.	A continuous beam ABCD having three equal spans of length 'l' each. It carries a uniformly distributed load w/unit length over its entire length. It is freely supported on all supports, which are at the same level. Draw the B.M. and S.F. diagrams for this beam.	14 Marks	L4	CO3	PO1 PO2 PO4 PO10

(OR)

6.	Analyse the continuous beam ABCD shown in Fig.2 by slope deflection method and draw the bending moment diagram.	14 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO10

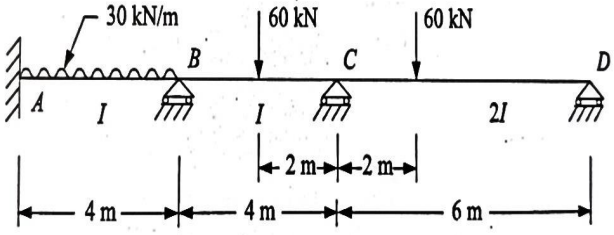

Fig.2

UNIT-IV

7.	Analyse the continuous beam shown in Fig.3 using moment distribution method.	14 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO10

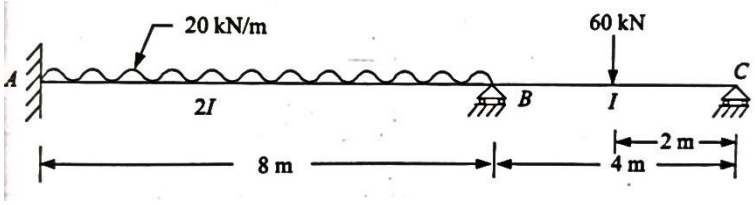

Fig.3

(OR)

8.	Analyse the continuous beam shown in Fig.4 by Kani's method. Flexural rigidity is constant throughout.	14 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO10

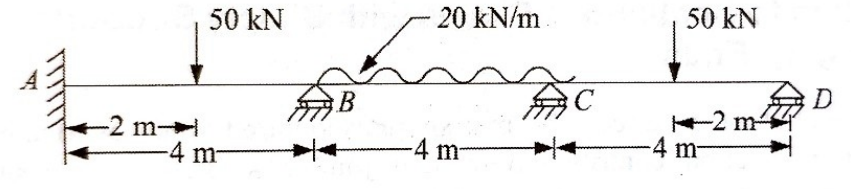

Fig.4

UNIT-V

9.	A train of 5-wheel loads 60 kN, 80 kN, 200 kN, 130 kN and 120 kN spaced 2.5 m between the consecutive loads crosses a beam of span 22.5 m with 120 kN load leading. Calculate the maximum positive and negative shear force values at the centre of the span and the absolute maximum bending moment anywhere in the span. Use Influence Lines method.	14 Marks	L4	CO4	PO1 PO2 PO4 PO10

(OR)

10.	a)	Define plastic hinge and plastic moment capacity.	4 Marks	L4	CO5	PO1 PO2
	b)	Determine the shape factor for the rectangular and circular section.	10 Marks	L4	CO5	PO1 PO2 PO10

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CODE No.: 20BT40105 SVEC-20

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-20) Supplementary Examinations, May – 2026

ENVIRONMENTAL POLLUTION AND CONTROL

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is global warming and its effects?	7 Marks	L2	CO1	PO7
	b)	i) What do you understand by noise pollution? ii) What is the meaning of noise level? Describe the term decibel.	7 Marks	L2	CO1	PO1 PO6
		(OR)				
2.	a)	Classify the air quality modeling and discuss any one model.	7 Marks	L4	CO1	PO1
	b)	Draw a neat sketch of different type of plumes and discuss the characteristics.	7 Marks	L3	CO1	PO1 PO4

UNIT-II

3.	a)	Discuss about the design and operation of settling chambers to remove particulate matter present in air.	7 Marks	L3	CO2	PO5 PO7
	b)	Explain the methods available to control of gaseous pollutants.	7 Marks	L2	CO2	PO10
		(OR)				
4.	a)	Tabulate the acceptable outdoor noise levels.	7 Marks	L2	CO2	PO7
	b)	Discuss the various means of control of noise pollution generated from an Industry.	7 Marks	L2	CO2	PO5 PO7

UNIT-III

5.	a)	Explain about the physical characteristics of surface water and note down the permissible range as per Indian Standard.	7 Marks	L4	CO3	PO1 PO7
	b)	Describe the experimental procedure using jar test apparatus to determine coagulant dose.	7 Marks	L2	CO3	PO6 PO10
		(OR)				
6.	a)	Distinguish rapid sand filter and slow sand filter.	7 Marks	L4	CO3	PO1
	b)	Tabulate the physical and chemical standards of water and their permissible limits.	7 Marks	L2	CO3	PO8

UNIT-IV

7.	a)	What are the causes and effects of soil pollution?	7 Marks	L2	CO4	PO1
	b)	Discuss about the latest developments in the soil pollution control.	7 Marks	L2	CO3	PO12
		(OR)				
8.		Discuss about soil pollutants and sources of soil pollution.	14 Marks	L2	CO4	PO1

UNIT-V

9.	a)	Discuss about the methods of handling solid waste for safe disposal.	7 Marks	L2	CO5	PO7 PO10
	b)	Explain in details the hazardous waste management.	7 Marks	L2	CO5	PO7
		(OR)				
10.	a)	Explain the different ways of collection of solid waste.	7 Marks	L2	CO5	PO1
	b)	Write in detail, the method of energy recovery from solid waste. What are the parameters that affect the energy recovery?	7 Marks	L2	CO5	PO1 PO6

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-20) Supplementary Examinations, May– 2026

CONTROL SYSTEMS

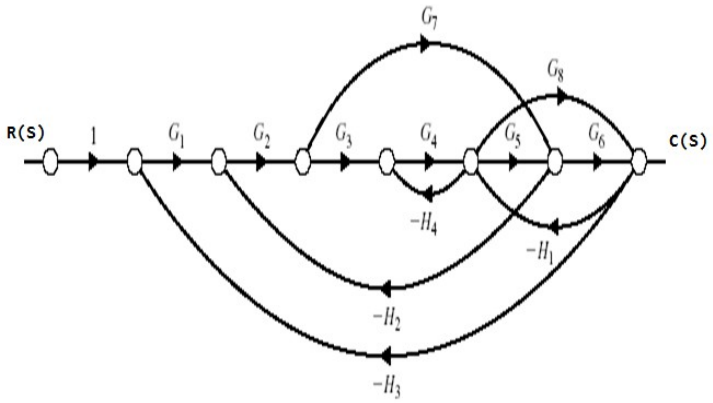
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

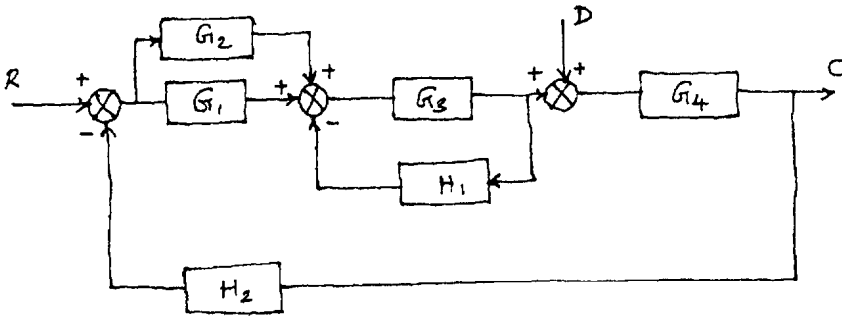
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Using Mason's gain formula find the transfer function of the given signal flow graph. 7 Marks L3 CO1 PO5

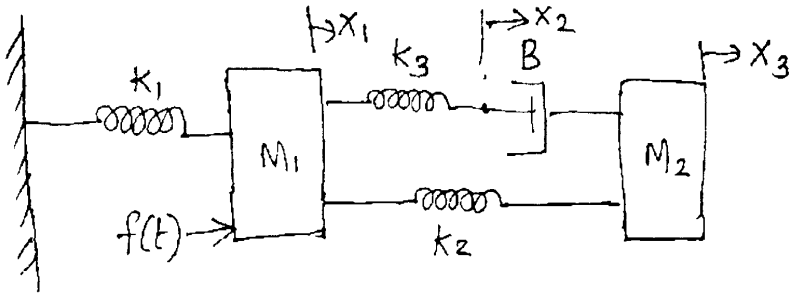


b) Using block diagram reduction rules find the transfer function for the given system. 7 Marks L3 CO1 PO5



(OR)

2. Write the differential equations governing the system and obtain the transfer function $X_2(S)/F(S)$ for the mechanical system shown in figure. Also draw the force–voltage analogous circuit. 14 Marks L3 CO1 PO2



UNIT-II

3.	a)	Derive the expression for the time response of a 2nd order critically damped system with unit step as input.	7 Marks	L3	CO2	PO1
	b)	For a unity feedback system $G(s) = \frac{36}{s(s+0.72)}$. determine the characteristic of the system. Hence calculate the un-damped frequency of oscillations and damped frequency of oscillations, damping factor, peak over shoot, time required to reach the peak output and settling time, when an unit step input is applied to the system.	7 Marks	L3	CO2	PO2

(OR)

4.	a)	The open loop transfer function of a unity feedback system is given by $G(S) = \frac{K}{S(TS+1)}$, where K & T are positive constants. By what factor should be amplifier gain K be reduced to that peak overshoot of unit step response of the system is reduced from 75% to 25%.	7 Marks	L3	CO2	PO4
	b)	For a closed loop system with $G(S) = \frac{1}{s+1}$ and H(s) =5, Calculate the generalized error coefficients and find the error series.	7 Marks	L3	CO2	PO2

UNIT-III

5.	a)	Using Routh criterion analyse the stability of the system whose characteristics equation is $S^4 + 8S^3 + 18S^2 + 16S + 5 = 0$.	7 Marks	L4	CO3	PO5
	b)	Sketch the root locus for a unity feedback control system having an open loop transfer function G(S)= K / S (S^2+4S+13).	7 Marks	L4	CO3	PO2

(OR)

6.	a)	What are the characteristics of lag compensation? Justify the circumstances under which the lag compensation is employed?	7 Marks	L4	CO3	PO1
	b)	Write down the procedure for designing lag compensator using Root-locus.	7 Marks	L4	CO3	PO3

UNIT-IV

7.		Sketch the Bode plots showing the magnitude in dB and phase angle in degrees as a function of log frequency for the transfer function $G(s)H(s) = \frac{2000}{s(s+2)(s+100)}$. Determine the gain crossover frequency, Phase crossover frequency, gain margin and phase margin. Also, determine the gain and the corresponding phase margin for a gain crossover frequency of 50 rad/sec.	14 Marks	L3	CO4	PO2

(OR)

8.		Consider the unity feedback system whose open loop transfer function is $G(s) = \frac{K}{S(1+s)(0.2S+1)}$. Design a suitable compensator to meet the following specifications. i) Velocity error constant, $K_v = 20\ Sec^{-1}$,	14 Marks	L4	CO4	PO3

ii) Phase Margin = 15^0 .

UNIT-V

9.	a)	Find the state transition matrix (STM) for a given system matrix using Laplace transform method. $$A = \begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix}$$	10 Marks	L3	CO5	PO2
	b)	Write the properties of state transition matrix.	4 Marks	L3	CO5	PO1

(OR)

10.	a)	Explain the Kalman's test for determining controllability and observability of a system.	7 Marks	L3	CO5	PO1
	b)	Obtain the solution of the state equation $\dot{X}(t) = \begin{bmatrix} 0 & 1 \\ 0 & -2 \end{bmatrix} X + \begin{bmatrix} 0 \\ 1 \end{bmatrix} U(t)$ *with* $X(0) = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$ and U(t) as a unit step input.	7 Marks	L3	CO5	PO2

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-20) Supplementary Examinations, May– 2026

DIGITAL ELECTRONICS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Reduce the following Boolean expressions to the minimum number of literals. i) $(B\overline{C}+\overline{A}D)\ (A\overline{B}+C\overline{D})$. ii) $\overline{A}B(\overline{D}+\overline{C}D)+B(A+B+\overline{C}D)$ iii) $\overline{A}\overline{C}+ABC+A\overline{C}$	7 Marks	L3	CO1	PO5
	b)	Simplify the Boolean function using K-map in SOP and POS forms. F=∑m(0, 5, 6, 8, 9, 10, 11, 16, 20, 42, 25, 26, 27)	7 Marks	L3	CO1	PO5
		(OR)				
2.	a)	Illustrate the following using DeMorgan's theorem, AB+CD=((AB)'.(CD)')' and (A+B)(C+D)=((A+B)'+(C+D)')'.	7 Marks	L3	CO1	PO2
	b)	Minimize the function F(a, b, c, d)=∑(0,4,6,8,9,10,12) with d=∑(2,13). Implement the function using only NOR gates.	7 Marks	L3	CO1	PO5

UNIT-II

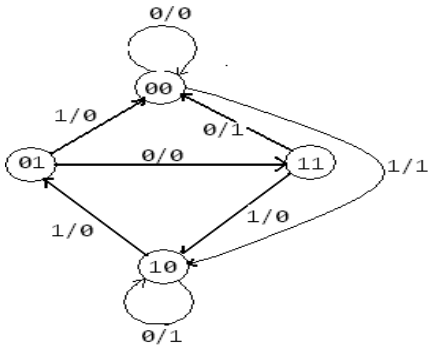
3.	a)	Design 3x3 multiplier using three-bit full adder.	7 Marks	L4	CO2	PO3
	b)	Design suitable multiplexer for the Boolean expression F=(A ⊕ B ⊕ C).	7 Marks	L4	CO2	PO3
		(OR)				
4.	a)	Demonstrate a Half adder. Design a full adder circuit optimally using two half adder circuits.	7 Marks	L3	CO2	PO3
	b)	Design 1-line to 8-line de-multiplexer with an example.	7 Marks	L4	CO2	PO3

UNIT-III

5.	a)	Explain the working of Master - Slave JK Flip-Flop.	6 Marks	L2	CO3	PO1
	b)	Classify the various types of registers according to the manner in which data can be entered into the register and explain Serial-in/ Serial-out shift register for four bit binary information $(1111)_2$ with a neat diagram.	8 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Convert JK Flip-Flop into D Flip-Flop.	7 Marks	L4	CO3	PO4
	b)	Explain the operation of universal shift register with neat block diagram.	7 Marks	L2	CO3	PO1

UNIT-IV

7. a) A sequential circuit has one input and one output. The state diagram is shown in below figure. Design the sequential circuit with i) D Flip-Flop ii) T Flip-Flop — 10 Marks L4 CO4 PO3



b) Realize a Logic function using F (A,B,C)= $\Sigma_m(2,4,5,6)$ using Hazard Free logic gate network. — 4 Marks L3 CO4 PO5

(OR)

8. Explain the procedure of state minimization for state table given below using the merger table. — 14 Marks L3 CO4 PO5

Present state	Next state, Z			
	I_1	I_2	I_3	I_4
A	-	C,1	E,1	B,1
B	E,0	-	-	-
C	F,0	F,1	-	-
D	-	-	B,1	-
E	-	F,0	A,0	B,1
F	C,0	-	B,0	C,1

UNIT-V

9. Construct a programable table to implement a BCD to XS-3 code conversion using PLA. — 14 Marks L3 CO5 PO5

(OR)

10. a) Explain the division algorithm with example. — 7 Marks L2 CO5 PO1

b) Perform the following in 8-bit 2's complement form. — 7 Marks L3 CO5 PO2

i) 6+13 ii) -6 + 13

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-20) Supplementary Examinations, May– 2026

ELECTRICAL MACHINES-II

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Justify. "Three phase induction motor slip is not equal to zero".	7 Marks	L2	CO1	PO2
	b)	Discuss the factors that affecting the sustainability of three phase induction machine.	7 Marks	L3	CO1	PO7
		(OR)				
2.	a)	Determine the rotor frequency, emf and reactance of three phase induction motor under standstill and running conditions.	6 Marks	L2	CO1	PO2
	b)	A 3-phase squirrel cage induction motor has a starting torque of 150% and a maximum torque of 300% with respect to rated torque at rated voltage and frequency. Neglect the stator resistance and rotational losses. Calculate the value of slip at maximum torque.	8 Marks	L2	CO1	PO4

UNIT-II

3.	a)	Identify the speed control methods used to control three phase induction motor beyond its rated speed and discuss those methods briefly.	7 Marks	L2	CO1	PO5
	b)	Give the applications of both self-excited and external excited induction generators.	7 Marks	L1	CO1	PO6
		(OR)				
4.	a)	Show that the maximum internal torque developed by a poly phase induction motor does not depend on the rotor circuit resistance and explain the torque slip characteristics.	6 Marks	L2	CO1	PO2
	b)	A 3 - ϕ 400v, 4pole, 50Hz, induction motor has a star connected stator and rotor. The rotor resistance and standstill reactance /ph are 0.25 Ω and 1.2 Ω respectively. The ratio of stator to rotor turns is 1.3. The full load slip is 4 %. Calculate: i). The power and torque developed at full load. And ii). Maximum torque and the speed at which it occurs.	8 Marks	L2	CO1	PO4

UNIT-III

5.	a)	Explain the effect of armature reaction on the terminal voltage of an alternator at i) UPF ii) ZPF lagging and iii) ZPF leading loads. Draw the relevant phasor diagrams.	7 Marks	L2	CO2	PO1
	b)	A 4 pole synchronous generator has 48 slots in which double layer winding is housed, each coil has 10 turns and is short pitched by an angle of 360 electrical. The fundamental flux/pole is 0.025 wb. Calculate. i) The line-line induced e.m.f. in volts for 3-phase star-connected armature. ii) The line-line induced e.m.f. in volts for a 2-phase connection.	7 Marks	L2	CO2	PO4
		(OR)				

6.	a)	Give the differences between synchronous impedance and saturated synchronous impedance methods.	7 Marks	L2	CO2	PO2
	b)	A 3 phase star connected salient pole alternator supplies a current of 10A having phase angle of 20^0 lagging at 400V. Find the load angle and components of armature current, if X_d=10 Ω/ph and X_q = 6.5 Ω/ph. Assume armature resistance is negligible.	7 Marks	L3	CO2	PO4

UNIT-IV

7.	a)	Derive an expression for the synchronizing power, synchronizing current and synchronizing torque between the two alternators connected in parallel.	7 Marks	L2	CO3	PO1
	b)	A 3 MVA, 6-pole alternator runs at 1000 rpm in parallel with other machines on 3.3 kV bus bars. The synchronous reactance is 25%. Calculate the synchronizing power per one mechanical degree of displacement and the corresponding synchronizing torque when the alternator as supplying full load at 0.8 pf lag.	7 Marks	L3	CO3	PO4

(OR)

8.	a)	Analyze the influence of varying excitation on the power factor, armature current and load angle of a synchronous generator connected to an infinite bus.	7 Marks	L4	CO3	PO2
	b)	Two identical 2 MVA alternators operate in parallel. The governor of first machine is such that the frequency drops uniformly from 50 Hz on no-load to 47.5 Hz on full-load. The corresponding uniform speed drop of second machine is 50Hz to 48 Hz. How will they share a load of 3 MW.	7 Marks	L3	CO3	PO4

UNIT-V

9.	a)	Explain the different methods of starting 3-phase synchronous motors.	7 Marks	L1	CO4	PO1
	b)	A factory has an average load of 300 kW at a power factor of 0.6 lagging. A synchronous motor with an efficiency of 85% is used to raise the combined power factor to 0.8 lagging and at the same time supply a mechanical load of 60kW. Calculate. i) total load kVA. ii) kVA capacity of the synchronous motor.	7 Marks	L3	CO4	PO4

(OR)

10.	a)	Develop the power circle for a cylindrical rotor synchronous motor. Find the maximum output power at which it occurs?	7 Marks	L2	CO4	PO2
	b)	How the synchronous motor can be used in a cement industry for power factor improvement to avoid penalty factor in their electricity bill.	7 Marks	L3	CO4	PO6

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-20) Supplementary Examinations, May– 2026

ELECTRICAL MEASUREMENTS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Describe the working of a universal shunt uses for multi range ammeters. Derive expressions for resistances of different sections of a universal shunt used for a 3 range ammeter.	8 Marks	L3	CO1	PO1
	b)	A basic D'Arsonval movement with a full scale reading of 50 μA and an internal resistance of 1800 Ω is available .It is to be converted into a 0-1 V, 0-10 V, 0-50 V, and 0-150 V. Design a multi range voltmeter using individual multipliers for each range. Calculate the value of individual multipliers.	6 Marks	L4	CO1	PO3
		(OR)				
2.	a)	Describe in detail the various errors that occur in the moving coil instruments and suggest the suitable compensation techniques to nullify the errors.	8 Marks	L2	CO1	PO5
	b)	List the advantages and disadvantages of moving iron instruments and also list its applications.	6 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Enumerate the sources of errors in single phase induction type energy meters and suggest the suitable compensations techniques are used to minimize them.	8 Marks	L3	CO2	PO5
	b)	Explain in detail the construction and working principle of Electrodynamometer type power factor meter with a neat sketch.	6 Marks	L2	CO2	PO1
		(OR)				
4.		Describe the construction, working principle of electrodynamometer type wattmeter with neat sketch and also derive the torque equation of wattmeter.	14 Marks	L2	CO2	PO1

UNIT-III

5.	a)	Explain the construction and working principle of current transformer with a neat sketch and also list its advantages over shunt multipliers.	7 Marks	L2	CO3	PO1
	b)	Describe in detail the construction and working principle of Polar type ac potentiometer with neat sketch and also list its applications.	7 Marks	L2	CO3	PO1
		(OR)				
6.		Discuss in detail the following applications of dc potentiometer. i) Measurement of unknown resistance ii) Calibration of MC type ammeter iii) Calibration of MC type Voltmeter	14 marks	L2	CO3	PO1

UNIT-IV

7.	a)	Derive the equation of balance for Maxwell's inductance-capacitance bridge used for measurement of unknown inductance of a coil. Draw the phasor diagram for conditions under balance. List the advantages and disadvantages of the bridge.	7 Marks	L3	CO4	PO1
	b)	Derive the equation of balance for a frequency measuring bridge and also draw the phasor diagram for conditions under balance. List the advantages and disadvantages of the bridge.	7 Marks	L3	CO4	PO1

(OR)

8.	a)	Discuss in detail the loss of charge method is used for the measurement of high resistance with a necessary circuit.	7 Marks	L3	CO4	PO1
	b)	List the classification of resistances. Describe in detail the suitable dc bridge used for the measurement of medium resistance and list its limitations.	7 Marks	L2	CO4	PO1

UNIT-V

9.	a)	Describe in detail the importance of a Lissajous patterns used in the CRO for the measurement of unknown frequency and phase of the electrical quantities.	7 Marks	L2	CO5	PO1
	b)	Draw the block diagram of CRO and write the function of each component with the help of neat sketch.	7 Marks	L2	CO5	PO1

(OR)

10.	a)	Describe in detail the working of digital multi-meters with neat block diagram and write the function of each component.	7 Marks	L2	CO5	PO1
	b)	List the different operating techniques of digital voltmeter and explain ramp type digital voltmeter in detail with a neat sketch.	7 Marks	L2	CO5	PO5

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-20) Supplementary Examinations, May– 2026

DYNAMICS OF MACHINERY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Briefly explain the functions of the clutch and mention few applications of clutch.	6 Marks	L2	CO1	PO1
	b)	A single plate clutch, effective on both sides, is required to transmit 25 kW at 3000 r.p.m. Determine the outer and inner radii of the frictional surface if the coefficient of friction is 0.255, the ratio of radii is 1.25 and the maximum pressure is not to exceed 0.1 N/mm^2 . Also determine the axial thrust to be provided by springs. Assume the theory of uniform wear.	8 Marks	L3	CO1	PO1 PO2

(OR)

2.	a)	Classify Dynamo meters and explain any one Dynamometer with a neat sketch.	6 Marks	L2	CO1	PO1
	b)	In a band and block brake, the band is lined with 14 blocks, each of which subtends an angle of 20° at the drum centre. One end of the band is attached to the fulcrum of the brake lever and the other to a pin 150 mm from the fulcrum. Find the force required at the end of the lever 1 metre long from the fulcrum to give a torque of 4 kN-m. The diameter of the brake drum is 1 metre and the coefficient of friction between the blocks and the drum is 0.25.	8 Marks	L3	CO1	PO1 PO2 PO6

UNIT-II

3.	A ship propelled by a turbine rotor which has a mass of 5 tonnes and a speed of 2100 r.p.m. The rotor has a radius of gyration of 0.5 m and rotates in a clockwise direction when viewed from the stern. Find the gyroscopic effects in the following conditions: i) The ship sails at a speed of 30 km/h and steers to the left in a curve having 60 m radius. ii) The ship pitches 6 degree above and 6 degree below the horizontal position. The bow is descending with its maximum velocity. The motion due to pitching is simple harmonic and the periodic time is 20 seconds. iii) The ship rolls and at a certain instant it has an angular velocity of 0.03 rad/s clockwise when viewed from stern. Determine also the maximum angular acceleration during pitching. Explain how the direction of motion due to gyroscopic effect is determined in each case.	14 Marks	L3	CO2	PO1 PO2 PO4 PO6

(OR)

4.		The turning moment curve for an engine is represented by the equation, T = (20000 + 9500 sin 2θ – 5700 cos 2θ) N-m, where θ is the angle moved by the crank from inner dead centre. If the resisting torque is constant, find: i) Power developed by the engine ; ii) Moment of inertia of flywheel in kg-m2 , if the total fluctuation of speed is not exceed 1% of mean speed which is 180 r.p.m; and. iii) Angular acceleration of the flywheel when the crank has turned through 45° from inner dead centre.	14 Marks	L3	CO3	PO1 PO2 PO4 PO6

UNIT-III

5.		In a spring loaded governor of the hartnell type, the mass of each ball is 5 kg and the lift of the sleeve is 50 mm the speed at which the governor begins to float is 240 rpm and at this speed the radius of the ball path is 110 mm, the mean working speed of a governor is 20 times the range of the speed when friction neglected. If the length of the ball and roller arm of the bell crank lever are 120 mm and 100 mm respectively, if the distance between the center of pivot of bell crank lever and axis of the governor spindle is 140 mm. Determine: i) The initial compression of the spring taking into account the obliquity of arms. ii) Equilibrium speed corresponding to radius of rotation of 150 mm.	14 Marks	L3	CO4	PO1 PO2 PO6

(OR)

6.		The lengths of the upper and lower arms of a porter governor are 200mm and 250mm respectively. Both the arms are pivoted on the axis of rotation. The central load is 150N, the weight of the each ball is 20N and the friction of the sleeve together with the resistance of the operating gear is equivalent to a force of 30N at the sleeve. If the limiting inclinations of the upper arms to the vertical are 30° and 40° taking friction in to account. Find the range of speed of the governor.	14 Marks	L3	CO4	PO1 PO2 PO6

UNIT-IV

7.	a)	Differentiate Static Balancing from Dynamic Balancing.	4 Marks	L3	CO5	PO1 PO2
	b)	The firing order in a 6 cylinder vertical 2-stroke in line engine is 1-4-5-2-3-6. The piston stroke is 100 mm and length of each connecting rod is 200 mm. The cylinder center lines are spaced at 300 mm. In the end view, the cranks are 60o apart the mass of reciprocating parts is 100 kg per cylinder and that of rotating parts 50 kg per crank. The engine rotates at 200 rpm. Examine the engine for the balance of primary and secondary forces and couples. Find the maximum unbalanced forced and couples.	10 Marks	L3	CO5	PO1 PO2 PO6

(OR)

8.		Four masses M1, M2, M3 and M4 are 200kg, 300kg, 240kg and 260kg respectively. The corresponding radii of rotation are 0.2m, 0.15m, 0.25m and 0.3m respectively and the angle between successive masses are 45°, 75° and 135°. Find the position and magnitude of balance mass required if its radius of rotation is 0.25m.	14 Marks	L3	CO5	PO1 PO2 PO6

UNIT-V

9.	With details graph and expression compare the response of under damped, critically damped and over damped system and discuss the salient points.	14 Marks	L3	CO6	PO1 PO2
	(OR)				
10.	A single-cylinder engine of total mass 200 kg is to be mounted on an elastic support which permits vibratory movement in vertical direction only. The mass of the piston is 3.5 kg and has a vertical reciprocating motion which may be assumed simple harmonic with a stroke of 150 mm. It is desired that the maximum vibratory force transmitted through the elastic support to the foundation shall be 600 N when the engine speed is 800 r.p.m. and less than this at all higher speeds. i) Find the necessary stiffness of the elastic support, and the amplitude of vibration at 800 r.p.m., and ii) If the engine speed is reduced below 800 r.p.m. at what speed will the transmitted force again becomes 600 N?	14 Marks	L3	CO6	PO1 PO2 PO6

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-20) Supplementary Examinations, May– 2026

FLUID MECHANICS AND MACHINES

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		An inverted U-tube manometer is connected to two horizontal pipes A and B through which water is flowing. The vertical distance between the axis of these pipes is 30 cm. When an oil of sp. gravity 0.8 is used as a gauge fluid, the vertical heights of the columns in the two limbs of the inverted manometer are found to be same and equal to 35 cm. Determine the difference of pressure between the pipes.	14 Marks	L3	CO1	PO1 PO2
		(OR)				
2.	a)	Explain the different types of fluids?	6 Marks	L2	CO1	PO1
	b)	What is the difference between dynamic viscosity and kinematic viscosity? State their units of measurements.	8 Marks	L1	CO1	PO1

UNIT-II

3.		The water is flowing through a pipe having diameters 20 cm and 10 cm at sections 1 and 2 respectively. The rate of flow through the pipe is 35 litres/sec. The section 1 is 6 m above datum and section 2 is 4 m above datum. If the pressure at section 1 is 39.24 N/cm^2, find the intensity of pressure at section 2.	14 Marks	L3	CO2	PO1 PO2
		(OR)				
4.		Derive Bernoulli's equation for the flow of an incompressible frictionless fluid from consideration of momentum.	14 Marks	L3	CO2	PO1 PO2

UNIT-III

5.	a)	What is a boundary layer? Why does it increase with distance from the upstream edge?	7 Marks	L1	CO3	PO1
	b)	How will you find the drag on a flat plate due to laminar and turbulent boundary layers?	7 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Draw a neat sketch of the Reynolds experiment and explain how the laminar flow can be demonstrated?	7 Marks	L2	CO3	PO1
	b)	The rate of flow of water through a horizontal pipe is 0.25 m^3/sec. The diameter of the pipe which is 20 cm is suddenly enlarged to 40 cm. The pressure intensity in the smaller pipe is 11.772 N/cm^2. Determine: i) Loss of head due to sudden enlargement, ii) Pressure intensity in larger pipe, iii) Power loss due to enlargement.	7 Marks	L3	CO3	PO1 PO2 PO3

UNIT-IV

7.		Derive an expression for the force exerted by a jet of water on moving flat and inclined plates in the direction of flow.	14 Marks	L3	CO4	PO1 PO2
		(OR)				

8.	a)	Derive an expression for specific speed of Francis turbine.	6 Marks	L3	CO4	PO1 PO2
	b)	A turbine is to operate under a head of 25 m at 200 r.p.m. The discharge 9 m3/s. If the efficiency is 90 %, determine the performance of the turbine under a head of 20 metres.	8 Marks	L2	CO4	PO1 PO2

UNIT-V

9.	a)	Draw and explain the operating characteristics of a centrifugal pump.	6 Marks	L2	CO5	PO1
	b)	A centrifugal pump is to discharge $0.118 m^3$/sec at a speed of 1450 rpm against a head of 25 m. The impeller diameter at outlet is 250 mm and its width at outlet is 50mm and manometric efficiency is 75%. Determine vane angle at outer periphery of the impeller.	8 Marks	L3	CO5	PO1 PO2 PO3

(OR)

10.	Explain construction and working principle of a single acting reciprocating pump with a neat diagram.	14 Marks	L2	CO5	PO1

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-20) Supplementary Examinations, May– 2026

THERMAL ENGINEERING-I

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the basic components and nomenclature of an IC engine with a neat sketch?	7 Marks	L2	CO1	PO1
	b)	Discuss the working of two stroke cycle petrol engine and draw port timing diagram.	7 Marks	L2	CO1	PO1 PO2
		(OR)				
2.	a)	Distinguish between SI Engine knocking and CI Engine knocking.	7 Marks	L2	CO1	PO1 PO2
	b)	Explain the stages of combustion in S.I engine with neat sketch.	7 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Explain the measurement of air by air box method.	6 Marks	L2	CO1	PO1
	b)	A four stroke four cylinder diesel engine running at 300 rpm produces 250 kW of brake power. The cylinder dimensions are 30 cm bore and 25 cm stroke. Fuel consumption rate is 1 kg/min while air fuel ratio is 10. The average indicated mean effective pressure is 0.8 MPa. Determine indicated power, mechanical efficiency, brake thermal efficiency and volumetric efficiency of engine. The calorific value of fuel is 43 MJ/kg. The ambient conditions are 1.013 bar, 27ºC.	8 Marks	L3	CO1	PO1 PO2 PO3
		(OR)				
4.	a)	Define the terms: brake power, indicated power, piston speed, brake mean effective pressure and brake thermal efficiency.	6 Marks	L2	CO1	PO1
	b)	A two stroke two cylinder engine runs with speed of 3000 rpm and fuel consumption of 5 liters/hr. The fuel has specific gravity of 0.7 and air-fuel ratio is 19. The piston speed is 500 m/min and indicated mean effective pressure is 6 bar. The ambient conditions are 1.013 bar, 15ºC. The volumetric efficiency is 0.7 and mechanical efficiency is 0.8. Determine brake power output considering R for gas = 0.287 kJ/kgK.	8 Marks	L3	CO1	PO1 PO2 PO3

UNIT-III

5.	a)	What are the disadvantages of closed cycle gas turbine over open cycle gas turbine?	6 Marks	L2	CO2	PO1
	b)	A gas turbine plant with pressure ratio of 1:5 takes air at 15°C. The maximum temperature is 600°C power 2200KW. The turbine and compressor efficiencies are equal to 0.85 take Cp=1kj/kg and Cv =0.714 kJ/kg. Determine: i) Actual overall efficiency of the turbine; ii) Mass air circulated by the turbine and iii) To draw T-S diagram of Gas turbine plant.	8 Marks	L3	CO2	PO1 PO2 PO3
		(OR)				
6.	a)	What is ram jet? Explain the working of ramjet with a neat	7 Marks	L2	CO2	PO1

		sketch.				
	b)	A gas turbine plant consist of two stage compressor with perfect inter cooler and a single stage turbine ,if the plant works between the temperature limits of 300K and 1000K at the pressure of 1 bar and 16 bar. Find the net power of the plant per kg of air and also draw T-S diagram with neat sketch. Take Cp as1kj/kg K.	7 Marks	L3	CO2	PO1 PO2 PO3
		UNIT-IV				
7.	a)	List out the classification of air compressors with suitable examples.	6 Marks	L2	CO3	PO1
	b)	Derive an expression for minimum work required for two stage compressor with inter cooler.	8 Marks	L3	CO3	PO1 PO2
		(OR)				
8.	a)	Explain the working principle of vane type compressor With neat sketch.	7 Marks	L2	CO3	PO1
	b)	A three-stage single acting reciprocating air compressor delivers 2.5 m3 of free air per minute from 1 bar to 72 bar. Calculate the power required to operate compressor if n = 1.3. The mean piston speed is 140 m/min. Find the piston area, neglecting the clearance volume.	7 Marks	L3	CO3	PO1 PO2 PO3
		UNIT-V				
9.	a)	Draw T-S diagram of Rankine cycle using dry saturated steam and develop the equation for the Rankine cycle efficiency.	7 Marks	L3	CO4	PO1 PO2
	b)	Dry saturated steam at 10 bar is expanded isentropically in a nozzle to 0.1 bar. Using steam tables only, find the dryness fraction of the steam at exit. Also find the velocity of steam leaving the nozzle when i) Initial Velocity is negligible and ii) Initial Velocity of steam is 135m/s.	7 Marks	L3	CO4	PO1 PO2 PO3
		(OR)				
10.	a)	Sketch the schematic diagram of a condensing steam power plant and show the sequence of operation on T-S diagram.	7 Marks	L3	CO4	PO1 PO2
	b)	Steam at 20 bar, 360^0C is expanded in a steam turbine to 0.08 bar. It then enters the condenser where it is condensed to saturated liquid water. The pump feeds back the water in to the boiler assuming ideal process, find the net work for kg of steam and cycle efficiency.	7 Marks	L3	CO4	PO1 PO2 PO3

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-20) Supplementary Examinations, May– 2026

ANALOG COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

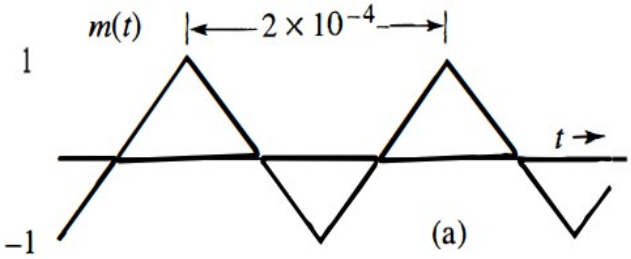
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the generation of SSB modulated signal. Also explain the concept of phase reversal.	10 Marks	L2	CO1	PO1
	b)	A broadcast radio transmitter radiates 5kW power when the modulation percentage is 60%. How much is the carrier power?	4 Marks	L3	CO1	PO4
		(OR)				
2.	a)	A SSB AM signal is generated by modulating an 800-kHz carrier by the signal m(t) = cos(2000πt) + 2sin(2000πt). The amplitude of the carrier is Ac = 100. i) Determine the (time domain) expression for the lower sideband of the SSB AM signal. ii) Determine the magnitude spectrum of the lower sideband SSB signal.	7 Marks	L3	CO1	PO4
	b)	In amplitude modulation, the message signal is having a peak amplitude of 5V, frequency of 6kHz which modulates the carrier signal with frequency 10 MHz and the peak amplitude of carrier signal is 10V. Determine modulation index, frequency and amplitude of LSB and USB.	7 Marks	L3	CO1	PO4

UNIT-II

3.	a)	Analyze the demodulation of FM using phase and frequency discrimination methods.	10 Marks	L2	CO1	PO2
	b)	An FM wave is given by $s(t)=20\cos(8\pi\times10^6t+9\sin(2\pi\times10^3t))$. Calculate the frequency deviation, bandwidth, and power of FM wave.	4 Marks	L3	CO1	PO4
		(OR)				
4.	a)	Explain in detail about generation of FM.	10 Marks	L1	CO1	PO1
	b)	Estimate BFM and BpM for the modulating signal m(t) in Figure for $k_f = 2\pi \times 10^5$.	4 Marks	L3	CO1	PO4



Assume the essential bandwidth of the periodic m(t) as the frequency of its third harmonic.
Repeat the problem if the amplitude of m(t) is doubled [if m(t) is multiplied by 2].

UNIT-III

5.	a)	Explain how FM is superior to AM in terms of noise.	7 Marks	L2	CO2	PO2
	b)	An AM receiver operates with a tone modulation, and the modulation index ma=0.4. The message signal is 20 Cos (1000Πt). Calculate the output SNR relative to the baseband performance.	7 Marks	L2	CO2	PO2
		(OR)				
6.	a)	An AM receiver operates with a tone modulation, and the modulation index ma=0.6. The message signal is 60 Sin (5000Πt). Calculate the output SNR relative to the baseband performance.	7 Marks	L2	CO2	PO2
	b)	Derive the expression for SNR of SSBSC system.	7 Marks	L2	CO2	PO2

UNIT-IV

7.	a)	Explain about amplitude limiting.	4 Marks	L1	CO3	PO1
	b)	Explain the operation of AM transmitter.	10 Marks	L1	CO3	PO1
		(OR)				
8.	a)	A super heterodyne receiver is tuned to a station at 3.7 MHz. The IF frequency of the receiver is 10.7 MHz. Assume that the local oscillator operates at a frequency above both the station and the IF: i) What is the local oscillator frequency? ii) If the local oscillator produces a second harmonic, what two additional frequencies will be received?	7 Marks	L4	CO3	PO3
	b)	Explain in detail the operation of TRF.	7 Marks	L1	CO3	PO1

UNIT-V

9.	a)	Explain the generation of PAM.	10 Marks	L1	CO4	PO1
	b)	List the merits and demerits of PAM.	4 Marks	L1	CO4	PO1
		(OR)				
10.	a)	For a PAM transmission of voice signal having maximum frequency equal to f_m = 3 kHz calculate the transmission bandwidth. It is given that the sampling frequency f_s = 8 kHz and the pulse duration τ=0.1 T_S.	7 Marks	L2	CO4	PO2
	b)	With neat block diagram and waveforms, explain the generation of a PWM signal.	7 Marks	L2	CO4	PO1

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Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-20) Supplementary Examinations, May– 2026

THEORY OF COMPUTATION

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering,]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Convert the following Moore machine into Melay machine. 7 Marks L3 CO1 PO4

Present State	Next State		Output
	a = 0	a = 1	
→a	d	b	1
B	a	d	0
C	c	c	0
D	b	a	1

b) Discuss about Finite Automata with epsilon Transitions. 7 Marks L2 CO1 PO1

(OR)

2. a) Convert the following NFA to a DFA. 7 Marks L3 CO1 PO4

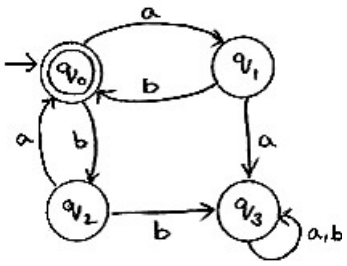
δ	a	b
p	$\{p\}$	$\{p,q\}$
q	$\{r\}$	$\{r\}$
r	$\{\phi\}$	$(\phi\}$

b) Find an equivalent ε-NFA for the following regular expression. 7 Marks L2 CO1 PO1

UNIT-II

3. a) Differentiate regular expression and regular language with an example. 7 Marks L4 CO2 PO2

b) Construct the regular expression accepted by following finite automaton. 7 Marks L4 CO2 PO3



(OR)

4. a) Construct a DFA for the regular expression 10 + (0+11) 0*1 and optimize the states. 7 Marks L4 CO2 PO4

b) Construct NFA for the regular expression a*b*. 7 Marks L3 CO2 PO5

UNIT-III

5. a) Construct equivalent grammar in Chomsky Normal Form for the grammar 7 Marks L4 CO3 PO3
G=({S,A,B},{a,b}, {S→aAbB, A→aA|a, B→bB|b }, S.

b) Write the context free grammar for the language $L = \{ a^n.b^n \mid n>=1\}$. 7 Marks L4 CO4 PO3

(OR)

6.	a)	Given the grammar Gas S→0B|1A, A→0|0S|1AA, B→1|1S|0BB Give the leftmost and rightmost derivations and parse tree to derive the string 00110101.	7 Marks	L3	CO3	PO
	b)	Construct a CFG for the language L = $a^n b^n$ where n>=1.	7 Marks	L3	CO4	PO3

UNIT-IV

7.	a)	Design a PDA to accept the following CFG: S →AA/a A →SA/b.	8 Marks	L4	CO1	PO3
	b)	Explain properties of Context Free Languages.	6 Marks	L2	CO4	PO1

(OR)

8.	a)	Explain in detail about the model of Linear Bounded Automata.	7 Marks	L2	CO4	PO1
	b)	What is deterministic PDA? Explain with an example.	7 Marks	L2	CO5	PO1

UNIT-V

9.	a)	Design a Turing Machine to recognize the language L={ $1^n 2^n 3^n$| n≥1}.	7 Marks	L4	CO5	PO3
	b)	Briefly explain Universal Turing Machine.	7 Marks	L2	CO5	PO1

(OR)

10.	a)	Design a Turing Machine which can multiply two positive integers.	7 Marks	L4	CO5	PO3
	b)	Design a TM that accepts the language of odd integers written in binary.	7 Marks	L3	CO5	PO3

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Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-20) Supplementary Examinations, May-2026

PRINCIPLES OF COMMUNICATIONS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Derive the relations between power and current equations of AM.	7 Marks	L3	CO2	PO1 PO2
	b)	Draw the block diagram of filter method for suppressing unwanted sideband. What are the frequency requirements of the filter?	7 Marks	L2	CO1	PO1 PO2
		(OR)				
2.		Differentiate the techniques of AM, DSB-SC and SSB-SC with the power on carrier power utilization and also draw the spectrum of each technique.	14 Marks	L2	CO2	PO1 PO2

UNIT-II

3.	a)	Use appropriate method for generation of FM signal.	7 Marks	L3	CO5	PO1
	b)	Give the types of FM demodulators and explain the operation of each with circuits.	7 Marks	L2	CO3	PO1
		(OR)				
4.	a)	Derive an equation for wide band FM and Narrow band FM and draw their spectrum.	10 Marks	L3	CO1	PO1 PO2
	b)	Give the advantages of FM over AM.	4 Marks	L2	CO2	PO1 PO2

UNIT-III

5.	a)	Justify how PWM signals are generated from PAM.	7 Marks	L4	CO2	PO1 PO2
	b)	Explain Asynchronous multiplexing and its advantages.	7 Marks	L1	CO1	PO1 PO2
		(OR)				
6.		Design and Explain the circuits for transmission of PAM signals and also methods for its demodulation.	14 Marks	L1	CO5	PO1

UNIT-IV

7.	a)	What do you mean by coherent and non-coherent detection? Discuss them with suitable examples.	9 Marks	L1	CO3	PO1
	b)	Explain the power spectra of binary PSK and FSK signals along with graphs.	5 Marks	L1	CO2	PO1 PO2
		(OR)				
8.		Differentiate different digital modulation techniques ASK, FSK, PSK, QPSK and DPSK.	14 Marks	L2	CO2	PO1 PO2

UNIT-V

9.	a)	The generator polynomial of (15,11) hamming code is defined by g(x)=1+x+x4. Develop the encoder and syndrome calculator for this code.	7 Marks	L3	CO4	PO1
	b)	The generator matrix for a (6,3) block code is given below. Find all the code vectors of this code. G = [100, 011, 010, 101, 001, 110].	7 Marks	L3	CO4	PO1
		(OR)				

10.	a)	State and explain Huffman theorem with a suitable example.	7 Marks	L3	CO4	PO1
	b)	Derive an expression for entropy function and also the relationship between marginal, joint and conditional entropies.	7 Marks	L3	CO2	PO1 PO2

CODE No.: 16BT1BS02 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations, May – 2026

ENGINEERING PHYSICS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	With the help of suitable diagram, explain the principle, construction and working of an optical fiber as a wave guide.	10 Marks
	b)	In an optical fibre, the material has refractive indices of core and cladding of 1.6 and 1.3 respectively. What is the value of critical angle? Also calculate the acceptance angle and acceptance cone.	4 Marks
		(OR)	
2	a)	Classify the different types of optical fibers.	10 Marks
	b)	List the applications of optical fibers in various fields.	4 Marks

UNIT-II

3	a)	Explain the de-Broglie hypothesis of duality of material particles.	6 Marks
	b)	Derive time independent Schrodinger's wave equation for a free particle.	8 Marks
		(OR)	
4		Show that the energies of a particle in infinite potential box are quantized.	14 Marks

UNIT-III

5	a)	Explain direct and indirect band gap semiconducting materials.	6 Marks
	b)	What is the principle of LED? Describe the construction and working of LED.	8 Marks
		(OR)	
6	a)	Explain the **ac** frequency dependence of different polarizability in dielectrics.	5 Marks
	b)	Explain ionic and orientation polarization.	9 Marks

UNIT-IV

7	a)	Define: i) Super conductor. ii) Critical temperature. iii) Cooper pair.	4 Marks
	b)	Explain penetration depth in superconductivity. Write any five applications of superconductors.	10 Marks
		(OR)	
8	a)	Explain the BCS theory of superconductivity.	7 Marks
	b)	Explain Josephson effects and their applications.	7 Marks

UNIT-V

9	a)	Describe the principle factors which affect the properties of nanomaterials.	5 Marks
	b)	Explain in detail about the fabrication of nanomaterials by pulsed laser deposition.	9 Marks
		(OR)	
10	a)	Define nanomaterial. Give the classification of nanomaterials.	4 Marks
	b)	Discuss the synthesis of nanomaterial by using pulsed laser deposition method. List the applications of nanomaterials in various fields of science and technology.	10 Marks

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CODE No.: 16BT20401 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations, May – 2026

ELECTRONIC DEVICES AND CIRCUITS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Explain the V-I characteristics of Zener diode and distinguish between Avalanche and Zener Break downs. 10 Marks

b) Sketch V-I characteristics of a PN diode for the following conditions: 4 Marks
$R_f = 0$, $R_r = 0$, $V_\gamma = 0.6$

(OR)

2 Explain the operation of inductor filter (FWR) and derive expression for ripple factor. 14 Marks

UNIT-II

3 a) With a neat diagram, explain the various current components in an NPN bipolar junction transistor and hence derive general equation for collector current I_C. 8 Marks

b) Describe the significance of the terms 'α' and 'β'. Establish a relation between them. 6 Marks

(OR)

4 a) Draw the emitter feedback bias circuit and obtain the expression for the stability factor. 10 Marks

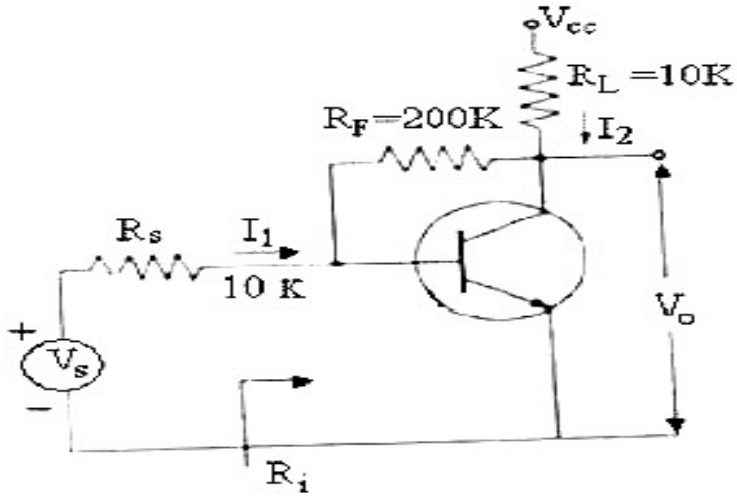
b) Define biasing. Draw the fixed bias circuit and obtain the expression for the stability factor. 4 Marks

UNIT-III

5 Compute current gain, voltage gain, input and output impedance of the CB amplifier, if it is driven by a voltage source of internal resistance R_s=1KΩ. The load impedance is R_L=1KΩ. The transistor parameters are h_{ib}= 22KΩ, h_{fb}= -0.98, h_{rb}=2.9 x 10^{-4}, h_{ob}= 0.5μA/V. 14 Marks

(OR)

6 Determine A_I, A_V, R_I, R_0 of a transistor with h_{ie} = 1.1KΩ, h_{fe} = 50, h_{re} = 205 x 10^{-4}, h_{oe} = 25μA/V is connected in CE configuration as shown in figure. 14 Marks



UNIT-IV

7		Draw the small-signal model of common drain FET amplifier. Derive expressions for voltage gain and output resistance.	14 Marks
		(OR)	
8	a)	Compare enhancement and depletion modes of a MOSFET with the help of its characteristics and construction.	7 Marks
	b)	Write the expressions for mid-frequency gain of a FET common source.	7 Marks

UNIT-V

9		Explain how the UJT can be used as a negative-resistance device with the aid of static characteristics.	14 Marks
		(OR)	
10		Explain the tunneling phenomenon. Explain the characteristics of tunnel diode with the help of necessary energy band diagrams.	14 Marks

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Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations, May – 2026

OBJECT ORIENTED PROGRAMMING THROUGH C++
[Computer Science and Engineering, Information Technology and Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1 a) What is type conversion? Explain about implicit and exploit type conversion. 7 Marks
b) Write a program which illustrates the format of floating point values. 7 Marks

(OR)

2 a) What are special casting operators supported in C++? Use a casting operator that can cast a pointer to parent object as pointer to the child object. 7 Marks
b) Describe the key object-oriented Concepts. 7 Marks

UNIT-II

3 a) Give the procedure to generate a Random Number. 7 Marks
b) Explain about In-Line functions with examples. 7 Marks

(OR)

4 a) When will the destructor of an object does not get called during function execution. 7 Marks
b) Write a suitable program mechanism for call by value and call by reference. 7 Marks

UNIT-III

5 a) Explain the procedure for returning a reference. 7 Marks
b) Write a program for linear search using pointer mechanism. 7 Marks

(OR)

6 a) What is string manipulation? Explain string manipulation mechanisms. 7 Marks
b) Write a program for liner search using pointer mechanism. 7 Marks

UNIT-IV

7 a) Develop a class structure to represent student's attributes and their behavior for attending to the classes and implement a function that queries marks obtained by a particular student and show the working of the class through a main function. 7 Marks
b) Bring out distinct differences that exist between constructor and member functions through examples. 7 Marks

(OR)

8 a) Create an array of student objects and cycle through them to print the marks obtained by each of the student. 7 Marks
b) What for constructors are used? Is it mandatory to write a constructor? Write an example that uses constructors. 7 Marks

UNIT-V

9 a) What are virtual base classes? Explain using an example how the ambiguity that exists in the Hybrid inheritance can be resolved using virtual base classes. 7 Marks
b) Discuss the linkage that exists between the generic data types defined for a class and generic data types defined for a template function defined within the same class. 7 Marks

(OR)

10 a) How is random access carried in C++? Explain with an example. 7 Marks
b) What is a template function and express using an example different ways of overloading a template function? 7 Marks

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CODE No.: 16BT21501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations, May – 2026

DIGITAL LOGIC DESIGN

[Computer Science and Engineering, Information Technology and Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1 Convert the following numbers from the given base to the other three bases indicated.
- i) Decimal 225.225 to binary and hexadecimal. 8 Marks
- ii) Octal 623.77 to decimal and hexadecimal. 6 Marks

(OR)

2 Convert the following numbers from the given base to the other three bases indicated.
- i) Binary 11010111.110 to decimal and octal. 6 Marks
- ii) Hexadecimal 2AC5.D to decimal and binary. 8 Marks

UNIT-II

3 a) Implement EX-OR using minimum number of NAND gates. 4 Marks

b) Simplify the following Boolean function using K-map: 6 Marks
$F(w, x, y, z) = \Sigma(0, 1, 2, 3, 7, 8, 10) + \Sigma(5, 6, 11, 15)$

c) Obtain the simplified expression in sum of products for the given Boolean expression $F(x, y, z) = \Sigma(2, 3, 6, 7)$. 4 Marks

(OR)

4 Simplify the following expression using K-map and implement with two-level NAND gate circuit: $F = AB' + ABD + ABD' + A'C'D' + A'BC'$ 14 Marks

UNIT-III

5 a) Show that a full-subtractor can be constructed with two half-subtractors and an OR gate. 7 Marks

b) A majority function is generated in a combinational circuit when the output is equal to 1, if the input variables have more 1's than 0's. The output is 0 otherwise. Design a 3 input majority function. 7 Marks

(OR)

6 a) Implement a full-adder using two half-adders and an OR gate. 7 Marks

b) Design a combinational circuit with three inputs and one output. The output is equal to logic 1, when the binary value of the input is less than 3. The output is logic 0 otherwise. 7 Marks

UNIT-IV

7 a) Illustrate the functioning of an SR latch using two 2 input NOR gates. 7 Marks

b) What is a characteristic equation? Obtain the characteristic equations for SR, JK, D and T flip-flops. 7 Marks

(OR)

8 a) Draw the circuit of JK flip-flop using NAND gates and explain its operation. 7 Marks

b) What is the difference between an excitation table and a characteristic table? Give the excitation tables for SR, JK, T and D flip-flops. 7 Marks

UNIT-V

9	a)	Differentiate between static RAM and Dynamic RAM.	6 Marks
	b)	Show how the PLA circuit would be programmed to implement the sum and carry outputs of a full-adder.	8 Marks

(OR)

10	Implement the following Boolean functions using PAL: $F_1 = \Sigma m(0, 2, 5, 7, 8, 10, 12, 13)$; $F_2 = \Sigma m(0, 2, 6, 8, 9, 14, 15)$	14 Marks

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CODE No.: 20BT5HS01 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-20) Supplementary Examinations, May – 2026

ORGANIZATIONAL BEHAVIOR

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Business Systems, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Science)

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain meaning of organizational behavior and its relevance in today's business environment.	7 Marks	L4	CO1	PO1
	b)	Discuss the various challenges for organization behavior.	7 Marks	L2	CO1	PO9
		(OR)				
2.		Explain scope of OB? Summaries the contribution of other disciplines to OB.	14 Marks	L4	CO1	PO9

UNIT-II

3.	a)	Explain various major factors that determine individual behavior.	7 Marks	L4	CO2	PO9
	b)	"Job satisfaction play a vital role in organization" Comment.	7 Marks	L5	CO2	PO12
		(OR)				
4.	a)	Describe components of attitude.	7 Marks	L2	CO2	PO9
	b)	Reasons for individual differences.	7 Marks	L5	CO2	PO12

UNIT-III

5.		Define perception, explain the process of perception and its relevance in OB.	14 Marks	L2	CO3	PO1
		(OR)				
6.		Define group and illustrate the process of group development in detail.	14 Marks	L2	CO3	PO2

UNIT-IV

7.		Discuss various leadership styles with suitable example.	14 Marks	L2	CO4	PO9
		(OR)				
8.		Summarize various theories of leadership.	14 Marks	L5	CO4	PO12

UNIT-V

9.	a)	Outline various factors influencing change.	7 Marks	L4	CO5	PO2
	b)	"Pressure for change is god or bad" comment.	7 Marks	L5	CO5	PO9
		(OR)				
10.	a)	"Organizational development process is a continues and pervasive in nature" comment.	7 Marks	L5	CO5	PO2
	b)	Describe the importance of organizational development interventions.	7 Marks	L1	CO5	PO12

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Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-20) Supplementary Examinations, May– 2026

PRINCIPLES OF BUSINESS ECONOMICS AND ACCOUNTANCY

[Civil Engineering, Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. Define Business economics. Examine whether business economics is micro Economics. 14 Marks L2 CO1 PO1

(OR)

2. Demonstrate the law of demand with the help of a table and graph. 14 Marks L3 CO1 PO1

UNIT-II

3. Interpret the concepts of Isoquants and Isocosts. 14 Marks L3 CO2 PO2

(OR)

4. Execute BEP and Margin of Safety during period II from the given data. 14 Marks L3 CO2 PO10

Particulars	Period I	Period II
Sales(Rs.)	4,00,000	6,00,000
Profit(Rs.)	40,000	80,000

UNIT-III

5. "Is monopoly socially desirable market scenario?" Discuss. 14 Marks L2 CO3 PO2

(OR)

6. Demonstrate the following: 14 Marks L3 CO3 PO2
Peak-loaded pricing.
Block pricing.
Market Skimming.

UNIT-IV

7. For the following transactions pass the necessary Journal entries in the books of Charisma for the month of October 2020. 14 Marks L4 CO4 PO11
Oct. 1 Charisma commenced a business with Cash Rs80,000/ furniture Rs. 30,000/-.
Oct. 5 Bought goods from Raman Rs.40,400/-
Oct. 9 Cash paid to Raman Rs.40,000/- in full settlement ofhis account.
Oct. 16 Sold goods to Neelima Rs.44,600/-
Oct. 25 Cash received from Neelima Rs.44,000/- in fullsettlement of her account.
Oct. 31 Dividend received through cheque Rs.12,800/-

(OR)

8. For the following transactions pass the necessary journal entries in the books of Jeevan. 14 Marks L4 CO4 PO11
2020 Sep. 1 Jeevan commenced a business with Rs.10,00,000/-
Sep. 6 Bought goods from Sheetal Agencies for cash Rs.1,00,000/-
Sep. 17 Bought goods by Surya Rs. 48,000/-
Sep. 21 Rent received Rs. 5,000/-
Sep. 28 Surya returned goods Rs.1,000/-

Sep. 30 Goods worth Rs. 20,000/- gifted to brother.

UNIT-V

9. A Bookkeeper has submitted to you the following Trail Balance: 14 Marks L4 CO5 PO11

Particulars	Debit (Rs)	Credit (Rs)
Capital		7,610
Cash in hand	30	
Purchases	8,990	
Sales		11,060
Cash at Bank	885	
Fixtures and Fittings	225	
Free hold Premises	1,500	
Lighting and Heating	65	
Bills Receivable	825	
Returns inwards	30	
Salaries	1,075	
Creditors		2,950
Debtors	6,700	
Stock on January 1-2021	3,000	
Printing	225	
Bills Payable		1,875
Rates, taxes,s and insurance	190	
Discounts receive		445
Discounts allowed	200	
Total	**23,940**	**23,940**

Stock on 31st Dec 2021 was valued at Rs. 1,800/-.You are required to prepare a Trading and Profit & Loss Account for the year ending Dec 31, 2021.

(OR)

10. From the following balances of accounts in the books of M/s Kavitha, prepare Trading, profit, and loss account for the year ending March 311, 202,1, and also Prepare balance sheets on that date taking into account the following 14 Marks L4 CO5 PO11

Particulars	Amount	Particulars	Amount
capital	450,000	Salaries	75,000
Sales	9,00,000	Commission (Dr)	15,000
Purchases	300,000	Interest (Dr)	10,000
Sales Returns	10,000	Gas, water,r and Power	30,000
Purchases returns	15,000	Loan form HARS	50,000
creditors	100,000	Bills Receivable	100,000
Debtors	200,000	Bills Payable	5,000
Opening Stock	90,000	Electricity	16,000
Machinery	600,000	wages	14,000
Furniture	100,000	Commission (cr)	40,000

Adjustments:

i) Prepaid salaries Rs.3,000/-
ii) Commission yet to be received Rs.5,000/-
iii) Closing stock Rs.2,00,000/-
iv) Charge depreciation @ 10% on machinery and @15 % on furniture.

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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III B.Tech I Semester (SVEC-20) Supplementary Examinations, May – 2026

DESIGN AND ANALYSIS OF ALGORITHMS

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Write an algorithm that inputs three integers and outputs them in non-decreasing order.	7 Marks	L2	CO1	PO1
	b)	Solve the recurrence relation using Recursion tree method and Identify the complexity. $T(n) = T(1)$ if $n=1$ $aT(n/b)+f(n)$ if $n>1$,where $a=3, b=4$ and $f(n)=cn^2$	7 Marks	L3	CO1	PO1

(OR)

2.	a)	Show that the cost of n stack operations, including copying the stack, is O(n) by assigning suitable amortized costs to the various stack operations.	7 Marks	L4	CO1	PO2
	b)	Prove that $(1/2)n^2 -3n= \theta(n^2)$.	7 Marks	L3	CO1	PO1

UNIT-II

3.	a)	Illustrate Simple Union() and Weighted Union() algorithms with an example.	6 Marks	L2	CO2	PO2
	b)	Consider the array of ten elements a[1:10]= (310, 285,179, 652, 351, 423,861, 254, 450, 520). Sort these elements using Merge sort algorithm. Analyze its time complexity and represent in the form of recurrence relation.	8 Marks	L3	CO2	PO2

(OR)

4.	a)	Define Divide and Conquer. i) List the applications of Divide and conquer. ii) Write the control abstraction of divide and conquer.	7 Marks	L1	CO2	PO1
	b)	Illustrate Strassen's Matrix Multiplication and compare its time complexity with conventional matrix multiplication.	7 Marks	L4	CO2	PO2

UNIT-III

5.	a)	State the Principle of Optimality. Compare and contrast greedy method and dynamic programming.	7 Marks	L2	CO2	PO2
	b)	Apply dynamic programming to obtain optimal binary search tree for the identifier set (a1, a2, a3, a4)=(cin, for, int, while) with (p1, p2, p3, p4)=(1, 4, 2, 1), (q0, q1, q2, q3, q4)=(4, 2, 4, 1, 1).	7 Marks	L3	CO3	PO3

(OR)

6.	a)	Apply Matrix chain multiplication using dynamic programming for the following sequence and compute $M [i,j], 0 \le i, j \le 5$. {4, 10, 3, 12, 20, and 7}.	7 Marks	L3	CO3	PO3
	b)	Apply 0/1 knapsack method for the case in which n = 3, W1 =2, W2 =3; W3 = 4, p1 =1, p2= 2,p3= 5, and m = 6, compute the maximum profit.	7 Marks	L3	CO3	PO3

UNIT-IV

7.	a)	Write general method of backtracking approach.	7 Marks	L2	CO2	PO2
	b)	Apply algorithm Job sequencing with deadlines and find out optimal solutions for the following problem. Let n = 4, (p1,p2,p3,p4) = (100,10,15,27), (d1,d2,d3,d4) = (2,1,2,1)	7 Marks	L3	CO3	PO3

(OR)

8.	a)	Apply Sum of Subsets algorithm and find all possible subsets of w[1:6]={5,10,12,13,15,18} that sum to m=30 using backtracking approach.	7 Marks	L3	CO3	PO3
	b)	Draw state space tree for Hamiltonian cycle for a graph using backtracking approach?	7 Marks	L3	CO3	PO2

UNIT-V

9.	a)	Define NP-Hard and NP-Complete problem. Explain Cook's Theorem.	7 Marks	L2	CO4	PO1
	b)	Compare and contrast deterministic and non-deterministic algorithms.	7 Marks	L2	CO4	PO2

(OR)

10.		Construct the portion of the state space tree for the following Knapsack instance: n=5, M=12, (p1,P2,p3,p4,p5) = (10,15,6,8,4), (w1,w2,w3,w4,w5) =(4,6,3,4,2) using the following Branch and Bound techniques i) LC Search ii) FIFO	14 Marks	L3	CO2	PO2

CODE No.: 20BT50504 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-20) Supplementary Examinations, May– 2026

CYBER SECURITY

[Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Briefly explain about Cybercrime definition and origins of the world.	7 Marks	L1	CO1	PO1
	b)	Analyze the various classifications of cybercrime.	7 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Discuss in detail about cybercrime and information security.	7 Marks	L1	CO1	PO1
	b)	Explain in detail about various online frauds.	7 Marks	L1	CO1	PO1

UNIT-II

3.	a)	Enumerate the procedure for How criminal plan the attacks.	7 Marks	L1	CO1	PO1
	b)	State the art of "Cyber Stalking".	7 Marks	L1	CO1	PO1
		(OR)				
4.	a)	List and explain various types of Identity Thefts.	7 Marks	L2	CO1	PO2
	b)	Specify various types of phishing techniques.	7 Marks	L1	CO1	PO2

UNIT-III

5.	a)	With a neat sketch explain in detail about proliferation of mobile and wireless devices.	7 Marks	L2	CO3	PO3
	b)	Discuss briefly about attacks on mobile/cell phones.	7 Marks	L1	CO3	PO1
		(OR)				
6.	a)	Describe briefly about security implications for organizations.	7 Marks	L1	CO3	PO1
	b)	What are the various security challenges posed by mobile devices?	7 Marks	L2	CO3	PO2

UNIT-IV

7.	a)	List and explain various types of Keyloggers in cybercrime.	7 Marks	L1	CO2	PO1
	b)	With a neat sketch, Discuss in detail about various aspects of DoS and DDoS attacks.	7 Marks	L1	CO2	PO2
		(OR)				
8.	a)	Specify various tools that are used to fine the common vulnerabilities in a cybercrime.	7 Marks	L1	CO2	PO5
	b)	Explain in detail about attacks on wireless networks.	7 Marks	L1	CO2	PO1

UNIT-V

9.	a)	Discuss in detail about Digital Forensics Lifecycle.	7 Marks	L1	CO4	PO6
	b)	Describe briefly about chain custody concept.	7 Marks	L1	CO4	PO6
		(OR)				
10.	a)	Illustrate the concept of how official website of maharastra government was hacked.	7 Marks	L3	CO5	PO6
	b)	How Indian Case of Intellectual property crime was solved.	7 Marks	L3	CO5	PO8

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Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-20) Supplementary Examinations, May– 2026

IMAGE PROCESSING

[Electrical and Electronics Engineering, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Develop the steps involved in sampling and quantization of an image.	6 Marks	L2	CO1	PO2
	b)	If an image A=[1 0 1 ;1 1 0; 0 1 1] & B= [0 1 1; 0 0 1; 1 1 0] Perform any four Logical operations on the two images A & B.	8 Marks	L4	CO1	PO4
		(OR)				
2.	a)	Define the following i) 4-Adjacency ii) 8-Adjacency iii) m-Adjacency	8 Marks	L2	CO1	PO1
	b)	Derive the DCT kernel matrix for N=4.	6 Marks	L2	CO1	PO2

UNIT-II

3.	a)	What are the different types of high pass filters used in image enhancement through frequency domain?	7 Marks	L4	CO2	PO3
	b)	Differentiate spatial and frequency domain Enhancement methods.	7 Marks	L2	CO2	PO2
		(OR)				
4.		Write a short note on : i) High-boost filtering. ii) Low pass filtering in spatial domain. iii) Median filter.	14 Marks	L2	CO2	PO1

UNIT-III

5.	a)	Derive degradation transfer function using constrained least squares filtering approach.	7 Marks	L3	CO3	PO5
	b)	Distinguish between various Filters present in spatial domain and explain the need of filtering techniques in image processing.	7 Marks	L2	CO3	PO2
		(OR)				
6.	a)	What is the need of Image restoration in Modern digital image processing?	7 Marks	L2	CO3	PO7
	b)	Explain how to restore the image corrupted with salt and pepper noise using Median filter?	7 Marks	L2	CO3	PO6

UNIT-IV

7.	a)	Explain the following: i) Interpixel Redundancy ii) Coding Redundancy	5 Marks	L2	CO4	PO1
	b)	Compare various Image Compression Models used in image processing.	9 Marks	L2	CO4	PO8
		(OR)				
8.		Apply LZW Compression on the message DAFDADRDAFDA and give the encoded message.	14 Marks	L3	CO4	PO5

UNIT-V

9.	a)	Define RGB model. Write the necessary expression for converting RGB to CMYK.	7 Marks	L2	CO6	PO1
	b)	Design Masks to detect Point, line and edge detection in image processing.	7 Marks	L4	CO5	PO3
		(OR)				
10.	a)	Appraise adaptive thresholding to differentiate between Foreground and background.	7 Marks	L2	CO5	PO2
	b)	Develop an Algorithm to convert RGB color model to HSI color model.	7 Marks	L4	CO6	PO3

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Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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IV B.Tech I Semester (SVEC-20) Supplementary Examinations, May– 2026

ESTIMATION AND QUANTITY SURVEYING

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. Find out the quantities of the following items of work from the drawing shown in Fig.1 below. — 14 Marks — L5 — CO1 — PO1 PO2 PO4 PO5
   i) Plastering with cement mortar 1:3
   ii) Flooring
   iii) White washing
   iv) Painting

   Door- 1000 x 2100mm, Window - 1400 x 1500mm

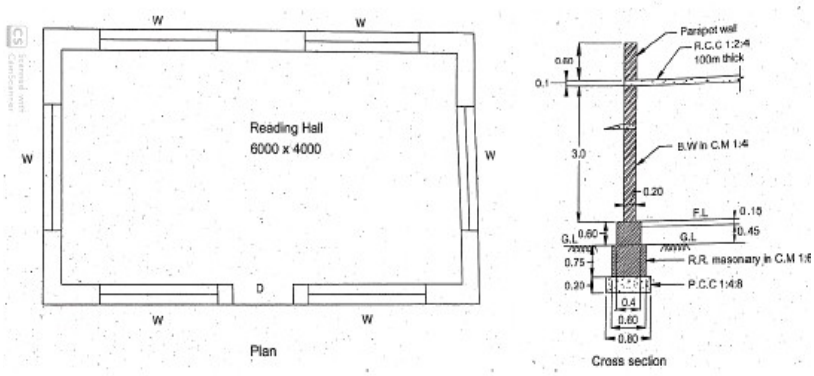


Fig.1

(OR)

2. Find out the quantities of the following items of work from the drawing shown in Fig.2 below using long wall short wall method. — 14 Marks — L5 — CO1 — PO1 PO2 PO4 PO5
   i) Earth work excavation in foundation.
   ii) Plain cement concrete 1:5:10 below the footing.

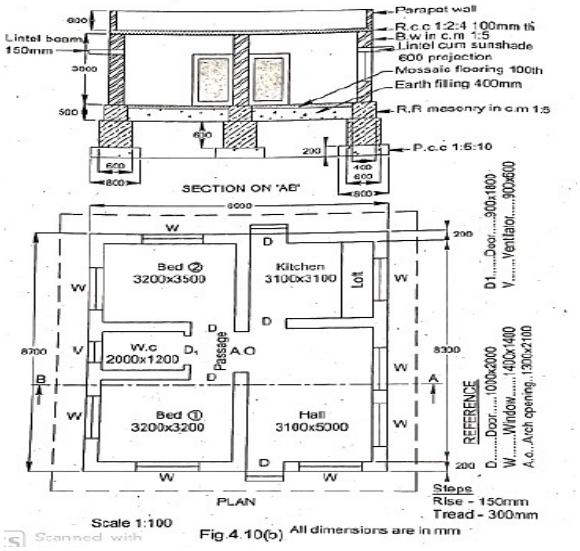


Fig.2

UNIT-II

3. a) Prepare a detailed estimate for the 'cement concrete road' from the given Fig.3 for a length of 200 m. — 7 Marks — L5 — CO2 — PO1, PO2, PO5

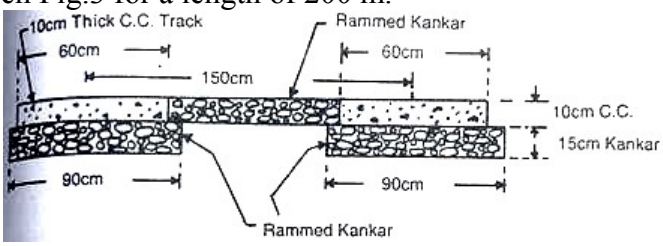
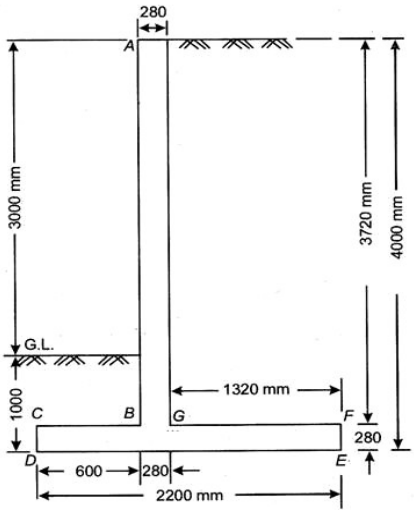


Fig.3

b) Explain a 'cantilever retaining wall' and prepare the estimate for the 100m length retaining wall shown in Fig.4 — 7 Marks — L5 — CO2 — PO1, PO2, PO5



Cantilever retaining wall

Fig.4

(OR)

4. Prepare the estimate for soak pit for the following Fig.5 — 14 Marks — L5 — CO2 — PO1, PO2, PO4, PO5

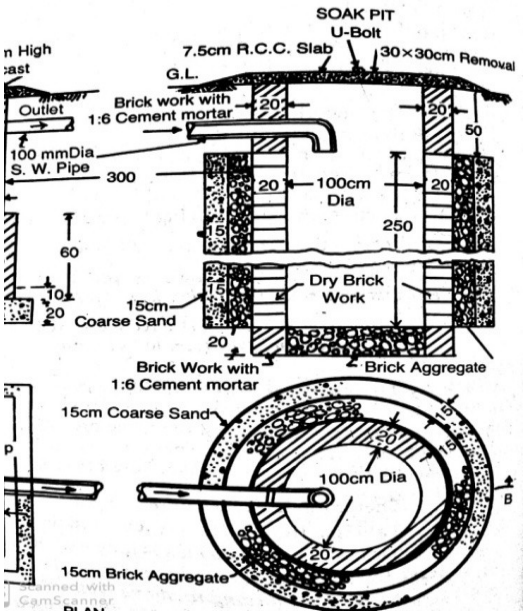


Fig.5

UNIT-III

5. a) Compare the first class and second class specifications for footing component. — 7 Marks — L4 — CO3 — PO1, PO2

b) Write down the rate analysis for various class buildings. — 7 Marks — L2 — CO3 — PO1, PO6

(OR)

6.	a)	Explain about lead statement.	7 Marks	L2	CO3	PO1
	b)	Calculate the rate analysis as per the SSR for the following items: i) RCC 1:2:4 for footing ii) Brick Masonry in CM 1:6 with 230mm thick for superstructure for 1st floor iii) Plastering in CM 1:4 with 20mm thick for 1st floor.	7 Marks	L4	CO3	PO1 PO2 PO4 PO5

UNIT-IV

7.	Develop a construction agreement for constructing the residential building having the built-up area of 1000 sq.m.	14 Marks	L6	CO4	PO1
	(OR)				
8.	Prepare a tender document for constructing a multistorey buildingon a plot of land measuring 5400 m^2.Assume other required data.	14 Marks	L6	CO4	PO1 PO2 PO3

UNIT-V

9.	A three storied building has been constructed on a plot of land measuring 900 m^2. The plinth area of each storey is 500 m^2. The life of the building structure may be taken as 80 years. The building fetches a gross rent of Rs. 7000/-month. Calculate the capitalized value of the property on the basis of 12% net yield. For sinking fund 4% compound interest may be assumed. Cost of land may be taken as Rs. 600/- per m^2, other data required may be assumed suitably.	14 Marks	L4	CO5	PO1 PO2 PO4 PO5 PO6 PO11
	(OR)				
10.	An R.C.C framed structure building having estimated future life of 80 years, fetched a gross annual rent of Rs2,200 per month. Work out its capitalized value on the basis of 6% net yield. The rate of compound interest for sinking fund may be 4%. The other outgoing is i) Repair and Maintenance = 1/12 of gross income ii) Municipal and property taxes=25% of gross income iii) Management and miscellaneous=7% of gross income The plinth area of the building=800 m^2 and cost per m^2 as Rs. 500/-.	14 Marks	L4	CO5	PO1 PO2 PO4 PO5 PO6 PO11

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-20) Supplementary Examinations, May– 2026

INFRASTRUCTURE DEVELOPMENT AND MANAGEMENT

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Discuss the impact of infrastructure development on economic growth, standard of living and environment.	14 Marks	L4	CO1	PO1 PO2 PO6 PO7 PO11
		(OR)				
2.	a)	Discuss the reasons for the rise of public sector and government involvement in infrastructural activities.	7 Marks	L4	CO1	PO1 PO2 PO6
	b)	Describe the changed socio-economic scenario and current infrastructure problems in India.	7 Marks	L4	CO1	PO1 PO2 PO6 PO11

UNIT-II

3.		State the current power scenario in India? Discuss different strategies of power generation and factors affecting power generation.	14 Marks	L4	CO2	PO1 PO2 PO6 PO7
		(OR)				
4.	a)	Discuss in detail about public private partnership contracts. Identify it's role in infrastructure development.	7 Marks	L4	CO2	PO1 PO2 PO6 PO8 PO11
	b)	Write a short note on turnkey contracts.	7 Marks	L2	CO2	PO1 PO8 PO11

UNIT-III

5.		Giving a historical review of the government policies on the highways infrastructure, discuss the different 20year plan for the development of highways in India.	14 Marks	L4	CO3	PO1 PO2 PO4 PO6
		(OR)				
6.	a)	Discuss the effects of current public policies on transportation, power and telecom sectors.	7 Marks	L4	CO3	PO1 PO2 PO4
	b)	Explain the legal framework for regulating private participation in roads and highways.	7 Marks	L2	CO3	PO1 PO8

UNIT-IV

7.	a)	Explain the construction component of oil and gas sector.	7 Marks	L2	CO4	PO1
	b)	Discuss the change in regulatory framework of government policies and future plans that could lead to the development of infrastructure in India.	7 Marks	L4	CO4	PO1 PO2 PO4 PO7

(OR)

8.	Discuss the technological and methodological demands on construction management in infrastructure development projects.	14 Marks	L4	CO4	PO1 PO2 PO4 PO6

UNIT-V

9.	What do you mean by thermal power and nuclear power? Discuss the advantages and disadvantages of both in infrastructure development.	14 Marks	L4	CO5	PO1 PO2

(OR)

10.	a)	Explain the toll collection strategy in India. Differentiate between shadow tolling and direct tolling.	7 Marks	L4	CO5	PO1 PO2 PO5 PO8 PO11
	b)	Write a brief note on MRTS, LRT and Multi model transport system.	7 Marks	L2	CO5	PO1 PO6 PO7

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Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-20) Supplementary Examinations, May– 2026

ADVANCED FOUNDATION ENGINEERING

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss Vesic's bearing capacity theory.	7 Marks	L2	CO1	PO1 PO5
	b)	A strip footing of width 3 m is founded at a depth of 2 m below the ground surface in a *(c* - ϕ) soil having a cohesion c = 30 kN/m^2 and angle of shearing resistance ϕ = 36°. The water table is at a depth of 5 m below ground level. The moist weight of soil above the water table is 17.25 kN/m^3. Determine i) the net ultimate bearing capacity of the soil, ii) the net allowable bearing pressure, by Hansen's Theory. Take a factor of safety of iii) Use the general shear failure. Consider N_c = 50.55, N_q = 37.7 and N_γ = 40.0 for ϕ = 36°.	7 Marks	L4	CO1	PO1 PO2 PO4 PO6 PO8 PO10

(OR)

2.	a)	Where do you provide a combined footing? Discuss the procedure for the design of trapezoidal combined footing.	7 Marks	L4	CO1	PO1
	b)	Figure 1 shows a shallow foundation in a clay. The following data are given: B = 1.4 m; D_f = 1.4 m; b = 0.9 m; H = 6.5 m; slope angle = 30°, unit weight of soil = 17.5 kN/m^3, φ=0° and c = 50 kN/m^2. Determine the gross allowable bearing capacity with a factor of safety 4. Take N_c = 6.3.	7 Marks	L4	CO1	PO1 PO2 PO4 PO6 PO8 PO10

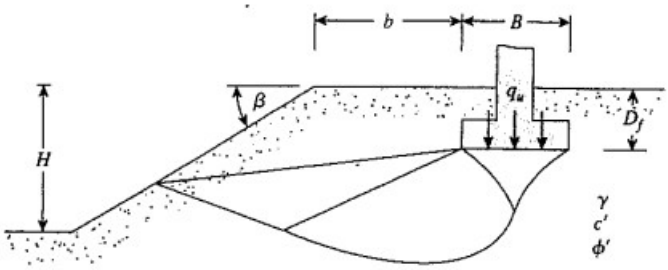

Fig. 1

UNIT-II

3.	a)	Discuss the Janbu's method of estimating end bearing resistance of pile, Q_p.	7 Marks	L2	CO2	PO1 PO5
	b)	A pile 40 cm in dia., 10 m long, is driven into a clay soil with C_u = 40 kN/m^2 and saturated unit weight of clay is 20 kN/m^3. Ground water is almost at the level of the ground surface. Determine the uplift capacity of the pile under undrained conditions. The submerged weight of the pile is 50 kN. Take α = 0.50.	7 Marks	L4	CO2	PO1 PO2 PO4 PO8

(OR)

4.	a)	Write a brief note on the analysis and design of laterally loaded piles.	7 Marks	L4	CO2	PO1 PO2

	b)	A steel pipe pile of 61 cm outside diameter with a wall thickness of 2.5 cm is driven into loose sand (D_r = 30%) under submerged conditions to a depth of 20 m. The submerged unit weight of the soil is 8.75 kN/m^3 and the angle of internal friction is 33°. The EI value of the pile is 4.35 x 10^{11} kg-cm^2 (4.35 x 10^2 MN-m^2). Compute the ground line deflection of the pile under a lateral load of 268 kN at ground level under a free head condition using the non-dimensional parameters of Matlock and Reese. The n_h value for D_r = 30% is 6 MN/m^3 for a submerged condition.	7 Marks	L4	CO2	PO1 PO2 PO4 PO5 PO6 PO8 PO10

UNIT-III

5.	a)	What are sheet piles? Classify sheet piles.	7 Marks	L4	CO3	PO1 PO2
	b)	A cantilever sheet pile is to be constructed to retain sandy soil to a depth of 8 m. The dry unit weight of sand is 17 kN/m^3 and the saturated unit weight is 20 kN/m^3. The angle of shearing resistance of sand is 34°. The water level is 4 m above the dredge line. Compute the depth of embedment of the sheet pile.	7 Marks	L6	CO3	PO1 PO2 PO3 PO4 PO8 PO10

(OR)

6.	a)	Draw different types of apparent pressure diagrams used in the design of braced cuts.	7 Marks	L2	CO3	PO1 PO10
	b)	An anchored bulkhead retains cohesionless soil of height 8 m. The free water level is at 2.0 m below the top ground surface. Anchors are provided at 1.0 m below top. The saturated and submerged unit weights of the soil are 18.5 kN/m^3 and 9 kN/m^3 respectively. The angle of internal friction of the soil is 30°. Determine i) depth of embedment, ii) anchor pull and iii) maximum moment in the sheet pile. Use the free earth support method.	7 Marks	L6	CO3	PO1 PO2 PO3 PO4 PO8 PO10

UNIT-IV

7.	a)	What are the characteristics of an expansive soil? How do you identify that? Discuss the factors affecting the swelling of expansive soils.	7 Marks	L2	CO5	PO1 PO2 PO8
	b)	Determine the length and capacity of triple undereamed pile of stem diameter 400 mm. The stratum is a deep deposit of average cohesion of 70 kN/m^2.	7 Marks	L4	CO4	PO1 PO2 PO8 PO10

(OR)

8.	a)	What are the foundation techniques available for different structures to be constructed in expansive soils? Describe any two of them in detail.	7 Marks	L4	CO5	PO1 PO2 PO10
	b)	Determine the capacity of a 5 m long single underreamed pile of 400 mm stem diameter. The stratum is a deep deposit of medium dense sand having γ = 18 kN/m^3 and φ = 30°.	7 Marks	L4	CO4	PO1 PO2 PO8 PO10

UNIT-V

9.		Write short notes on the following: i) Breakwaters ii) Wharves iii) Jetties iv) Ship Impact	14 Marks	L2	CO6	PO1 PO10

(OR)

10.	a)	Explain different types of marine structures and their uses.	7 Marks	L2	CO6	PO1 PO10
	b)	Enumerate the design of rubble-mound breakwaters.	7 Marks	L2	CO4	PO1

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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IV B.Tech I Semester (SVEC-20) Supplementary Examinations, May– 2026

PRESTRESSED CONCRETE

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain in detail on the different types of prestressing.	7 Marks	L2	CO1	PO1
	b)	Differentiate between the full prestressing and partial prestressing.	7 Marks	L4	CO1	PO1 PO2

(OR)

2.	a)	Explain with neat sketch on Freyssinet system of prestressing.	7 Marks	L2	CO1	PO1
	b)	Compare and contrast pre-tensioning and post-tensioning system.	7 Marks	L4	CO1	PO1 PO2

UNIT-II

3.		A prestressed concrete beam of section 140 mm wide and 300 mm deep is used over an effective span of 6 m to support a uniformly distributed load of 4 kN/m, which includes the self-weight of the beam. The beam is prestressed by a straight cable carrying a force of 180 kN and located at an eccentricity of 50 mm. Determine the location of the thrust-line in the beam and plot its position at quarter and central span sections.	14 Marks	L4	CO2	PO1 PO2

(OR)

4.	a)	A concrete beam is prestressed by a cable carrying an initial prestressing force of 300 kN. The cross-sectional area of the wires in the cable is 300 mm^2. Calculate the percentage loss of stress in the cable only due to shrinkage of concrete using IS: 1343 recommendations assuming the beam to be, i) pre-tensioned and ii) post-tensioned. Assume E_s = 210 kN/mm^2 and age of concrete at transfer = 8 days.	7 Marks	L4	CO2	PO1 PO2
	b)	A concrete beam is post-tensioned by a cable carrying an initial stress of 1000 N/mm^2. The slip at the jacking end was observed to be 5 mm. The modulus of elasticity of steel is 210 kN/mm^2. Estimate the percentage loss of stress due to anchorage slip if the length of the beam is (a) 30 m and (b) 3 m.	7 Marks	L4	CO2	PO1 PO2

UNIT-III

5.		A prestressed road bridge of span 10 m consists of a concrete slab 380 mm thick with parallel post-tensioned cables, in each of which the force at transfer is 360 kN. If the bridge is required to support an uniformly distributed applied load of 25 kN/m^2, with the tensile stress in the concrete not exceeding 0.7 N/mm^2 at any time, calculate the maximum horizontal spacing of the cables, their distance from the soffit of the slab at mid-span and their lowest possible position at the supports. Assume 20 per cent loss of prestress after transfer.	14 Marks	L6	CO3	PO1 PO2 PO3 PO8

(OR)

6.	A prestressed girder of rectangular section 200 mm wide by 400 mm deep is to be designed to support an ultimate shear force of 140 kN. The uniform prestress across the section is 5 N/mm^2. Given the characteristic cube strength of concrete as 40 N/mm^2 and Fe-415 HYSD bars of 8 mm diameter, design suitable spacing for the stirrups confirming to the Indian Standard Code IS 1343 recommendations. Assume cover to the reinforcement as 50 mm.	14 Marks	L6	CO3	PO1 PO2 PO3 PO8
	UNIT-IV				
7.	The end block of a post tensioned prestressed concrete beam, 300 mm wide and 300 mm deep, is subjected to a concentric anchorage force of 935800 N by a anchorage of an area 14520 sq mm. Design and detail the anchorage reinforcement for the end block.	14 Marks	L6	CO4	PO1 PO2 PO3 PO5
	(OR)				
8.	The end block of a prestressed concrete beam, rectangular in section is 100mm wide and 200 mm deep. The prestressing force of 100 kN is transmitted to concrete by a distribution plate, 100 mm wide and 50 mm deep, concentrically located at the ends. Calculate the position and magnitude of the maximum tensile stress on the horizontal section through the centre and edge of the anchor plate. Compute the bursting tension on the horizontal planes using Magnel method.	14 Marks	L6	CO4	PO1 PO2 PO3 PO5 PO8
	UNIT-V				
9.	Design a composite slab for the bridge deck using a standard inverted T-section. The top flange is 250 mm wide and 100 mm thick. The bottom flange is 500 mm wide and 250 mm thick. The web thickness is 100 mm and the overall depth of the inverted T-section is 655 mm. The bridge deck has to support a characteristic imposed load of 50 kN/m^2 over an effective span of 14 m. Grade-40 concrete is specified for the precast pretensioned T-with a compressive strength at transfer of 36 N/mm^2. Concrete of grade 30 is used for the in situ part. Determine the minimum prestress necessary and check for safety under serviceability limit state.	14 Marks	L6	CO5	PO1 PO2 PO3
	(OR)				
10.	A compsite T-beam is made up of a pre-tensioned rib 100 mm wide and 200 mm deep, and a cast in situ slab 400 mm wide and 40 mm thick having a modulus of elasticity of 28 kN/mm^2. If the differential shrinkage is 100x10^{-6} units, determine the shrinkage stresses developed in the precast can cast in situ units.	14 Marks	L4	CO5	PO1 PO2

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Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-20) Supplementary Examinations, May– 2026

BRIDGE ENGINEERING

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Explain the various types of IRC loadings in the design of highway bridges.	14 Marks	L2	CO1	PO1 PO6 PO8 PO10
		(OR)				
2.	a)	Indicate the extent of survey to be undertaken and the relevant data to be collected for fixing site and waterway of the bridge.	7 Marks	L2	CO1	PO1 PO6 PO8
	b)	Mention the importance of investigation of site in bridge design considering sustainable development.	7 Marks	L2	CO1	PO1 PO6 PO8

UNIT-II

3.		Design a reinforced concrete slab bridge using the following data: Clear width of road way=7.7 m Clear span =12 m Live load= IRC class AA loading. Use M-25 grade concrete & Fe 415 steel.	14 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO10
		(OR)				
4.		Recommend a suitable culvert bridge and design for a national highway crossing with the following data: Clear vent way = 4 m × 4 m Live load = 50 kN/m^2. Dead load = 12 kN/m^2 Density of soil = 15 kN/m^3 Angle of repose of soil = 30^0 Materials: M20 grade and Fe415 grade HYSD bars. Draw the details of reinforcement in the box culvert.	14 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO10

UNIT-III

5.		Design RCC T-beam deck slab of a NH two lane bridge with effective span of 16.0 m subjected to IRC class A-A tracked vehicle with M25 and Fe415 grade materials.	14 Marks	L6	CO3	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8

					PO10
	(OR)				
6.	Using Courbon's method, compute the design moments and shears. Design and sketch the typical details of reinforcement for RC-T-beam girder bridge to suit the following data: Clear width of roadway = 7.5 m Width of kerbs = 600 mm Effective span = 20 m Live load = I.R.C class-AA tracked vehicle. Thickness of wearing coat = 80 mm Number of main girders = 4 Concrete = M20 grade Steel = Fe415 grade HYSD bars Spacing of cross girders = 4 m Spacing of main girders = 2.5 m.	14 Marks	L6	CO3	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO10
	UNIT-IV				
7.	What are the different types of bearings considering in the design of RCC bridges? Explain them with neat sketches.	14 Marks	L2	C04	PO1 PO6 PO8 PO10
	(OR)				
8.	Design an elastomeric pad bearing to support a tee beam girder using the following data. Max. dead load reaction per bearing =350kN Max. live load reaction per bearing =750kN Longitudinal force due to friction per bearing = 45kN Effective span of the girder = 18m Estimated rotation at bearing of the girder due to dead and live loads is 0.002 rad, Concrete for tee beam and bed block is M-20 grade and Total estimated shear strain due to creep, shrinkage and temperature is 6 $x10^{-4}$ units.	14 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO10
	UNIT-V				
9.	What are the different types of piers used for bridges and explain them with neat sketches?	14 Marks	L2	CO5	PO1 PO6 PO8 PO10
	(OR)				
10.	Write short notes on: i) Stability analysis of abutments. ii) Types of wing walls. iii) Types of bridge foundations.	14 Marks	L2	CO5	PO1 PO6 PO8

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Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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IV B.Tech I Semester (SVEC-20) Supplementary Examinations, May– 2026

GEOSPATIAL TECHNOLOGIES

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss the computation of photographs for flight planning.	7 Marks	L2	CO1	PO1
	b)	Calculate the flying height of the aircraft if the elevation of terrain is 800m above MSL, the camera's focal length50mm and the scale of image required is 1:3500.	7 Marks	L4	CO1	PO1 PO2 PO4 PO10

(OR)

2.	a)	Explain Categories of aerial photogrammetry.	7 Marks	L2	CO1	PO1
	b)	Calculate the scale of photographs, if the flying height of the aircraft is 1500m, the elevation of terrain is 1000m and the focal length of the camera is 250mm.	7 Marks	L4	CO1	PO1 PO2 PO4 PO10

UNIT-II

3.	What is the basic process and elements involved in electromagnetic remote sensing of earth resources? Explain them.	14 Marks	L4	CO2	PO1 PO2 PO4 PO5 PO6

(OR)

4.	a)	Explain the following : i) Spatial resolution ii) Spectral resolution	7 Marks	L4	CO2	PO1 PO2 PO7
	b)	Explain the basics of visual interpretation of imageries.	7 Marks	L4	CO2	PO1 PO2 PO7

UNIT-III

5.	Distinguish between Raster GIS and vector GIS.	14 Marks	L4	CO3	PO1 PO2 PO5 PO6

(OR)

6.	Explain the Geographical Information system and also explain the components used in GIS analysis.	14 Marks	L4	CO3	PO1 PO2 PO5 PO6

UNIT-IV

7.	Evaluate the various network analysis tools used in GIS	14 Marks	L4	CO4	PO1

(OR)

8.	Analyze the process of vector overlay analysis to identify the availability of natural resources.	14 Marks	L4	CO4	PO1

UNIT-V

9.	How GIS is useful as a tool in Urban planning and management.	14 Marks	L4	CO5	PO1 PO2 PO4 PO5 PO6
	(OR)				
10.	Discuss suitable RS and GIS methods to assess the impact due to floods and droughts.	14 Marks	L4	CO5	PO1 PO2 PO4 PO5 PO6

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Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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IV B.Tech I Semester (SVEC-20) Supplementary Examinations, May– 2026

SOLID STATE DRIVES

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	With the relevant mathematical conditions and characteristics, analyze the concept of steady state stability of electric drive.	9 Marks	L1	CO1	PO2
	b)	Elucidate in detail of choice of electrical drives based on some important factors,	5 Marks	L4	CO1	PO1
		(OR)				
2.	a)	Analyze the equivalent values of driving parameters under different sections of a load through different gears, such as rotational motion.	9 Marks	L1	CO1	PO2
	b)	With a neat block diagram, explain in detail about current limit control.	5 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Why does three phase full-controlled rectifier fed DC motor operate in industries as two quadrants? Justify your answer with relevant expression and speed-torque characteristics.	5 Marks	L3	CO2	PO6
	b)	A 200V, 875rpm, 150A separately excited dc motor has an armature resistance of 0.06Ω. It is fed from a single phase fully-controlled rectifier with an AC source voltage of 220V, 50Hz. Assuming continuous conduction. Determine i) firing angle for rated motor torque and 750rpm. ii) firing angle for rated motor torque and (-500) rpm. iii) motor speed for $\alpha = 160^0$ and rated torque.	9 Marks	L2	CO2	PO4
		(OR)				
4.	a)	With a neat sketch and expressions, elucidate the operation of a three-phase full converter fed separately excited motor drive.	9 Marks	L1	CO2	PO1
	b)	With appropriate expressions, analyze the speed-torque characteristics of a three-phase semi-converter fed separately excited DC motor under continuous conduction.	5 Marks	L4	CO2	PO2

UNIT-III

5.	a)	An industrial application demands motoring control. Suggest a suitable arrangement of chopper fed motor meeting the requirements. Justify your suggestion with relevant proof.	9 Marks	L4	CO2	PO6
	b)	Why are thyristors not usually preferred for chopper-fed DC drives? Justify your answers.	5 Marks	L1	CO2	PO2
		(OR)				
6.	a)	A 230 V, 960 rpm and 200 A separately excited DC motor has an armature resistance of 0.02 Ω. The motor is fed from a chopper which provides both motoring and braking operations. The source has a voltage of 230 V. Assuming continuous condition. i) Calculate duty ratio of chopper for motoring operation at rated torque and 350 rpm. ii) Calculate duty ratio of chopper for braking operation at rated torque and 350 rpm.	7 Marks	L2	CO2	PO4

	b)	With relevant circuit diagram and waveforms, explain the operation of two quadrant type-A chopper fed DC drives.	7 Marks	L1	CO2	PO1

UNIT-IV

7.	a)	Discuss in detail, how does the speed of a 3-phase induction motor can be controlled by varying the stator voltage with the help of relevant characteristics and circuit diagram?	7 Marks	L1	CO3	PO1
	b)	Classify various voltage source inverter fed driving methods. Also, explain why PWM voltage source inverters are best suited for many driving applications than other voltage source inverters with relevant characteristics and expressions?	7 Marks	L2	CO3	PO5

(OR)

8.		Discuss in detail about the Static Scherbius drive improves the sustainability of slip ring induction motor. Also mention the drive circuit, equivalent circuit, speed-torque characteristics with necessary mathematical equations.	14 Marks	L3	CO3	PO7

UNIT-V

9.		Analyze the operation and characteristics of load commutated current source inverter fed synchronous motor drive with the neat diagram.	14 Marks	L2	CO4	PO2

(OR)

10.	a)	List the important features of stepper motor.	7 Marks	L1	CO4	PO1
	b)	Explain the stepper motor characteristics based on stepping rate with a neat sketch.	7 Marks	L2	CO4	PO1

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-20) Supplementary Examinations, May– 2026

POWER SYSTEM AUTOMATION

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define operating mode. List the various operating modes that occur in power system control. Explain the in-secured mode of operation in power system.	7 Marks	L2	CO1	PO1
	b)	Enumerate various entities in a deregulated power system and explainthe activities of control center in the new power system model.	7 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Distinguish between any two market structures used in power system deregulation.	7 Marks	L4	CO1	PO1
	b)	Describe the various methods of transmission pricing in a new environment.	7 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Explain various types of SCADA systems used in power system automation.	7 Marks	L2	CO1	PO1
	b)	With neat diagram, explain the Human-machine interface (HMI) in power system.	7 Marks	L2	CO1	PO5
		(OR)				
4.	a)	Explain the Structure of Intelligent Electronic Devices (IED) in detail.	7 Marks	L2	CO1	PO5
	b)	Compare Intelligent Electronic Devices (IED) and Remote Terminal Unit (RTU).	7 Marks	L3	CO1	PO5

UNIT-III

5.		Illustrate the procedure for substation automation application functions.	14 Marks	L3	CO2	PO6
		(OR)				
6.	a)	Discuss briefly about components used in a modern substation automation system.	7 Marks	L2	CO2	PO6
	b)	Describe the architecture of new digital simulation with a block diagram.	7 Marks	L3	CO2	PO5

UNIT-IV

7.		Defineandlist the study mode oscillations. Describe any one method of study mode oscillation that occur in transmission system with a suitable example.	14 Marks	L3	CO3	PO1
		(OR)				
8.		Describe the major functions of an energy control center in modern transmission system.	14 Marks	L2	CO3	PO1

UNIT-V

9.		With a suitable example, write the procedure for Optimal feeder reconfiguration in radial feeder.	14 Marks	L5	CO4	PO5
		(OR)				
10.	a)	Define Distribution automation. Describe the functions of distribution automation with neat block diagram.	7 Marks	L2	CO4	PO1
	b)	Define Customer automation. Write the necessary information required in customer automation used in DA.	7 Marks	L2	CO4	PO1

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Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-20) Supplementary Examinations, May– 2026

OPERATIONS MANAGEMENT

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. Discuss the major operations management issues that manufacturing organizations face in India. 14 Marks L2 CO1 PO1

(OR)

2. Give a brief note on the significance of production systems decisions. 14 Marks L4 CO1 PO1 PO6

UNIT-II

3. Shipments of welded tube by an aluminium producer are shown in following table. Compute 3 year moving average, the forecast for the 12th year using simple moving average method. 14 Marks L2 CO2 PO1 PO2

Year	1	2	3	4	5	6	7	8	9	10	11
Sales (In Lakhs)	2	3	6	10	8	7	12	14	14	18	19

(OR)

4. Analyze the components of time series. Explain with suitable examples. 14 Marks L4 CO2 PO1 PO2

UNIT-III

5. A firm uses simple exponential smoothing with $\alpha = 0.02$ to forecast demand. The forecast for the first week of January was 400 units, whereas actual demand turned out to be 450 units. 14 Marks L2 CO3 PO1 PO2 PO3
   i) Forecast the demand for the second week of January.
   ii) Assume that the actual demand during the second week of January turned out to be 460 units.

   Forecast the demand upto February third week, assuming the subsequent demands as 465, 434, 420, 498 and 462 units.

(OR)

6. Explain about Bill of Materials (BOM).Why do organization need BOM? 14 Marks L2 CO3 PO1 PO2 PO3

UNIT-IV

7. Examine the linkage of Scheduling with other aspects of production planning. Explain with the help of suitable example. 14 Marks L2 CO4 PO1 PO2

(OR)

8. Compare the implications of using completion-based measures as opposed to due date-based measures for evaluating scheduling rules. 14 Marks L2 CO4 PO1 PO2 PO3

UNIT-V

9.	Describe in detail the relationship between lean management and JIT manufacturing.	14 Marks	L4	CO5	PO1 PO2 PO3
	(OR)				
10.	What do you mean by continuous improvement? Give two examples of continuous improvements that organizations undertake.	14 Marks	L4	CO5	PO1 PO2 PO3

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Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-20) Supplementary Examinations, May– 2026

POWER PLANT ENGINEERING

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What factories should be taken in to consideration while selecting the site for steam power plant and explain briefly?	7 Marks	L2	CO1	PO1 PO2
	b)	What is electrostatic precipitator. Explain the working principle with neat sketch.	7 Marks	L2	CO1	PO1 PO2 PO7
		(OR)				
2.		List out the advantages of pulverized coal system and explain unit system with the help of neat sketch.	14 Marks	L2	CO1	PO1

UNIT-II

3.	Draw the schematic arrangement of diesel power plant with neat sketch and explain fuel injection system.	14 Marks	L2	CO2	PO1 PO2
	(OR)				
4.	Enumerate and explain briefly the components of a gas turbine plant with neat sketch.	14 Marks	L2	CO2	PO1 PO2

UNIT-III

5.	How are the hydro electric power plants are classified and explain it briefly with neat sketch.	14 Marks	L2	CO3	PO1 PO2
	(OR)				
6.	Describe with the help of neat sketch the construction, working of pressurized water reactor (PWR) .	14 Marks	L2	CO3	PO1 PO2

UNIT-IV

7.	Explain with the help of neat sketch construction , the working of solar power plant.	14 Marks	L2	CO4	PO1 PO2
	(OR)				
8.	List outthe merit and demerits of fuel cell and also explain the working of a fuel cell with neat sketch.	14 Marks	L3	CO4	PO1 PO2

UNIT-V

9. A power plant has to supply load as follows: — 14 Marks | L3 | CO5 | PO1 PO2 PO3

Time (hrs)	0-6	6-12	12-14	14-18	18-24
Load (MW)	45	135	90	150	75

i)Draw the load curve, ii)load duration curve, iii) Choose suitable generation units to supply the load, iv) Calculate the load factor, v) Calculate the plant capacity factor.

(OR)

10. Explain the following terms — 14 Marks | L2 | CO5 | PO1 PO2

i) Demand ii) Maximum demand
iii) Connected load iv) Demand factor

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Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-20) Supplementary Examinations, May– 2026

RAPID PROTOTYPING

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	Select a product and appropriate prototypes for each of the four quadrants of the focused-comprehensive vs. physical-analytical chart. Justify the reason for placing it in respective quadrant?	14 Marks	L2	CO1	PO1 PO5
	(OR)				
2.	Explain the historical evaluation of Rapid Prototyping in detail? Briefly explain various types of prototypes?	14 Marks	L2	CO1	PO1 PO2 PO5

UNIT-II

3.	What is Selective Laser Sintering (SLS)? Explain various components of SLS Equipment? How SLS is different from Stereo lithography System?	14 Marks	L2	CO2	PO1 PO5
	(OR)				
4.	List out various powder based Rapid Prototyping (RP) systems? Explain various steps involved in the manufacturing of a typical product using any of the powder based RP system with neat sketches?	14 Marks	L2	CO2	PO1 PO5

UNIT-III

5.	Discuss the steps involved in Laminated Object manufacturing to create a typical product using suitable laser power and heater speed in detail with a neat sketch. Also list the merits and demerits of Laminated object manufacturing process.	14 Marks	L2	CO3	PO1 PO2 PO3
	(OR)				
6.	Write a short note on: i) Sander's model maker ii) GenisysXs printer HP system	14 Marks	L3	CO3	PO1 PO6 PO10

UNIT-IV

7.		Based on the available knowledge on indirect soft tooling select a RP method and demonstrate the procedure to produce urethane or epoxy prototypes under vaccum condition.	14 Marks	L3	CO4	PO1 PO8
		(OR)				
8.	a)	Explain the process of Laminated tooling in detail.	7 Marks	L3	CO4	PO1 PO5
	b)	Discuss briefly on direct AIM process with a neat sketch.	7 Marks	L3	CO4	PO1 PO2

UNIT-V

9.		Write a short note on the following: i) STL files ii) Magic communicator	14 Marks	L3	CO5	PO1 PO4 PO6
		(OR)				
10.	a)	Identify various factors influencing the accuracy in a Rapid Manufacturing Process?	7 Marks	L3	CO5	PO1 PO5
	b)	Explain the Vacuum Casting process with a neat sketch.	7 Marks	L3	CO5	PO1 PO2

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-20) Supplementary Examinations, May– 2026

INDUSTRIAL INTERNET OF THINGS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Explain the physical and logical design of IoT in detail.	14 Marks	L2	CO1	PO1
		(OR)				
2.		Demonstrate the IIoT Components with neat diagram.	14 Marks	L2	CO1	PO1

UNIT-II

3.		Explain in detail about the devices and gateways with respect to IIoT concept.	14 Marks	L2	CO2	PO1 PO2
		(OR)				
4.		Deliberate the need of network and explain in detail the modern communication protocols implemented in industrial internet systems.	14 Marks	L2	CO2	PO1 PO6 PO10

UNIT-III

5.	a)	Enlighten the concept of Augmented Reality	7 Marks	L2	CO3	PO1
	b)	Enlist the applications of big data platforms in Cyber-Physical Systems.	7 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Detail the relationship between IIoT and Big Data with suitable exambles.	7 Marks	L3	CO3	PO1
	b)	Explain the application of Cyber-Physical Systems.in machine tools	7 Marks	L3	CO3	PO1

UNIT-IV

7.	a)	Designate a use case example of M2M and IoT approach.	7 Marks	L3	CO4	PO1
	b)	Explain the application of IIOT in Smart Logistics Management.	7 Marks	L3	CO4	PO1
		(OR)				
8.	a)	Distingus between M2M value chain and IoT value chain	7 Marks	L3	CO4	PO1
	b)	Explain the application of IIOT in Predictive Maintenance	7 Marks	L3	CO4	PO1

UNIT-V

9.	a)	Explain the Business process in IOT.	7 Marks	L3	CO5	PO1
	b)	Explain in detail about the Data Management	7 Marks	L3	CO5	PO1
		(OR)				
10.		Discuss cloud of things? And explain the service variation from Web of things to cloud of things.	14 Marks	L3	CO5	PO1

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-20) Supplementary Examinations, May– 2026

EMBEDDED SYSTEMS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering Information Technology, Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Contrast RISC to CISC architectural features.	7 Marks	L3	CO1	PO2
	b)	Illustrate the role language plays in programming microcontrollers using suitable example.	7 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Sketch the Anatomy of a typical microcontroller.	7 Marks	L2	CO1	PO1
	b)	Sketch the pin out of MSP430 and explain each pin.	7 Marks	L1	CO1	PO1

UNIT-II

3.	a)	Evaluate the usage of movement instruction in MSP430 assembly programming.	7 Marks	L2	CO2	PO5
	b)	Develop an Assembly Language Programme to multiply two 16-bit numbers.	7 Marks	L4	CO2	PO3
		(OR)				
4.	a)	Illustrate the block diagram of clock module in MSP430F and summarize its usage.	7 Marks	L1	CO2	PO6
	b)	Develop program for MSP430 to read input from a push button switch and switch on Led when the push button switch was pressed.	7 Marks	L4	CO2	PO4

UNIT-III

5.	a)	Model the block diagram of basic Timer 1 and discuss about associated counters and their configuration using BTCTL register.	7 Marks	L3	CO3	PO5
	b)	Outline the block diagram of comparator A and list the bits that control its operation.	7 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Model the block diagram of Timer_A in MSP430 microcontroller.	7 Marks	L1	CO3	PO1
	b)	Explore MSP430 Timers and importance of resolution of a timer.	7 Marks	L1	CO3	PO6

UNIT-IV

7.	a)	Paraphrase the usage of USI in MSP430 Communication Interfaces.	7 Marks	L1	CO3	PO1
	b)	Contrast USART to USCI communication models	7 Marks	L3	CO3	PO2
		(OR)				
8.	a)	Detail out various MSP430 Communication modules	7 Marks	L1	CO3	PO8
	b)	Discuss in detail about SPI.	7 Marks	L1	CO3	PO8

UNIT-V

9.	a)	Distinguish FSM to FSMD models.	7 Marks	L3	CO4	PO2
	b)	Write short notes on Processor Technology.	7 Marks	L2	CO4	PO6
		(OR)				

10	a)	Explain in detail about PSM system modeling.	7 Marks	L2	CO4	PO1
.	b)	Discuss in detail about Concurrent Process Model.	7 Marks	L2	CO4	PO2

CODE No.: 20BT70406 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-20) Supplementary Examinations, May– 2026

SPEECH PROCESSING

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Describe the acoustic theory of speech production.	7 Marks	L2	CO1	PO1
	b)	Explain the effect of nasal coupling on the vocal tract transfer function.	7 Marks	L2	CO1	PO1
		(OR)				
2.		Derive the transfer function for a non-uniform lossless tube model of the vocal tract.	14 Marks	L4	CO1	PO2

UNIT-II

3.		Explain the concept of windowing in speech processing. Why is it necessary, and what are the commonly used window functions?	14 Marks	L2	CO1	PO2
		(OR)				
4.		Explain the process of pitch period estimation using the autocorrelation method. What are its limitations?	14 Marks	L2	CO1	PO1

UNIT-III

5.	a)	Describe the working principle of linear predictive synthesizers. How do they differ from formant synthesizers?	7 Marks	L2	CO2	PO2
	b)	Explain the concept of copy synthesis. What are its applications in speech processing?	7 Marks	L2	CO2	PO1
		(OR)				
6.	a)	Discuss the process of concatenative synthesis using multi-phonemic units.	7 Marks	L2	CO2	PO1
	b)	Explain the concept of articulatory speech synthesis.	7 Marks	L2	CO2	PO1

UNIT-IV

7.	a)	Describe the principle of transform coding in speech compression.	7 Marks	L2	CO3	PO1
	b)	Explain the working of a formant vocoder. How does it achieve speech compression?	7 Marks	L2	CO3	PO1
		(OR)				
8.	a)	Discuss the vector quantizer coders for speech coding. What are their strengths and weaknesses?	7 Marks	L2	CO3	PO1
	b)	Compare and contrast cepstral vocoders and linear predictive vocoders. In what scenarios would you prefer one over the other?	7 Marks	L2	CO3	PO2

UNIT-V

9.	a)	Explain the parametric representations used in speech recognition systems.	7 Marks	L2	CO4	PO2
	b)	Describe the process of speaker identification. What features are typically used to distinguish between speakers?	7 Marks	L2	CO4	PO2
		(OR)				
10.		Explain the process of word recognition using HMMs. How are the models applied to continuous speech recognition?	14 Marks	L2	CO1	PO1

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Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-20) Supplementary Examinations, May– 2026

LOW POWER CMOS VLSI DESIGN

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Briefly outline the need of low power VLSI chips in developing real electronics.	7 Marks	L1	CO1	PO1
	b)	Construct the equivalent circuit for charging and discharging of CMOS inverter with its necessary equations and explain.	7 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Organize, how scaling is affected by technology.	7 Marks	L1	CO1	CO1
	b)	Analyze the charging Discharging capacitances of CMOS design.	7 Marks	L4	CO1	CO2

UNIT-II

3.	a)	Interpret the Data Correlation Analysis in evaluating the performance of DSP systems.	7 Marks	L2	CO2	CO2
	b)	Define Simulation and Analyze the importance of Simulation at various levels of abstraction with an example.	7 Marks	L1	CO2	CO2
		(OR)				
4.	a)	Discuss in detail about Monto Carlo Simulation techniques.	7 Marks	L4	CO2	PO1
	b)	Clearly explain the Dynamic events and static states of a 2-input CMOS NOR gate. Also discuss any two different implementations of NOR gate result in different dynamic energy dissipation events.	7 Marks	L1	CO1	PO2

UNIT-III

5.	a)	Discuss the switching activity reduction techniques in CMOS digital Systems.	7 Marks	L2	CO3	PO1
	b)	Explain local restructuring rules of transformation with relevant illustrations.	7 Marks	L1	CO3	PO1
		(OR)				
6.	a)	Design a Flip-flop with Self gating technique also compare the performance of self gating and regular flip-flop.	7 Marks	L3	CO3	PO3
	b)	Explain hardware architecture of State Machine Encoding with transition analysis.	7 Marks	L1	CO3	PO1

UNIT-IV

7.	a)	Appraise two level clock tree using chip and package co design. Originate its use with respect to two level clock distribution.	7 Marks	L4	CO2	PO2
	b)	Illustrate power reduction for clock signals by voltage swing reduction technique.	7 Marks	L2	CO4	PO1
		(OR)				
8.	a)	What is Delay Balancing, Explain in detail about delay balancing with an example.	7 Marks	L1	CO4	PO1
	b)	Classify different power reduction techniques in clock network.	7 Marks	L1	CO4	PO1

UNIT-V

9.	a)	Explain the basic principles to update the filter order length in digital filters.	7 Marks	L1	CO4	PO2
	b)	Clearly explain the Switching Activity Reduction with examples.	7 Marks	L1	CO4	PO2
		(OR)				
10.	a)	Categorize the Power dissipation of uni processing and parallel processing systems.	7 Marks	L2	CO4	PO2
	b)	Identify the technique to reduce hardware resources in digital systems.	7 Marks	L1	CO4	PO1

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations, May – 2026

SPECIAL FUNCTIONS AND COMPLEX ANALYSIS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define Beta function and applying it show that $\beta(m+1, n) + \beta(m, n+1) = \beta(m, n)$	CO1, CO4	7 Marks
	b)	Evaluate the integrals i) $\int_0^1 x^7 (1-x)^5 \, dx$ ii) $\int_0^{\pi/2} \sin^{7/2}\theta \cos^{3/2}\theta \, d\theta$ making use of beta and gamma functions.	CO4	7 Marks

(OR)

2	Define Bessel function $J_n(x)$. Express $J_{1/2}(x), J_{-1/2}(x)$ in terms of sin x and cos x and hence or otherwise show that $\left[J_{1/2}(x)\right]^2 + \left[J_{-1/2}(x)\right]^2 = \frac{2}{\pi x}$.	CO1, CO4	14 Marks

UNIT-II

3	Define velocity potential and find the velocity potential ϕ in a two dimensional flow of a fluid whose stream function is $\psi = \frac{-y}{x^2+y^2}$.	CO4	14 Marks

(OR)

4	Show that $\left[\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2}\right] \lvert \text{Real } f(z) \rvert^2 = 2\left\lvert f'(z)\right\rvert^2$, if $f(z)$ is a regular function of z.	CO3	14 Marks

UNIT-III

5	a)	Evaluate contour integral $\int_c \frac{\log z}{(z-1)^3} dz$ where C is $\lvert z-1\rvert = \frac{1}{2}$ using Cauchy's Integral formula.	CO4	7 Marks
	b)	Express $f(z) = e^z$ as a Taylor's series expansion about z = 1 and z = 3.	CO1	7 Marks

(OR)

6	a)	Construct a power series for $f(z) = \frac{z}{z^4+9}$ about the point $z = 0$.	CO3	7 Marks
	b)	State Cauchy's Integral theorem and applying it show that $\int_C \frac{dz}{z^2(z^2+16)} = 0$ where $C: 1 \le \lvert z\rvert \le 2$.	CO1, CO4	7 Marks

UNIT-IV

7	Define residue of $f(z)$ at pole $z = a$ of order m. Applying the calculus of residues, show that $\int_0^\infty \frac{1}{1+x^6} dx = \frac{\pi}{3}$.	CO1, CO4	14 Marks

(OR)

8	a)	Define simple pole and reside at the simple pole. Find the poles and corresponding residues of $f(z) = \dfrac{z+1}{z^2(z-2)}$.	CO1, CO4	7 Marks
	b)	Evaluate $\oint_c \dfrac{2e^z}{z(z-3)} dz$ where C: $\lvert z \rvert = 2$ by applying theory of residues.	CO4	7 Marks

UNIT-V

9	a)	Check whether the mapping $w = \cos z$ is conformal or not.	CO4	7 Marks
	b)	Construct an image for the region in the z-plane between the lines y=0 and y=$\dfrac{\pi}{2}$ under the transformation $\boldsymbol{w = e^z}$.	CO3	7 Marks

(OR)

10	a)	Construct a Bilinear transformation which maps the points $z = 1, i, -1$ onto the points $w = i, 0, -i$ and hence find the image of $\lvert z \rvert < 1$ under this transformation.	CO3	7 Marks
	b)	Construct an image of the disc $\lvert z \rvert < 1$ under the transformation $w = \dfrac{1+iz}{1-iz}$.	CO3	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations, May – 2026

SIGNALS AND SYSTEMS

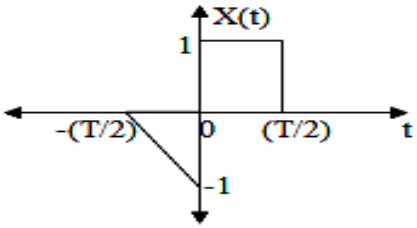
[Electronics and Communication Engineering]

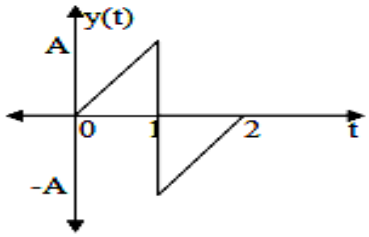
Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Represent the following signals in terms of step and ramp functions. CO2 8 Marks





b) Derive the conditions for causality and stability of LTI systems. CO1 6 Marks

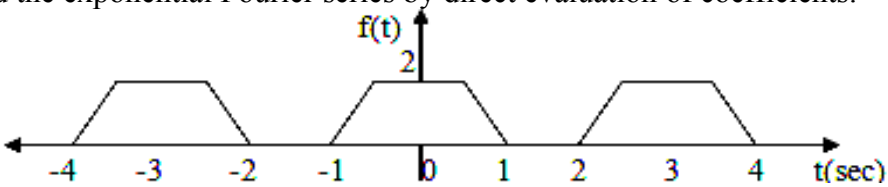
(OR)

2 a) Define the following elementary signals. CO1 7 Marks
i) Real Exponential signal.
ii) Continuous time version of a sinusoidal signal.

b) List out the properties of an LTI system. CO2 7 Marks

UNIT-II

3 Find the exponential Fourier series by direct evaluation of coefficients. CO4 14 Marks



(OR)

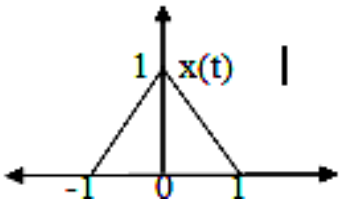
4 a) Obtain the fourier transform of; CO4 7 Marks
i) Sgn(t).
ii) $\Delta(t) = \begin{cases} 1 - \frac{2|t|}{\tau} & for\ |t| < \tau \\ 0 & elsewhere \end{cases}$.

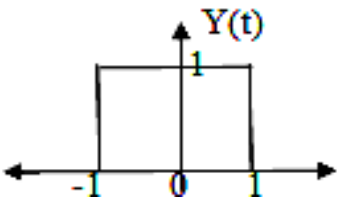
b) State and prove the: CO1 7 Marks
(i) Modulation theorem of Fourier transform.
(ii) Duality property of Fourier transform.

UNIT-III

5 a) Prove that for a signal, auto correlation and PSD form a Fourier transform pair CO2 7 Marks

b) Find the cross correlation between unit triangular and unit gate pulse as follows: CO4 7 Marks





(OR)

6	a)	Determine auto and cross correlation, ESD of the signal x(t)=A sin(wt+$\emptyset$)	CO4	7 Marks
	b)	Find auto correlation, power, RMS value and sketch the PSD for the signal x(t)=(A+sin100t)cos200t.	CO4	7 Marks

UNIT-IV

7	a)	Derive the relation between Laplace transform and Z-transfrom.	CO2	7 Marks
	b)	Determine $x(t)$ and ROC for the function $X(s) = \frac{(s+1)(s+2)}{s^2 - s - 1} \operatorname{Re}\{s\} \geq 1/2$.	CO4	7 Marks

(OR)

8	a)	Write the properties of region of convergence for Laplace transform.	CO1	7 Marks
	b)	State and prove initial and final value of laplace transform and explain its significance in analyzing a system	CO2	7 Marks

UNIT-V

9	a)	Bring out the differences between Fourier, Laplace and Z-transform.	CO2	7 Marks
	b)	Prove that for causal sequences ROC is in exterior of circle of some radius r.	CO1	7 Marks

(OR)

10	a)	Using partial fractions expansion, Find the Inverse Z-Transform of the system $X(Z) = \frac{1 - 1/3z^{-1}}{(1 - Z^{-1})(1 + 2Z^{-1})} \lvert Z \rvert > 2$.	CO3	7 Marks
	b)	A finite sequence $x[n]$ is defined as $x[n] = \{5,3, -2, 0, 4, -3\}$. Find $X[Z]$ and its ROC.	CO4	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Supplementary Examinations, May – 2026

DISCRETE MATHEMATICAL STRUCTURES

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Find the Conjunctive normal form of $\sim(p\vee q)\leftrightarrow(p\wedge q)$.	CO1	7 Marks
	b)	Is $[(p\rightarrow r)\wedge(q\rightarrow r)]\rightarrow[(p\vee q)]\rightarrow r]$ a Tautology or not? Justify.	CO5	7 Marks
		(OR)		
2	a)	Identify and explain the rules of inference to verify that the following argument is valid. If Clifton does not live in France, then he does not speak French Clifton does not drive Datsun. If Clifton lives in France, then he rides a bicycle. Either Clifton speaks French or he drives Datsun. Hence, Clifton rides a bicycle	CO3	7 Marks
	b)	Write the negation of following statement. For each integer x, if x is even, then $\boldsymbol{x^2+x}$ is even.	CO1	7 Marks

UNIT-II

3	a)	If the relations R and S are reflexive, symmetric and transitive show that $R\cap S$ is also reflexive, symmetric and transitive.	CO2	7 Marks
	b)	Determine the value of $fog, gof, f^{-1}og$ and $g^{-1}of^{-1}$ for the functions f and g: $R\rightarrow R$ (set of real numbers) defined by $\boldsymbol{f(x)=x^2-2, g(x)=x+4}$.	CO4	7 Marks
		(OR)		
4	a)	Define a Poset. Illustrate the Poset diagram of $(P(S),\subseteq)$ where P(S) is the power set of $S=\{a, b, c\}$.	CO1	7 Marks
	b)	Determine that the poset{ (1, 3, 6, 9, 123), / }is a Lattice and prove that it is a distributive Lattice.	CO4	7 Marks

UNIT-III

5	a)	Examine whether the set N of natural numbers is a semi group with respect to the binary operation defined by $x*y=\max\{x, y\}$ for all $x, y\in$ N or not.	CO2	7 Marks
	b)	State and prove Lagrange's theorem.	CO1	7 Marks
		(OR)		
6	a)	Define algebraic structure. For the algebraic system (**I**, +, ×) where I is the set of integers, list the important properties of these operations '+', '×'.	CO1	7 Marks
	b)	Let $S=\{a, b, c\}$, and let * denote a binary operation on S given by table. i) Also let $P=\{1,2,3\}$ and $\oplus$ be a binary operation on P given by table. ii) Show that $(S, *)$ and $(P, \oplus)$ are Isomorphic.	CO5	7 Marks

table 1

*	a	b	c
a	a	b	c
b	b	b	c
c	c	b	c

table 2

$\oplus$	1	2	3
1	1	2	1
2	1	2	2
3	1	2	3

UNIT-IV

7	a)	Show by Mathematical induction that x-y is a factor of the polynomial $x^n - y^n$ where n $\geq$0.	CO1	5 Marks
	b)	A computer password consists of a letter of the alphabet followed by 3 or 4 digits. Find: i) The total number of passwords that can be created. ii) The number of passwords in which no digit repeats.	CO4	4 Marks
	c)	Find the coefficient of x^{20} in $(x^3 + x^4 + x^5 + \ldots..)^5$.	CO3	5 Marks

(OR)

8	a)	Solve the recurrence relation. $u_n - 4u_{n-1} - 12u_{n-2} = 0$ for $n \geq 2$, $u_0 = 4$, $u_1 = 16/3$	CO4	7 Marks
	b)	If a_n is solution of the recurrence relation $a_{n+1} = k\ a_n$ for n $\geq$ 0 and a_3=58/48, a_5=1378/2408, what is k.	CO2	7 Marks

UNIT-V

9	a)	Determine whether the following graphs are isomorphic.	CO2	7 Marks

	b)	Discuss the following by giving of a graph which contains. i) An Eulerian circuit that is also a Hamilton circuit. ii) An Eulerian circuit, but not a Hamilton circuit. iii) A Hamilton circuit , but not an Eulerian circuit.	CO2	7 Marks

(OR)

10	a)	Analyze depth first search algorithm with an example.	CO4	7 Marks
	b)	Define Minimum Spanning Tree**.** Explain Prim's algorithm with an example.	CO3	7 Marks

CODE No.: 16BT31501 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations, May – 2026

OPERATING SYSTEMS

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Explain about the evolution of operating systems. CO1 8 Marks

b) What are the main functions of operating system? Explain them. CO1 6 Marks

(OR)

2 a) Define a Process. Describe Process State transition diagram with a neat sketch. CO1 7 Marks

b) List and describe different types of schedulers. CO1 7 Marks

UNIT-II

3 a) Explain the concept of Monitors. CO2 7 Marks

b) Write and explain Producer-Consumer classical synchronization problem. CO2 7 Marks

(OR)

4 a) Describe necessary conditions for deadlock occurrence. CO2 6 Marks

b) Consider the following snapshot of a system: CO2 8 Marks

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	0	0	1	2	0	0	1	2	1	5	2	0
P1	1	0	0	0	1	7	5	0				
P2	1	3	5	4	2	3	5	6				
P3	0	6	3	2	0	6	5	2				
P4	0	0	1	4	0	6	5	6				

Answer the following questions using the banker's algorithm:

i) What is the content of the matrix *Need?*

ii) Is the system in a safe state?

iii) If a request from process Pi arrives for (0,4,2,0), can the request be granted immediately?

UNIT-III

5 a) Describe First-fit, Best-fit and Worst-fit algorithms. CO2 6 Marks

b) Briefly explain about different Contiguous allocation memory management techniques. CO2 8 Marks

(OR)

6 a) Describe the demand-paging Memory Management technique. CO2 6 Marks

b) Describe Page Replacement algorithms with an example. CO2 8 Marks

UNIT-IV

7 a) What is a file? What are the different operations that can be performed on a file? CO3 7 Marks

b) Discuss in detail about various file system implementation. CO3 7 Marks

(OR)

8 a) Explain the concept of Swap-Space Management. CO3 6 Marks

b) Explain in detail about disk scheduling algorithms with examples. CO1 8 Marks

UNIT-V

9 Describe various block and character devices in detail. CO5 14 Marks

(OR)

10 Discuss in detail about the protection and security of an operating system. CO5 14 Marks

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CODE No.: 20BT3BS01 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Supplementary Examinations, May – 2026

NUMERICAL METHODS, PROBABILITY AND STATISTICS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Science), Computer Science and Business Systems,

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Determine a real root of f(x) = $x^4 - x = 10$ by Regula-Falsi method up to 2nd iteration. 7 Marks L3 CO1 PO3

   b) Find a real root f(x) = $x^3 - 5x + 3 = 0$ by using Newton Raphson method correct up to 2 decimal places. 7 Marks L3 CO1 PO3

(OR)

2. a) Find the solution using Newton's Backward Difference formula and estimate the value of x = 4. 7 Marks L1 CO1 PO1

x	0	1	2	3
f(x)	1	0	1	10

   b) Find the solution using Lagrange's interpolation and estimate the value of x = 301. 7 Marks L1 CO1 PO1

x	300	304	305	307
f(x)	2.4771	2.4829	2.4843	2.4871

UNIT-II

3. a) Compute $f'(x)$ and $f''(x)$ at x = 16 by using Newton forward numerical differentiation formula from the following table. 7 Marks L1 CO2 PO1

x	15	17	19	21	23	25
f(x) = $\sqrt{x}$	3.873	4.123	4.359	4.583	4.796	5.800

   b) Compute the approximation for $\int_0^2 \sqrt{x}\, dx$ using a regular partition with n = 10 by Simphson's 1/3 and 3/8 rule. 7 Marks L1 CO2 PO1

(OR)

4. a) Solve $y' = x^2 - y,\ y(0) = 1$ using Taylor's series method compute y(0.1) taking h=0.1 correct to 4 decimal places. 7 Marks L2 CO2 PO2

   b) Using R K Method, find the solution of $y' = 0.25y^2 + x^2$ with initial condition y(0) = 1 with h=0.1 to find y(0.1). 7 Marks L2 CO2 PO2

UNIT-III

5. a) A random variable x has the following probability distribution. Find: i) V (x) ii) P(x≤2) iii) P(-2≤x<2). 7 Marks L1 CO3 PO1

X	-3	-2	-1	0	1	2	3
P(x)	0.05	0.10	0.30	0	0.30	0.15	0.10

   b) A random variable X has the density function: 7 Marks L1 CO3 PO1

$$f(x) = k\,\frac{1}{1+x^2};\ if\ -\infty < x < +\infty$$
$$= 0 \text{ otherwise.}$$

Determine *K* and also find mean and variance of x.

(OR)

6.	a)	If it rains, a rain coat dealer can earn Rs 500 per day. If it is a dry day, he can lose Rs 100 per day. What is his expectation, if the probability of rain is 0.4?	7 Marks	L1	CO3	PO1
	b)	If a, b and c are constants, then show that E(ax +by +c) = aE(X) +bE(Y) +c and Var(ax +by +c) = a 2Var(X) + b 2Var(Y) + 2abCov(X,Y).	7 Marks	L1	CO3	PO1

UNIT-IV

7.	a)	The probability that the noise level of a wide-band amplifier will exceed 2 DB is 0.05. Find the probabilities that among 12 such amplifiers the noise level of i) one will exceed 2DB; ii) at least 9 will exceed 2 DB.	7 Marks	L2	CO4	PO2
	b)	Consider a computer system with Poisson job-arrival stream at an average of 2 per minute. Determine the probability that in any one-minute interval there will be i) no arrival; ii) at least 2 arrivals; iii) at most 3 arrivals.	7 Marks	L2	CO4	PO2

(OR)

8.	a)	Mean weight of 400 students is 62 kg and S.D is 5 kg. Find percentage of adult will have i) weight above 59 kg?, ii) weight between 58 and 63 kg and iii) weights below 64 kg?	7 Marks	L2	CO4	PO2
	b)	Suppose that the length of a phone call, in minutes, is an exponential random variable with decay parameter is 1/12. If another person arrives at a public telephone just before you, find the probability that you will have to wait more than five minutes.	7 Marks	L2	CO4	PO2

UNIT-V

9.	a)	A trucking firm is suspicious of the claim that the average life time of certain tires is at least 28,000 miles. To check the claim, the firm puts 40 of these tires on its trucks and gets a mean life time of 27,462 miles with a S.D of 1,348 miles. What can it conclude if the probability of a type-I error is to be at most 0.01?	7 Marks	L3	CO5	PO3
	b)	A cigarette manufacturing firm claims that its brand A line of cigarette outsells its brand B by 8%. If it is found that 42 out a sample of 200 smokers prefer brand A and 18 out of another sample 0f 100 smokers prefer brand B, test whether the 8% difference is a valid claim.	7 Marks	L3	CO5	PO3

(OR)

10.	a)	An ambulance service claims that it takes on the average less than 10 minutes to reach its destination in emergency calls. A sample of 16 calls has a mean of 11 minutes with standard deviation 1.45 minutes. Test the significance at 5% level of significance.	7 Marks	L3	CO5	PO3
	b)	Mechanical engineers, testing a new arc welding technique, classified welds both with respect to appearance and an x-ray inspection.	7 Marks	L3	CO5	PO3

	Appearance	
X ray inspection	bad	good
Bad	10	18
Normal	13	16
Good	18	21

Test for independence using $\alpha = 0.05$ and find the individual cell contributions to the chi-square test statistics.

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CODE No.: 20BT4HS17 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-20) Supplementary Examinations, May – 2026

LIFE SKILLS

[Civil Engineering, Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

	UNIT-I				
1.	What are different methods to measure the attitude? Explain each with necessary relevant examples.	14 Marks	L1	CO1	PO1 PO2
	(OR)				
2.	When one can change the attitude? Explain the process of changing the attitude.	14 Marks	L2	CO1	PO1 PO2
	UNIT-II				
3.	List some examples of interpersonal skills? How its is important in development of attitude.	14 Marks	L1	CO2	PO1 PO2
	(OR)				
4.	How do you deal with interpersonal skills?What are the 4 types of interpersonal relationships? Explain.	14 Marks	L2	CO2	PO1 PO2
	UNIT-III				
5.	What are the 4 types of communication styles? Explain each with suitable examples.	14 Marks	L2	CO3	PO1 PO2
	(OR)				
6.	Why Is Cross-Cultural Communication Important? Explain its importance.	14 Marks	L2	CO3	PO1 PO2
	UNIT-IV				
7.	What are the core thinking skills? Explain the processes of thinking skills?	14 Marks	L2	CO4	PO1 PO2
	(OR)				
8.	Explain the methods to improve critical thinking skills in students? Take	14 Marks	L2	CO4	PO1 PO2
	UNIT-V				
9.	Explain different methods of delivery of speech? Take one example and explain in detail.	14 Marks	L1	CO5	PO1
	(OR)				
10.	What are differences between the nervousness and stage fright? How to Overcome Stage Fright and Nervousness in Public speaking.	14 Marks	L2	CO5	PO1

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Supplementary Examinations, May – 2026

FLUID MECHANICS AND HYDRAULIC MACHINERY

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	State Newton's low of viscosity and explain the terms i) dynamic viscosity and ii) kinematic viscosity. state their units of measurements.	7 Marks	L2	CO1	PO1
	b)	Two horizontal plates are placed 1.25 cm apart, the space between them being filled with oil of viscosity 14 poise. Determine the shear stress in oil if upper plate is moved with a velocity of 2.5 m/s.	7 Marks	L4	CO1	PO1 PO2 PO4 PO10
		(OR)				
2.	a)	A rectangular plane surface is 2m wide and 3 m deep. It lies in vertical plane in water. Determine the total pressure and the position of center of pressure on the plane surface when its upper edge is horizontal and i) coincides with water surface, ii) 2.5m below the water surface.	7 Marks	L4	CO1	PO1 PO2 PO4
	b)	Explain the phenomenon of capillarity. Obtain an expression for capillary rise of a liquid.	7 Marks	L4	CO1	PO1

UNIT-II

3.	a)	In a fluid, the velocity field is given byV = (3x + 2y) i + (2z + 3x2) j + (2t – 3z) k Determine: i) The velocity components u, v, w at any point in the flow field; ii) The speed at point (1, 1, 1); iii) The speed at time t = 2s at point (0, 0, 2). Also classify the velocity field as steady, or unsteady, uniform or non-uniform and one, two orthree dimensional.	7 Marks	L4	CO2	PO1 PO2 PO4
	b)	The diameters of a tapering pipe at the sections1-1 and 2-2 are 100 mm and 150 mm respectively.If the velocity of water flowing through the pipe at section 1-1 is 5 m/s, find: i) Discharge through the pipe, and ii) Velocity of water at section 2-2.	7 Marks	L4	CO2	PO1 PO2 PO4 PO10
		(OR)				
4.	a)	A discharge through a 24 cm diameter horizontal pipe increases linearly from 30to 120 liters/sec of water in 4 seconds. i) What pressure gradient must exist to produce this acceleration? ii) What is the difference in pressure intensity that exists between two sections that lie 9 m apart?	7 Marks	L4	CO2	PO1 PO2 PO10
	b)	A pipe (1) 400 mm in diameter, conveying water, branches into two pipes (2) and 3 of diameters300 mm and 200 mm respectively. (i) Find the discharge in pipe (1) if the average velocity of water in this pipe is 3 m/s. (ii) Determine the velocity of water in 200mm pipe if the average velocity in 300mm diameter pipe is 2 m/s.	7 Marks	L4	CO2	PO1 PO2 PO4 PO10

UNIT-III

5.	a)	Three pipes of lengths 900 m, 600 m and 450 m and of diameters 600 mm, 450mm and 350 mm respectively are connected in series. These pipes are to be replaced by a single pipe of length 1500 m. Design the dimeter of the single pipe.	7 Marks	L6	CO3	PO1 PO2 PO3
	b)	The velocity of water flowing through a 12 cm diameter pipe was found to be 3.5 m/s. The flow path in pipe is destructed by an iron plate of 8 cm diameter. Calculate, the loss of head due to obstruction if co-efficient of contraction Cc = 0.75.	7 Marks	L4	CO4	PO1 PO2 PO4
		(OR)				
6.	a)	Describe the procedure to determine the relationship between dependent and independent variable using Rayleigh's method.	7 Marks	L4	CO4	PO1
	b)	A 7.2 m high and 15 m long spillway discharges 94 m3/s discharge under a head of 2.03. If 1: 9 scale model of this spillway is to be constructed, determine model dimensions, head over spillway model and the model discharge. If model experiences a force of 7500 N, determine force on the prototype.	7 Marks	L6	CO3	PO1 PO2 PO3 PO4 PO5

UNIT-IV

7.	a)	Define open channel flow and compare with flow in closed conduit flow.	7 Marks	L4	CO5	PO1
	b)	A trapezoidal channel having the side slope equal to 60° with the horizontal and laid on a slope of 1 in 750, carries a discharge of 10 m3/s. Find the width at the base and depth of flow for most economical section. Take the value of Chezy's resistance co-efficient C = 66.	7 Marks	L6	CO5	PO1 PO2 PO3
		(OR)				
8.	a)	Discuss on open channel flow for non-uniform flow.	7 Marks	L2	CO5	PO1 PO10
	b)	A trapezoidal channel has side slopes of 1 horizontal to 2 vertical and the slope of its bed is 1 in 2500. Determine the optimum dimensions of the channel if it is to carry water at 0.5 m3/s. Take Chezy's constant as 70.	7 Marks	L6	CO5	PO1 PO2 PO3

UNIT-V

9.	a)	A Pelton wheel is to be designed for: Shaft Power = 11572 kW; Head = 350 M; Speed = 700 rpm; Overall efficiency = 88 %; Jet diameter is not to exceed one-sixth of the wheel diameter. Determine: i) the wheel diameter, ii) The no of jets required, iii) Diameter of the jet.	7 Marks	L6	CO6	PO1 PO2 PO3 PO4 PO5
	b)	A centrifugal pump delivers water against a net head of 14.5 meters and a design speed of 1000 rpm. The vanes are curved at the back to an angle of 30^0 with the periphery. The impeller diameter is 300 mm and the outlet width is 50 mm. determine the discharge of the pump if the manometric efficiency is 95%.	7 Marks	L4	CO6	PO1 PO2 PO5
		(OR)				
10.		A Francis turbine with an overall efficiency of 75% is required to produce 148.25 kW power. It is working under a head of 7.62 m. the peripheral velocity = $0.26\sqrt{(2gH)}$ and the radial velocity of flow at inlet is = $0.96\sqrt{(2gH)}$. The wheel runs at 150 rpm and the hydraulic losses in the turbine are 22% of the available energy. Assuming the radial discharge, determine: i) the guide blade angle, ii) the wheel vane angle at inlet, iii) diameter of the wheel at the inlet and iv) width of the wheel at inlet.	14 Marks	L6	CO6	PO1 PO2 PO3 PO4 PO10

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Supplementary Examinations, May – 2026

ENGINEERING THERMODYNAMICS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Differentiate between macroscopic and microscopic views in thermodynamics.	7 Marks	L2	CO1	PO1
	b)	Differentiate between the following: i) Intrinsic and Extrinsic properties. ii) Reversible and Irreversible processes.	7 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Derive the SFEE for a single stream entering and single stream leaving a control volume and explain the various terms in it.	7 Marks	L3	CO1	PO1
	b)	A cylinder contains one kg of certain fluid at an initial pressure of 20bar. The fluid is allowed to expand reversibly behind a piston according to the law PV^2=constant until volume is doubled. The fluid is then cooled reversibly at a constant pressure until piston regains its original position. Heat is supplied reversibly with the piston firmly locked in position until pressure rises to the original value of 20bar. Calculate the net work done by the fluid for an initial volume of $0.05m^3$.	7 Marks	L3	CO1	PO1 PO2

UNIT-II

3.	a)	Explain heat engine, heat pump and refrigerator.	7 Marks	L1	CO1	PO1
	b)	Two kilograms of water at 90^0C are mixed with 5 kg of ice at 0^0C in an isolated system. Calculate: i) The change of entropy and ii) The change of entropy of 1 instead of 5 kg of ice were present. The specific heat of water is 4.18 kJ/kgK and latent heat of melting ice is 333.5 kJ/kg.	7 Marks	L3	CO1	PO1 PO2
		(OR)				
4.	a)	A domestic food refrigerator maintains a temperature of -12^0C, the ambient air temperature is 35^0C. If heat leaks into the freezer at the continuous rate of 2 kg/s. Determine the least power necessary to pump this heat out continuously.	7 Marks	L2	CO1	PO1 PO2 PO6
	b)	Explain reversibility and irreversibility. Explain causes of irreversibility.	7 Marks	L1	CO1	PO1

UNIT-III

5.		Derive the Maxwell relations and explain their importance in thermodynamics.	14 Marks	L3	CO2	PO1 PO2
		(OR)				
6.	a)	Draw a P – T diagram for a pure substance and mark various regions.	7 Marks	L2	CO2	PO1 PO2
	b)	Derive Tds relations in terms of temperature and pressure changes and temperature and volume changes.	7 Marks	L3	CO2	PO1 PO2

UNIT-IV

7.	a)	State and explain the importance of internal energy and enthalpy of gas mixtures.	7 Marks	L1	CO3	PO1
	b)	A certain gas C_p = 1.968 and C_V = 1.507 kJ/kgK. Find the molecular weight and the gas constant. A constant volume chamber of 0.3 m^3 capacity contains 2 kg of this gas at 5^0C. Heat is transferred to the gas until the temperature is 100^0C. Find the work done, the heat transferred and the changes in internal energy, enthalpy and entropy.	7 Marks	L3	CO3	PO1 PO2
		(OR)				
8.	a)	A mixture of hydrogen (H_2) and oxygen (O_2) is to be made so that the ratio of H_2 to O_2 is 2:1 by volume respectively. Calculate. i) The mass of O_2 required ii) Volume of the container.	7 Marks	L3	CO3	PO1 PO2
	b)	Explain Dalton law of partial pressures.	7 Marks	L1	CO3	PO1

UNIT-V

9.	a)	Explain dual cycle and derive efficiency of dual cycle.	7 Marks	L1	CO4	PO1
	b)	The stroke and cylinder diameter of a compressor ignition engine are 250 mm and 150 mm respectively. If the clearance volume is 0.0004 m^3 and fuel injection takes place at constant pressure for 5 percent of the stroke, determine the efficiency of the engine. Assume engine is working on diesel cycle.	7 Marks	L3	CO4	PO1 PO2 PO6
		(OR)				
10.	a)	Derive an expression for the air standard efficiency of diesel cycle.	8 Marks	L3	CO4	PO1
	b)	A gas turbine plant working on Brayton cycle. The air at inlet is 0.1MPa and 27^0C. The pressure ratio is 6.25 and the maximum temperature is 800^0C. The efficiency of the compressor and the turbine are each 80%. Find the compressor work, turbine work, heat supplied and cycle efficiency and turbine exhaust temperature. Mass of air may be considered as 1 kg. Draw T-s diagram.	6 Marks	L3	CO4	PO1 PO2

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Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Supplementary Examinations, May – 2026

KINEMATICS OF MACHINERY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss various types of constrained motion.	7 Marks	L2	CO1	PO1
	b)	Explain Kutzback's criterion for degree of freedom of plane mechanisms? In what way is Grubler's criterion different from it?	7 Marks	L2	CO1	PO1
		(OR)				
2.		Enumerate the inversions of the single slider crank chain. Explain each of themwith their applications.	14 Marks	L3	CO1	PO1 PO2

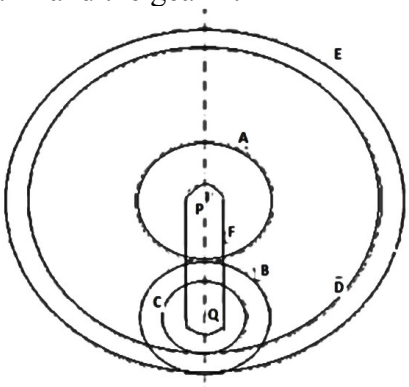
UNIT-II

3.	a)	Explain pantograph mechanism with a neat sketch. State its applications.	7 Marks	L3	CO2	PO1 PO2
	b)	Two shafts are connected by a Hooke's joint. The driving shaft revolves uniformly at 500rpm. If the total permissible variation in speed of a driven shaft is not to exceed = 6% of the mean speed, find the greatest permissible angle between the centerlines of the shafts. Also determine the maximum and minimum speeds of the driven shaft.	7 Marks	L4	CO3	PO1 PO2 PO3
		(OR)				
4.	a)	Sketch and describe the Scott-Russel and Robert's straight-line motion mechanisms.	7 Marks	L3	CO2	PO1 PO2
	b)	In a Davis steering gear, the distance between the pivots of the front axle is 1metre and the wheel base is 2.5 metres. Find the inclination of the track arm to the longitudinal axis of the car, when it is moving along a straight path.	7 Marks	L4	CO3	PO1 PO2 PO3

UNIT-III

5.	a)	Derive an expression for minimum number of teeth required on a pinion to avoid interference when it gears with a rack.	7 Marks	L3	CO4	PO1 PO2
	b)	A pair of 20^0 full depth involute spur gears having 30 and 50 teeth respectively of module 4 mm are in mesh. The smaller gear rotates at 1000 r.p.m. Determine: i) Sliding velocities at engagement and at disengagement of pair of a teeth, and ii) Contact ratio.	7 Marks	L4	CO4	PO1 PO2 PO3
		(OR)				
6.		A compound epicyclic gear is shown in Figure. The gears A, D and E are free to rotate on axis P. The compound gears B and C rotate together on the axis Q at the end of arm F. All the gears have equal pitch. The number of external teeth on gears, A B and C are 18, 45 and 21 respectively. The gears D and E are annulus gears. The gear A rotates at 100 rpm in anticlockwise direction and the gear D rotates at 450 rpm clockwise. Find the speed and	14 Marks	L4	CO4	PO1 PO2 PO3 PO10

direction of the arm and the gear E.



UNIT-IV

7.	Derive expressions for displacement, velocity, and accelerations for a roller follower of a circular cam when the contact is on i) circular flank and ii) on circular nose.	14 Marks	L3	CO5	PO1 PO2
	(OR)				
8.	A cam operating a knife - edged follower has the following data: i) Follower moves outwards through 40mm during 60^0 of cam rotation. ii) Follower dwells for the next 45^0 . iii) Follower returns of its original position during next 90^0 . iv) Follower dwells for the rest of the rotation. The displacement of the follower is to take place with simple harmonic motion during both the outward and return strokes. The least radius of the cam is 50mm. Draw the profile of the cam when the axis of the follower is offset 20mm towards right from the cam axis. If the cam rotates at 300 r.p.m., determine maximum velocity and acceleration of the follower during the outward stroke and the return stroke	14 Marks	L4	CO5	PO1 PO2 PO3 PO10

UNIT-V

9.	a)	Derive the expression to determine the magnitude of the coriolis component of acceleration	7 Marks	L3	CO6	PO1 PO2
	b)	Explain the procedure to determine the velocity and acceleration of a slider crankmechanism by Klein's construction.	7 Marks	L3	CO6	PO1 PO3
		(OR)				
10.		For the inverted slider-crank mechanism shown in Figure, find the angular velocity and angular acceleration of the link BC and the sliding velocity of the block on the link BC .The crank OA is 200 mm long and rotates at 30 rad/s in the clockwise direction. OB is 600 mm and angle BOA = 40^0.	14 Marks	L4	CO6	PO1 PO2 PO3 PO10

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Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Supplementary Examinations, May – 2026

STRENGTH OF MATERIALS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Derive the relation between Youngs Modulus of Elasticity and Rigidity Modulus of Elasticity.	7 Marks	L2	CO1	PO1
	b)	Three bars made of copper; zinc and aluminium are of equal length and have cross section 500, 700, and 1000 sq.mm respectively. They are rigidly connected at their ends. If this compound member is subjected to a longitudinal pull of 250 KN, estimate the proportional of the load carried on each rod and the induced stresses. Take the value of E for copper = 1.3×10^5 N/mm^2, for zinc = 1×10^5 N/mm^2 and for aluminium = 0.8×10^5 N/mm^2.	7 Marks	L3	CO1	PO1 PO2

(OR)

2.	A steel tube of 30 mm external diameter and 20 mm internal diameter encloses a copper rod of 15 mm diameter to which it is rigidly joined at each end. If at a temperature of 10^0 C there is no longitudinal stress, calculate the stresses in the rod and tube when the temperature is raised to 200^0C. Es = 210 GPa; Ecu = 100 GPa; $\alpha_s = 11 \times 10^{-6}/\,^0C$; $\alpha_{cu} = 18 \times 10^{-6}/\,^0C$.	14 Marks	L3	CO1	PO1 PO2 PO3 PO4

UNIT-II

3.	Draw shear force and bending moment diagram for the beam given in Fig.1.	14 Marks	L3	CO2	PO1 PO2 PO3

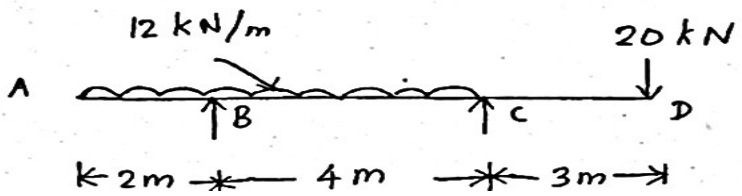

Fig.1

(OR)

4.	a)	Derive the relation between shear force, bending moment and intensity of loading.	7 Marks	L2	CO2	PO1
	b)	A cantilever of length 2 m carries a uniformly distributed load of 1.5 KN/m run over the whole length and a point load of 2 KN at a distance of 0.5 m from the free end. Draw the Shear force and Bending Moment diagrams.	7 Marks	L3	CO2	PO1 PO2 PO3

UNIT-III

5.	The tension flange of a girder of I section is 240 mm x 40 mm, whereas the compression flange 120 mm x20 mm. The web is 300 mm deep and 20 mm thick. If the girder is used as a simply supported beam of 8 m span, determine the load per m run if the allowable stress is 90 MPa in compression and 30 MPa in tension.	14 Marks	L3	CO2	PO1 PO2 PO3

(OR)

6.	a)	Derive an expression for the shear stress at a point on a transverse section subjected to shear force S.	7 Marks	L2	CO2	PO1
	b)	A square of side 'a' is used as a beam with its diagonal in horizontal position. If shear force is S, determine the value and location of maximum shear stress occurring at the section. Also find shear stress at Neutral axis.	7 Marks	L2	CO2	PO1

UNIT-IV

7.	a)	Derive torsion equation.	7 Marks	L2	CO3	PO1
	b)	A hollow shaft has an external diameter of 360 mm and a bore of 220 mm. When transmitting power, it is observed that the angle of twist is 0.5^0 in the length of 3.5 m. If G = 8 x 10^4 N/mm^2 and T_{max} = 1.4 T_{mean}, Calculate: i) The power transmitted by the shaft if speed is 5 rps ii) The maximum shear stress induced in the shaft.	7 Marks	L3	CO3	PO1 PO2 PO3

(OR)

8.	At a point in a strained material there is tensile stress of 90 N/mm^2 upon a horizontal plane and a compressive stress of 50 N/mm^2 upon a vertical plane. There is also a shear stress of 30 N/mm^2 upon each of these planes. Determine: i) Principle plane orientation and magnitude of principle stresses ii) Orientation of maximum shear stress plane and magnitude of maximum shear stress. Use Mohr's circle method.	14 Marks	L3	CO3	PO1 PO2 PO3

UNIT-V

9.		A beam AB of 6 m span is simply supported at the ends. It carries a concentrated load of 6 KN at a distance of 2 m from the left support an a uniformly distributed load of 2 KN/m at the right half of the beam. Find the deflection at the mid span and slope at the left end support. E = 200 GPa and I = 40 x 10^6 mm^4.	14 Marks	L3	CO4	PO1 PO2 PO3

(OR)

10.	a)	Derive equation of deflected curve.	7 Marks	L2	CO4	PO1
	b)	A beam of length 6 m is simply supported at its ends and carries two point loads of 48 KN and 40 KN at a distance of 1m and 3m respectively from the left support. Find i) Deflection under each load. E= 2 x10^5 N/mm^2 and I = 85 x 10^6 mm^4.	7 Marks	L3	CO4	PO1 PO2 PO3

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Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Supplementary Examinations, May – 2026

COMPUTER ORGANIZATION

[Computer Science and Engineering, Computer Science and Systems Engineering, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Science), Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	List the possible ways of representing the floating-point numbers in computer memory with examples.	7 Marks	L3	CO1	PO2
	b)	Explain different types of buses and its uses.	7 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Develop a circuit to perform 4 arithmetic and 4 logical operations. Using the control line distinguish both the operations in a single module.	7 Marks	L3	CO1	PO2
	b)	Interpret the working of PUSH and POP instructions. Explain immediate, register, direct and register indirect addressing modes.	7 Marks	L2	CO1	PO2

UNIT-II

3.	a)	What is a program status word? If the last operation performed on a computer with an 8-bit word was an addition in which the two operands were 11010110 and 01101011, what would be the value of the following flags? Carry Zero Overflow Sign Even Parity	7 Marks	L3	CO2	PO1
	b)	Give the micro-instruction format and explain the fields in the format.	7 Marks	L3	CO2	PO3
		(OR)				
4.	a)	Compare and explain the various addressing Modes using examples.	7 Marks	L2	CO2	PO2
	b)	What is an interrupt and explain different types of interrupts?	7 Marks	L2	CO2	PO2

UNIT-III

5.	a)	Describe input-output-processor (IOP) Organization in detail?	8 Marks	L4	CO2	PO4
	b)	Illustrate various types of Transfer Micro-operations with examples.	6 Marks	L2	CO2	PO1
		(OR)				
6.	a)	Write down the advantages and disadvantages of micro-programmed and hardwired control unit?	7 Marks	L3	CO2	PO2
	b)	Explain Priority interrupt and its types.	7 Marks	L2	CO2	PO3

UNIT-IV

7.		Differentiate different types of memory mapping techniques in cache memory.	14 Marks	L2	CO3	PO2
		(OR)				
8.	a)	Define ROM? Explain different types of Rom in detail.	7 Marks	L3	CO3	PO2
	b)	Explain about Solid state drives and its working in detail.	7 Marks	L4	CO3	PO3

UNIT-V

9.	a)	Discuss about interconnection structures in Multiprocessors.	7 Marks	L2	CO4	PO1
	b)	Illustrate the terms arithmetic pipeline and instruction pipeline and write short notes on them.	7 Marks	L2	CO4	PO1
		(OR)				
10.	a)	Describe hazards to the instruction pipeline with their solution.	7 Marks	L3	CO3	PO2
	b)	Differentiate Hardware performance & software performance issues in detail.	7 Marks	L3	CO4	PO2

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-20) Supplementary Examinations, May – 2026

LINEAR AND DIGITAL IC APPLICATIONS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

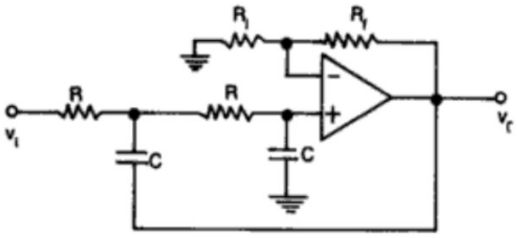
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Develop an instrumentation amplifier for a gain of 100 to amplify a low voltage ECG / EEG signals taken from the patient with a neat circuit diagram and derive the expression for a voltage gain.	9 Marks	L3	CO1	PO6
	b)	Sketch and explain the block diagram and operation of IC 555 timer in Astable mode.	5 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Design a Mono stable multi vibrator using 555 timer to produce a pulse width of 100 m sec.	8 Marks	L3	CO1	PO3
	b)	A PLL has a free running frequency of 500 KHz, the bandwidth of the LPF=10KHz. Will the PLL lock-in if f_i =60 KHz? What is the frequency of the VCO output?	6 Marks	L4	CO1	PO4

UNIT-II

3.	a)	In the circuit given below, R= 3.3KΩ, C= 0.047µf, Ri= 27KΩ and Rf=20KΩ. Calculate the high frequency cut-off fh and pass band gain A0.	8 Marks	L4	CO2	PO2



	b)	Design a Second order Butter worth LPF and plot the Frequency response?	6 Marks	L3	CO2	PO3
		(OR)				
4.	a)	Explain the operation of a successive approximation type Analog to Digital converter.	7 Marks	L1	CO3	PO1
	b)	Describe in detail the operation of a dual slope Analog to digital converter.	7 Marks	L1	CO3	PO1

UNIT-III

5.	a)	Differentiate initial and always statements.	7 Marks	L1	CO4	PO1
	b)	Explain the structure of various LOOP statements in Verilog HDL with examples.	7 Marks	L1	CO4	PO1
		(OR)				
6.	a)	Discuss system tasks and compiler directives available in Verilog HDL.	7 Marks	L1	CO4	PO1
	b)	Write Verilog HDL code for 4-to-1 Multiplexer Using Conditional Operators.	7 Marks	L2	CO4	PO2

UNIT-IV

7.	a)	Design a Priority encoder circuit and which 74XX series IC is used for it.	7 Marks	L1	CO5	PO3
	b)	With neat circuit diagram explain the working of a 4-bit odd parity generator.	7 Marks	L1	CO5	PO1
		(OR)				
8.	a)	Explain about Comparator and design a 16-bit comparator using 74×85IC's.Write Verilog HDL program.	7 Marks	L2	CO5	PO6
	b)	Write the Verilog HDL code for a dual priority encoder.	7 Marks	L2	CO5	PO2

UNIT-V

9.	a)	Sketch the logic diagram of 74x194 4-bit universal shift register and develop a Verilog HDL module for the same.	7 Marks	L2	CO5	PO2
	b)	Draw the circuit of MOD 16 Down ripple counter with D-flip-flops and explain its operation.	7 Marks	L1	CO5	PO1
		(OR)				
10.	a)	Model the MIS device IC 74x163 in free running mode. Analyze with the help of functional table. Develop Verilog HDL program for a 74x163 like 4-bit binary counter.	7 Marks	L3	CO5	PO4
	b)	Write a Verilog HDL code for a 4-bit up counter with enable and clear inputs.	7 Marks	L2	CO5	PO2

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Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-20) Supplementary Examinations, May – 2026

ARTIFICIAL INTELLIGENCE

[Computer Science and Engineering, Computer Science and Design
Computer Science and Engineering (Data Science),
Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the foundations and the characteristics of artificial intelligence.	7 Marks	L2	CO1	PO1
	b)	Discuss the advantages of artificial intelligence.	7 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Define rational agent? Describe the properties of task environment.	7 Marks	L1	CO1	PO1
	b)	Define intelligent agents? Describe the structure of the agent.	7 Marks	L1	CO1	PO1

UNIT-II

3.	a)	Explain the four-phase problem-solving process followed by agents.	7 Marks	L1	CO2	PO1
	b)	Describe informed search strategies with examples.	7 Marks	L2	CO2	PO2
		(OR)				
4.	a)	Discuss the importance of using problem-solving agents to solve real-world problems.	7 Marks	L2	CO2	PO1
	b)	Analyze the process of generating heuristics from sub-problems with suitable example.	7 Marks	L4	CO2	PO2

UNIT-III

5.	a)	Explain simulated annealing algorithm.	7 Marks	L2	CO2	PO1
	b)	Discuss the importance of using move ordering in game with relevant example.	7 Marks	L2	CO2	PO3
		(OR)				
6.	a)	Illustrate Hill-climbing search mechanism using 8-queens problem.	7 Marks	L2	CO2	PO1
	b)	Examine the importance of using alpha-beta pruning to make optimal decision in multiplayer games.	7 Marks	L2	CO2	PO2

UNIT-IV

7.	a)	Elaborate the process of constructing Bayesian networks with suitable example.	7 Marks	L2	CO3	PO1
	b)	Discuss the applications of kalman filter.	7 Marks	L1	CO3	PO3
		(OR)				
8.	a)	Explain the Simplified matrix algorithms used in Hidden Markov Model.	7 Marks	L2	CO3	PO2
	b)	Examine the importance of using Hidden Markov Models for localization problem in vacuum world considering noise in sensors and random movement of robot.	7 Marks	L4	CO3	PO2

UNIT-V

9.	a)	Elaborate on robotic frameworks.	7 Marks	L2	CO4	PO1
	b)	Outline the Trust and Transparency mechanism in artificial intelligence.	7 Marks	L2	CO5	PO7

(OR)

10.	a)	Analyze localization and mapping using a simplified kinematic and sensor model for robots.	7 Marks	L2	CO4	PO1
	b)	Discuss the negative aspects of artificial intelligence and its impact on society.	7 Marks	L2	CO5	PO8

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-20) Supplementary Examinations, May – 2026

TRANSPORTATION ENGINEERING

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss the characteristics of road transport in comparison with other systems?	7 Marks	L4	CO1	PO1
	b)	Calculate the safe overtaking sight distance for design speed of 85 kmph. Assume all other data.	7 Marks	L6	CO2	PO1
		(OR)				
2.	a)	Explain in detail the necessity and objects of highway planning.	7 Marks	L2	CO1	PO1
	b)	While aligning a highway in a built up area, it was necessary to provide a horizontal curve of radius 350 mt. Design the i) Super elevation ii) length of transition curve.	7 Marks	L6	CO2	PO1

UNIT-II

3.	a)	The properties of subgrade are as follows Liquid Limit = 70% Plastic Limit = 50% Passing through No.200 Sieve = 65%. i) Determine Group Index ii) Suitability of soil as subgrade	7 Marks	L4	CO3	PO1 PO2 PO5 PO8
	b)	What are the applications and limitations of shear, bearing and penetration tests?	7 Marks	L2	CO1	PO1 PO5
		(OR)				
4.	a)	Properties of soil are as follows: Passing through 0.074 sieve = 55%, Liquid Limit = 50% Classify the soil. Discuss the suitability of soil as subgrade.	7 Marks	L4	CO1	PO1 PO2 PO4 PO5
	b)	Mention various tests carried out on bitumen? Briefly mention the principle and uses of each test.	7 Marks	L2	CO3	PO1 PO8

UNIT-III

5.	a)	What is the significance of road user characteristics in traffic engineering? Discuss various factors which affect road user characteristics and their effects in traffic performance.	7 Marks	L4	CO4	PO1 PO2 PO12
	b)	Explain origin and destination study. What are various uses of O&D studies?	7 Marks	L2	CO4	PO1 PO10
		(OR)				
6.	a)	Estimate the basic capacity of traffic lane at a speed of 50 kmph. Assume all vehicles are of average length 4.5 m.	7 Marks	L4	CO4	PO1 PO2
	b)	Explain the relationship between speed, travel time, volume, density and capacity.	7 Marks	L4	CO4	PO1

UNIT-IV

7.	a)	Explain the classification of signals.	7 Marks	L2	CO5	PO1
	b)	Find out the expression for sleeper density for a BG track if 19 sleepers are used under a rail length.	7 Marks	L4	CO5	PO1
		(OR)				

8.	a)	Define fixtures and fastenings and explain its function.	7 Marks	L2	CO5	PO1
	b)	Classify Signals and explain.	7 Marks	L4	CO5	PO1

UNIT-V

9.	a)	How can you avoid water logging on airport runways?	7 Marks	L4	CO6	PO1
	b)	Discuss about aircraft characteristics in detail.	7 Marks	L4	CO6	PO1

(OR)

10.		Calculate the length of runway with reference to temperature of 17.2^0C. ii) If the bearing of longest line in wind rose is S 45^0 E, Determine the numbering for the bearing of runway.	14 Marks	L4	CO6	PO1

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-20) Supplementary Examinations, May – 2026

CONSTRUCTION EQUIPMENT AND AUTOMATION

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is equipment maintenance? List the objectives of maintenance.	7 Marks	L2	CO1	PO1 PO3
	b)	A excavator is purchased in the year 12 may, 2000 with a cost of Rs. 32,00,000/- which the company assured its service period as 20years.the scrap value of the equipment is Rs. 25000/- find the depreciation value for each and year using diminishing method. Also, find the rate of depreciation.	7 Marks	L4	CO1	PO1 PO2 PO5 PO10
		(OR)				
2.	a)	List the steps to improve equipment's productivity.	7 Marks	L2	CO1	PO1 PO5
	b)	A lathe machine is purchased for Rs. 84,000/- and the assumed life is 10years and scrap value is Rs. 20,000/-. If the depreciation is charged by diminishing balance method, calculate the percentage by which, value of the lathe is reduced every year and depreciation fund after 2years and also find out the cost of the lathe machine for each year.	7 Marks	L3	C01	PO1 PO2 PO5 PO10

UNIT-II

3.	a)	What are basic earthwork operations? Suggest a multipurpose equipment to perform different earthwork operations	7 Marks	L4	CO2	PO1 PO2 PO5 PO6
	b)	Explain densification of soil with neat sketch.	7 Marks	L2	CO2	PO1 PO5 PO10
		(OR)				
4.	a)	Enlist different soil compaction principles.	7 Marks	L2	CO2	PO1 PO5
	b)	What is dump truck? How will you calculate the number of dump trucks required for a project?	7 Marks	L4	CO2	PO1 PO2 PO5 PO6

UNIT-III

5.	a)	How will you enhance the production capacity of: i) Jaw crushers. ii) Hammer mills. iii) Screening plants. iv) Crushing plants	7 Marks	L4	CO3	PO1 PO2 PO4 PO5
	b)	Explain the method of tunnelling by "drill and blast".	7 Marks	L2	CO3	PO1 PO5 PO6

(OR)

6.	a)	Write the uses of Ready Mix Concrete (RMC)	7 Marks	L2	CO3	PO1 PO5
	b)	Compare and contrast the following: i) Multi-stage pump ii) Submersible pump iii) Deep well pump	7 Marks	L4	CO3	PO1 PO2 PO5

UNIT-IV

7.	a)	Explain the stages of project planning	7 Marks	L2	CO4	PO1 PO11
	b)	In which aspects the BIM is useful? Explain in detail.	7 Marks	L4	CO4	PO1 PO2 PO5 PO10 PO11

(OR)

8.	a)	How do building automation system work? Explain with neat sketch.	7 Marks	L2	CO4	PO1 PO5 PO10 PO11
	b)	What sort of barriers would a engineer face while implementing BIM.	7 Marks	L4	CO4	PO1 PO2 PO5 PO10 PO11 PO12

UNIT-V

9.	a)	Define a robot. Illustrate different types of robots.	7 Marks	L2	CO5	PO1 PO5 PO11
	b)	Write the advancement in surveying using autonomous machines and explain how drone survey helps in surveying the areas with ease.	7 Marks	L4	CO5	PO1 PO2 PO5 PO11

(OR)

10.	a)	What steps would you like to take for starting the use of your own drone in construction project?	7 Marks	L4	CO5	PO1 PO2 PO5 PO11 PO12
	b)	Discuss the use of robots in pre-fabrication works for housing projects.	7 Marks	L4	CO5	PO1 PO2 PO5 PO11

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Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-20) Supplementary Examinations, May – 2026

TRANSMISSION AND DISTRIBUTION

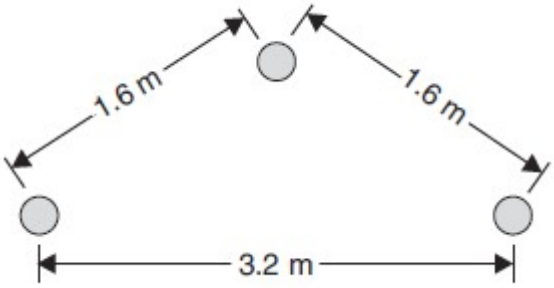
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Derive the expression for flux linkages due to internal flux and external flux.	7 Marks	L2	CO1	PO1
	b)	Determine the inductance of a 3-phase line operating at 50 Hz and conductors arranged as follows. The conductor diameter is 0.8 cm.	7 Marks	L3	CO1	PO2



(OR)

2.	a)	List out the various properties of dielectric compounds to be used for insulation of cables and explain the capacitance grading of cables.	7 Marks	L2	CO1	PO1
	b)	A single-core cable working on 66 kV on 3-phase system has a conductor diameter of 2 Cm and a sheath of inside diameter 5.3 Cm. If two intersheaths are used, find the best positions, maximum stress and the voltage on the intersheaths.	7 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Discuss the classification of overhead transmission lines based on the length of overhead transmission lines. Define A, B, C and D constants of a transmission line.	7 Marks	L2	CO2	PO1
	b)	A 1 – ϕ, overhead transmission line delivers 1100 kW at 33 kV at 0.8 pf lagging. The total resistance and inductive reactance of the line are 10 Ω and 15 Ω respectively. Determine: i) Sending end voltage ii) Sending end power iii) Transmission efficiency.	7 Marks	L3	CO2	PO2

(OR)

4.	a)	Explain why a short length of cable is connected between the dead end tower and the terminal apparatus in a station.	7 Marks	L2	CO2	PO1
	b)	An overhead line with surge impedance 400 ohms bifurcates into two lines of surge impedance 400 ohms and 40 ohms respectively. If a surge of 20 kV is incident on the overhead line, determine the magnitudes of voltage and current which enter the bifurcated lines.	7 Marks	L3	CO2	PO2

UNIT-III

5.	a)	Define string efficiency and enumerate various methods to improve string efficiency.	7 Marks	L2	CO3	PO7
	b)	An insulator string consists of three units, each having a safe working voltage of 15 kV. The ratio of self-capacitance to shunt capacitance of each unit is 8:1. Find the maximum safe working voltage of the string. Also find the string efficiency.	7 Marks	L4	CO3	PO7

(OR)

6.	a)	A 132 kV transmission line has the following data : Wt. of conductor = 680 kg/km; Length of span = 260 m Ultimate strength = 3100 kg; Safety factor = 2 Calculate the height above ground at which the conductor should be supported. Ground clearance required is 10 metres	7 Marks	L3	CO3	PO7
	b)	Explain the following terms with reference to corona : i) Critical disruptive voltage. ii) Visual critical voltage. iii) Power loss due to corona.	7 Marks	L2	CO3	PO1

UNIT-IV

7.	a)	Discuss briefly the design considerations in distribution system.	7 Marks	L2	CO4	PO1
	b)	A two-wire DC distributor cable 1000 metres long is loaded with 0·5 A/metre. Resistance of each conductor is 0·05 Ω/km. Calculate the maximum voltage drop if the distributor is fed from both ends with equal voltages of 220 V. What is the minimum voltage and where it occurs?	7 Marks	L3	CO4	PO2

(OR)

8.	a)	What are the advantages of a doubly fed distributor over singly fed distributor?	7 Marks	L2	CO4	PO1
	b)	A single phase a.c. distributor AB 300 metres long is fed from end A and is loaded as under: i) 100 A at 0·707 p.f. lagging 200 m from point A ii) 200 A at 0·8 p.f. lagging 300 m from point A The load resistance and reactance of the distributor is 0·2 Ω and 0·1 Ω per km. Calculate the total voltage drop in the distributor. The load power factors refer to the voltage at the far end.	7 Marks	L3	CO4	PO2

UNIT-V

9.	a)	How do you analyze a substation service area with 'n' primary feeders?	7 Marks	L3	CO5	PO1
	b)	Explain the procedure to select the location of substation.	7 Marks	L2	CO5	PO1

(OR)

10.	a)	Explain the factors affecting the loading of a primary feeder.	7 Marks	L2	CO5	PO1
	b)	Discuss in detail the present design practice of secondary distribution system.	7 Marks	L2	CO5	PO3

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-20) Supplementary Examinations, May – 2026

ELECTRICAL MACHINE DESIGN

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain various factors affecting the choice of the specific magnetic loading on a machine while designing.	5 Marks	L2	CO1	PO1
	b)	A 350 kW, 500 V, 450 RPM, 6 pole DC generator is built with an armature diameter of 0.87 m and a core length of 0.32 m. The lap wound armature has 660 conductors. Calculate the specific magnetic and electric loadings.	6 Marks	L3	CO1	PO4
	c)	Write some of the standard specifications of insulated Copper conductors used for armature windings.	3 Marks	L3	CO1	PO8

(OR)

2.	a)	Explain the various steps involved in design of series field of DC machine.	7 Marks	L2	CO1	PO1
	b)	Classify the insulating materials used in electrical machines according to their thermal stability. Comment on selection of class of insulating material.	7 Marks	L2	CO1	PO1

UNIT-II

3.	a)	List and discuss the factors affecting the choice of specific electric loading of DC machine.	7 Marks	L2	CO2	PO1
	b)	Determine suitable values for the number of poles, diameter and length for a 1000 kW, 500 V, and 300 RPM DC shunt generator. Assume average gap density of 1 Tesla and specific electric loading as 400 Ampere conductors / centimeter.	7 Marks	L3	CO2	PO3

(OR)

4.	a)	Predict the performance of DC machine using design values.	9 Marks	L4	CO2	PO1
	b)	Estimate the main dimensions of a 200 kW, 250 Volts, 6 pole, 1000 RPM DC generator to meet the specifications. The maximum value of flux density in the air gap is 0.87 Wb/m^2 and the ampere conductors per metre length of armature periphery are 31000; The ratio of pole arc to pole pitch is 0.67 and the efficiency is 91 percent; Assume that the ratio of length of core to pole pitch as 0.75.	5 Marks	L3	CO2	PO3

UNIT-III

5.	a)	Discuss the design procedure of core, windings and yoke of shell type transformer.	7 Marks	L3	CO3	PO1
	b)	Estimate the no-load current of a three phase transformer from design values.	7 Marks	L4	CO3	PO1

(OR)

6.	a)	Derive the output equation of a single phase transformer.	7 Marks	L3	CO3	PO1
	b)	Calculate the core and window areas required for a 1000 kVA, 6600/400 V, 50 Hz, single phase core type transformer use for society. Assume flux density of 1.25 Wb/m^2 and a current density of 3.5 A/mm^2. Voltage per turn = 35 V. Window space factor = 0.32.	7 Marks	L3	CO3	PO4

UNIT-IV

7.	a)	Discuss the advantages of selecting larger air gap in a three phase induction motor.	7 Marks	L2	CO4	PO1
	b)	Determine the approximate diameter and length of stator core and stator turns per phase for a 11 kW, 400 V, 3 phase, 4 pole, 1425 RPM, delta connected induction motor. Given that average flux density is 0.45 Tesla and 'ac' value is 23000 ampere conductors per meter. The motor operating at 0.88 power factor lagging with efficiency of 85 %. The stator has a double layer winding. Assume (L/τ) value is unity.	7 Marks	L3	CO4	PO3

(OR)

8.	a)	Write short notes on: i) Design of rotor bars and slots and ii) Design of end rings.	7 Marks	L2	CO4	PO1
	b)	Design a cage rotor for a 18.8 HP, 3phase, 440 V, 50 Hz, 1000 RPM, induction motor having full load efficiency of 0.86 and power factor of 0.86.Take diameter = 0.25 m and length = 0.14 m.Zss/Ss = 54. Assume missing data if any.	7 Marks	L3	CO4	PO3

UNIT-V

9.	a)	Derive output equation of synchronous machine.	7 Marks	L4	CO4	PO1
	b)	Evaluate the main dimensions of stator core for an 8 pole alternator rated at 3300 kVA, 300V, 50Hz. Assume specific electric loading to be 28000amp. cond./m and magnetic loading to be 0.6 Wb/m^2. Pole arc is equal to 0.65 times pole pitch. Assume square pole.	7 Marks	L3	CO4	PO3

(OR)

10.	a)	Explain the factors to be considered while selecting number of armature slots in the design of a synchronous machine.	7 Marks	L2	CO4	PO1
	b)	Compute the main dimensions of a 12MVA, 13.8 kV, 50Hz,1500RPM, 3 phase star connected alternator. Bav= 0.6 Tesla, ac =42000amp. cond./m, peripheral speed = 80m/s. Find also the maximum flux.	7 Marks	L3	CO4	PO3

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Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-20) Supplementary Examinations, May – 2026

ENERGY SYSTEMS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	A thermal power station has the following data Max Demand: 20,000 kW; Load factor: 40% Boiler efficiency: 85%; Turbine efficiency : 90% Coal Consumption : 0.9kg/kWh; Cost of 1 ton of coal : Rs.600/- Determine: i) Thermal efficiency ii) Coal bill per annum.	7 Marks	L3	CO1	PO2
	b)	What are the peak and base load power plants? Explain in detail about the working and operation of the pumped storage power plant operating as a peak load power plant.	7 Marks	L2	CO1	PO1
		(OR)				
2.	a)	List out the advantages and disadvantages of the nuclear power plants.	7 Marks	L2	CO1	PO1
	b)	Enumerate the merits and demerits of pressurized water reactor and boiling water reactor.	7 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Write short notes on greenhouse gas emission from various energy sources and its adverse effects on environment.	7 Marks	L2	CO2	PO7
	b)	Enumerate the advantages and disadvantages of diesel power plants.	7 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Explain the various social and environmental problems associated with hydro power plants.	7 Marks	L2	CO2	PO7
	b)	Explain the various pollution threats to environment by thermal power plants.	7 Marks	L2	CO2	PO7

UNIT-III

5.	a)	Describe in detail the operation of a PV system with a neat block diagram.	7 Marks	L2	CO3	PO1
	b)	What is the function of PV cell, and explain the various types of PV cells and their configurations?	7 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Explain the working principle of darrieus rotor type vertical axis wind turbine with a neat sketch.	7 Marks	L2	CO3	PO1
	b)	Writes short notes on the following: i) Geothermal resources, ii) Environmental issues of usage of geothermal energy for electric power generation.	7 Marks	L2	CO3	PO7

UNIT-IV

7.	a)	Explain in detail the working principle and operation of the closed cycle OTEC electric power plant with a neat sketch.	7 Marks	L2	CO4	PO1
	b)	Compare the operation of single basin and double basin tidal power plants for power generation.	7 Marks	L2	CO4	PO1

(OR)

8.	a)	Explain the process of generation of biogas using the anaerobic digestion technique.	7 Marks	L2	CO4	PO5
	b)	Explain the working principle and operation of a tidal power plant with neat sketch.	7 Marks	L2	CO4	PO1

UNIT-V

9.	a)	Explain how the gas turbine plant can be used as a Co-generation plant.	7 Marks	L2	CO5	PO1
	b)	List out various energy storage systems used in the hybrid energy systems and explain in detail about the Superconducting Magnetic Energy Storage (SMES).	7 Marks	L2	CO5	PO1

(OR)

10.	a)	List the advantages and disadvantages of a hybrid energy systems.	7 Marks	L2	CO5	PO1
	b)	Write short notes on the following: i) PV-diesel hybrid power plants. ii) Wind-diesel hybrid power plants.	7 Marks	L2	CO5	PO1

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-20) Supplementary Examinations, May – 2026

INTELLECTUAL PROPERTY RIGHTS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	List and describe the significant in international treaties related to intellectual property	7 Marks	L2	CO1	PO1
	b)	Explain the functions and responsibilities of national intellectual property offices in administering and enforcing IPR at the country level.	7 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Discuss the scope of protection offered to designs, the requirements for registration, and examples of industries where design rights are crucial.	7 Marks	L2	CO1	PO6
	b)	Discuss how geographical indications protect products with a geographical origin and their significance in preserving cultural heritage and promoting local economies.	7 Marks	L3	CO1	PO6

UNIT-II

3.	a)	Analyze the types of matter that can be protected as trademarks, including words, logos, slogans, and even non-traditional marks like sounds and colors.	8 Marks	L1	CO2	PO1
	b)	Discuss the differences between national and international trademark registration systems.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Discuss the significance of trademarks in branding, consumer recognition, and market competition.	7 Marks	L2	CO2	PO6
	b)	Explain the importance of using trademarks in commerce to establish rights and distinguish products and services.	7 Marks	L1	CO2	PO8

UNIT-III

5.	a)	Explain the methods and tools used for conducting patent searches and how they help inventors, businesses, and patent examiners assess the novelty and non-obviousness of inventions.	7 Marks	L2	CO3	PO6
	b)	Discuss the different types of inventions eligible for patent protection.	7 Marks	L2	CO3	PO1
		(OR)				
6.		Define the concept of originality in copyright law. Discuss the criteria for determining whether a work qualifies for copyright protection and provide examples of works that meet these criteria.	14 Marks	L2	CO3	PO8

UNIT-IV

7.	a)	Discuss the importance of maintaining secrecy, the economic value of the information, and the reasonable efforts taken to safeguard its confidentiality.	7 Marks	L2	CO4	PO6
	b)	Discuss the remedies available to trade secret owners, including injunctive relief and damages.	7 Marks	L2	CO4	PO1
		(OR)				

8.	a)	Analyze the legal protections and considerations for employees or individuals who disclose potential trade secret misappropriation or submit information to authorities.	7 Marks	L1	CO4	PO1
	b)	Explore the legal framework for addressing false advertising in unfair competition cases.	7 Marks	L2	CO4	PO8

UNIT-V

9.	Analyze and discuss recent changes or landmark cases in trademark law that have had a significant impact on the protection and enforcement of trademarks. How have these developments affected brand owners and businesses?	14 Marks	L2	CO4	PO8

(OR)

10.	Analyze recent international developments in copyright law, including updates to international copyright treaties and agreements. How have these developments addressed cross-border copyright issues, particularly in the digital context?	14 Marks	L2	CO4	PO8

CODE No.: 20BT50302 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-20) Supplementary Examinations, May – 2026

OPERATIONS RESEARCH

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. Solve following Linear Programming problem using Simplex method. 14 Marks L3 CO1 PO1 PO2

$$Maximize\ Z = X_1 + X_2 + X_3.$$
$$Subject\ to\ 4X_1 + 5X_2 + 3X_3 \le 15.$$
$$10X_1 + 7X_2 + X_3 \le 12.$$
$$and\ X_1, X_2, X_3 \ge 0.$$

(OR)

2. Use two-phase method to solve the following Linear Programming Problem. 14 Marks L3 CO1 PO1 PO2

$$Max\ Z = 3X_1 - X_2$$
$$Subject\ to\ 2X_1 + X_2 \ge 2$$
$$X_1 + 3X_2 \le 2$$
$$X_2 \le 4$$
$$and\ X_1, X_2 \ge 0.$$

UNIT-II

3. Goods have to be transported from sources S_1, S_2 and S_3 to destination D_1, D_2 and D_3. The transportation cost per unit, capacities of the sources, and the requirements of the destinations are given in the following table. 14 Marks L3 CO1 PO1 PO2

	D_1	D_2	D_3	Supply
S_1	8	5	6	120
S_2	15	10	12	80
S_3	3	9	10	80
Demand	150	80	50	

Determine a transportation schedule so that cost is minimized. Use North-west corner rule to find Basic Feasible Solution.

(OR)

4. A travelling salesman has to visit 5 cities. He wishes to start from a particular city, visit each city once and then return to his starting point. The travelling cost (in '000 Rs) of each city from a particular city is given below: 14 Marks L3 CO1 PO1 PO2

		To city				
		A	B	C	D	E
From city	A	-	2	5	7	1
	B	6	-	3	8	2
	C	8	7	-	4	7
	D	12	4	6	-	5
	E	1	3	2	8	-

What should be the sequence of visit of the salesman so that the cost is minimum?

UNIT-III

5. a) Explain: 4 Marks L1 CO2 PO1

i) Two-person Zero-sum game.

ii) Pure strategy in a game.

b) Solve the game whose payoff matrix is given below: 10 Marks L3 CO2 PO1 PO2

Player B

Player A		B_1	B_2	B_3	B_4
	A_1	3	2	4	0
	A_2	3	4	2	4
	A_3	4	2	4	0
	A_4	0	4	0	8

(OR)

6. Find the optimal order quantity of a product for which the price breaks are as follows: 14 Marks L3 CO3 PO1 PO2

Quantity (Units)	Price per Unit (Rs)
$0 < Q_1 < 100$	20
$100 \leq Q_2 < 200$	18
$200 \leq Q_3$	16

The monthly demand of the product is 400 units. The storage cost is 20 % of the unit cost and the cost of ordering is Rs 25.

UNIT-IV

7. The following table gives the activities of construction project and duration: 14 Marks L3 CO4 PO1 PO2 PO3

Activity	1-2	2-3	2-4	3-5	3-6	4-6	4-7	5-8	6-8	7-8
Duration (days)	2	3	5	4	1	6	2	8	7	4

Draw the network for the project. Find the critical path and project duration.

(OR)

8. A small project involves 7 activities and their estimates are listed in the following table. 14 Marks L3 CO4 PO1 PO2 PO3

Activity	Duration (Weeks)		
	Optimistic	Most likely	Pessimistic
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

i) Draw the network of the activities.

ii) Find expected duration, variance for each activity and expected Project Length.

iii) What is the probability that the project will be completed at least 4 weeks earlier than expected time.

UNIT-V

9. Trucks arrive at a loading dockat an average rate of 4 trucks per hour. The loading of a truck takes 10 minutes on the average by a crew of three men. The operating cost of a truck is Rs 20 per hour and the men are paid at Rs 6 each per hour. Is it advisable to add another crew of three men? 14 Marks L3 CO5 PO1 PO2 PO3

(OR)

10.	A company trading in motor vehicle spare parts wishes to determine the levels of stock it should carry for the items in the range. The demand is not certain and there is a lead time for stock replenishment. For an item A, the following information is obtained:	14 Marks	L4	CO5	PO1 PO2 PO3

Demand (units/day)	3	4	5	6	7
Probability	0.10	0.20	0.30	0.30	0.10

Carrying cost (per unit/day) =Rs 2, Ordering cost (per order)=Rs 50, lead time for replenishment = 3 days. Stock on hand at the beginning of the simulation exercise was 20 units. Carry out a simulation run over a period of 10 days with the objective of evaluating the inventory rule: Order 15 units when present inventory falls below 15 units. Use random numbers in the sequence: 0, 9, 1, 1, 5, 1, 8, 6, 3, 5. Also calculate total inventory cost.

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-20) Supplementary Examinations, May – 2026

THERMAL ENGINEERING-II

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define boiler. Briefly explain boiler accessories.	7 Marks	L2	CO1	PO1
	b)	A Boiler evaporates 3.5 kg of water per kg of coal in to dry saturated steam at 10 bars. The temperature of feed water is 30^0 C. Find the equivalent of evaporation and factor of evaporation.	7 Marks	L2	CO1	PO1 PO2
		(OR)				
2.	a)	Differentiate natural draught and forced draught.	7 Marks	L2	CO1	PO1
	b)	The following data pertaining to a steam power plant: Height of chimney = 30m Draught produced = 16.5 mm of water gauge Temperature of flue gases = 250^0 C Temperature of boiler house = 28^0 C Atmospheric pressure = 1.013 bar Determine the quantity of air used per kg of fuel burnt in the boiler.	7 Marks	L3	CO1	PO1 PO2

UNIT-II

3.	a)	Derive the expression for velocity of steam flow through nozzle.	7 Marks	L2	CO2	PO1 PO2
	b)	Estimate the mass flow rate of steam in a nozzle with the following data: Inlet pressure and temperature = 10 bar &200ºC, Back pressure = 0.5 bar, throat diameter = 12mm.	7 Marks	L3	CO2	PO1 PO2
		(OR)				
4.	a)	Describe with neat sketch the construction and working of low-level parallel jet condenser.	7 Marks	L2	CO2	PO1
	b)	Calculate the vacuum efficiency from the following data, Vacuum at steam inlet to condenser = 700 mm of Hg; Barometer reading = 760 mm of Hg; Hot well temperature = 30^0 C.	7 Marks	L2	CO2	PO1 PO2

UNIT-III

5.	a)	Explain with a neat sketch working of de-laval impulse turbine.	7 Marks	L1	CO3	PO1
	b)	In a de-laval turbine, the steam enters the wheel through a nozzle with a velocity of 500 m/s and at an angle of 20° to the direction of motion of blade. The blade speed is 200 m/s and the exit angle of the moving blade is 25°. Find the inlet angle of the moving blade, exit velocity of steam and its direction and work done per kg of steam.	7 Marks	L3	CO3	PO1 PO2
		(OR)				

6.	a)	A certain stage ofa parson's turbine consists of one row of fixed blades and one row of moving blades. The details of the turbine are as follows; Mean diameter of the blades = 680mm; RPM of the turbine = 3000 Mass of steam passing per second = 13.5 kg Steam velocity at exit from fixed blades = 143.7m/s Calculate the power developed in the stage and the gross efficiency assuming carry over efficiency as 0.74 and the efficiency of conversion of heat energy into kinetic energy in the blade channels as 0.92.	7 Marks	L3	CO3	PO1 PO2 PO3
	b)	Classify steam turbines and draw the velocity and pressure variation of steam in a impulse turbine.	7 Marks	L3	CO3	PO1 PO2 PO3

UNIT-IV

7.	a)	With a neat sketch working of VCR system.	7 Marks	L3	CO4	PO1
	b)	A refrigerator working on Bell-Coleman cycle operates between pressure limits of 1.05 bar and 8.5 bar. Air is drawn from the cold chamber at 10°C, compressed and then it is cooled to 30°C before entering the expansion cylinder. The expansion and compression follow the law $PV^{1.3}$= C. Determine the theoretical COP of the system.	7 Marks	L3	CO4	PO1 PO2

(OR)

8.	a)	Write a brief note on refrigerants.	7 Marks	L3	CO4	PO1
	b)	The capacity of a refrigerator is 210 TR when working between -10° C and 28° C. Determine the mass of ice produced per day from water at 28°C. Also find the power required to drive the unit. Assume that the cycle operates on reversed carnot cycle and latent heat of ice is 335 kJ/kg.	7 Marks	L3	CO4	PO1 PO2

UNIT-V

9.	a)	Explain in brief, sensible heating and cooling. Represent the same on a psychrometric chart.	7 Marks	L3	CO5	PO1
	b)	The atmospheric air has a dry bulb temperature of 21°C and wet bulb temperature of 18°C. If the barometer reads 750mm of Hg, determine the partial pressure of water vapour, relative humidity and dew point temperature.	7 Marks	L3	CO5	PO1 PO2

(OR)

10	a)	Explain briefly the psychrometric properties.	7 Marks	L3	CO5	PO1
.	b)	In a laboratory test a psychometer recorded 38°C DBT and 28°C WBT calculate the following terms. i) vapour pressure, ii) relative humidity, iii) specific humidity.	7 Marks	L3	CO5	PO1 PO2

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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III B.Tech I Semester (SVEC-20) Supplementary Examinations, May – 2026

VLSI SYSTEM DESIGN

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Compare TTL and CMOS logic families.	8 Marks	L4	CO1	PO2
	b)	Define the following terms with reference to logic families. i) Logic levels. ii) Power supply rails iii) DC noise margin iv) Propagation delay.	6 Marks	L1	CO1	PO1

(OR)

2.	a)	Illustrate CMOS Steady State Behavior.	7 Marks	L2	CO1	PO1
	b)	Develop 2-input DTL NOR gate and DTL NAND gate with truth table.	7 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Describe a step-by-step procedure for a typical p-well CMOS process with neat diagrams.	7 Marks	L1	CO2	PO1
	b)	Analyze pull up to pull down ratio of CMOS driven to another CMOS inverter with necessary equations.	7 Marks	L4	CO2	PO2

(OR)

4.	a)	Describe a step-by-step procedure for a typical NMOS process with neat diagrams.	7 Marks	L1	CO2	PO1
	b)	Analyze the expressions of V_T, g_m, g_{ds} and ω_0.	7 Marks	L4	CO2	PO2

UNIT-III

5.	a)	List the various MOS Layers used in CMOS Logic. Justify the use of Stick Diagrams.	7 Marks	L4	CO3	PO1
	b)	Calculate the rise time and fall time of the CMOS inverter (W/L)n = 2 and (W/L)p = 4, Kn = 150μA/V^2, Vtn = 0.6V, Kp= 62μA/V^2, Vtp = -0.6V , V_{DD} = 3.3V, Total output capacitance = 120 fF.	7 Marks	L3	CO3	PO4

(OR)

6.	a)	Model a schematic and stick diagram using NMOS logic for Y= ((A+B)(C+D))'.	8 Marks	L3	CO3	PO3
	b)	Identify the role of Lambda based rules in fabrication of ICs.	6 Marks	L3	CO3	PO8

UNIT-IV

7.	a)	Distinguish between Asynchronous and Synchronous Counters.	7 Marks	L4	CO4	PO2
	b)	Justify the use of carry select adder for high performance applications.	7 Marks	L2	CO4	PO6

(OR)

8.	a)	Design 4 × 4 Barrel Shifter with neat sketch.	7 Marks	L4	CO4	PO3
	b)	Explain the working of a carry skip adder and analyze its performance.	7 Marks	L2	CO4	PO2

UNIT-V

9.	a)	Develop the flow chart of VLSI Design Flow.	7 Marks	L3	CO5	PO6
	b)	List and analyze the various Design Styles.	7 Marks	L4	CO5	PO5
		(OR)				
10	a)	Justify the role of programmable interconnects in FPGAs.	7 Marks	L4	CO5	PO7
.	b)	Compare FPGAs and CPLDs.	7 Marks	L4	CO5	PO2

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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III B.Tech I Semester (SVEC-20) Supplementary Examinations, May – 2026

COMPUTER NETWORKS

[Computer Science and Engineering, Electronics and Instrumentation Engineering, Computer Science and Systems Engineering, Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	With a neat diagram explain ISO - OSI reference model.	7 Marks	L1	CO1	PO1
	b)	Compare Optical Fibers and Copper Cable Guided Transmission Mediums.	7 Marks	L2	CO2	PO2
		(OR)				
2.	a)	Explain in detail about TCP/IP reference model with a neat diagram.	7 Marks	L1	CO1	PO1
	b)	Draw the electromagnetic spectrum and explain it's useful for communication.	7 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Suppose we want to transmit the "message 1011 0010 0111 and protect it from errors using the CRC polynomial $x^4 + x^2 + 1$. Use polynomial long division to determine the message that should be transmitted. Suppose the leftmost bit of the message is inverted due to noise on the transmission link. What is the result of the 'receiver's CRC calculation? How does the receiver know that an error has occurred?	7 Marks	L2	CO3	PO2
	b)	Differentiate classical ALOHA and slotted ALOHA.	7 Marks	L2	CO1	PO2
		(OR)				
4.	a)	Briefly describe the differences between store-and-forward and cut-through switches.	7 Marks	L2	CO1	PO1
	b)	Discuss the principle of stop and wait flow control algorithm. Draw time line diagrams and explain how loss of a frame and loss of an ACK are handled. What is the effect of delay-bandwidth product on link utilization?	7 Marks	L3	CO3	PO2

UNIT-III

5.	a)	Develop link state routing to find shortest path with an example.	7 Marks	L3	CO2	PO4
	b)	Explain Internet Protocol with the neat block diagram of IP header format.	7 Marks	L3	CO5	PO8
		(OR)				
6.	a)	Apply distance vector routing algorithm to compute shortest path routing.	7 Marks	L3	CO2	PO2
	b)	Distinguish between datagram networks and virtual circuit networks.	7 Marks	L1	CO1	PO1

UNIT-IV

7.	a)	Evaluate TCP congestion control mechanisms.	7 Marks	L3	CO3	PO1
	b)	What is the total size of the minimum TCP MTU, including TCP and IP overhead but not including data link layer overhead?	7 Marks	L3	CO3	PO1
		(OR)				

8.	a)	A client uses UDP to send data to server. The data length is 16 bytes. Calculate the efficiency of this transmission at the UDP level(ration of useful bytes to total bytes).	7 Marks	L3	CO3	PO2
	b)	Elucidate the following Timers in TCP. i) Retransmission Time Out. ii) Persistence Timer.	7 Marks	L1	CO1	PO1

UNIT-V

9.	a)	What is the use of HTTP protocol? Mention the default port number of HTTP protocol.	7 Marks	L3	CO4	PO6
	b)	List and discuss the types of DNS records.	7 Marks	L2	CO4	PO6

(OR)

10.	a)	Discuss the need for name resolution. Illustrate the domain name hierarchy and the steps in resolution.	7 Marks	L2	CO4	PO6
	b)	Write short notes on File Transfer Protocol.	7 Marks	L1	CO1	PO1

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech I Semester (SVEC16) Supplementary Examinations, May – 2026

ENGINEERING CHEMISTRY

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Central Water Commission (CWC) of Tirupati section reports on underground water sample (in mg/L) at the proposed site for the construction of thermal power plant (300 MW) near Vijayawada is as follows: $Ca(HCO_3)_2$ = 220, $MgCl_2$ = 130, $CaSO_4$ = 98, $Mg(HCO_3)_2$ = 56, $MgSO_4$ = 84, DO = 8 and Na_2CO_3 = 22. Discuss in detail the operational troubles suffer by the boiler if above sample of water is to be fed into 56.24×10^4 kg m^{-2} boiler. 8 Marks

   b) Discuss purification of water by using reverse osmosis method. 6 Marks

(OR)

2. a) Rishika want to investigate the reason for unpredicted explosion of home boiler. After explosion the following deposits were found on analysis of boiler pieces. $CaSO_4$, $CaSiO_3$, $MgSiO_3$, Fe_2O_3, $Mg(OH)_2$, Na_2FeO_2, $CaCO_3$. Looking at the data, Rishika discussed about how boiler has suffered before explosion predicting the impurities present in water. Can you write the report discussing the attributes for explosion? 8 Marks

   b) Write the chemistry of estimation of water hardness by EDTA method. 6 Marks

UNIT-II

3. Write the synthesis, properties and applications of the following engineering plastics 14 Marks

   i) Poly Carbonates. ii) Teflon.

(OR)

4. a) Discuss the preparation, properties and uses of Poly Carbonates. 5 Marks

   b) Explain the types of fiber reinforced composites and write their significance. 9 Marks

UNIT-III

5. a) Write informative notes on recent trends in Nano Technology and future trends of Green Chemistry. 10 Marks

   b) Illustrate disadvantages of Nanomaterials. 4 Marks

(OR)

6. a) Outline the role of Green Chemistry in our day-to-day life. 7 Marks

   b) Summarize the commercial applications of bio-diesel. 7 Marks

UNIT-IV

7. a) Identify the type of battery commonly used in each of these consumer electronic products in olden days and today. Discuss their Construction and Chemistry only. Assume none uses solar cells. 10 Marks

   i) Digital Camera. ii) MP3 Player.

   b) Discuss the applications of electrochemical sensors 4 Marks

(OR)

8. a) Differentiate dry cell, storage cell and fuel cell with suitable examples. 10 Marks

   b) Write the similarities between Lithium-ion battery and Lithium-polymer 4 Marks

batteries.

UNIT-V

9.	a)	Define lubricant. Mention the important functions of lubricant.	7 Marks
	b)	Write an explanatory note on any two solid lubricants.	7 Marks

(OR)

10.	a)	How will you assess the situation and identify the type of corrosion from the physical manifestation of the corroded components / parts?	8 Marks
	b)	Discuss the functions of lubricants with suitable examples.	6 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech I Semester (SVEC16) Supplementary Examinations, May – 2026

MULTI-VARIABLE CALCULUS AND DIFFERENTIAL EQUATIONS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Determine the solution of $2xydy - (x^2 + y^2 + 1)dx = 0$. 7 Marks

   b) Determine the orthogonal trajectories of the family of circles $x^2 + y^2 + 2fy + 1 = 0$. 7 Marks

(OR)

2. a) Identify the order and degree and determine the solution of the differential equation $\frac{dy}{dx} + \frac{y}{x} = y^2 x \sin x$. 7 Marks

   b) Determine the orthogonal trajectories of the family of cardioids $r = a(1 - \cos\theta)$, where 'a' is the parameter. 7 Marks

UNIT-II

3. a) Applying the technique of finding particular integral, establish a general solution of $(D^3 + 2D^2 + D)y = e^{2x} + x^2 + x + \sin 2x$. 7 Marks

   b) Solve the differential equation $(D^2 + 3D + 2)y = 2\cos(2x + 3) + 2e^x + x^2$. 7 Marks

(OR)

4. a) Determine the solution of initial value problem $y'' - y' - 2y = 3e^{2x}, y(0) = 0, y'(0) = -2$. 7 Marks

   b) The charge $q(t)$ on the capacitor is given by the differential equation $\frac{d^2q}{dt^2} + 12\frac{dq}{dt} + 100q = 24\sin 10t$. If the charge q=0 and current i=0 at t=0, then determine the charge at time t > 0. 7 Marks

UNIT-III

5. a) If $x = u(1 - v), y = uv$ prove that $JJ' = 1$. 7 Marks

   b) Apply Taylor's theorem to expand polynomial $x^2y + 3y - 2$ in powers of $(x - 1)$ and $(y + 2)$. 7 Marks

(OR)

6. a) Investigate the continuity at (0 , 0) of the function 7 Marks

$$f(x,y)=\begin{cases} \dfrac{x^2-y^2}{x^2+y^2}, & (x,y)\neq(0,0) \\ 0 & (x,y)=(0,0) \end{cases}$$

b) If $u = f(r,s,t)$ where $r=\dfrac{x}{y}$, $s=\dfrac{y}{z}$, $t=\dfrac{z}{x}$, then show that 7 Marks

$$x\frac{\partial u}{\partial x}+y\frac{\partial u}{\partial y}+z\frac{\partial u}{\partial z}=0$$

UNIT-IV

7. a) Evaluate $\int_0^\infty\int_0^\infty e^{-(x^2+y^2)}dxdy$ by changing into polar co-ordinates. 7 Marks

b) Apply triple integration and obtain the volume of the sphere $x^2+y^2+z^2=a^2$. 7 Marks

(OR)

8. a) Show that the whole length of the curve $x^2(a^2-x^2)=8a^2y^2$ is $\pi a\sqrt{2}$. 7 Marks

b) Show that the area of the surface generated by the revolution about x–axis of the loop of the curve $3ay^2=x(x-a)^2$. 7 Marks

UNIT-V

9. a) Evaluate the directional derivative of $\phi = x^2yz+4xz^2$ at the point (1,-2,1) in the direction of the vector $2i-j-2k$. 7 Marks

b) Evaluate $\oint_S F.ds$ where $F=4xi-2y^2j+z^2k$ and S is the surface bounded by the region $x^2+y^2=4, z=0$ and $z=3$. 7 Marks

(OR)

10. a) Prove the vector identity $\nabla^2(r^n)=n(n+1)r^{n-2}$. 7 Marks

b) Verify Gauss Divergence theorem for the vector function $F=yi+xj+z^2k$ over the cylindrical region bounded by $x^2+y^2=9, z=0$ and $z=2$. 7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC20) Supplementary Examinations, May – 2026

MATERIAL SCIENCE AND ENGINEERING

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Draw Iron-Iron-Carbide diagram neatly and explain the critical temperatures, phases and boundaries existing in it.	14 Marks	L2	CO1	PO2
		(OR)				
2.		Explain the expression for the Gibb's Phase rule and recall the Hume-Rothery rule.	14 Marks	L2	CO1	PO1 PO2

UNIT-II

3.	a)	Explain the annealing process and describe with neat sketches the full, spheroidised and Process annealing techniques.	7 Marks	L1	CO1	PO1 PO2
	b)	Explain the concept of time temperature transformation with a neat sketch.	7 Marks	L2	CO1	PO1 PO2
		(OR)				
4.		Define carburizing and describe the types of carburizing in detail.	14 Marks	L1	CO1	PO1

UNIT-III

5.	a)	Classify the types of carbon steels with their specific features and applications.	7 Marks	L2	CO2	PO1
	b)	Write a short note on White and Malleable cast iron.	7 Marks	L1	CO2	PO1 PO2
		(OR)				
6.		Recall the designations of steels and mention the types, composition, properties and applications of tool steels.	14 Marks	L1	CO2	PO1 PO2

UNIT-IV

7.	a)	Interpret the composition, features and applications of Titanium and its alloys.	7 Marks	L2	CO2	PO1
	b)	List the properties and applications of Nickel.	7 Marks	L1	CO2	PO1
		(OR)				
8.		Explain the types, properties and uses of magnesium and its alloys in detail.	14 Marks	L1	CO2	PO1 PO2

UNIT-V

9.	a)	Define composite materials. What unique properties have they, over the conventional materials?	7 Marks	L1	CO2	PO1
	b)	Discuss on the particle reinforced composites, and fiber reinforced composites and also describes its impact on environment.	7 Marks	L2	CO2	PO1 PO7
		(OR)				
10.		Write short notes on Metal Matrix composites and Ceramic-matrix composites.	14 Marks	L1	CO2	PO1

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

DISTRIBUTED SYSTEMS

[Computer Science and Engineering (Artificial Intelligence and Machine Learning)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is logical clock in distributed systems?	2 Marks	L1	CO1
	b)	What is the key difference between synchronous and asynchronous execution in computing	2 Marks	L1	CO1
	c)	How does asynchronous execution benefit performance in parallel systems?	2 Marks	L1	CO2
	d)	Define vector time and how it extends scalar time to track causality.	2 Marks	L1	CO2
	e)	What is global state in distributed systems.	2 Marks	L1	CO3
	f)	What role do consistent snapshots play in monitoring the global state of a distributed system?	2 Marks	L1	CO3
	g)	How does the Ricart–Agrawala algorithm ensure mutual exclusion in a distributed system.	2 Marks	L1	CO4
	h)	What is the use of Maekawa's algorithm.	2 Marks	L1	CO4
	i)	What is meant by a "system model" in the context of distributed systems.	2 Marks	L1	CO5
	j)	How does the Chandy–Misra–Haas algorithm detect deadlocks in distributed systems using the OR model.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe the concept of task scheduling in parallel multiprocessor systems.	8 Marks	L2	CO1
	b)	Discuss the concept of distributed shared memory in multicomputer systems.	8 Marks	L1	CO1

(OR)

3.	a)	What are the advantages and disadvantages of using synchronous execution in distributed systems?	8 Marks	L1	CO1
	b)	Explain the different models of process communication in distributed systems.	8 Marks	L1	CO1

MODULE-II

4.	a)	Discuss the challenges in efficiently implementing vector clocks in large-scale distributed systems.	8 Marks	L3	CO3
	b)	What is the role of vector clocks in detecting causality in distributed systems? Explain	8 Marks	L1	CO3

(OR)

5.	a)	Define Matrix time and its structure, which extends vector clocks to represent causal relationships in a matrix form.	8 Marks	L2	CO3
	b)	What are the advantages and limitations of Virtual Time compared to physical clock-based synchronization in distributed systems.	8 Marks	L2	CO3

MODULE-III

6.	a)	Discuss the challenges in capturing global state due to the absence of a global clock and the asynchronous nature of distributed systems.	8 Marks	L2	CO2
	b)	What are FIFO channels, and why are they important in the context of the Chandy-Lamport snapshot algorithm?	8 Marks	L2	CO2

(OR)

7.	a)	Define non-FIFO channels and describe how message ordering may not be guaranteed in such channels.	8 Marks	L2	CO2
	b)	How does a snapshot algorithm handle the issue of capturing a global state in systems with causal message delivery?	8 Marks	L2	CO2

MODULE-IV

8.	a)	Describe the Ricart–Agrawala mutual exclusion algorithm.	8 Marks	L1	CO3
	b)	Explain the fair mutual exclusion algorithm proposed by Lodha and Kshemkalyani.	8 Marks	L1	CO3

(OR)

9.	a)	Describe the Agarwal–El Abbadi quorum-based mutual exclusion algorithm.	8 Marks	L2	CO3
	b)	Explain Raymond's tree-based mutual exclusion algorithm.	8 Marks	L2	CO3

MODULE-V

10.	a)	Discuss the different models of deadlocks in detail.	8 Marks	L1	CO4
	b)	Explain Mitchell and Merritt's algorithm for detecting deadlock in the single-resource model.	8 Marks	L2	CO4

(OR)

11.	a)	Explain the advantages of using distributed shared memory (DSM) over explicit message-passing mechanisms in a distributed system.	8 Marks	L1	CO4
	b)	Define memory consistency models and explain the various types of consistency models commonly used in distributed systems.	8 Marks	L1	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

COMPILER DESIGN

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define a compiler.	2 Marks	L1	CO1
	b)	Distinguish between recursive and iterative interpreters.	2 Marks	L1	CO1
	c)	Define a parser in compiler design	2 Marks	L2	CO2
	d)	Eliminate left recursion from the grammar: $E \rightarrow E + T \mid T$	2 Marks	L1	CO2
	e)	What is a syntax tree?	2 Marks	L2	CO3
	f)	Define type expression with an example.	2 Marks	L2	CO3
	g)	What is the purpose of preprocessing in intermediate code generation?	2 Marks	L3	CO4
	h)	What is the role of flow-of-control statements in code generation?	2 Marks	L2	CO4
	i)	Explain the importance of data flow analysis in optimization.	2 Marks	L3	CO5
	j)	Define register allocation.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the structure of a compiler with neat diagram.	8 Marks	L2	CO1
	b)	Differentiate between compiler and interpreter with examples.	8 Marks	L2	CO1

(OR)

3.	a)	Design a simple lexical analyzer for arithmetic expressions using LEX.	8 Marks	L5	CO1
	b)	Evaluate the advantages of compiler over interpreter with examples.	8 Marks	L4	CO1

MODULE-II

4.	a)	Discuss why ambiguity must be eliminated and methods to handle it.	8 Marks	L4	CO2
	b)	Discuss the differences between SLR, CLR, and LALR parsers with examples.	8 Marks	L3	CO2

(OR)

5.	a)	Apply YACC specifications to implement a simple arithmetic expression parser	8 Marks	L5	CO2
	b)	Compare top-down parsing and bottom-up parsing with examples.	8 Marks	L4	CO2

MODULE-III

6.	a)	Compare parse tree and syntax tree with suitable examples.	8 Marks	L4	CO3
	b)	Write short notes on: i) Annotated Parse Tree ii) Translation Schemes.	8 Marks	L3	CO3

(OR)

7.	a)	Discuss syntax tree construction with a neat algorithm.	8 Marks	L3	CO3
	b)	Discuss the advantages and limitations of L-attributed definitions.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Write short notes on preprocessing of if-statements and goto-statements.	8 Marks	L3	CO4
	b)	Generate the three-address code for the expression: (a + b) * (c - d). Write short notes on: (a) Quadruples (b) Triples (c) Indirect	8 Marks	L3	CO4

(OR)

9.	a)	Translate a switch-case statement into intermediate code representation	8 Marks	L2	CO4
	b)	What are activation records in runtime environments?	8 Marks	L2	CO4

MODULE-V

10.	a)	List and explain the principal sources of optimization.	8 Marks	L5	CO5
	b)	Define optimization of basic blocks with simple examples.	8 Marks	L4	CO5

(OR)

11.	a)	Discuss common subexpression elimination, dead code elimination, and loop optimization.	8 Marks	L3	CO5
	b)	Differentiate between local and global optimization with examples.	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

DATA VISUALIZATION

[Computer Science and Engineering (Data Science), Information Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List any two types of data used in data visualization.	2 Marks	L1	CO1
	b)	What are the basic principles of data visualization?	2 Marks	L2	CO2
	c)	Give two examples of data visualization tools	2 Marks	L1	CO2
	d)	What is meant by ETL in data processing	2 Marks	L1	CO3
	e)	Define a geo map.	2 Marks	L1	CO3
	f)	Give any one difference between a filled map and a symbol map.	2 Marks	L3	CO3
	g)	Mention any two benefits of dashboards.Mention any two benefits of dashboards.	2 Marks	L1	CO4
	h)	Name two types of dashboards.	2 Marks	L1	CO4
	i)	Mention one advanced feature of Power BI.	2 Marks	L1	CO6
	j)	Name any two variants of Power BI.	2 Marks	L1	CO6

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Illustrate the concept of storytelling using data visualization with an example from social communication	8 Marks	L2	CO1
	b)	Explain the role of color, labels, and legends in making a visualization more communicative	8 Marks	L4	CO1

(OR)

3.	a)	How can visualizations be used to support strategic decisions in a business environment	8 Marks	L2	CO2
	b)	Describe the benefits of using interactive dashboards. Give examples from tools like Tableau or Power BI.	8 Marks	L4	CO2

MODULE-II

4.	a)	Illustrate different data formats and schemas used in data visualization projects.	8 Marks	L2	CO3
	b)	Explain the role of open-source data cleansing tools with examples	8 Marks	L3	CO3

(OR)

5.	a)	Describe scorecards and bullet charts with use cases in performance tracking	8 Marks	L4	CO3
	b)	Discuss the integration of Power BI with data sources and its visualization capabilities	8 Marks	L4	CO3

MODULE-III

6.	a)	Describe the step-by-step procedure to create a geo map in Tableau using a sample dataset.	8 Marks	L3	CO4
	b)	What is a symbol map? Explain its creation procedure in Tableau with an example.	8 Marks	L2	CO4

(OR)

7.	a)	Compare symbol maps and filled maps with suitable examples.	8 Marks	L4	CO4
	b)	Explain the concept of a filled map and its procedure in Tableau.	8 Marks	L3	CO4

MODULE-IV

8.	a)	Explain the procedure to create a dashboard using Google Data Studio.	8 Marks	L2	CO5
	b)	Write the step-by-step procedure to create a dashboard in Tableau.	8 Marks	L4	CO5

(OR)

9.	a)	Explain the importance of dashboard size and steps to set overall dashboard size in Tableau.	8 Marks	L4	CO5
	b)	Describe the process of grouping items using layout containers in Tableau dashboards.	8 Marks	L4	CO5

MODULE-V

10.	a)	Describe the steps involved in connecting to different data sources in Power BI.	8 Marks	L2	CO6
	b)	Explain the concept of data modeling in Power BI and its importance in creating reports.	8 Marks	L2	CO6

(OR)

11.	a)	Discuss the process of data transformation in Power BI using Power Query.	8 Marks	L2	CO6
	b)	Explain the concept of relationships in Power BI with examples of one-to-one and one-to-many relationships.	8 Marks	L4	CO6

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

DATA SCIENCE

[Computer Science and Engineering (Artificial Intelligence and Machine Learning)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Differentiate between structured and unstructured data with an example.	2 Marks	L4	CO1
	b)	What is the role of data preprocessing in a data science workflow?	2 Marks	L2	CO1
	c)	Define feature extraction in the context of data science.	2 Marks	L1	CO2
	d)	Evaluate the pros and cons of Random Forest compared to a single decision tree.	2 Marks	L5	CO2
	e)	Explain the role of legends in a plot.	2 Marks	L2	CO3
	f)	Compare bar plots and stacked bar plots in terms of data presentation.	2 Marks	L4	CO3
	g)	Analyze the effect of bin size on the readability of histograms.	2 Marks	L4	CO4
	h)	Explain the difference between sample variance and population variance.	2 Marks	L4	CO4
	i)	Define time series analysis.	2 Marks	L1	CO5
	j)	How can the .rolling() method in pandas be applied to calculate a Simple Moving Average (SMA)?	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.		Compare CSV, XML, and JSON-like formats (RSS) in terms of usability for data storage and sharing.	16 Marks	L4	CO1

(OR)

3.	a)	Explain 3Vs of data.	8 Marks	L2	CO1
	b)	How can SQL be used in data science projects?	8 Marks	L2	CO1

MODULE-II

4.	a)	Describe the difference between *interpretability* and *predictive power* in user retention models.	8 Marks	L4	CO2
	b)	Compare Principal Component Analysis (PCA) and Singular Value Decomposition (SVD) in dimensionality reduction.	8 Marks	L4	CO2

(OR)

5.		Propose a project that uses Random Forest to analyze healthcare data.	16 Marks	L6	CO2

MODULE-III

6.	a)	Evaluate the usefulness of scatter plots in identifying variable relationships.	8 Marks	L5	CO3
	b)	Examine how choropleth maps, point maps, and heatmaps differ in representing geographical data.	8 Marks	L5	CO3

(OR)

7.	a)	Describe the different types of scatter plots (positive, negative, and null correlation) with examples.	8 Marks	L2	CO3
	b)	Explain the applications of line plots with markers and those without markers.	8 Marks	L5	CO3

MODULE-IV

8.	a)	Differentiate between a line graph and an area chart in terms of usage.	8 Marks	L4	CO4
	b)	Examine the differences between PMFs and CDFs in representing probability distributions.	8 Marks	L4	CO4

(OR)

9.	a)	Apply the variance sum law to explain how changes in variables affect distribution measures.	8 Marks	L3	CO4
	b)	Explain the concept of a cumulative distribution function (CDF) with an example.	8 Marks	L3	CO4

MODULE-V

10.	a)	Evaluate the usefulness of ROC-AUC as a metric for predictive modeling compared to accuracy.	8 Marks	L5	CO5
	b)	Examine the challenges of overfitting in complex time series models.	8 Marks	L5	CO5

(OR)

11.	a)	Explain the four main elements of time series data.	8 Marks	L1	CO5
	b)	Explain the role of data cleaning before building predictive models.	8 Marks	L1	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

BUSINESS INTELLIGENCE TOOLS

[Computer Science and Engineering (Data Science), Information Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is the primary purpose of Real-time Business Intelligence?	2 Marks	L2	CO1
	b)	Briefly explain the concept of Embedded Analytics.	2 Marks	L2	CO1
	c)	Briefly explain the concept of Business Activity Monitoring (BAM).	2 Marks	L2	CO2
	d)	What does CEP stand for in Operational Intelligence, and what is its main function?	2 Marks	L1	CO2
	e)	What is the primary purpose of the View Layer in data modeling?	2 Marks	L2	CO4
	f)	Differentiate between Fact Normalization and Denormalization.	2 Marks	L2	CO4
	g)	Name two open-source ETL suites.	2 Marks	L1	CO4
	h)	Briefly explain the 'Extract' phase of ETL.	2 Marks	L2	CO4
	i)	What is the significance of "Starting from Top Left" in dashboard design?	2 Marks	L2	CO5
	j)	What are PDI Command-Line Tools used for?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Elaborate on the importance of Data Visualization and Data Profiling as essential aspects of Business Intelligence.	8 Marks	L2	CO1
	b)	Discuss how Business Performance Management and Business Process Discovery are crucial for effective Business Intelligence.	8 Marks	L2	CO1

(OR)

3.	a)	Explain the concept of Context Analysis and its significance in understanding business problems for BI solutions.	8 Marks	L2	CO1
	b)	Compare and contrast Social Media Analytics and Behavior Analytics, highlighting their applications in BI.	8 Marks	L4	CO1

MODULE-II

4.	a)	Explain how Business Process Management (BPM) integrates with Operational Intelligence to optimize business operations.	8 Marks	L2	CO2
	b)	Discuss the steps involved in conducting effective Marketing Research and how the insights gained can be applied to different data sets.	8 Marks	L2	CO2

(OR)

5.	a)	Elaborate on the concept of Root Cause Analysis and its application in identifying and resolving operational issues.	8 Marks	L2	CO2
	b)	Compare and contrast Market Research and Operational Intelligence, highlighting their distinct objectives and areas of application.	8 Marks	L4	CO2

MODULE-III

6.	a)	Describe how Time Transformations and Fact Phases are handled in data modeling for BI solutions.	8 Marks	L2	CO4
	b)	Analyze the importance of "Real vs. Potential" and "Historical Hierarchies" in creating robust data models for BI.	8 Marks	L4	CO4

(OR)

7.	a)	Discuss the role of Agile Management Tools in facilitating the development and maintenance of BI projects.	8 Marks	L2	CO3
	b)	Explain how "Multiple Views Using a Table" and "Entity Isolation" can be implemented to optimize data models.	8 Marks	L3	CO4

MODULE-IV

8.	a)	Analyze the challenges associated with the ETL process and propose strategies to overcome them.	8 Marks	L4	CO4
	b)	Compare and contrast different approaches to ETL, such as batch processing versus real-time ETL.	8 Marks	L4	CO4

(OR)

9.	a)	Explain how the "Need of ETL Process" arises from the disparate nature of source systems and the requirements of BI reporting.	8 Marks	L2	CO4
	b)	Discuss the role of data governance and data quality checks within the ETL process.	8 Marks	L2	CO4

MODULE-V

10.	a)	Analyze the importance of "Security" and "Auditing" in maintaining a robust and compliant BI production environment.	8 Marks	L4	CO5
	b)	Compare and contrast any two BI Tools mentioned (e.g., Microsoft Power BI, Qlik Sense, Micro Strategy Desktop) based on their features and suitability for different reporting needs.	8 Marks	L4	CO5

(OR)

11.	a)	Discuss how "Formatting Recommendations" and effective "Graphic Usages" contribute to the clarity and impact of BI dashboards.	8 Marks	L2	CO5
	b)	Explain the process of "Scheduling Jobs in the Task Scheduler" for automated BI processes.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

DATA ANALYTICS

[Computer Science and Engineering (Data Science)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Write R code to import packages into our systems	2 Marks	L1	CO2
	b)	What is big data?	2 Marks	L1	CO3
	c)	Differentiate TYPE I and TYPE II error.	2 Marks	L1	CO2
	d)	What is the way to detect and identify anomalies in the data set	2 Marks	L1	CO2
	e)	List the applications of Time Series Analysis.	2 Marks	L2	CO3
	f)	What is time series data?	2 Marks	L1	CO3
	g)	What is the main role of Project Manager in data analytics life cycle?	2 Marks	L2	CO5
	h)	What are the three main project goals?	2 Marks	L1	CO5
	i)	List the types of tokens.	2 Marks	L1	CO3
	j)	What is text mining?	2 Marks	L2	CO3

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the differences between Business Intelligence and Data Science.	8 Marks	L2	CO1
	b)	Discuss the Data evolution and the rise of Big Data sources in Data Analytics.	8 Marks	L2	CO1

(OR)

3.	a)	Describe the challenges and Key Roles for a Successful Analytics Project Background.	8 Marks	L4	CO4
	b)	What kinds of tools would be used in the following phases, and for which kinds of use scenarios? Phase 2: Data preparation Phase 4: Model building.	8 Marks	L1	CO2

MODULE-II

4.	a)	Which R command(s) would use to remove null values from a dataset? Is it a better approach to remove null values from the data set every time? Explain with an example.	8 Marks	L2	CO2
	b)	What we observe while visualizing a single variable and multiple variables in data analytics phase. Explain with an example.	8 Marks	L2	CO2

(OR)

5.	a)	Explain in detail about how the Anscombe dataset may explain about the importance of visualization in the field of data analytics.	8 Marks	L3	CO2
	b)	List out differences between Exploratory Data Analysis and Statistical Methods for Evaluation for data Analysis in R programming.	8 Marks	L4	CO2

MODULE-III

6.	a)	What are the main challenges of text analysis and What is the definition of topic in topic models?	8 Marks	L2	CO3
	b)	When should an ARIMA (p, d, q) model in which d > 0 be considered instead of an ARMA (p, q) model?	8 Marks	L4	CO3

(OR)

7.	a)	Why use autocorrelation instead of autocovariance when examining stationary time series?	8 Marks	L2	CO3
	b)	Explain moving average model in time series with a neat sketch?	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain in detail about what are the additional tips we need to follow to achieve our goals.	8 Marks	L2	CO4
	b)	Explain Providing Technical Specifications and Code for authoring the final presentations.	8 Marks	L3	CO4

(OR)

9.	a)	What is the focus of a technical understanding than the sponsors, such as those who will implement the code on the analytics team?	8 Marks	L2	CO4
	b)	As part of operationalizing an analytics project, which phase would you expect to assess the benefits of the project work?	8 Marks	L4	CO5

MODULE-V

10.	a)	Illustrate the importance of tokenization in data analytics and explain its types.	8 Marks	L2	CO5
	b)	Compute the basic and structural properties of the network: diameter, centralization scores, cliques, clustering coefficient and modularity.	8 Marks	L3	CO5

(OR)

11.	a)	Explain in detail about how to perform conversion to structured data on different Data Types.	8 Marks	L3	CO5
	b)	Explain in detail about feature extraction with an example.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

MLOPS

[Information Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List any two benefits of MLOps.	2 Marks	L1	CO1
	b)	Define the term "ML model lifecycle."	2 Marks	L1	CO1
	c)	What is feature engineering?	2 Marks	L1	CO2
	d)	Mention the purpose of model tracking.	2 Marks	L1	CO2
	e)	Define version control in MLOps.	2 Marks	L1	CO3
	f)	What is the significance of Git in CI/CD?	2 Marks	L1	CO3
	g)	What is scalability in ML systems?	2 Marks	L1	CO4
	h)	Define model behavior monitoring.	2 Marks	L1	CO4
	i)	List any two cloud service providers for MLOps.	2 Marks	L1	CO5
	j)	What is meant by data privacy?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Illustrate the MLOps pipeline with an appropriate diagram.	8 Marks	L2	CO1
	b)	Discuss the benefits and drawbacks of implementing MLOps in ML projects.	8 Marks	L1	CO1

(OR)

3.	a)	Explain the ML lifecycle stages and identify MLOps tools used at each stage.	8 Marks	L1	CO1
	b)	What are the major barriers to adopting MLOps in organizations?	8 Marks	L1	CO1

MODULE-II

4.	a)	Describe techniques for model evaluation and validation.	8 Marks	L3	CO2
	b)	What is the significance of data governance in MLOps?	8 Marks	L1	CO2

(OR)

5.	a)	Explain the need for data validation and monitoring in MLOps pipelines.	8 Marks	L2	CO2
	b)	Describe model tracking and versioning with tools like MLflow or DVC.	8 Marks	L2	CO2

MODULE-III

6.	a)	Write in detail about reproducible ML pipelines and automated testing.	8 Marks	L2	CO3
	b)	Describe steps involved in deploying models as scalable services.	8 Marks	L2	CO3

(OR)

7.	a)	What are the benefits of CI/CD in ML workflows? Illustrate with a tool-based example.	8 Marks	L2	CO3
	b)	Explain the need and process of packaging ML models for deployment.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain the importance of monitoring model behavior in production systems.	8 Marks	L1	CO4
	b)	Write a detailed note on logging practices in ML systems.	8 Marks	L1	CO4

(OR)

9.	a)	What are key performance metrics tracked in production ML systems?	8 Marks	L2	CO4
	b)	Discuss best practices for performance tuning in deployed ML pipelines.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain how cloud resources are provisioned and managed for ML workloads.	8 Marks	L1	CO5
	b)	Describe common security risks in ML deployment and how they can be mitigated.	8 Marks	L2	CO5

(OR)

11.	a)	Compare cloud vs on-premises deployments for ML applications.	8 Marks	L1	CO5
	b)	Discuss the importance of compliance and governance in MLOps workflows.	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

CELLULAR AND MOBILE COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define co-channel interference.	2 Marks	L1	CO1
	b)	Write the formula for reuse distance (D) and explain the terms.	2 Marks	L1	CO1
	c)	What is the purpose of antenna sectoring?	2 Marks	L1	CO2
	d)	Write any two features of the Lee model for cell coverage prediction.	2 Marks	L1	CO2
	e)	What does SDCCH stand for?	2 Marks	L1	CO3
	f)	List any two GPRS interfaces.	2 Marks	L1	CO3
	g)	List any two 3G services.	2 Marks	L1	CO4
	h)	Expand UMTS.	2 Marks	L1	CO4
	i)	Name the two main parts of the Evolved Packet System (EPS).	2 Marks	L1	CO5
	j)	What is the role of the MME in LTE?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.		Analyze the characteristics used to specify the uniqueness of Mobile radio environment and brief about the model of transmission medium.	16 Marks	L3	CO1

(OR)

3.	a)	Justify how cell splitting will improve the utilization of spectrum efficiency.	8 Marks	L2	CO1
	b)	Derive the expression for co-channel interference reduction factor and discuss its significance.	8 Marks	L4	CO1

MODULE-II

4.	a)	Discuss antenna sectoring and cell splitting as interference reduction techniques.	8 Marks	L3	CO2
	b)	Explain the role of hysteresis and threshold levels in handoff management.	8 Marks	L2	CO2

(OR)

5.		With suitable diagrams, outline the working of fixed channel assignment and non-fixed channel assignment methods.	16 Marks	L2	CO2

MODULE-III

6.		Interpret the network elements introduced in GPRS and their integration with GSM.	16 Marks	L2	CO3

(OR)

7.	a)	Discuss the role of MSC, HLR, and VLR in GSM operation	8 Marks	L2	CO3
	b)	Examine the working of GPRS mobility management.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Compare FDD and TDD modes in WCDMA.	8 Marks	L2	CO4
	b)	Illustrate the Handover procedure in UMTS.	8 Marks	L2	CO4

(OR)

9.	a)	Explain the working of HSPA in improving 3G performance.	8 Marks	L3	CO4
	b)	Discuss the concept of Handoff in WCDMA.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain the WCDMA concept and its advantages over earlier multiple access techniques.	8 Marks	L2	CO5
	b)	Interpret how Multi service capacity in WCDMA systems is done to serve the customers.	8 Marks	L3	CO5

(OR)

11.	a)	Describe the air interface architecture and processingin WCDMA.	8 Marks	L2	CO5
	b)	Discuss how UMTS integrates with GSM andGPRS networks for global coverage.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

SCADA AND DCS

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	How are analog signals handled before being received by the RTU?	2 Marks	L1	CO1
	b)	What is the purpose of analog control instructions in SCADA systems?	2 Marks	L1	CO1
	c)	What is a data highway in industrial communication?	2 Marks	L1	CO2
	d)	Name any two common network topologies used in industrial control systems.	2 Marks	L1	CO2
	e)	What is a DCS configuration?	2 Marks	L1	CO3
	f)	Mention the function of Local Control Unit in DCS.	2 Marks	L1	CO3
	g)	Define supervisory control in a DCS system.	2 Marks	L1	CO3
	h)	What is production monitoring in process control?	2 Marks	L1	CO3
	i)	Name any two network requirements in industrial communication systems.	2 Marks	L1	CO4
	j)	Define the term 'field bus'.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the major functions of a SCADA system: data acquisition, data communication, and data presentation. Discuss how these functions work together to ensure efficient monitoring and control of industrial processes.	8 Marks	L2	CO1
	b)	Explain the applications of SCADA systems in industrial automation.	8 Marks	L2	CO1

(OR)

3.	a)	Explain the role of analog output in SCADA systems. How are analog signals used to control field devices such as valves, louvers, or machine speed controllers?	8 Marks	L2	CO1
	b)	Illustrate the process of how a discrete signal travels from a field device to the MTU in a SCADA system. Use the example of the high-level switch LSH-101 to explain each step	8 Marks	L3	CO1

MODULE-II

4.	a)	Describe equipment control displays in SCADA systems and explain how they enable operators to issue commands and control field devices.	8 Marks	L3	CO2
	b)	Explain the configuration of an I/O Server in a SCADA system.	8 Marks	L2	CO2

(OR)

5.	a)	What is a trend display? What is its significance in process control	8 Marks	L2	CO2

		environment			
	b)	Discuss the importance of Alarm and Event Summaries in SCADA systems	8 Marks	L2	CO2
		MODULE-III			
6.	a)	What is a data highway? Discuss the relative features of a data highway.	8 Marks	L2	CO2
	b)	Discuss the advantages of using fibre optics as a data highway	8 Marks	L2	CO2
		(OR)			
7.	a)	Discuss the role of a keyboard in a control console, highlighting how it is used for data entry, command execution, and interaction with the control system.	8 Marks	L3	CO2
	b)	List the advantages and features of using DCS for process control applications	8 Marks	L2	CO2
		MODULE-IV			
8.	a)	What is the man-machine interface? Why is it important for computer aided process control applications?	8 Marks	L3	CO3
	b)	Explain the concept of supervisory control and optimization in process industries?	8 Marks	L2	CO3
		(OR)			
9.		Explain how a Distributed Control System (DCS) integration with Programmable Logic Controllers and computers to achieve effective process control.	16 Marks	L3	CO3
		MODULE-V			
10.		What is the use of field buses in industrial process control system? What are different types of field buses? Discuss the advantages and disadvantages.	16 Marks	L2	CO4
		(OR)			
11.		Analyze the working principles of PROFIBUS and evaluate its suitability for different application areas. Compare its types and examine how its communication features support industrial automation requirements.	16 Marks	L2	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

AUTOMOTIVE INSTRUMENTATION

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is the principle of alternator?	2 Marks	L2	CO1
	b)	Define rotor and mention the types of rotor.	2 Marks	L1	CO1
	c)	Define axial starter motor and mention the purpose of using it in automobiles.	2 Marks	L1	CO2
	d)	Differentiate starter solenoid, starter switch and starter relay.	2 Marks	L1	CO2
	e)	Write full form of DTSI, DST-SI and DTS-FI and mention their significance.	2 Marks	L1	CO3
	f)	Compare single and twin spark technology.	2 Marks	L2	CO3
	g)	What is the usage of electronic stability control and also list out the different sensors used in ESC.	2 Marks	L1	CO4
	h)	What is the need of anti-lock brake system in automobiles.	2 Marks	L1	CO4
	i)	Explain positive temperature coefficient and negative temperature coefficient.	2 Marks	L2	CO5
	j)	Define piezo resistive effect.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the construction of alternator.	8 Marks	L4	CO1
	b)	Describe the generation of constant current with a neat sketch.	8 Marks	L2	CO1

(OR)

3.	a)	Analyze the working operation of three phase alternator with neat diagram.	8 Marks	L2	CO1
	b)	Explain the principle of operation of DC generator with neat sketch.	8 Marks	L2	CO1

MODULE-II

4.		Interpret the mechanism of starting system circuit and explain its operation.	16 Marks	L4	CO2

(OR)

5.		Elaborate Bendix Drive Starter Drive Mechanisms with a neat sketch.	16 Marks	L4	CO2

MODULE-III

6.	a)	Point out the advantages of electronic ignition systems.	8 Marks	L1	CO3
	b)	Explain Transistorized Ignition system with a neat sketch.	8 Marks	L2	CO3

(OR)

7.	a)	DTS-Si technology gives the highest possible fuel efficiency, Justify.	8 Marks	L2	CO3
	b)	What is i-DSI? What are its features?	8 Marks	L1	CO3

MODULE-IV

8.	a)	Describe traction control system with appropriate block diagram.	8 Marks	L2	CO4
	b)	Explain the principle of voice warning system.	8 Marks	L2	CO4

(OR)

9.	a)	Briefly explain crash protection devices in a car.	8 Marks	L2	CO4
	b)	Analyze the working of anti-lock brake system.	8 Marks	L4	CO4

MODULE-V

10.	a)	Draw a neat sketch of an electric horn and explain how it works.	8 Marks	L2	CO5
	b)	Select a gauge which can indicate the oil pressure in the engine and explain its operation in detail.	8 Marks	L2	CO5

(OR)

11.		Describe the types of speedometers used in automobile.	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

BIOMEDICAL INSTRUMENTATION

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	State the main structural components of a cell.	2 Marks	L1	CO1
	b)	What is resting potential?	2 Marks	L1	CO1
	c)	Draw the Einthoven triangle in ECG measurement?	2 Marks	L1	CO2
	d)	List any two instruments used to measure blood pressure.	2 Marks	L1	CO2
	e)	A patient on a ventilator has irregular pressure readings despite constant airflow settings. Which physiological or mechanical factor might be responsible?	2 Marks	L4	CO3
	f)	During a spirometry test, a subject's expiratory volume is lower than normal, but inspiratory volume is within range. What type of respiratory disorder could this indicate?	2 Marks	L3	CO3
	g)	During a surgical procedure, excessive heat from diathermy is damaging surrounding tissues. What adjustment or method can be suggested to minimize collateral damage?	2 Marks	L4	CO4
	h)	Define the need for a cardiac pacemaker.	2 Marks	L1	CO4
	i)	During echocardiography, a technician notices unclear valve motion. Which imaging mode (A, B, or M) should be used for clearer observation, and why?	2 Marks	L3	CO5
	j)	State the Doppler principle used in medical ultrasound.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Define the following i) Action potential ii) Resting potential iii) Propagation rate	6 Marks	L2	CO1
	b)	Discuss the problems encountered while measuring physiological parameters for a living system.	10 Marks	L2	CO1

(OR)

3.	List the various bio chemical electrodes and explain any one in detail.	16 Marks	L2	CO1

MODULE-II

4.	Sketch the cardio vascular circulation and explain each block in detail.	16Marks	L3	CO2

(OR)

5.		Analyze the importance of electromagnetic flow meters with neat sketches.	16Marks	L3	CO2

MODULE-III

6.	a)	Demonstrate central nervous system with a neat diagram and explain different parts of it and their activity.	8 Marks	L3	CO3
	b)	Identify suitable electrodes for EEG and explain each block of EEG recording setup.	8 Marks	L3	CO3

(OR)

7.	a)	Describe 10-20 electrode system used in EEG based on standard norms.	10 Marks	L3	CO3
	b)	Write a brief notes on Pneumatograph Ventilators.	6 Marks	L2	CO3

MODULE-IV

8.	a)	Differentiate internal and external Defibrillators.	8 Marks	L3	CO4
	b)	Compare Internal and external pacemakers.	8 Marks	L3	CO4

(OR)

9.		Analyze the procedure of Hemodialysis with a suitable block diagram.	16 Marks	L3	CO4

MODULE-V

10.		Show the block diagram of CT scan and explain different blocks in it in detail.	16 Marks	L2	CO5

(OR)

11.		Choose the relevant technique to identify nerve damage in biological system with a neat Structure and explain each block in detail.	16 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

EMBEDDED SYSTEMS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What does the ALU do in the MSP430 CPU?	2 Marks	L1	CO1
	b)	What is the role of the Program Counter (PC)?	2 Marks	L1	CO1
	c)	What is the difference between single-operand and dual-operand instructions?	2 Marks	L1	CO2
	d)	What is a jump instruction used for?	2 Marks	L1	CO2
	e)	What is the WDTCTL register used for?	2 Marks	L1	CO3
	f)	Why is a password required when writing to WDTCTL?	2 Marks	L1	CO3
	g)	What does USCI stand for?	2 Marks	L1	CO4
	h)	Name two modes supported by USCI_Ax.	2 Marks	L1	CO4
	i)	Define Design Technology.	2 Marks	L1	CO5
	j)	What are design trade-offs in embedded systems?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe memory-mapped I/O with an example using P1IN/P1OUT/P1DIR/P1SEL.	8 Marks	L2	CO1
	b)	Explain "exceptions" (interrupts, resets) and the purpose of the vector table.	8 Marks	L2	CO1

(OR)

3.	a)	Explain little- vs big-endian with a word example; relate to MSP430.	8 Marks	L2	CO1
	b)	Explain why instructions must lie at even addresses and how this affects fetching.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain how the constant generator helps reduce code size; show a small sequence.	8 Marks	L2	CO2
	b)	Explain orthogonality in MSP430 with an example mixing instructions and addressing modes.	8 Marks	L2	CO2

(OR)

5.	a)	Write the basic steps to read a switch and toggle an LED.	8 Marks	L2	CO2
	b)	Explain the role of subroutines/functions and show how SP/PC change on call/return.	8 Marks	L2	CO2

MODULE-III

6.	a)	Outline steps to generate a PWM using Timer_A compare units.	8 Marks	L3	CO3
	b)	Explain how RTC_A achieves a 1-second tick using RT0PS and RT1PS.	8 Marks	L3	CO3

(OR)

7.	a)	Describe the four Timer_A modes (up, continuous, up/down, stop) with simple use-cases.	8 Marks	L3	CO3
	b)	Explain how to measure input pulse width using Timer_A capture mode.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain how automatic baud-rate detection helps in LIN.	8 Marks	L3	CO4
	b)	Describe pulse shaping support for IrDA in USCI.	8 Marks	L3	CO4

(OR)

9.	a)	Describe a basic UART initialization and frame format (start/data/stop) conceptually.	8 Marks	L3	CO4
	b)	Compare SPI and I²C: wires used, addressing, and typical use-cases.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain a state-oriented model at concept level with a small illustrative case.	8 Marks	L3	CO5
	b)	Describe an activity-oriented model and when it is preferred.	8 Marks	L3	CO5

(OR)

11.	a)	Explain the distinction between a model and a language in system design with one simple example of each.	8 Marks	L3	CO5
	b)	Describe the five co-design model categories and the emphasis of each.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

IMAGE PROCESSING

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define image sampling.	2 Marks	L1	CO1
	b)	What is image quantization.	2 Marks	L1	CO1
	c)	What are intensity transformation functions.	2 Marks	L1	CO2
	d)	Define histogram.	2 Marks	L2	CO2
	e)	Define image degradation.	2 Marks	L1	CO3
	f)	What are the different noise models used in image restoration.	2 Marks	L1	CO3
	g)	Define image compression.	2 Marks	L1	CO4
	h)	What are redundancies in image compression.	2 Marks	L1	CO4
	i)	Define dilation in morphological image processing.	2 Marks	L1	CO5
	j)	What is erosion in image processing.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the fundamental steps in image processing.	8 Marks	L2	CO1
	b)	Describe image sampling and quantization with an example.	8 Marks	L3	CO1

(OR)

3.	a)	Explain the concept and properties of 2D-DFT.	8 Marks	L2	CO1
	b)	Derive the transformation equations for Walsh and Hadamard transforms.	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain the different intensity transformation functions used in spatial domain enhancement.	8 Marks	L2	CO2
	b)	Discuss the methods of histogram equalization and its application.	8 Marks	L3	CO2

(OR)

5.	a)	Describe the fundamentals of spatial filtering techniques.	8 Marks	L2	CO2
	b)	Discuss the difference between smoothing and sharpening spatial filters with examples.	8 Marks	L3	CO2

MODULE-III

6.	a)	Describe different noise models used in image restoration.	8 Marks	L2	CO3
	b)	Explain the process of image restoration using inverse filtering.	8 Marks	L3	CO3

(OR)

7.	a)	What is Weiner filtering? Derive the equation for its implementation.	8 Marks	L2	CO3
	b)	Discuss the concept and application of constrained least squares filtering in image restoration.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain the different image compression techniques.	8 Marks	L2	CO4
	b)	Discuss the principle and application of Huffman coding in image compression.	8 Marks	L3	CO4

(OR)

9.	a)	What is arithmetic coding? Explain its working and application in image compression.	8 Marks	L2	CO4
	b)	Discuss JPEG compression in detail.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain the process of dilation and its application in image processing.	8 Marks	L2	CO5
	b)	Describe the role of erosion in image enhancement.	8 Marks	L3	CO5

(OR)

11.	a)	What are opening and closing operations? How do they affect image morphology?	8 Marks	L2	CO5
	b)	Compare dilation and erosion in terms of their impact on image processing.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

ELECTRIC VEHICLES

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define hybrid electric vehicle.	2 Marks	L1	CO1
	b)	List two challenges in HEV development.	2 Marks	L2	CO1
	c)	What is the difference between isolated and non-isolated converters?	2 Marks	L2	CO2
	d)	Write two desirable characteristics of converters for inductive charging.	2 Marks	L2	CO2
	e)	What is meant by hybrid-excited PM motor?	2 Marks	L1	CO3
	f)	Define doubly salient PM motor.	2 Marks	L1	CO3
	g)	What is a fuel cell?	2 Marks	L1	CO4
	h)	Write one limitation of flywheel energy storage.	2 Marks	L2	CO4
	i)	What is a magnetic gear?	2 Marks	L1	CO5
	j)	Mention one application of MG-EVT systems.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.		With neat block diagram, explain the power flow control in series hybrid electric vehicles.	16 Marks	L2	CO1

(OR)

3.	a)	List out the environmental impacts of electric vehicles.	8 Marks	L1	CO1
	b)	With neat block diagram, discuss in detail the electric power components involved in electric vehicle.	8 Marks	L2	CO1

MODULE-II

4.		Describe in detail about the role of non-isolated bidirectional DC-DC converter in EVs.	16 Marks	L3	CO2

(OR)

5.		Explain in detail about the converters used in battery chargers and also identify their suitability.	16 Marks	L3	CO2

MODULE-III

6.		Discuss the construction and operation of flux reversal permanent magnet motor drives with neat diagrams and necessary equations.	16 Marks	L2	CO3

(OR)

7.		Describe the design criteria of outer-rotor hybrid-excited DSPM motor drives for EVs with relevant equations.	16 Marks	L3	CO3

MODULE-IV

8.	a)	With neat diagram explain the modeling of fuel cell.	8 Marks	L2	CO4
	b)	Give a short note on battery charging control.	8 Marks	L2	CO4
		(OR)			
9.		Explain in detail about different battery technologies.	16 Marks	L2	CO4

MODULE-V

10.	With a neat sketch, explain the types and working principle of magnetic gear machines with suitable pictorial representation and necessary equations.	16 Marks	L2	CO5
	(OR)			
11.	List the various types of multiport magnetic gear, explain it with EVT systems and mention its industrial applications.	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

SOLID STATE DRIVES

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define the fundamental torque equation of electrical drives and identify its main variables.	2 Marks	L1	CO1
	b)	State the advantages of electric drives compared with conventional mechanical drive systems.	2 Marks	L1	CO1
	c)	Define the speed-torque expression for a DC separately excited motor with full converter.	2 Marks	L1	CO2
	d)	State the effect of continuous conduction in single phase half bridge converter fed drives.	2 Marks	L2	CO2
	e)	Define the principle of one quadrant chopper control of DC separately excited motor.	2 Marks	L1	CO3
	f)	What are the operating modes of a two-quadrant chopper fed DC motor drive?	2 Marks	L1	CO3
	g)	Define the speed-torque characteristics of three phase induction motors under rated conditions.	2 Marks	L1	CO4
	h)	What is the impact of unbalanced supply voltages on induction motor drive operation?	2 Marks	L2	CO4
	i)	Define the principle of separate control of synchronous motors and its operational feature.	2 Marks	L1	CO5
	j)	What is the significance of self-control of synchronous motors in drive applications?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss in detail about the multi-quadrant operation of electric drives with a hoist load.	8 Marks	L1	CO1
	b)	"Regenerative braking is preferred for an electric vehicular application in comparison with dynamic braking". Justify the statement.	8 Marks	L4	CO1

(OR)

3.	a)	With a neat block diagram, discuss the functional operation of an electric drive system.	9 Marks	L1	CO1
	b)	Elucidate the principal operation of plugging used in four quadrant industrial drives.	7 Marks	L2	CO1

MODULE-II

4.	a)	Why does three phase half-controlled rectifier fed DC motor operate in first quadrant? Justify your answer with relevant expression and speed-torque characteristics.	8 Marks	L3	CO2
	b)	A 220 V, 960 rpm, 12.8 A separately excited DC motor has armature circuit resistance and inductance of 2 Ω and 150 mH. It is fed from single phase	8 Marks	L2	CO2

half-controlled rectifier with an AC source voltage of 230 V, 50 Hz. Determine the following parameters of single phase half-controlled rectifier for the following conditions:
Motor torque for α = 60° and speed = 600 rpm.
Motor torque for α = 60° and T = 20 N-m.

(OR)

5.	a)	With a neat sketch, elucidate the operation of a three-phase semi converter fed separately excited motor drive.	9 Marks	L1	CO2
	b)	Analyze the motor terminal voltage and current waveforms of three phase full converter fed separately excited DC motor under continuous conduction with speed-torque characteristics. Derive the equation of motor terminal voltage, which is connected to three phase full converter. Also Justify your suggestion for motoring and braking operation with relevant proof.	7 Marks	L4	CO2

MODULE-III

6.	a)	An industrial application demands four-quadrant operation. Suggest a suitable arrangement of chopper fed motor meeting the requirements. Justify your suggestion with relevant proof.	10 Marks	L4	CO3
	b)	List out the application of DC chopper drives.	6 Marks	L1	CO3

(OR)

7.	a)	A chopper used for ON and OFF control of a DC separately excited motor has supply voltage of 230V, TON = 10 ms, TOFF = 15ms. Neglecting armature inductance and assuming continuous conduction of motor current. Determine the average load current when the motor speed is 1500 rpm, has a voltage constant Kv = 0.5 V/rad/sec. The armature resistance is 2 Ω.	8 Marks	L2	CO3
	b)	With relevant circuit diagram and waveforms, explain the operation of two quadrant type-B chopper fed DC drives.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Discuss in detail, how does the speed of a 3-phase induction motor can be controlled by varying the frequency with the help of relevant expressions and circuit diagram?	8 Marks	L1	CO4
	b)	Why PWM inverter is the most suitable to control of AC drives rather than square wave inverter? Justify your answer with relevant proof.	8 Marks	L2	CO4

(OR)

9.	a)	A 3-phase, 4 pole, 50 Hz slip ring induction motor when fully loaded, run with a slip of 4%. Find the value of the resistance necessary in series per phase of the rotor to reduce the speed by 15 %. Assume that the resistance of the rotor per phase is 0.5 Ω.	7 Marks	L2	CO4
	b)	Discuss in detail about the static kramer drive improves the sustainability of slip ring induction motor. Justify your suggestions with relevant proof.	9 Marks	L3	CO4

MODULE-V

10.	a)	Why are driver circuits needed in stepper motors? Discuss the operation of the stepper motor driver circuit with a neat sketch.	8 Marks	L2	CO5
	b)	Compare constant margin angle and power factor control of synchronous motor and justify which is suitable for synchronous motor?	8 Marks	L2	CO5

(OR)

11.	a)	Discuss the operation of self-controlled synchronous motor with current source inverter.	9 Marks	L1	CO5
	b)	A 500 kW, 3-phase, 3.3 kV, 0.8 (lagging) power factor, 4 pole, star connected synchronous motor has the following parameters. Xs=15 Ω, Rs=0.5 Ω and rated field current is 10 A. Determine armature current and power factor at half the rated torque and field current	7 Marks	L2	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

IOT FOR ELECTRICAL SYSTEMS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define IoT. Explain its conceptual framework.	2 Marks	L1	CO1
	b)	List key milestones in the evolution of IoT.	2 Marks	L1	CO1
	c)	Define sensors and actuators with examples.	2 Marks	L1	CO2
	d)	List types of sensors commonly used in IoT.	2 Marks	L1	CO2
	e)	Define IPv6 and its importance for IoT.	2 Marks	L1	CO3
	f)	What is 6LoWPAN?	2 Marks	L1	CO3
	g)	Define IoT platform.	2 Marks	L1	CO4
	h)	What are the phases of IoT system design?	2 Marks	L1	CO4
	i)	What is smart home automation?	2 Marks	L1	CO5
	j)	List two energy management techniques in smart homes.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe the evolution of IoT and its impact on various industries.	8 Marks	L2	CO1
	b)	Explain the architecture of IoT with reference to device, network, and application layers.	8 Marks	L2	CO1

(OR)

3.	a)	Discuss the role and benefits of fog, edge, and cloud computing in IoT systems.	8 Marks	L2	CO1
	b)	Analyze the enabling technologies that make IoT possible.	8 Marks	L2	CO1

MODULE-II

4.	a)	Describe the functional blocks of an IoT ecosystem.	8 Marks	L2	CO2
	b)	Explain different types of sensors and their applications in IoT.	8 Marks	L2	CO2

(OR)

5.	a)	Discuss the differences between microcontrollers and microprocessors for IoT.	8 Marks	L2	CO2
	b)	Explain the working of Bluetooth and Zigbee communication modules in IoT.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the IPv6 protocol and why it is essential for IoT addressing.	8 Marks	L3	CO3
	b)	Discuss 6LoWPAN protocol and its adaptation for low-power wireless networks.	8 Marks	L3	CO3

(OR)

7.	a)	Describe MQTT protocol, including its publish-subscribe mechanism and QoS levels.	8 Marks	L3	CO3
	b)	Explain RFID technology, types of tags, and system components with examples.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain the phases of IoT system design and their significance.	8 Marks	L3	CO4
	b)	Discuss security challenges in IoT platforms and mitigation techniques.	8 Marks	L3	CO4

(OR)

9.	a)	Compare open source and proprietary IoT platforms with examples.	8 Marks	L3	CO4
	b)	Describe a layered architecture model for IoT platforms.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain the key features of smart home automation and its benefits.	8 Marks	L3	CO5
	b)	Discuss the role of smart grids in modern energy management.	8 Marks	L3	CO5

(OR)

11.	a)	Describe predictive maintenance and its impact on industrial IoT systems.	8 Marks	L3	CO5
	b)	Explain the use of wearable devices in smart healthcare applications.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

POWER QUALITY

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define power quality.	2 Marks	L1	CO1
	b)	Classify the difference between voltage sag and voltage swell.	2 Marks	L2	CO1
	c)	What is Harmonic Distortion?	2 Marks	L2	CO2
	d)	Identify the key sources of harmonics in electrical systems.	2 Marks	L1	CO2
	e)	Outline the importance of PQ monitoring in industrial systems	2 Marks	L2	CO3
	f)	List the examples of PQ measurement standards.	2 Marks	L1	CO3
	g)	List the examples of custom power devices for PQ improvement.	2 Marks	L2	CO4
	h)	Outline the role of passive filters in harmonic mitigation.	2 Marks	L2	CO4
	i)	Explain the PQ issues caused by integration of distributed generation.	2 Marks	L2	CO5
	j)	Define the islanding and its impact on PQ.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Classify the concept of power quality and group the various PQ problems.	8 Marks	L2	CO1
	b)	Compare Short-term and long-term variations with diagrams	8 Marks	L3	CO1

(OR)

3.	a)	Interpret the nature of impulsive and oscillatory transients.	8 Marks	L3	CO1
	b)	Analyze the impact of sustained interruptions and outages.	8 Marks	L3	CO1

MODULE-II

4.	a)	Outline the contrast voltage harmonics with current harmonics using waveforms.	8 Marks	L2	CO2
	b)	Compare the methods for evaluating harmonic distortion and key indices.	8 Marks	L3	CO2

(OR)

5.	a)	Illustrate the origin of harmonics from commercial and industrial sources.	8 Marks	L3	CO2
	b)	Analyze the strategies to control harmonic effects.	8 Marks	L3	CO2

MODULE-III

6.	a)	Demonstrate the criteria for choosing PQ monitoring points.	8 Marks	L3	CO3
	b)	Illustrate the operation of PQ measuring instruments with block diagrams.	8 Marks	L3	CO3

(OR)

7.	a)	List and explain the procedure for PQ benchmarking and data interpretation.	8 Marks	L4	CO3
	b)	Outline the global standards relevant to PQ monitoring.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain the role of a DVR for PQ improvement.	8 Marks	L4	CO4
	b)	Explain the difference between DSTATCOM and UPQC.	8 Marks	L3	CO4

(OR)

9.	a)	Explain the role of Solid State Breaker in PQ management.	8 Marks	L3	CO4
	b)	Analyze the load compensation process using UPQC.	8 Marks	L3	CO4

MODULE-V

10.	a)	Distinguish the PQ issues during integration of distributed generation.	8 Marks	L2	CO5
	b)	Analyze the islanding in DG systems and PQ consequences.	8 Marks	L3	CO5

(OR)

11.	a)	Formulate the fault clearing and voltage regulation challenges in DG.	8 Marks	L4	CO5
	b)	Interpret the influence of DG siting and sizing on PQ.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

NON-TRADITIONAL MACHINING PROCESSES

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	List any two considerations in selecting a non-traditional machining process.	2 Marks	L1	CO1
	b)	What are the limitations of Chemical Machining?	2 Marks	L2	CO1
	c)	Define Overcut in Electrochemical Machining (ECM).	2 Marks	L1	CO2
	d)	Write two applications of Electrochemical Honing.	2 Marks	L1	CO2
	e)	What is cavitation in Ultrasonic Machining?	2 Marks	L2	CO3
	f)	Mention two advantages of Water Jet Machining.	2 Marks	L2	CO3
	g)	Define Tool Wear in EDM.	2 Marks	L1	CO4
	h)	State any two advantages of Wire EDM over conventional EDM.	2 Marks	L3	CO4
	i)	Mention two applications of Electron Beam Machining.	2 Marks	L1	CO5
	j)	Differentiate between Plasma Arc Machining and Laser Beam Machining (any two points).	2 Marks	L4	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the classification of non-traditional machining processes with suitable examples	8 Marks	L2	CO1
	b)	Discuss the factors that influence the selection of a non-traditional machining process.	8 Marks	L4	CO1

(OR)

3.	a)	Explain the process steps involved in Chemical Machining with neat sketches	8 Marks	L2	CO1
	b)	Evaluate the applications and limitations of Chemical Machining in aerospace industries	8 Marks	L5	CO1

MODULE-II

4.	a)	Derive the material removal rate equation in Electrochemical Machining.	8 Marks	L3	CO2
	b)	Analyze the effect of surface roughness on performance of ECM.	8 Marks	L4	CO2

(OR)

5.	a)	Explain the principle and applications of Electrochemical deburring	8 Marks	L2	CO2
	b)	Propose how Electrochemical Honing improves accuracy compared to conventional honing	8 Marks	L6	CO2

MODULE-III

6.	a)	Describe the tool feed mechanisms used in Ultrasonic Machining.	8 Marks	L2	CO3
	b)	Analyze the economic considerations in Ultrasonic Machining.	8 Marks	L4	CO3
		(OR)			
7.	a)	Explain the working principle and process parameters of Abrasive Water Jet Machining.	8 Marks	L2	CO3
	b)	Compare Abrasive Jet Machining and Water Jet Machining based on performance and applications.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Explain the mechanics of material removal in EDM.	8 Marks	L2	CO4
	b)	Evaluate the influence of dielectric fluids on surface quality in EDM.	8 Marks	L5	CO4
		(OR)			
9.	a)	Describe the construction and working principle of Wire EDM with a neat diagram.	8 Marks	L2	CO4
	b)	Propose a case study for the application of Wire EDM in tool and die making.	8 Marks	L6	CO4

MODULE-V

10.	a)	Explain the working principle and thermal characteristics of Electron Beam Machining.	8 Marks	L2	CO5
	b)	Evaluate the advantages and limitations of EBM in micro-machining.	8 Marks	L5	CO5
		(OR)			
11.	a)	Describe the principle and process parameters of Laser Drilling.	8 Marks	L2	CO5
	b)	Compare Plasma Arc Machining and Laser Beam Machining in terms of accuracy and surface finish.	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

POWER PLANT ENGINEERING

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is a traveling grate stoker?	2 Marks	L1	CO1
	b)	State the purpose of spreader stokers.	2 Marks	L1	CO1
	c)	Define maximum demand.	2 Marks	L2	CO2
	d)	What is a spillway in a dam?	2 Marks	L2	CO2
	e)	List any two types of wind energy systems.	2 Marks	L2	CO4
	f)	Define connected load.	2 Marks	L2	CO4
	g)	Name any two types of nuclear reactors.	2 Marks	L2	CO3
	h)	What is meant by thermoelectric conversion?	2 Marks	L2	CO3
	i)	Define demand factor	2 Marks	L2	CO5
	j)	Define plant use factor.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss the principle and operation of traveling grate stokers with a neat sketch.	8 Marks	L2	CO1
	b)	Explain various ash handling systems used in thermal power plants.	8 Marks	L3	CO1

(OR)

3.	a)	Explain overfeed and underfeed stokers with diagrams.	8 Marks	L2	CO1
	b)	Describe different types of dust collectors used in thermal power plants.	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain the requirements and classification of gas turbine plants.	8 Marks	L2	CO2
	b)	Discuss the layout of a gas turbine power plant with auxiliaries.	8 Marks	L3	CO2

(OR)

5.	a)	Compare diesel and gas turbine power plants in terms of efficiency and applications.	8 Marks	L2	CO2
	b)	Describe constructional details of a gas turbine plant.	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain the working of a pressurized water reactor with a neat diagram.	8 Marks	L2	CO3
	b)	Discuss the hydrological cycle and its importance in hydroelectric power generation.	8 Marks	L3	CO3

(OR)

7.	a)	Explain surge tanks and draft tubes with neat diagrams.	8 Marks	L2	CO3
	b)	Describe the working of a boiling water reactor with a neat sketch.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain tidal and ocean energy conversion systems.	8 Marks	L2	CO4
	b)	Discuss geothermal energy conversion systems with diagrams.	8 Marks	L3	CO4
		(OR)			
9.	a)	Describe the working principle of thermoelectric and thermionic conversion systems.	8 Marks	L2	CO4
	b)	Explain photovoltaic power systems and their applications.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain load factor, diversity factor, and plant capacity factor with examples.	8 Marks	L2	CO5
	b)	Discuss the cost analysis of power plants with suitable examples.	8 Marks	L3	CO5
		(OR)			
11.	a)	Explain plant use factor and its significance.	8 Marks	L2	CO5
	b)	Discuss economic considerations in selecting power plants.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

HYBRID AND ELECTRIC VEHICLES

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What are the component of an EV?	2 Marks	L1	CO1
	b)	When Electrical vehicle was invented and by whom?	2 Marks	L1	CO1
	c)	What are the electric components in EV?	2 Marks	L1	CO2
	d)	What is meant by induction principle?	2 Marks	L1	CO2
	e)	What is the advantage of using EV technology?	2 Marks	L1	CO3
	f)	Give any 2 difference between EV and HEV.	2 Marks	L1	CO3
	g)	What are the various capacitors?	2 Marks	L1	CO4
	h)	Give any two difference in series and parallel motors used in EV.	2 Marks	L1	CO4
	i)	Define the term efficiency ratio	2 Marks	L1	CO5
	j)	What are the various implementation issues in EMS?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	Discuss in detail the Environmental Impact of the modern transportation system with few case studies.	16 Marks	L2	CO1

(OR)

3.	Discuss the History of Modern transportation system. How the Electrical Vehicles transformed the life of people in society?	16 Marks	L2	CO1

MODULE-II

4.	Explain the various configuration and control techniques of DC motor drives.	16 Marks	L2	CO2

(OR)

5.	Discuss the construction of permanent magnet motor with neat sketch.	16 Marks	L2	CO2

MODULE-III

6.	How matching of an Electrical Motor can be done with IC Engine. Discuss with required diagrams.	16 Marks	L2	CO3

(OR)

7.	What are the factors to be considered for selecting an Energy storage device. Discuss about any one energy storage device in detail.	16 Marks	L2	CO3

MODULE-IV

8.	Define the term specific Energy. With the neat sketch discuss the working of Lead acid Battery used in Electric Vehicles.	16 Marks	L2	CO4

(OR)

9.	Explain with neat sketch the working of Nickel based Battery used as energy storage device in Electrical Vehicles.	16 Marks	L2	CO4

MODULE-V

10.	What are the performance parameter taken in to consideration for an Energy management system. Discuss.	16 Marks	L2	CO5

(OR)

11.	Explain the classification of Energy management strategies. Discuss in detail.	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

INDUSTRIAL INTERNET OF THINGS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is IIoT?	2 Marks	L1	CO1
	b)	Mention any two enabling technologies of IoT.	2 Marks	L1	CO1
	c)	Define edge device.	2 Marks	L1	CO2
	d)	List two modern wireless communication technologies.	2 Marks	L1	CO2
	e)	Define smart manufacturing.	2 Marks	L1	CO3
	f)	Write two characteristics of Industry 4.0.	2 Marks	L1	CO3
	g)	Mention two components of IAM.	2 Marks	L1	CO4
	h)	Define M2M.	2 Marks	L1	CO4
	i)	State the purpose of gateways in IIoT.	2 Marks	L1	CO5
	j)	What is meant by service-oriented architecture?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain different layers in IoT architecture.	8 Marks	L2	CO1
	b)	Describe enabling technologies and applications of IoT.	8 Marks	L2	CO1

(OR)

3.	a)	Explain the functional and operational views of IIoT architecture.	8 Marks	L2	CO1
	b)	Describe the IIoT reference architecture with block diagrams.	8 Marks	L2	CO1

MODULE-II

4.	a)	Discuss the proximity network and its key features.	8 Marks	L2	CO2
	b)	Differentiate legacy and modern protocols with examples.	8 Marks	L3	CO2

(OR)

5.	a)	What is the role of access networks in industrial systems?	8 Marks	L2	CO2
	b)	Explain types and functions of IIoT gateways.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain smart factory and its role in Industry 4.0.	8 Marks	L2	CO3
	b)	Write a note on Siemens' Amberg Electronics Plant.	8 Marks	L2	CO3

(OR)

7.	a)	Discuss Industry 4.0 value chain and design principles.	8 Marks	L2	CO3
	b)	Explain the impact of smart manufacturing on traditional industries.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Compare M2M and IoT in terms of value chain.	8 Marks	L3	CO4
	b)	Describe security issues in PLCs and how to mitigate them.	8 Marks	L2	CO4

(OR)

9.	a)	Describe threats at network and system levels in manufacturing.	8 Marks	L2	CO4
	b)	Discuss the role of IAM in IIoT security.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain data representation and remote-control challenges in IoT.	8 Marks	L2	CO5
	b)	Discuss IMC-AESOP architecture in detail.	8 Marks	L2	CO5

(OR)

11.	a)	Describe cloud of things integration in industrial automation	8 Marks	L2	CO5
	b)	Explain how SOCRADES helps in automation using web technologies.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

GENERATIVE AI

[Computer Science and Engineering (Artificial Intelligence and Machine Learning)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Give one example each of an LLM developed by OpenAI and Google.	2 Marks	L1	CO1
	b)	What does LLaMA stand for in Meta's LLM?	2 Marks	L1	CO1
	c)	What is bidirectional token prediction?	2 Marks	L1	CO2
	d)	State one advantage of fine-tuning an LLM.	2 Marks	L2	CO2
	e)	What is conditional pre-training?	2 Marks	L1	CO3
	f)	State one advantage of reinforcement learning from human feedback.	2 Marks	L2	CO3
	g)	What is emotional attachment theory?	2 Marks	L1	CO4
	h)	Mention one benefit of human-chatbot relationships.	2 Marks	L1	CO4
	i)	Mention any two features of Microsoft Copilot.	2 Marks	L1	CO5
	j)	What is Google Bard primarily designed for?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Compare and contrast Google's Bard/LaMDA with Microsoft's Bing AI.	8 Marks	L2	CO1
	b)	Evaluate the role of Meta's LLaMA and Stanford's Alpaca in advancing LLM research.	8 Marks	L3	CO1

(OR)

3.	a)	Illustrate how LLMs handle natural language understanding and generation tasks.	8 Marks	L3	CO1
	b)	Discuss the societal and ethical implications of using LLMs.	8 Marks	L2	CO1

MODULE-II

4.	a)	Analyze the concept of emergent properties in LLMs with examples.	8 Marks	L3	CO2
	b)	Explain few-shot learning in LLMs and discuss its advantages over traditional training.	8 Marks	L2	CO2

(OR)

5.	a)	Evaluate the ethical concerns arising from encoding bias in LLMs.	8 Marks	L3	CO2
	b)	Discuss methods to detect and reduce sensitive information leakage from LLMs.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain how reinforcement learning from AI feedback differs from human feedback.	8 Marks	L2	CO3
	b)	Analyze the commercial risks associated with improper handling of user data in LLMs.	8 Marks	L3	CO3

(OR)

7.	a)	Discuss how inadvertent data leakage can occur in LLMs and suggest preventive measures.	8 Marks	L2	CO3
	b)	Evaluate the effectiveness of content filtering in preventing harmful outputs from LLMs.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Examine the ethical considerations in fostering human-chatbot relationships.	8 Marks	L2	CO4
	b)	Propose methods to ensure beneficial interactions between humans and chatbots.	8 Marks	L2	CO4

(OR)

9.	a)	Compare the social impact of human-human and human-chatbot interactions.	8 Marks	L2	CO4
	b)	Assess how chatbots can be designed to provide emotional support without causing overdependence.	8 Marks	L3	CO4

MODULE-V

10.	a)	Analyze the importance of reasoning and summarizing abilities in AI chatbots for academic purposes.	8 Marks	L3	CO5
	b)	Illustrate with examples how “truthiness” can affect the reliability of chatbot responses.	8 Marks	L3	CO5

(OR)

11.	a)	Evaluate the security and privacy concerns when interacting with AI chatbots.	8 Marks	L3	CO5
	b)	Explain how AI chatbots integrate natural language processing to simulate human-like conversations.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

STREAM DATA ANALYTICS

[Computer Science and Engineering (Artificial Intelligence and Machine Learning)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is latency in stream processing?	2 Marks	L1	CO1
	b)	Define architectural blueprint in stream processing.	2 Marks	L1	CO1
	c)	What are the basic building blocks of a stream processing architecture?	2 Marks	L1	CO2
	d)	What is meant by scalability in stream processing architecture?	2 Marks	L1	CO2
	e)	Differentiate between sliding window and tumbling window.	2 Marks	L2	CO3
	f)	What are communication techniques in stream data systems?	2 Marks	L2	CO3
	g)	Mention the purpose of sampling in stream data.	2 Marks	L2	CO4
	h)	Define dimensionality reduction.	2 Marks	L1	CO4
	i)	List any two key requirements for a patient monitoring application.	2 Marks	L1	CO5
	j)	What is the role of evaluation in stream analytics applications?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the architecture of a real-time stream processing system with a neat diagram.	8 Marks	L3	CO1
	b)	Describe the security challenges in stream data processing systems.	8 Marks	L4	CO1

(OR)

3.	a)	Discuss the importance of streaming analytics in real-world applications.	8 Marks	L2	CO1
	b)	Write in detail about different architectural building blocks of stream data systems.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the InfoSphere Streams architecture and its core components.	8 Marks	L2	CO2
	b)	Describe the services offered by InfoSphere Streams with suitable examples.	8 Marks	L3	CO2

(OR)

5.	a)	Explain any four non-functional requirements of stream applications in detail.	8 Marks	L2	CO2
	b)	Illustrate how InfoSphere Streams supports scalable and fault-tolerant stream Applications.	8 Marks	L5	CO2

MODULE-III

6.	a)	Explain the role of algorithms in streaming data analysis and handling constraints.	8 Marks	L2	CO3
	b)	Describe in detail sliding window and tumbling window methods with examples.	8 Marks	L3	CO3

(OR)

7.	a)	How do windowing strategies affect performance in stream analytics? Discuss with diagrams.	8 Marks	L5	CO3
	b)	Illustrate the workflow of a stream processing system applying summarization and filtering.	8 Marks	L5	CO3

MODULE-IV

8.	a)	Explain the process of data pre-processing and transformation in stream analytics.	8 Marks	L2	CO4
	b)	Discuss the use of descriptive statistics and sampling in streaming data analysis.	8 Marks	L4	CO4

(OR)

9.	a)	Explain quantization and dimensionality reduction techniques in stream analytics.	8 Marks	L3	CO4
	b)	How does dimensionality reduction improve real-time model performance?	8 Marks	L5	CO4

MODULE-V

10.	a)	Explain the design and architecture of an operations monitoring stream analytics application.	8 Marks	L4	CO5
	b)	Elaborate on the evaluation strategies used in real-time analytics applications.	8 Marks	L5	CO5

(OR)

11.	a)	Analyze the impact of stream analytics on decision-making in healthcare and manufacturing.	8 Marks	L4	CO5
	b)	Explain the stream analytics approach in semiconductor process control applications.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

DEEP LEARNING

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is the role of a softmax function in multiclass classification models?	2 Marks	L1	CO1
	b)	Define outlier in the context of machine learning.	2 Marks	L1	CO1
	c)	Define a "cliff" in a loss surface.	2 Marks	L2	CO2
	d)	What is the learning rate decay schedule?	2 Marks	L2	CO2
	e)	Give an example of a penalty term used in regularization.	2 Marks	L1	CO3
	f)	How does early stopping help prevent overfitting?	2 Marks	L2	CO3
	g)	What is the role of the “forget gate” in an LSTM?	2 Marks	L1	CO4
	h)	Define the vanishing gradient problem in the context of RNNs.	2 Marks	L2	CO4
	i)	What is the purpose of using pooling layers in a CNN?	2 Marks	L2	CO5
	j)	What is the primary innovation introduced in ResNet?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss the working principle of an autoencoder. How is it trained, and what is its purpose?	8 Marks	L3	CO1
	b)	Explain the need for non-linear activation functions in deep learning. Give examples and show how they affect the decision boundary.	8 Marks	L3	CO1

(OR)

3.	a)	Compare and contrast binary and multiclass classification neural network architectures. Provide diagrams and examples.	8 Marks	L3	CO1
	b)	Write a step-by-step explanation of how backpropagation is used in a deep autoencoder.	8 Marks	L3	CO1

MODULE-II

4.	a)	Discuss techniques for handling shared weights during backpropagation. Use convolutional neural networks (CNNs) as a reference.	8 Marks	L2	CO2
	b)	Discuss gradient-based strategies for optimization. Compare vanilla gradient descent, learning rate scheduling, and adaptive optimizers.	8 Marks	L2	CO2

(OR)

5.	a)	Explain momentum-based learning and how it helps neural networks escape local minima or flat regions.	8 Marks	L4	CO2
	b)	What is parameter-specific learning rate? Give examples of how it's used in algorithms like Adagrad, RMSProp, and Adam.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain how regularization terms are added to a loss function. Provide examples using both L1 and L2 penalties.	8 Marks	L2	CO3
	b)	Compare and contrast L1 and L2 regularization. Include their mathematical forms and impact on model parameters.	8 Marks	L4	CO3

(OR)

7.	a)	How can cross-validation help address generalization issues during model selection? Explain with a workflow diagram.	8 Marks	L3	CO3
	b)	Describe the types of regularization used in unsupervised models like PCA, k-means, and autoencoders.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Compare LSTM and GRU. Highlight structural differences, advantages, and typical use cases.	8 Marks	L3	CO4
	b)	Discuss the role of RNNs in automatic image captioning. How are CNNs and RNNs combined in such models?	8 Marks	L3	CO4

(OR)

9.	a)	Describe the gating mechanism in GRU and how it simplifies the LSTM cell while retaining performance.	8 Marks	L4	CO4
	b)	Describe the use of RNNs for sentence-level classification. How does it differ from word-level classification?	8 Marks	L5	CO4

MODULE-V

10.	a)	What is feature visualization in CNNs? Describe methods used to visualize features learned by a trained CNN.	8 Marks	L5	CO5
	b)	Describe how CNNs can be applied in content-based image retrieval (CBIR). Include a system overview.	8 Marks	L5	CO5

(OR)

11.	a)	Explain ResNet's skip connections. How do they help address the vanishing gradient problem in deep networks?	8 Marks	L3	CO5
	b)	Explain the role of data augmentation in CNN training. How does it improve generalization?	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

PATTERN RECOGNITION AND ANOMALY DETECTION

[Computer Science and Engineering,
Computer Science and Engineering (Artificial Intelligence and Machine Learning)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	State two applications of anomaly detection.	2 Marks	L1	CO1
	b)	What is meant by the confusion matrix?	2 Marks	L1	CO1
	c)	Write the formula for a Z-test.	2 Marks	L1	CO2
	d)	Define null hypothesis and alternative hypothesis.	2 Marks	L1	CO2
	e)	Write one application of kernel methods.	2 Marks	L1	CO3
	f)	Define Bayesian network.	2 Marks	L1	CO3
	g)	Name one clustering-based anomaly detection method.	2 Marks	L1	CO4
	h)	Define Local Outlier Factor (LOF).	2 Marks	L1	CO4
	i)	Define time-series anomaly detection.	2 Marks	L1	CO5
	j)	Name one challenge of anomaly detection in big data.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss the importance of evaluation metrics in anomaly detection. Explain accuracy, precision, recall, and F1-score with their formulas and highlight why F1-score is more suitable for imbalanced datasets.	8 Marks	L4	CO1
	b)	Explain the role of probability theory in pattern recognition. Illustrate the use of conditional probability and Bayes' theorem in classification tasks with a simple example.	8 Marks	L3	CO1

(OR)

3.	a)	Explain neat diagrams, explain ROC curve and Precision-Recall curve. Discuss how each is interpreted and why PR curve is more effective for anomaly detection with highly imbalanced data.	8 Marks	L3	CO1
	b)	Explain the challenges of applying anomaly detection in high-dimensional datasets. Explain issues like curse of dimensionality, noise, and sparsity with examples.	8 Marks	L3	CO1

MODULE-II

4.	a)	Define p-value. Explain its significance in hypothesis testing and describe how it is interpreted in practical scenarios.	8 Marks	L2	CO2
	b)	Compare Z-test and T-test in terms of assumptions, applications, and limitations. Provide examples for each.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the steps involved in performing a Z-test for comparing sample means. Include an example dataset for clarity.	8 Marks	L3	CO2
	b)	Consider a dataset with unknown anomalies. Explain how you would use statistical tests and regression models to detect and analyze these anomalies. Discuss the workflow, assumptions, and interpretation of results.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the architecture of a neural network. Discuss the role of layers, neurons, and activation functions in pattern recognition tasks.	8 Marks	L3	CO3
	b)	Explain the learning process of neural networks. Explain forward propagation, loss computation, and backpropagation with a simple example.	8 Marks	L3	CO3

(OR)

7.	a)	Write short notes on: i) Neural network use cases in image recognition ii) Kernel methods in pattern recognition iii) Graphical models for structured data	8 Marks	L2	CO3
	b)	Discuss sampling methods for pattern recognition. Explain the importance of random sampling, stratified sampling, and MCMC in real-world datasets.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Explain how nearest neighbor-based techniques detect anomalies. Include a step-by-step example and advantages over other methods.	8 Marks	L3	CO4
	b)	Discuss contextual anomaly detection in depth. How do temporal and spatial contexts affect detection accuracy?	8 Marks	L4	CO4

(OR)

9.	a)	Explain rule-based anomaly detection techniques. Discuss their advantages and why they may fail in dynamic environments.	8 Marks	L3	CO4
	b)	Discuss the IDS analysis strategy for anomaly detection. Include types of IDS and their respective anomaly detection approaches.	8 Marks	L4	CO4

MODULE-V

10.	a)	Explain the challenges of anomaly detection in big data environments, including data volume, velocity, and variety.	8 Marks	L3	CO5
	b)	Explain the architecture and application of autoencoders for anomaly detection in tabular and image data	8 Marks	L3	CO5

(OR)

11.	a)	Explain predictive maintenance using anomaly detection. Include an example of industrial equipment monitoring.	8 Marks	L3	CO5
	b)	Compare deep learning-based and traditional anomaly detection methods. Discuss advantages, limitations, and suitable applications.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

INTERNET OF THINGS

[Computer Science and Engineering,
Computer Science and Engineering (Artificial Intelligence and Machine Learning)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Note down the examples of communicating devices.	2 Marks	L1	CO1
	b)	Compose the equation for simple conceptual framework.	2 Marks	L1	CO1
	c)	What are the examples of sensors.	2 Marks	L1	CO2
	d)	Describe about HTTP.	2 Marks	L1	CO2
	e)	What is mean by RTOS.	2 Marks	L1	CO3
	f)	List out the features of Beagle Bone.	2 Marks	L1	CO3
	g)	What is device and component integration.	2 Marks	L1	CO4
	h)	Illustrate about smart lighting.	2 Marks	L1	CO4
	i)	List out the top ten vulnerabilities in IoT.	2 Marks	L1	CO5
	j)	What are the five functional components of security in IoT.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain IoT layered architecture with a neat diagram.	6 Marks	L2	CO1
	b)	Case Study: Smart City IoT implementation – traffic management and waste monitoring. Analyze challenges.	10 Marks	L4	CO1

(OR)

3.	a)	Design an IoT-based Hospital Monitoring System including sensors, gateway, and cloud.	10 Marks	L6	CO1
	b)	Compare IoT vs M2M communication with practical examples.	6 Marks	L2	CO1

MODULE-II

4.	a)	Explain sensor technology with a case study on Smart Agriculture.	8 Marks	L3	CO2
	b)	Describe RFID working and illustrate its role in supply chain management.	8 Marks	L2	CO2

(OR)

5.	a)	Analyze the differences between SMTP, FTP, and HTTP with examples.	6 Marks	L4	CO2
	b)	Design a network connectivity model for IoT devices in Smart Campus applications.	10 Marks	L6	CO2

MODULE-III

6.	a)	Case Study: Prototype an IoT system to monitor air quality and upload data to the cloud.	10 Marks	L6	CO3
	b)	Discuss the role of AWS IoT Core and Amazon Kinesis in IoT development.	6 Marks	L2	CO3

(OR)

7.	a)	Evaluate Arduino vs NodeMCU for IoT applications.	8 Marks	L5	CO3
	b)	Explain embedded platforms for IoT prototyping with examples.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss the functional and operational view specifications in IoT design methodology.	6 Marks	L2	CO4
	b)	Case Study: Evaluate the IoT design of a Smart Agriculture system (soil, irrigation, climate monitoring).	10 Marks	L5	CO4

(OR)

9.	a)	Analyze the design challenges in IoT-based Smart Home systems.	6 Marks	L4	CO4
	b)	Design a generic IoT application development process for Smart Environment monitoring.	10 Marks	L6	CO4

MODULE-V

10.	a)	Explain Hadoop MapReduce and its role in IoT batch data processing.	6 Marks	L2	CO5
	b)	Case Study: Security requirements in Smart Grid IoT systems.	10 Marks	L5	CO5

(OR)

11.	a)	List and explain 5 major IoT security threats	6 Marks	L2	CO5
	b)	Design a secure IoT communication protocol flow (identity management, encryption, authentication).	10 Marks	L6	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

INTERNET OF THINGS

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Write the equation for the IoT conceptual framework for enterprise processes.	2 Marks	L1	CO1
	b)	Draw the IoT architectural view.	2 Marks	L1	CO1
	c)	Why ADC is required.	2 Marks	L1	CO2
	d)	What is smart sensor.	2 Marks	L1	CO2
	e)	State simulator.	2 Marks	L1	CO3
	f)	What is Amazon EC2.	2 Marks	L1	CO3
	g)	Illustrate about home intrusion detection.	2 Marks	L1	CO3
	h)	Write the steps involved in purpose & requirements specification.	2 Marks	L1	CO3
	i)	Define threat analysis.	2 Marks	L1	CO5
	j)	How do you define message privacy.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Mention the communication protocols used for M2M local area networks.	8 Marks	L4	CO1
	b)	Briefly Explain about data enrichment.	8 Marks	L2	CO1
		(OR)			
3.	a)	Interpret Network Function Virtualization	8 Marks	L2	CO1
	b)	Compare any two communication technologies.	8 Marks	L4	CO1

MODULE-II

4.	a)	Describe on Internet connectivity.	8 Marks	L4	CO2
	b)	Illustrate the sensor technology in IoT.	8 Marks	L2	CO2
		(OR)			
5.	a)	State the difference between static and dynamic IP address.	8 Marks	L3	CO2
	b)	Memorize on Internet Protocols.	8 Marks	L1	CO2

MODULE-III

6.	a)	Demonstrate the features of mBed that distinguish it from Arduino.	8 Marks	L3	CO3
	b)	Outline the software components required for connecting sensors and actuators to the internet.	8 Marks	L2	CO3
		(OR)			
7.	a)	What is Amazon DynamoDB? Describe an application that can benefit from Amazon DynamoDB.	8 Marks	L4	CO3
	b)	Summarize the internet connectivity.	8 Marks	L2	CO3

MODULE-IV

8.	a)	State the purpose of information model?	8 Marks	L4	CO3
	b)	What are the objects and their uses at city parking spaces and gateways domain?	8 Marks	L2	CO3

(OR)

9.	a)	List the steps involved in IoT system design methodology and discuss.	8 Marks	L2	CO3
	b)	Describe an application that can benefit from Amazon DynamoDB.	8 Marks	L2	CO3

MODULE-V

10.	a)	What do you mean by trust?	8 Marks	L2	CO5
	b)	List the physical cum data link layer attacks in layered attack model.	8 Marks	L2	CO5

(OR)

11.	a)	Identity the need of non-Repudiation.	8 Marks	L2	CO5
	b)	Illustrate steps to authenticate two end points communicating the message.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

IOT SECURITY

[Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define IoT security requirements	2 Marks	L1	CO1
	b)	Define "Security in Enabling Technologies" in IoT.	2 Marks	L2	CO1
	c)	Define a cryptographic primitive.	2 Marks	L2	CO2
	d)	Write the difference between encryption and decryption.	2 Marks	L4	CO2
	e)	Define identity lifecycle in IoT IAM.	2 Marks	L2	CO3
	f)	Give two examples of authentication credentials in IoT.	2 Marks	L1	CO3
	g)	Define data dissemination in IoT.	2 Marks	L1	CO4
	h)	Define lightweight privacy protection scheme.	2 Marks	L2	CO4
	i)	Define cloud-enabled IoT.	2 Marks	L1	CO5
	j)	List two cloud service models suitable for IoT.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the security requirements in IoT architecture with examples.	8 Marks	L2	CO1
	b)	Discuss the role of enabling technologies in IoT security.	8 Marks	L4	CO1

(OR)

3.	a)	Describe different security concerns in IoT applications.	8 Marks	L1	CO1
	b)	Explain insufficient authentication/authorization in IoT with real-time examples.	8 Marks	L4	CO1

MODULE-II

4.	a)	Explain various cryptographic primitives used in IoT security.	8 Marks	L2	CO2
	b)	Compare symmetric and asymmetric encryption with examples relevant to IoT.	8 Marks	L4	CO2

(OR)

5.	a)	Describe the role of hashing in IoT security and data integrity.	8 Marks	L1	CO2
	b)	Explain digital signatures and their applications in IoT.	8 Marks	L4	CO2

MODULE-III

6.	a)	Explain the identity lifecycle in IoT IAM.	8 Marks	L2	CO3
	b)	Discuss different types of authentication credentials used in IoT.	8 Marks	L5	CO3

(OR)

7.	a)	Describe the architecture of IoT IAM infrastructure.	8 Marks	L5	CO3
	b)	Explain the publish/subscribe scheme and its role in authorization.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain concerns in data dissemination in IoT networks.	8 Marks	L2	CO4
	b)	Discuss lightweight and robust schemes for privacy protection in IoT.	8 Marks	L2	CO4
		(OR)			
9.	a)	Describe different trust models used in IoT.	8 Marks	L4	CO4
	b)	Explain the concept of "self-organizing Things" in IoT security.	8 Marks	L1	CO4

MODULE-V

10.	a)	Explain how cloud services support IoT applications.	8 Marks	L2	CO5
	b)	Discuss offerings related to IoT from cloud service providers.	8 Marks	L4	CO5
		(OR)			
11.	a)	Describe cloud IoT security controls with examples.	8 Marks	L5	CO5
	b)	Explain the enterprise IoT cloud security architecture.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

CLOUD SECURITY

[Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is meant by access control?	2 Marks	L1	CO1
	b)	What is meant by EDoS?	2 Marks	L1	CO1
	c)	Give any two examples of hypervisors.	2 Marks	L1	CO2
	d)	What is meant by snapshot in virtualization?	2 Marks	L2	CO2
	e)	What is cloud authorization?	2 Marks	L1	CO3
	f)	Define segregation of duties.	2 Marks	L4	CO3
	g)	What is anonymization?	2 Marks	L1	CO4
	h)	Name any one U.S. privacy law.	2 Marks	L1	CO4
	i)	What is internal policy compliance?	2 Marks	L1	CO5
	j)	What is Security-as-a-Service?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe the challenges in maintaining availability of Internet-facing resources.	8 Marks	L3	CO1
	b)	Explain any two availability mitigation techniques.	8 Marks	L2	CO1

(OR)

3.	a)	Explain the differences between network-level and application-level security in the cloud.	8 Marks	L2	CO1
	b)	Discuss how both levels work together to protect the infrastructure	8 Marks	L4	CO1

MODULE-II

4.	a)	Describe the architecture of VMware vCenter.	8 Marks	L3	CO2
	b)	Explain its role in virtualization management.	8 Marks	L3	CO2

(OR)

5.	a)	Explain virtual machine encryption	8 Marks	L2	CO2
	b)	Describe any two approaches used to implement it.	8 Marks	L2	CO2

MODULE-III

6.	a)	Describe the IAM challenges in cloud environments.	8 Marks	L3	CO3
	b)	Suggest solutions for overcoming these challenges.	8 Marks	L5	CO3

(OR)

7.	a)	What is patch management?	8 Marks	L3	CO3
	b)	Explain its importance in cloud security management.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain the phases of the data life cycle.	8 Marks	L3	CO4
	b)	Discuss the privacy challenges for any two phases.	8 Marks	L4	CO4
		(OR)			
9.	a)	Discuss the global nature of cloud services and its impact on enforcing privacy laws.	8 Marks	L2	CO4
	b)	Highlight the differences between U.S. and international privacy regulation	8 Marks	L3	CO4

MODULE-V

10.	a)	Define GRC and explain its components.	8 Marks	L2	CO5
	b)	Discuss their relevance to cloud computing.	8 Marks	L3	CO5
		(OR)			
11.	a)	Explain vulnerability management as a service.	8 Marks	L4	CO5
	b)	Describe how it supports audit and compliance.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

SYSTEM SECURITY

[Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is computer security?	2 Marks	L1	CO1
	b)	Define a security threat in computing.	2 Marks	L2	CO1
	c)	What is an operating system security model?	2 Marks	L2	CO2
	d)	Name two classic security models used in operating system security	2 Marks	L4	CO2
	e)	What is storage security, and why is it important?	2 Marks	L2	CO3
	f)	How has storage security evolved over time?	2 Marks	L1	CO3
	g)	What is Radio Frequency (RF) security in wireless networks?	2 Marks	L1	CO4
	h)	How can attackers exploit RF signals in a wireless network?	2 Marks	L2	CO4
	i)	What are the common vulnerabilities of email protocols?	2 Marks	L1	CO5
	j)	How does SPF (Sender Policy Framework) help in email security?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Define computer security and explain its key objectives.	8 Marks	L2	CO1
	b)	Discuss different types of security attacks with suitable examples.	8 Marks	L4	CO1

(OR)

3.	a)	Explain the difference between active and passive attacks in computer security.	8 Marks	L1	CO1
	b)	Describe various malware types and their impact on computer systems.	8 Marks	L4	CO1

MODULE-II

4.	a)	Explain different Operating System Security Models and their significance.	8 Marks	L2	CO2
	b)	Describe Classic Security Models and their role in system security.	8 Marks	L4	CO2

(OR)

5.	a)	What is a Reference Monitor? Discuss its importance in computer security.	8 Marks	L1	CO2
	b)	Explain the concept of Trustworthy Computing and its impact on OS security.	8 Marks	L4	CO2

MODULE-III

6.	a)	Explain the evolution of storage security and how it has changed over time.	8 Marks	L2	CO3
	b)	Describe modern storage security techniques and their significance in cybersecurity.	8 Marks	L5	CO3

(OR)

7.	a)	Discuss various risks associated with storage security and how they can be mitigated.	8 Marks	L5	CO3
	b)	What are the common threats to data storage, and how can they be prevented?	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain the fundamental principles of Radio Frequency (RF) Security and its significance in wireless communication.	8 Marks	L2	CO4
	b)	Discuss different types of RF attacks and their countermeasures.	8 Marks	L2	CO4

(OR)

9.	a)	How does signal interference affect wireless network security, and what techniques can mitigate it?	8 Marks	L4	CO4
	b)	Describe the concept of frequency hopping spread spectrum (FHSS) and its role in wireless security.	8 Marks	L1	CO4

MODULE-V

10.	a)	Discuss the impact of email spoofing and phishing and the security measures to mitigate them.	8 Marks	L2	CO5
	b)	Explain the role of SPF, DKIM, and DMARC in securing email communications.	8 Marks	L4	CO5

(OR)

11.	a)	Explain the vulnerabilities of SMTP, POP3, and IMAP and their countermeasures.	8 Marks	L5	CO5
	b)	What are the different types of email-based attacks, and how can they be prevented?	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VII Semester (MBU-22) Supplementary Examinations, March – 2026

CYBER FORENSICS AND INVESTIGATION

[Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What are Computer Forensics Systems?	2 Marks	L1	CO1
	b)	Mention any two vendors providing Computer Forensics Services.	2 Marks	L1	CO1
	c)	Briefly explain the concept of "Information Warfare Arsenal."	2 Marks	L1	CO2
	d)	Name two types of "Macro Threats" and how they impact a computer system.	2 Marks	L2	CO2
	e)	Differentiate between identity theft and identity fraud.	2 Marks	L2	CO3
	f)	How do hackers contribute to the theft of digital components?	2 Marks	L3	CO3
	g)	Explain the significance of the "Chain of Custody" in mobile forensics cases.	2 Marks	L2	CO4
	h)	Briefly describe two key challenges in performing forensic analysis on a modern smartphone.	2 Marks	L2	CO4
	i)	What is the purpose of a Computer Investigation Toolkit?	2 Marks	L2	CO5
	j)	How do you "store and archive" digital evidence?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Examine the process of evidence collection and data seizure. What are the key steps an investigator must follow to ensure the admissibility of digital evidence in court?	8 Marks	L3	CO1
	b)	Explain the concept of duplication and preservation of digital evidence. Why is it crucial to create a forensic duplicate (or 'image') of a suspect drive rather than working on the original?	8 Marks	L4	CO1

(OR)

3.	a)	Explain the principle of 'chain of custody' in digital forensics. What information must be documented at each stage of the evidence handling process?	8 Marks	L2	CO1
	b)	Differentiate between a logical and a physical acquisition of digital evidence. In which scenarios would you choose one over the other?	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the methodology for reconstructing past events from digital evidence. What steps are involved in creating a comprehensive timeline of activities?	8 Marks	L2	CO2
	b)	Discuss how log files from operating systems, applications, and networks are used to reconstruct a sequence of events. What are the limitations and potential issues with relying solely on log data?	8 Marks	L3	CO2

(OR)

5.	a)	Describe the process of file system and registry analysis for reconstructing user activities. How can artifacts like prefetch files, LNK files, and jump lists provide insights into a user's behavior?	8 Marks	L4	CO2
	b)	Analyze the challenges of time synchronization and time zone discrepancies in reconstructing events. How can a forensic investigator overcome these issues to create an accurate timeline?	8 Marks	L4	CO2

MODULE-III

6.	a)	Explain the concepts of identity theft and identity fraud. Describe the various forms of these crimes and the digital artifacts that can be used to trace the perpetrators.	8 Marks	L2	CO3
	b)	Analyze the role of organized crime and terrorism in the digital world. How do these groups use technology to facilitate their activities, and how does forensic analysis aid in their disruption?	8 Marks	L4	CO3

(OR)

7.	a)	Describe the legal avenues for prosecuting computer-related crimes. Discuss the role of different government agencies and the international cooperation required for such cases.	8 Marks	L3	CO3
	b)	Evaluate the challenges in attributing cyberattacks to specific individuals or organizations. How do methods like obfuscation and using proxy networks complicate the forensic process?	8 Marks	L5	CO3

MODULE-IV

8.	a)	Provide an introduction to mobile forensics. Explain the importance of mobile forensics and how it differs from traditional computer forensics. Discuss the primary goals of a mobile forensic investigation.	8 Marks	L2	CO4
	b)	Describe the forensic analysis process for an Android device. Detail the steps involved in data acquisition, from logical to physical, and explain the types of artifacts an investigator can recover.	8 Marks	L3	CO4

(OR)

9.	a)	Discuss a case study where computer forensics played a critical role in solving a crime. Detail the nature of the crime, the digital evidence recovered, and how it contributed to the case's resolution.	8 Marks	L5	CO4
	b)	Evaluate the ethical considerations faced by a forensic investigator during evidence collection and analysis. How can an investigator ensure they maintain objectivity and avoid privacy violations?	8 Marks	L5	CO4

MODULE-V

10.	a)	Describe the components of a comprehensive computer investigation toolkit. Discuss the essential hardware and software tools required for effective and forensically sound data acquisition.	8 Marks	L2	CO5
	b)	Elaborate on how an organization can prepare itself for a potential computer investigation. What policies, procedures, and infrastructure should be in place?	8 Marks	L3	CO5

(OR)

11.	a)	Discuss the detailed process of collecting digital data during an investigation. Differentiate between volatile and non-volatile data collection and explain the methods for each.	8 Marks	L4	CO5
	b)	Explain the best practices for storing and archiving digital evidence. Why is maintaining a strict chain of custody and using write-blockers essential in this phase?	8 Marks	L3	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech V Semester (MBU-22) Supplementary Examinations, March – 2026

POWER PLANT INSTRUMENTATION

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Which fuel is commonly used in a coal-based thermal power plant?	2 Marks	L1	CO1
	b)	Name the two main types of nuclear reactions used in nuclear power plants.	2 Marks	L1	CO1
	c)	Name two instruments used for water and steam pressure measurements.	2 Marks	L1	CO2
	d)	Name one device commonly used to measure water flow in a power plant.	2 Marks	L1	CO2
	e)	How does feed-forward control improve temperature regulation?	2 Marks	L1	CO3
	f)	Why is it important to control the temperature of superheated steam?	2 Marks	L1	CO3
	g)	Name one electrical parameter monitored in the turbo alternator system.	2 Marks	L1	CO4
	h)	What is the primary role of the rotor in a steam turbine?	2 Marks	L1	CO4
	i)	What is the primary goal of preventive maintenance?	2 Marks	L1	CO5
	j)	Why is grounding important for electrical safety in instruments?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	With the block diagram, explain the operation of nuclear power plant and also mention its important parameters to be monitored in each block.	8 Marks	L1	CO1
	b)	List conventional and non-conventional resources.	8 Marks	L4	CO1

(OR)

3.	a)	List various methods of power generation, explain any one method in detail.	8 Marks	L4	CO1
	b)	Provide an engineering solution for drum water level measurement in power plants and explain.	8 Marks	L4	CO1

MODULE-II

4.	a)	Justify how the differential pressure method is used for drum level measurement	8 Marks	L2	CO2
	b)	Design a measurement system setup to measure steam pressure and steam temperature.	8 Marks	L2	CO2

(OR)

5.	a)	Analyze the various methods of water flow measurement in	8 Marks	L2	CO2

		powerplants.			
	b)	Select an appropriate technique for the measurement of water an steam pressure in power plants.	8 Marks	L2	CO2

MODULE-III

6.	a)	Name different Principle parts of steam turbine and explain each in detail.	8 Marks	L4	CO3
	b)	Name and explain the different methods used for controlling superheated steam temperature.	8 Marks	L4	CO3
		(OR)			
7.	a)	Describe Cascade steam temperature control with neat sketch,	8 Marks	L2	CO3
	b)	Design a controller to control Fire side steam temperature and Steam pressure.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Emphasize the safety measures in controlling the turbine control system.	8 Marks	L3	CO4
	b)	Justify the need of safety and process control system in turbine control system	8 Marks	L2	CO4
		(OR)			
9.	a)	Classify steam turbines. Explain any two methods in detail.	8 Marks	L2	CO4
	b)	Explain about governing mode operation in detail	8 Marks	L2	CO4

MODULE-V

10.		Explain about explosion hazards and intrinsic safety in power plants..	16 Marks	L2	CO5
		(OR)			
11.	a)	What is the need of maintenance of measuring instruments in power plants?	8 Marks	L2	CO5
	b)	Explain about explosion hazards and intrinsic safety in power plants.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech V Semester (MBU-22) Supplementary Examinations, March – 2026

DIGITAL COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Name the two types of Quantization noise in Delta Modulation.	2 Marks	L1	CO1
	b)	Write an expression for signal to noise ratio in DM.	2 Marks	L1	CO1
	c)	List the types of line coding techniques.	2 Marks	L1	CO2
	d)	What is baseband shaping?	2 Marks	L1	CO2
	e)	What is optimum filter?	2 Marks	L1	CO2
	f)	Sketch the output of ASK transmitter for the binary input 110011.	2 Marks	L1	CO2
	g)	Write any two properties of Mutual information.	2 Marks	L1	CO3
	h)	What is conditional entropy?	2 Marks	L1	CO3
	i)	List the graphical approaches of convolutional codes.	2 Marks	L1	CO4
	j)	Differentiate linear block codes and convolution codes.	2 Marks	L2	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain different quantization techniques.	8 Marks	L2	CO1
	b)	Derive an expression for Signal to Quantization noise ratio in Pulse Code Modulation system.	8 Marks	L4	CO1

(OR)

3.	a)	Discuss the types of Quantization errors in delta modulation.	8 Marks	L2	CO1
	b)	Derive an expression for the effect thermal noise in Pulse Code Modulation	8 Marks	L4	CO1

MODULE-II

4.	a)	Explain Duobinary signaling with precoding.	8 Marks	L2	CO2
	b)	Explain the elements of Base band binary PAM system.	8 Marks	L2	CO2

(OR)

5.	a)	Define Inter Symbol Interference (ISI) and explain its causes in digital communication systems	8 Marks	L2	CO2
	b)	Explain the concept and importance of the eye pattern in evaluating the performance of a digital communication system.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the generation and reception of DPSK signals with neat sketches.	8 Marks	L2	CO2
	b)	Provide an example of an ASK modulated signal and explain how it can be demodulated.	8 Marks	L4	CO2

(OR)

7.	a)	With neat sketches explain the process of generating FSK signals.	8 Marks	L2	CO2
	b)	Derive an expression for error probability PSK system.	8 Marks	L4	CO2

MODULE-IV

8.	a)	What is redundancy in information theory? How does it relate to entropy and conditional entropy?	8 Marks	L4	CO3
	b)	A message source generates one of four messages randomly every microsecond. The probabilities of these messages are [0.4, 0.3, 0.2, 0.1]. Each emitted message is independent of the other messages in the sequence. Find the source entropy.	8 Marks	L4	CO3

(OR)

9.	a)	A discrete message source is generating the message sequence [X] = [A B C D E F G H] with probabilities [P]=[0.50, 0.15, 0.15, 0.08, 0.08, 0.02, 0.01, 0.01]. Find the Code words using Shanon-Fano coding.	8 Marks	L3	CO3
	b)	Explain the concept of channel capacity for continuous channels.	8 Marks	L2	CO3

MODULE-V

10.	a)	Find (7, 4) cyclic codeword generated in Systematic form when message data $D(1101)$, $D(0110)$ is applied to Cyclic Encoder with generator polynomial $g(x) = 1 + x + x^3$	8 Marks	L3	CO4
	b)	Explain time domain approach domain approach of convolutional codes with an example	8 Marks	L2	CO4

(OR)

11.	a)	Assess error detection and error correction capabilities of linear block codes.	8 Marks	L4	CO4
	b)	The generator polynomial of a (7, 4) cyclic Encoder is $g(x) = 1 + x^2$. Find the code words when the following inputs are applied i). 1011 ii). 1010	8 Marks	L3	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech V Semester (MBU-22) Supplementary Examinations, March – 2026

PROCESS CONTROL INSTRUMENTATION

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define the degrees of freedom of a process and write its significance.	2 Marks	L1	CO1
	b)	Define controlled variable?	2 Marks	L1	CO1
	c)	What is proportional band? Define narrow and wide proportional bands.	2 Marks	L1	CO2
	d)	Write about single speed-floating control action and its applications.	2 Marks	L1	CO2
	e)	What is controller tuning and why is it needed?	2 Marks	L1	CO2
	f)	Briefly explain the evaluation criteria of IAE, ISE and ITAE.	2 Marks	L1	CO2
	g)	What is Rangeability and Turndown of control valve?	2 Marks	L1	CO3
	h)	Write about cavitation and flashing in control valves.	2 Marks	L1	CO3
	i)	What is split range control? Where its used?	2 Marks	L1	CO4
	j)	What is multivariable control? List applications of multivariable control.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Evaluate the transfer function of two single tanks liquid level systems are connected in non interacting.	8 Marks	L2	CO1
	b)	Explain regulatory problem with an example.	8 Marks	L2	CO1

(OR)

3.	a)	Evaluate the transfer function of two single capacity systems are connected in interacting.	8 Marks	L2	CO1
	b)	Explain & list the process variables.	8 Marks	L2	CO1

MODULE-II

4.	a)	Compare proportional, integral and derivative controller.	8 Marks	L3	CO2
	b)	Draw the circuit diagram of an electronic proportional controller.	8 Marks	L2	CO2

(OR)

5.	a)	A proportional controller has an output changing linearly from 0 to 15psi when the deviation changes from -100 to 0 to 100 degrees. Calculate the controller sensitivity.	8 Marks	L2	CO2
	b)	Design an integral controller has an input range of 1 to 8 V and an output range of 0 to 12 V. If K_I = 12%/(%/min), find G_I , R, and C.	8 Marks	L3	CO2

MODULE-III

6.	a)	List the general approaches can use for tuning a controller.	8 Marks	L2	CO2
	b)	What is decay ratio? Explain the concept of quarter decay ratio criterion.	8 Marks	L2	CO2

(OR)

7.	a)	Write a short note on the following errors. i) IAE ii) ISE iii) ITAE	8 Marks	L2	CO2
	b)	Discuss process reaction method for control loop tuning.	8 Marks	L2	CO2

MODULE-IV

8.	a)	Explain the working principle of a spring actuator. With the help of a neat diagram, describe its construction, operation, and applications in process control systems.	8 Marks	L2	CO3
	b)	Write short notes on selection of control valves.	8 Marks	L2	CO3

(OR)

9.	a)	Explain the construction and working principle of sliding-stem control valves. Discuss their advantages, limitations, and typical industrial applications.	8 Marks	L2	CO3
	b)	Write short notes on rotating-shaft control valves	8 Marks	L2	CO3

MODULE-V

10.	a)	Discuss the rationale of a cascade control system and demonstrate why it provides better response than simple feedback.	8 Marks	L2	CO4
	b)	List and brief the applications of ratio control.	8 Marks	L2	CO4

(OR)

11.	a)	Discuss the rationale behind an override control system. Why is it very useful, and what situations is it called upon to control?	8 Marks	L2	CO4
	b)	With a neat diagram, explain the control scheme of constant-bottom product and reflux rate.	8 Marks	L2	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech V Semester (MBU-22) Supplementary Examinations, March – 2026

LINEAR AND DIGITAL IC APPLICATIONS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define CMRR	2 Marks	L1	CO1
	b)	Differentiate between monostable and astable operations of a 555 timer.	2 Marks	L1	CO1
	c)	List out different Analog to digital convertors and justify which A/D convertor is best in terms of speed.	2 Marks	L1	CO3
	d)	Draw the schematic of a second order High-pass filter and sketch the frequency response.	2 Marks	L1	CO2
	e)	Define the term Simulation	2 Marks	L2	CO4
	f)	Difference between data flow and structural modeling in Verilog HDL.	2 Marks	L1	CO4
	g)	What is an ALU?	2 Marks	L3	CO4
	h)	Draw the IC diagram of 74X138?	2 Marks	L3	CO4
	i)	Classify shift registers.	2 Marks	L2	CO4
	j)	What is State diagram and explain its importance.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	With a suitable circuit diagram, explain the operating principle of an instrumentation amplifier and derive its gain	8 Marks	L2	CO1
	b)	Illustrate the operation of log and antilog amplifier using Op-Amps with neat sketches.	8 Marks	L2	CO1

(OR)

3.	a)	Draw the block diagram of Astable operations using IC 555 and derive its time constant.	8 Marks	L1	CO1
	b)	Draw the internal diagram of a 555 timer IC and explain significance of each pin.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the second order low pass filter with a neat diagram. Derive its frequency response and plot the same	8 Marks	L2	CO2
	b)	Explain the working principles of R-2R ladder DAC.	8 Marks	L2	CO3

(OR)

5.	a)	Discuss about successive-approximation type ADC.	8 Marks	L1	CO3
	b)	Explain the first order band pass filter with a neat diagram. Derive its frequency response and plot the same	8 Marks	L3	CO2

MODULE-III

6.	a)	Describe the following relevant to gate level modeling with necessary syntax using .(i) Gate Delays (ii) Net types	8 Marks	L2	CO4
	b)	What are the data types available in Verilog HDL? Discuss them with necessary syntax and an example.	8 Marks	L2	CO4

(OR)

7.	a)	Describe the following relevant to behavioral modeling with necessary syntax for.(i) if-else Statement (ii) Case Statement	8 Marks	L1	CO4
	b)	Implement the gate-level description of D flip-flop circuit with relevant logic diagram and Verilog HDL source code	8 Marks	L3	CO4

MODULE-IV

8.	a)	Explain the function of 74x86 Exclusive-OR gates, 74x280 9-Bit Parity Generator Circuits.	8 Marks	L3	CO4
	b)	Design a 32X1 mux using 74X138 and 74X151 ICs.	8 Marks	L3	CO4

(OR)

9.	a)	Develop a source code of a 2-bit ALU module. Let the module inputs A and B be 2-bit wide. D is the 2-bit output. Ci is the carry input and Co is the carry output. F is the function select vector. If F = 1, D = A + B; If F = 2, D = A + B + Ci; If F = 3, D =A - B; If F = 4, D = A-B - Ci; If F = 5, D = A OR B; If F = 6, D = A AND B; If F = 7, D = A X OR B.	8 Marks	L3	CO4
	b)	Design a 16X1 Mux using 74X151 IC's and develop the source code.	8 Marks	L2	CO4

MODULE-V

10.	a)	Design a Johnson Counter and write a Verilog HDL code for it .	6 Marks	L3	CO4
	b)	Write a Verilog HDL program for the 4 bit universal shift register.	10 Marks	L3	CO4

(OR)

11.	a)	Design an IC74x169 up/down counter with state diagram and write verilog code for the same.	8 Marks	L3	CO4
	b)	Design a 3bit LFSR also develop a source code in Verilog HDL .	8 Marks	L3	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech V Semester (MBU-22) Supplementary Examinations, March – 2026

SPECIAL ELECTRICAL MACHINES

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Compare the advantages of stepper motors over DC motors.	2 Marks	L2	CO1
	b)	Define a step angle in a stepper motor.	2 Marks	L1	CO1
	c)	Differentiate between open-loop and closed-loop control in SRMs.	2 Marks	L2	CO2
	d)	List the methods of rotor position sensing in switched reluctance motors.	2 Marks	L1	CO2
	e)	Define the phasor diagram of a Synchronous Reluctance Motor.	2 Marks	L1	CO3
	f)	Name two advantages of Synchronous Reluctance Motors.	2 Marks	L1	CO3
	g)	List the factors involved in the analysis of magnetic circuits.	2 Marks	L1	CO4
	h)	List the torque-speed characteristics of a BLDC motor.	2 Marks	L1	CO4
	i)	Mention the methods of control for Linear Synchronous Motors.	2 Marks	L1	CO5
	j)	List two applications of a Linear Synchronous Motor.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Sketch the closed loop control circuit for a 2-phase hybrid stepper motor. Discuss the working of various blocks of this control circuit.	8 Marks	L2	CO1
	b)	With a neat diagram, explain the working principle of permanent magnet motor.	8 Marks	L2	CO1

(OR)

3.	a)	Justify the need of closed loop technique for the sustainable operation of stepper motor and explain it.	8 Marks	L3	CO1
	b)	A stepper motor has a step angle of 1.8 degree. Find: i) Resolution ii) Number of steps required for 50 revolutions iii) Shaft speed if the stepping frequency is 5000 pulse/sec.	8 Marks	L2	CO1

MODULE-II

4.	a)	With neat diagram, explain the converters technique related to (n+1) switching devices and (n+1) diodes, and C-dump for switched reluctance motor and also mention its merits and demerits.	8 Marks	L2	CO2
	b)	Mention the needs of rotor position sensing techniques associated in ensuring the sustainable operation of SRM and also explain it with neat diagrams.	8 Marks	L2	CO2

(OR)

5.	a)	With neat diagram, explain the concepts of microprocessor based control technique of switched reluctance motor and also mention the function of controllers.	8 Marks	L2	CO2

	b)	Design a suitable pole arc and rotor tooth arc for a four-phase SRM with eight stator poles and six rotor tooth by drawing the feasible zone for stator and rotor pole arcs.	8 Marks	L3	CO2

MODULE-III

6.	a)	With neat diagram and necessary equation, explain the phasor diagram of synchronous reluctance motor.	8 Marks	L2	CO3
	b)	With neat diagram, explain the construction of axial, radial and line start synchronous reluctance motor.	8 Marks	L2	CO3

(OR)

7.	a)	With neat diagram and necessary equation, explain the constant direct axis current control scheme for synchronous reluctance motor.	8 Marks	L2	CO3
	b)	A 3-phase, 4 pole, 50 Hz, 400 V, star connected synchronous reluctance motor has direct axis and quadrature axis synchronous reactance's of 8 ohm and 2 ohm respectively. For a load torque of 80 nm, find load angle, line current and power factor. Neglect armature resistance and mechanical losses.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Draw and discuss the torque-speed characteristics of PMSM and also mention its applications related to industrial and societal needs.	8 Marks	L2	CO4
	b)	Derive the torque equation of PMSM sine wave motor with practical windings	8 Marks	L2	CO4

(OR)

9.		With the help of neat diagram, explain the working technique involved with 120 degree magnet arc and 180 degree waveform for PMBLDC motor.	16 Marks	L2	CO4

MODULE-V

10.	a)	Derive the thrust equation of linear induction motor.	8 Marks	L2	CO5
	b)	With neat diagram and necessary equation, explain the technique associated with performance of linear induction motor by incorporating end and edge effects.	8 Marks	L2	CO5

(OR)

11.	a)	With neat diagram, explain the construction of LSM with permanent magnet with active reaction rail and also discuss the technique to reduce the damping.	8 Marks	L2	CO5
	b)	The frequency of applied voltage to a linear induction motor is 50 Hz. The pole pitch of the double sided primary is 10 cm. find the synchronous velocity.	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech V Semester (MBU-22) Supplementary Examinations, March – 2026

LINEAR CONTROL SYSTEMS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define closed loop system	2 Marks	L1	CO1
	b)	Define transfer function	2 Marks	L1	CO1
	c)	What is the importance of time constant in time response.	2 Marks	L1	CO2
	d)	How the system is classified based in the value of damping?	2 Marks	L2	CO2
	e)	Define steady state error.	2 Marks	L1	CO2
	f)	What are frequency domain specifications?	2 Marks	L1	CO3
	g)	What is the need for compensation in feedback control system?	2 Marks	L1	CO4
	h)	Draw the electrical lag compensator network.	2 Marks	L1	CO4
	i)	List the properties of State transition matrix	2 Marks	L1	CO5
	j)	What is the composite matrix to test controllability and observability?	2 Marks	L1	CO5

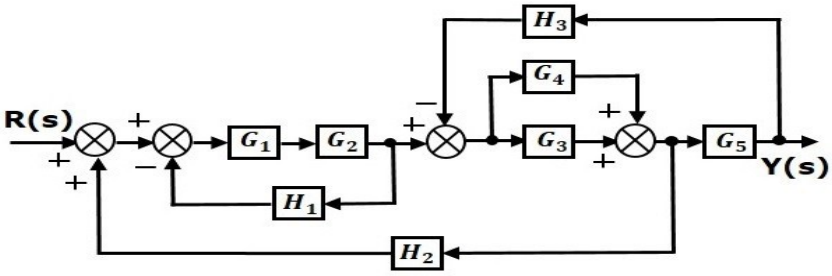
PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

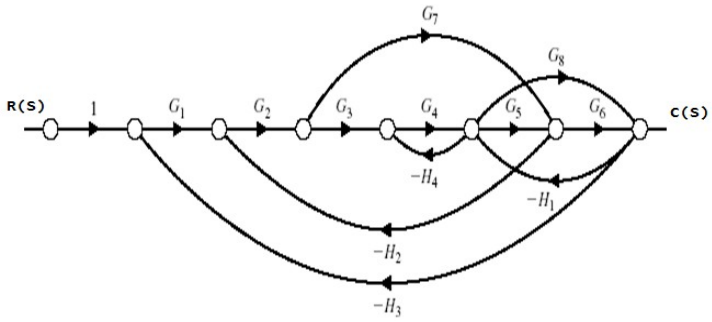
MODULE-I

2.	a)	Derive the transfer function of a field-controlled DC servomotor	8 Marks	L2	CO1
	b)	Find the transfer function for the given block diagram	8 Marks	L3	CO1

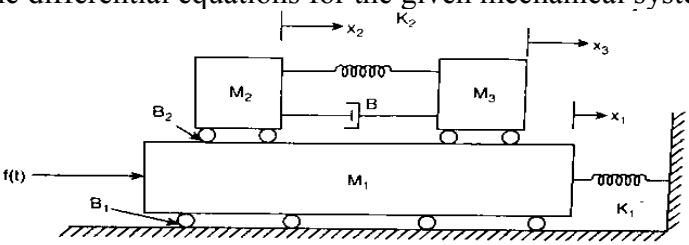


(OR)

3.	a)	Using Mason's gain formula find the transfer function of the given signal flow graph.	8 Marks	L3	CO1



b) Write the differential equations for the given mechanical system — 8 Marks — L3 — CO1



MODULE-II

4. a) Determine the undamped natural frequency and damping ratio of the system response $c(t) = 1 + 0.2e^{-60t} - 1.2e^{-10t}$ — 8 Marks — L3 — CO2

b) Determine the Rise time, peak time, Settling time and peak overshoot for ξ=0.5 w_n=6 rad/sec for a typical second order system — 8 Marks — L3 — CO2

(OR)

5. a) Derive the system response for a second order system with unit step input for an under damped case. — 8 Marks — L3 — CO2

b) Find the static error coefficients of the system forward path transfer function $G(s) = \frac{10}{s(0.1s + 1)}$ and find the steady-state error for step input. — 8 Marks — L3 — CO2

MODULE-III

6. a) Determine the stability of the system characterized by the polynomial $S^4+8S^3+18S^2+16S+5 = 0$ using Routh criterion. — 8 Marks — L2 — CO3

b) Explain various rules used to plot the root locus — 8 Marks — L3 — CO3

(OR)

7. a) Explain the stability in terms of the location of the poles with relevant characteristics. — 8 Marks — L2 — CO3

b) Sketch the root locus for a system whose open-loop transfer function — 8 Marks — L3 — CO3

MODULE-IV

8. a) Write the steps to design a lag compensator using bode plot in frequency domain. — 8 Marks — L2 — CO4

b) Realize the Lead and lag compensator with suitable electrical circuits. — 8 Marks — L2 — CO4

(OR)

9. a) Sketch the Bode plot and find GM and PM for the open loop transfer function $G(s) = \frac{2}{s(s + 1)(1 + 0.2s)}$ — 8 Marks — L3 — CO4

b) Discuss Nyquist stability criteria to determine stability. — 8 Marks — L2 — CO4

MODULE-V

10. a) Test the controllability and observability of the given state model — 8 Marks — L3 — CO5

$$x = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -1 & -5 & -1 \end{bmatrix} X + \begin{bmatrix} 0 \\ 5 \\ -24 \end{bmatrix} u; \quad y = \begin{bmatrix} 1 & 0 & 0 \end{bmatrix} x + [0]u,$$

b) Define controllability and observability. — 8 Marks — L3 — CO5

(OR)

11. a) Derive the state model for the Armature controlled DC servomotor. — 8 Marks — L3 — CO5

b) Derive the state model for a RLC series circuit, assume relevant parameters. — 8 Marks — L3 — CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech V Semester (MBU-22) Supplementary Examinations, March – 2026

DESIGN AND ESTIMATION OF ELECTRICAL SYSTEMS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define the term "current carrying capacity of a wire.	2 Marks	L1	CO1
	b)	List the basic components required for residential wiring system.	2 Marks	L1	CO1
	c)	Mention the advantages of bundled conductors in in overhead lines.	2 Marks	L2	CO2
	d)	List the various types of used insulators used in overhead lines.	2 Marks	L1	CO2
	e)	Write the role and significance of transformer used substations.	2 Marks	L2	CO3
	f)	Define the primary function of switchgear in a industrial electrical system.	2 Marks	L1	CO3
	g)	What does photometric analysis involve?	2 Marks	L1	CO4
	h)	Write the merits and demerits of street lighting.	2 Marks	L2	CO4
	i)	List the various types of electric heating methods.	2 Marks	L1	CO5
	j)	Mention the advantages and disadvantages for welding	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Compare and explain the Looping-in-system of wiring and cutout system of wiring.	8 Marks	L2	CO1
	b)	List out the different types of domestic wiring systems.	8 Marks	L1	CO1

(OR)

3.	Suggest suitable wiring system for the following and justify. i) Auditorium ii) Machine shop iii) Damp places iv) Workshop v) Engineering college Drawing Hall	16 Marks	L3	CO1

MODULE-II

4.	a)	Define the terms Feeder, Distributor and Service mains.	8 Marks	L1	CO2
	b)	Explain different characteristics of conductor materials used for transmission and distribution lines.	8 Marks	L1	CO2

(OR)

5.	A 1 km long 415 V, 3-ph, 50 Hz OH distribution line is to be erected along a straight route from 100 kVA, 11/0.433 kV pole mounting substation. The line is to be laid with 6/1 X 3.00 mm ACSR conductor on RCC poles of 9 m length. Furnish the list of material and estimate the cost of the line. The span between adjacent poles is 50 m. Also draw a rough sketch of the route.	16 Marks	L4	CO2

MODULE-III

6.	a)	Explain how the ratings of conductors, cables and fuse wires for wiring a motor installation are determined.	8 Marks	L2	CO3
	b)	One 10 HP, 440 V, 3-Ph, Induction Motor and One 5 HP, 440 V, 3-Ph, Induction motor are to be installed in a small workshop of size 7.5 m X 25 m. The motors are 10 m apart from each other. Prepare the estimate of materials and find out the cost of the installation work. Make necessary assumptions about material and labor costs.	8 Marks	L4	CO3

(OR)

7.	A new block of Flats having 5 floors in all, and three flats on each floor is supplied with a 415 V, 3-Ph, 4 – wire supply. A 240 V, 1-Ph supply is to be given to each flat through a 60 A capacity main switch installed in each flat. There are also 3, 3-Ph motors of ratings 2 kW, 2.5 kW and 4 kW. Describe the form of distribution you would install from the incoming supply to main switches controlling supplies to separate flats and to the motor. Draw relevant single line diagram.	16 Marks	L4	CO3

MODULE-IV

8.	a)	State and explain the laws of illumination.	8 Marks	L1	CO4
	b)	A 250 V lamp has a total flux of 3000 lumens and takes a current of 0.8A. Calculate i) Lumens per watt ii) MSCP per watt	8 Marks	L2	CO4

(OR)

9.	a)	With neat diagram, explain about sodium vapor lamp and high pressure mercury vapor lamp.	8 Marks	L1	CO4
	b)	Design the lighting scheme for the engineering workshop producing machine parts in which the work is done at a height of 1 m above the floor level and dimensions of the hall are 24 X 10 m. The trusses are at a height of 5 m from floor level and at a spacing of 3 m.	8 Marks	L4	CO4

MODULE-V

10.	a)	State and explain the principle of induction heating.	8 Marks	L1	CO5
	b)	Suggest and explain suitable welding technique to join two metal pieces with desired angle.	8 Marks	L3	CO5

(OR)

11.	a)	Discuss different methods of induction heating. Give some applications of induction heating.	8 Marks	L2	CO5
	b)	A small piece of plywood having dimensions, length 5 cm, width 2 cm and thickness 1 cm is placed in between two electrodes having dimensions, length 25 cm, width 2 cm and with 2 cm distance between them. Electric current at frequency of 10 MHz is passed through electrodes for heating of wood by the process of dielectric heating. If the power consumption for heating the piece of wood is 1 kW, determine Voltage applied across the electrodes, and Current through the plywood piece. Assume that the plywood is an imperfect dielectric and has relative permittivity 5 and p.f. 0.04.	8 Marks	L4	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech V Semester (MBU-22) Supplementary Examinations, March – 2026

WEB TECHNOLOGIES

[Computer Science and Engineering, Computer Science and Engineering (Data Science), Computer Science and Engineering (Cyber Security), Information Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	How can you add an image and alternative text for an image using HTML?	2 Marks	L1	CO1
	b)	Explain the <input> element in HTML with an example.	2 Marks	L2	CO1
	c)	What are the types of positioning?	2 Marks	L1	CO2
	d)	What is the purpose of using classes and IDs in CSS?	2 Marks	L1	CO2
	e)	What is meant by a responsive layout in Bootstrap?	2 Marks	L1	CO3
	f)	Give an example for creating Bootstrap button group.	2 Marks	L2	CO3
	g)	What is the difference between a string and an array in PHP?	2 Marks	L1	CO4
	h)	How do you define a constant in PHP, and how is it different from a variable?	2 Marks	L1	CO4
	i)	What is the purpose of the $_POST and $_GET superglobals in PHP?	2 Marks	L1	CO5
	j)	Explain how cookies are set and retrieved in PHP.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss the usage of Table in HTML. How to create them with and without borders?	8 Marks	L2	CO1
	b)	Describe how <frameset> element is used in HTML with a suitable example.	8 Marks	L2	CO1

(OR)

3.	a)	Elaborate the features of HTML5 and explain the structure of a HTML5 Document	8 Marks	L2	CO2
	b)	How are data attributes used? Discuss about custom data attributes.	8 Marks	L3	CO1

MODULE-II

4.	a)	Describe various types of Cascading Style Sheets available for a web programmer with an example.	8 Marks	L2	CO3
	b)	Differentiate between ID selector and Class selector in jQuery.	8 Marks	L2	CO5

(OR)

5.	a)	Compare and Contrast AJAX Web Application Model and Classical Web Application Model.	8 Marks	L2	CO2
	b)	Describe how mouse events are handled in JavaScript.	8 Marks	L2	CO5

MODULE-III

6.		Create contact us page using bootstrap responsive classes.	16 Marks	L3	CO3
		(OR)			
7.	a)	Develop Contact Us Web page using the grid system in bootstrap.	8 Marks	L5	CO6
	b)	Develop a predefined alert messages web page using bootstrap.	8 Marks	L5	CO3

MODULE-IV

8.	a)	Describe various ways of creating Arrays in PHP.	8 Marks	L2	CO4
	b)	Discuss how to Embed PHP code in a web page.	8 Marks	L3	CO5
		(OR)			
9.	a)	Classify data types of PHP.	8 Marks	L2	CO4
	b)	Discuss various OOP principles in PHP.	8 Marks	L2	CO5

MODULE-V

10.	a)	Develop a PHP code to store database connection into a separate file. Explain its usage.	8 Marks	L3	CO5
	b)	Develop a PHP code to create and delete session variables.	8 Marks	L3	CO5
		(OR)			
11.	a)	Explain how to interact with the database in PHP using MySQL.	8 Marks	L2	CO6
	b)	Develop a web page to store employee information including Name, ID, Department, Salary and Address in MySQL database.	8 Marks	L5	CO6

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech V Semester (MBU-22) Supplementary Examinations, March – 2026

APPLIED THERMODYNAMICS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define water tube boiler.	2 Marks	L1	CO1
	b)	What is the function of fusible plug?	2 Marks	L1	CO1
	c)	Write two functions of steam nozzles.	2 Marks	L1	CO2
	d)	Define condenser efficiency.	2 Marks	L1	CO2
	e)	What is a De-Laval turbine?	2 Marks	L1	CO3
	f)	What is the degree of reaction for Parsons turbine?	2 Marks	L1	CO3
	g)	Define refrigerating effect.	2 Marks	L1	CO4
	h)	Define coefficient of performance (COP) of a refrigerator.	2 Marks	L1	CO4
	i)	Define wet bulb temperature (WBT).	2 Marks	L1	CO5
	j)	How is enthalpy represented in a psychrometric chart?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	What is the purpose of Boiler mountings and accessories List the various mountings and accessories with their functions.	8 Marks	L2	CO1
	b)	Classify draught systems. Differentiate between natural draught and artificial draught.	8 Marks	L2	CO1

(OR)

3.	a)	Derive the expression for the height of chimney required to produce a given draught and discharge.	8 Marks	L3	CO1
	b)	A boiler generates 10,000 kg of steam per hour at 10 bar pressure from feedwater at 30°C. The dryness fraction of steam is 0.95. The calorific value of coal is 32,000 kJ/kg. Coal consumption is 1250 kg/hr. Calculate: i) Equivalent evaporation ii) Boiler efficiency	8 Marks	L3	CO1

MODULE-II

4.	a)	Discuss the phenomenon of meta stable flow of steam through a nozzle. What is the significance of Wilson's line in it?	8 Marks	L2	CO2
	b)	Dry air at a temperature of 27° C and pressure of 20 bar enters a nozzle and leaves at a pressure of 4 bar. Find the mass of air discharged; if the area of the nozzle is 200 mm^2.	8 Marks	L3	CO2

(OR)

5.	a)	List the various jet condenser and explain the working of parallel flow jet condenser.	8 Marks	L2	CO2
	b)	In a surface condenser, the vacuum maintained is 700 mm of Hg. The barometer reads 754 mm. If the temperature of condensate is 18°C, determine: i. mass of air per kg of steam , and ii. vacuum efficiency.	8 Marks	L3	CO2

MODULE-III

6.	a)	Distinguish Impulse and Reaction Turbine.	8 Marks	L2	CO3
	b)	Explain the methods of compounding of steam turbines with neat sketch.	8 Marks	L2	CO3

(OR)

7.		Steam enters an impulse wheel having a nozzle angle 200 at a velocity of 450m/sec. The exit angle of moving blade is 200 and the relative velocity of steam may be assumed to remain constant over the moving blades. If the blade speed is 180m/sec; Calculate i) Blade angle at inlet, ii) Work done per kg of steam, iii) Power developed if rate of steam flow is 1.6 kg/sec.	16 Marks	L3	CO3

MODULE-IV

8.	a)	Explain the working of Simple air refrigeration system with a neat sketch	8 Marks	L2	CO4
	b)	Explain the working of a Reversed Carnot cycle of refrigeration with P-V and T-S Diagrams.	8 Marks	L2	CO4

(OR)

9.		A refrigerator working on Bell-Coleman cycle operates between pressure limits of 1.05 bar and 8.5 bar. Air is drawn from the cold chamber at 10°C, compressed and then it is cooled to 30°C before entering the expansion cylinder. The expansion and compression follow the law $PV^{1.3}= C$. Determine the theoretical COP of the system. Draw the suitable diagrams to represent the processes.	16 Marks	L3	CO4

MODULE-V

10.		Draw a psychometric Chart and represent the various psychometric processes in a skeleton psychometric chart and explain them in detail.	16 Marks	L2	CO5

(OR)

11.		In a laboratory test a psychometer recorded 34°C DBT and 28°C WBT calculate the following terms. i) vapour pressure, ii) relative humidity, iii) specific humidity, iv) degree of saturation, v) dew point temperature, vi) enthalpy of the mixture.	16 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech V Semester (MBU-22) Supplementary Examinations, March – 2026

ENGINEERING METALLURGY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is the purpose of a Cupola Furnace?	2 Marks	L2	CO1
	b)	Mention one advantage of Electric Arc Furnace.	2 Marks	L1	CO1
	c)	What is pearlitic transformation?	2 Marks	L2	CO2
	d)	What is austenite?	2 Marks	L1	CO2
	e)	What is a slip system?	2 Marks	L3	CO3
	f)	Mention one type of deformation by twinning.	2 Marks	L1	CO3
	g)	What is hardness testing?	2 Marks	L2	CO4
	h)	Define TEM.	2 Marks	L3	CO4
	i)	Name one method of producing metal powders.	2 Marks	L2	CO5
	j)	What is cold isostatic pressing (CIP)?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Discuss the Bessemer Converter Process in detail with its advantages and limitations.	16 Marks	L2	CO1

(OR)

3.	Explain the thermodynamic principles behind the melting of metals in a Cupola Furnace.	16 Marks	L1	CO1

MODULE-II

4.	Explain the process of solidification of metal in an ingot mould with a neat diagram.	16 Marks	L2	CO2

(OR)

5.	Explain the stages of precipitation and age hardening process with suitable examples.	16 Marks	L1	CO2

MODULE-III

6.	Describe the characteristics and types of dislocations in detail.	16 Marks	L2	CO3

(OR)

7.	Describe the recovery process in metals after plastic deformation.	16 Marks	L4	CO3

MODULE-IV

8.	Describe different hardness testing methods (Brinell and Vickers) with applications.	16 Marks	L2	CO4

(OR)

9.	Explain the working and applications of Transmission Electron Microscope (TEM).	16 Marks	L2	CO4

MODULE-V

10.	Discuss mechanical alloying, process steps, and its applications.	16 Marks	L1	CO5
	(OR)			
11.	List and explain applications of powder metallurgy in engineering fields.	16 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech V Semester (MBU-22) Supplementary Examinations, March – 2026

ENGINEERING METROLOGY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is calibration of slip gauges?	2 Marks	L1	CO1
	b)	Compare limitations of line standards and end standards in linear measurement.	2 Marks	L2	CO1
	c)	Differentiate between plug and ring gauges.	2 Marks	L2	CO2
	d)	Sketch any one comparator.	2 Marks	L2	CO2
	e)	Sketch the working principle of an auto-collimator in measuring flatness.	2 Marks	L2	CO3
	f)	What are surface plates in flatness measurement.	2 Marks	L1	CO3
	g)	Sketch the 2-wire method for measuring the effective diameter of a screw thread.	2 Marks	L2	CO4
	h)	Compare the 2-wire method and the 3-wire method for measuring thread pitch.	2 Marks	L2	CO4
	i)	Compare the methods for measuring compressive and tensile strains using strain gauges.	2 Marks	L2	CO5
	j)	Sketch how thermocouples measure temperature.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Compare and contrast between any two types of fits with suitable examples.	8 Marks	L2	CO1
	b)	Discuss the effect of temperature on the application of limits.	8 Marks	L2	CO1

(OR)

3.		Define the following Accuracy Precision Readability Reproducibility Calibration vi) Range vii) standard viii) Sensitivity	16 Marks	L1	CO1

MODULE-II

4.	a)	With the help of neat sketches, explain how a sine bar is used to determine the taper angle of an inclined surface?	8 Marks	L2	CO2
	b)	Describe mechanical comparator with a neat sketch and Discuss its magnification.	8 Marks	L2	CO2

(OR)

5.	a)	Classify the comparators and discuss about the optical comparator with necessary diagram.	8 Marks	L2	CO2
	b)	Discuss a method to measure the angle and diameters of a taper ring gauge with a neat sketch.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the role of flatness measurement in various industries. How does ensuring flatness impact the quality and performance of components and products?	8 Marks	L2	CO3
	b)	Explain how autocollimators use optical principles to measure small angular displacements with high precision?	8 Marks	L2	CO3

(OR)

7.	a)	Explain calibration, maintenance and potential errors involved in usage of optical flats.	8 Marks	L2	CO3
	b)	Describe two different methods of testing flatness of a surface, stating advantages and limitations of each.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Differentiate between two- wire and three- wire methods of measuring screw threads.	8 Marks	L2	CO4
	b)	Name the various types of pitch errors found in screw. State their causes.	8 Marks	L2	CO4

(OR)

9.	a)	Discuss the methods employed for gear tooth measurement? Explain anyone in detail with suitable illustrations.	8 Marks	L2	CO4
	b)	Demonstrate pitch measurement of gears with suitable sketches.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain the fundamental principles behind the measurement of stress and strain in materials?	8 Marks	L2	CO5
	b)	What are the Methods of measuring temperature? Explain in detail about Thermopiles.	8 Marks	L2	CO5

(OR)

11.	a)	Explain how the principle of a resistance strain gauge allows it to measure bending stress and strain?	8 Marks	L2	CO5
	b)	Explain with suitable diagrams, how the principle of a resistance strain gauge allows it to measure compressive stress and strain?	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

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SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech V Semester (MBU-22) Supplementary Examinations, March – 2026

FUNDAMENTALS OF MACHINE DESIGN

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is the definition of the design process?	2 Marks	L1	CO1
	b)	What is meant by endurance limit in fatigue design?	2 Marks	L1	CO1
	c)	What is the function of a key in a shaft assembly?	2 Marks	L1	CO2
	d)	Name any two types of couplings used in mechanical design.	2 Marks	L1	CO2
	e)	Explain the use of a cap screw in threaded joints.	2 Marks	L1	CO3
	f)	What are the uses of fillets in mechanical components?	2 Marks	L1	CO3
	g)	What is a journal bearing?	2 Marks	L1	CO4
	h)	Define dynamic load in ball and roller bearings.	2 Marks	L1	CO4
	i)	What is the spring index in helical spring design?	2 Marks	L1	CO5
	j)	Define the energy storage capacity of a helical spring.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a	Explain the basic procedure involved in design of any machine component.	6Marks	L2	CO1
	b	A hollow shaft of 40 mm outer diameter and 25 mm inner diameter is subjected to a twisting moment of 120 N-m, simultaneously, it is subjected to an axial thrust of 10 kN and a bending moment of 80 N-m. Calculate the maximum compressive and shear stresses.	10 Marks	L3	CO1

(OR)

3.	a	What are causes of stress concentration and illustrate the methods of reducing stress concentration?	8 Marks	L2	CO1
	b	What are the factors to be considered for the selection of materials for the design of machine elements?	8Marks	L1	CO1

MODULE-II

4.		Design a clamp coupling to transmit 30 kW at 100 r.p.m. The allowable shear stress for the shaft and key is 40 MPa and the number of bolts connecting the two halves are six. The permissible tensile stress for the bolts is 70 MPa. The coefficient of friction between the muff and the shaft surface may be taken as 0.3.	16 Marks	L3	CO2

(OR)

5.		Given Data (2 Marks) Equations (2 Marks) Calculation of Torque and Shaft Dimensions (5 Marks) Calculation of Bolt Size and Number (5 Marks) Final Design Verification (2 Marks)	16 Marks	L2	CO2

MODULE-III

6.	a	Explain bolts of uniform strength.	6Marks	L2	CO3
	b	Pressure of steam acting on the head of the cylinder is 0.7 MPa, when the diameter of the cylinder is 300 mm. The load is held in position by 12 bolts of size M20 × 2.5. The soft copper gasket is used to make the joint. Determine the stresses induced in bolt.	10 Marks	L3	CO3

(OR)

7.	Explain the design procedure of a welded joint when a load acts eccentrically in the plane of welds.	16 Marks	L2	CO3

MODULE-IV

8.	A full journal bearing of 60mm diameter and 80mm long has a bearing pressure of 1.7 N/mm^2. The speed of the journal is 800 r.p.m. and the ratio of journal diameter to the diametral clearance is 1000. The bearing is lubricated with oil whose absolute viscosity at operating temperature of 700C may be taken as 0.01 kg/m-s. The room temperature is 300C. Find: i) the amount of artificial cooling required. ii) the mass of the lubricating oil required if the difference between the outlet and inlet temperature of oil is 15 ^{0}C. Take specific heat of oil as 1890 J/kg/ ^{0}C.	16Marks	L3	CO4

(OR)

9.	Select a suitable ball bearing from SKF series to support a radial load of 6kN and an axial load of 3kN. Minimum life required is 12,000 hours at 1440 r.p.m. For the selected bearing, find: i) The expected life under the given loads. The equivalent load that can be supported with a probability of survival of 90% with 8,000 hours.	16 Marks	L4	CO4

MODULE-V

10.	Design a close coiled helical compression spring for a service load ranging from 2250 N to 2750 N. The axial deflection of the spring for the load range is 6 mm. Assume a spring index of 5. The permissible shear stress intensity is 420 MPa and modulus of rigidity, G = 84 kN/mm^2. Neglect the effect of stress concentration. Draw a fully dimensioned sketch of the spring, showing details of the finish of the end coils.	16 Marks	L4	CO5

(OR)

11.	A gear drive is required to transmit a maximum power of 22.5 kW. The velocity ratio is 1:2 and r.p.m. of the pinion is 200. The approximate centre distance between the shafts may be taken as 600 mm. The teeth has 20° stub involute profiles. The static stress for the gear material (which is cast iron) may be taken as 60 MPa and face width as 10 times the module. Find the module, face width and number of teeth on each gear. Check the design for dynamic and wear loads. The deformation or dynamic factor in the Buckingham equation may be taken as 80 and the material combination factor for the wear as 1.4.	16 Marks	L4	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech V Semester (MBU-22) Supplementary Examinations, March – 2026

THEORY OF COMPUTATION

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Differentiate between NFA and DFA.	2 Marks	L2	CO1
	b)	Define Positive Closure.	2 Marks	L1	CO1
	c)	Define Regular Expression.	2 Marks	L3	CO2
	d)	State Arden's Theorem.	2 Marks	L1	CO2
	e)	What is Chomsky Normal Form (CNF)?	2 Marks	L3	CO2
	f)	State the pumping lemma for context-free languages	2 Marks	L1	CO2
	g)	Draw block diagram of Pushdown Automata.	2 Marks	L2	CO1
	h)	What is the role of the stack in PDA?	2 Marks	L3	CO1
	i)	List variants of Turing Machine.	2 Marks	L2	CO1
	j)	What are the possible move directions for a Turing machine head?	2 Marks	L3	CO1

PART - B

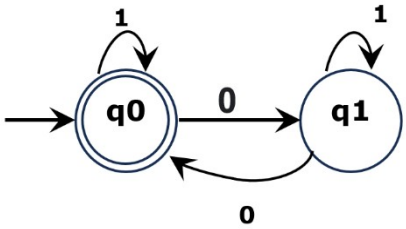
Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2. a) Check whether the following strings are accepted or not. 8 Marks L2 CO1

i) 010001 ii) 011001

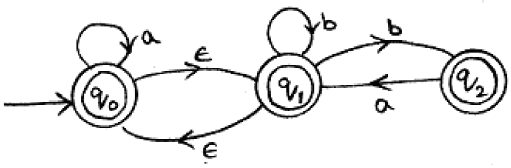


b) Convert the following NFA to DFA. 8 Marks L3 CO1

State/ Σ	a	b
→ q0	q0, q1	q2
q1	q0	q1
(q2)		q0, q1

(OR)

3. a) Construct a DFA equivalent to the following Finite automaton 8 Marks L1 CO1



b) Convert the following ε-NFA to DFA — 8 Marks — L4 — CO1

states	ε	a	b	C
p	Φ	{p}	{q}	{r}
q	{p}	{q}	{r}	Φ
*r	{q}	{r}	ϕ	{p}

MODULE-II

4. a) Write in detail about the identity rules of regular expressions. — 8 Marks — L4 — CO2

b) List the applications of regular expressions and write the regular expression for the following sets: — 8 Marks — L3 — CO2

The set of all strings over {0,1} having at most one pair of 0's or at most of one pair of 1's.

The set of all strings over {a,b} in which there are at least two occurrences of "b" between any two occurrences of "a".

(OR)

5. a) Construct a DFA for the regular expression 10 + (0+11) 0*1 and optimize the states. — 8 Marks — L3 — CO2

b) Prove that the set $\{0^n1^m / n \leq m\}$ is not a regular language. — 8 Marks — L1 — CO2

MODULE-III

6. a) Show that the following CFG is ambiguous. E □ E+E | E*E | (E) — 8 Marks — L4 — CO3

b) Eliminate Null Productions from the following CFG. S □ aS | AB , A □ Λ — 8 Marks — L3 — CO3

(OR)

7. a) Convert the following CFG into GNF. — 8 Marks — L3 — CO3

S □ AB | BC, A□ aB | bA | a , B □ bB | cC | b , C □ c

b) Construct a parse tree for the string 0110001 using the following CFG: S □ AB, A □ 0A | 1B | 0, B □1A | 0B | 1 by using i) Leftmost derivation ii) Rightmost derivation — 8 Marks — L1 — CO3

MODULE-IV

8. a) Explain in detail the Chomsky hierarchy of languages. — 8 Marks — L4 — CO4

b) Define Pushdown Automata. Draw the model of the Pushdown Automata. What is the purpose of Pushdown Store? — 8 Marks — L3 — CO4

(OR)

9. a) Design a Pushdown Automata to accept the language: $\{ 0^n 1^n | \ n > 0 \}$ — 8 Marks — L3 — CO4

b) Construct a Pushdown Automata accepting all palindromes over { a ,b }. — 8 Marks — L1 — CO4

MODULE-V

10. a) Design a Turing Machine to recognize the language: $0^n 1^n | n > 0 \}$ — 8 Marks — L4 — CO5

b) Explain in detail the Recursive and recursively enumerable languages (REL) and their properties. — 8 Marks — L3 — CO5

(OR)

11. a) Write short notes on — 8 Marks — L3 — CO5

i) Variants of Turing Machines

ii) Universal Turing Machine

b) Design a Turing Machine to recognize the language: $\{ 0^n 1^{2n} | \ n > 0 \}$ — 8 Marks — L1 — CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech V Semester (MBU-22) Supplementary Examinations, March – 2026

DATA MINING

[Computer Science and Engineering (Data Science)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define data mining.	2 Marks	L1	CO1
	b)	What are the different kinds of data in data mining?	2 Marks	L1	CO1
	c)	Define frequent itemsets in association rule mining.	2 Marks	L1	CO2
	d)	What is support and confidence in association rule mining?	2 Marks	L2	CO2
	e)	Name two density-based clustering methods.	2 Marks	L1	CO3
	f)	What is the difference between k-means and k-medoids clustering methods?	2 Marks	L4	CO3
	g)	What is sequence data mining?	2 Marks	L1	CO4
	h)	Define spatial data in the context of data mining.	2 Marks	L1	CO4
	i)	What are Chernoff Faces used for in data visualization?	2 Marks	L1	CO5
	j)	What is volume rendering in data visualization?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	How to deal with missing data in data cleaning Briefly explain with an example.	8 Marks	L3	CO1
	b)	Describe different Kinds of Patterns that can used to mine data.	8 Marks	L2	CO1
		(OR)			
3.	a)	Why we need to preprocess the data? Discuss major tasks in data preprocessing.	8 Marks	L2	CO1
	b)	Create a Data Cube for AllElectronics Ecommerce website by considering the below three dimensions and its values **address** (with city values Chicago, New York, Toronto, Vancouver) **time** (with quarter values Q1, Q2, Q3, Q4)and **item**(with item type values home entertainment, computer, phone, security) and perform roll up and drill down operations on it and explain with neat sketch.	8 Marks	L4	CO1

MODULE-II

4.		Describe the Apriori algorithm. How does it ensure the generation of frequent itemsets efficiently?	16 Marks	L3	CO2

Transactional Data for an *AllElectronics* Branch

TID	*List of item_IDs*
T100	I1, I2, I5
T200	I2, I4
T300	I2, I3
T400	I1, I2, I4
T500	I1, I3
T600	I2, I3
T700	I1, I3
T800	I1, I2, I3, I5
T900	I1, I2, I3

Consider the above table and find frequent Itemsets by candidate generation with minimum support is 2.

(OR)

5.	a)	Explain the concept of support, confidence in association rule mining with examples.	8 Marks	L2	CO2
	b)	Discuss how frequent itemsets can be used to generate strong association rules.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the how optimal number of clusters in k-means can be generated. Provide an example.	8 Marks	L3	CO3
	b)	What are some real-world applications of density-based clustering methods (DBSCAN)?	8 Marks	L3	CO3

(OR)

7.	a)	What are some real-world applications of density-based clustering methods like DBSCAN?	8 Marks	L3	CO3
	b)	Explain the role of data normalization in clustering. Why is it important?	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain sequence data mining. How is it applied in real-world scenarios?	8 Marks	L3	CO4
	b)	Discuss the challenges and techniques in mining spatial data. Provide examples.	8 Marks	L4	CO4

(OR)

9.	a)	What is text mining? Describe the key steps involved in the process.	8 Marks	L2	CO4
	b)	Discuss methods for mining multimedia data. Include examples from images, audio, and video mining.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain the role of multidimensional visualization in analyzing complex datasets.	8 Marks	L2	CO5
	b)	Illustrate with an example how Kiviat diagrams are constructed and interpreted.	8 Marks	L3	CO5

(OR)

11.	a)	Compare and contrast 3D scattergrams and 3D line graphs. Provide examples of their applications.	8 Marks	L4	CO5
	b)	Discuss the design and utility of Chernoff Faces for multidimensional data representation.	8 Marks	L2	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech V Semester (MBU-22) Supplementary Examinations, March – 2026

MACHINE LEARNING

[Computer Science and Engineering , Information Technology ,
Computer Science and Engineering (Artificial Intelligence and Machine Learning),
Computer Science and Engineering (Data Science),
Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What are different objectives of machine learning? How are these related with human learning?	2 Marks	L2	CO1
	b)	Explain the concept of penalty and reward in reinforcement learning.	2 Marks	L2	CO1
	c)	Explain the process of clustering in details.	2 Marks	L1	CO2
	d)	Differentiate between Predictive model and descriptive model.	2 Marks	L2	CO2
	e)	Differentiate between Cross-validation and bootstrapping.	2 Marks	L1	CO3
	f)	Write any two features of Bayesian learning methods.	2 Marks	L2	CO3
	g)	Describe one problem that is suitable for decision tree learning.	2 Marks	L2	CO4
	h)	What is unsupervised learning?	2 Marks	L2	CO4
	i)	What is hierarchical clustering?	2 Marks	L2	CO5
	j)	What is the difference between bagging and boosting in ensemble learning?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain, in details, the process of machine learning.	8 Marks	L3	CO1
	b)	Compare the different types of machine learning	8 Marks	L2	CO1

(OR)

3.	a)	Explain, in details, the process of evaluating the performance of a classification model. Explain the different parameters of measurement.	8 Marks	L2	CO1
	b)	What is underfitting in context of machine learning models? What is the major cause of underfitting?	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain importance the importance of Model selection and model Trainning	8 Marks	L2	CO2
	b)	Explain different evaluation metrics for classification and Regression	8 Marks	L2	CO2

(OR)

5.	a)	What is feature engineering? Explain, in details, the different aspects of feature engineering.	8 Marks	L2	CO2
	b)	How Bayes' theorem supports the concept learning principle?	8 Marks	L2	CO2

MODULE-III

6.	a)	Analyze the decision tree learning algorithm.	8 Marks	L3	CO3
	b)	How does Decision Tree search the hypothesis space, and what role does inductive bias play in this process?	8 Marks	L3	CO3

(OR)

7.	a)	Describe the assumptions underlying linear regression analysis	8 Marks	L3	CO3
	b)	How do these assumptions impact the validity of the regression model?	8 Marks	L3	CO3

MODULE-IV

8.	a)	Discuss the main applications of unsupervised learning. Provide examples of real-world problems where unsupervised learning has been successfully applied	8 Marks	L3	CO4
	b)	Explain clustering as a machine learning task. What are the key objectives of clustering, and why is it important in unsupervised learning?	8 Marks	L2	CO4

(OR)

9.	a)	What is DBSCAN, and how does it perform density-based clustering? Discuss its algorithm, including how it handles noise and identifies core, border, and outlier points.	8 Marks	L2	CO4
	b)	Compare DBSCAN with hierarchical and partitioning methods. In what scenarios would DBSCAN be the preferred choice for clustering?	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss the architecture of Multilayer Neural Networks	8 Marks	L2	CO5
	b)	Write and Explain Back-Propagation Algorithm	8 Marks	L4	CO5

(OR)

11.	a)	Examine the role of neural networks in solving real-world problems.	8 Marks	L2	CO5
	b)	Provide examples where neural networks have been successfully applied, highlighting the challenges and solutions.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc V Semester (MBU-22) Supplementary Examinations, March – 2026

MICROBIAL BIOTECHNOLOGY

[Biotechnology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Show a neat labeled diagram of Eukaryotic cell	2 Marks	L1	CO1
	b)	Define Extremophiles with examples	2 Marks	L2	CO1
	c)	Show a neat labeled diagram of Fermenter	2 Marks	L1	CO2
	d)	Define recombinant DNA technology	2 Marks	L2	CO2
	e)	Define Bioremediation	2 Marks	L1	CO3
	f)	What is downstream processing and steps in it?	2 Marks	L1	CO3
	g)	What are Rhizosphere soils with any two examples?	2 Marks	L1	CO4
	h)	What is phytoremediation and its applications?	2 Marks	L1	CO4
	i)	What is biosafety?	2 Marks	L1	CO5
	j)	Define bioprocessing and its ethics.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss in detail comparison between eukaryotic and prokaryotic cells.	8 Marks	L2	CO1
	b)	How does the microbial diversity helps in biotechnology?	8 Marks	L2	CO1
		(OR)			
3.	a)	Discuss in detailed note on the extremophiles.	8 Marks	L2	CO1
	b)	What are the different cell components of prokaryotic cell and explain?	8 Marks	L1	CO1

MODULE-II

4.	a)	Explain about gene cloning and genomics.	8 Marks	L2	CO2
	b)	Explain about the optimization of fermentation process.	8 Marks	L2	CO2
		(OR)			
5.	a)	What are the basics of fermentation and requirements?	8 Marks	L1	CO2
	b)	What are the microbes involved in food industries and its functions?	8 Marks	L1	CO2

MODULE-III

6.	a)	Show a neat labeled diagram of bioreactor.	8 Marks	L1	CO3
	b)	Explain about downstream processing of any commercial product.	8 Marks	L2	CO3
		(OR)			
7.	a)	What are the challenges in industrial production?	8 Marks	L1	CO3
	b)	Describe on recovery of the microbial products after fermentation.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss in detailed note on environmental cleanup by microbes.	8 Marks	L2	CO4
	b)	What are the advantages of sustainable agriculture?	8 Marks	L1	CO4
		(OR)			
9.	a)	Explain about soil micro biome and its relation with environment.	8 Marks	L2	CO4
	b)	List out some beneficiary microbes of Agriculture.	8 Marks	L1	CO4

MODULE-V

10.	a)	What are the future trends and challenges in regulatory affairs?	8 Marks	L1	CO5
	b)	What is the approval process for microbial products?	8 Marks	L1	CO5
		(OR)			
11.	a)	Discuss about the rules and regulation on research ethics.	8 Marks	L2	CO5
	b)	Discuss on Genetic engineering – its ethical issues.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc V Semester (MBU-22) Supplementary Examinations, March – 2026

AGRI- FOOD MICROBIOLOGY

[Biotechnology, Microbiology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What are the main shapes of bacteria observed under a microscope?	2 Marks	L1	CO1
	b)	Define microbial morphology.	2 Marks	L1	CO1
	c)	Define composting.	2 Marks	L1	CO2
	d)	Define biocontrol agents.	2 Marks	L1	CO2
	e)	Define food borne pathogens.	2 Marks	L1	CO3
	f)	Name three common food borne bacterial pathogens.	2 Marks	L1	CO3
	g)	Name two key organizations responsible for food regulation in the United States.	2 Marks	L1	CO4
	h)	List three common applications of artificial intelligence (AI) in food safety.	2 Marks	L1	CO4
	i)	What is the primary function of probiotics in the human gut?	2 Marks	L1	CO5
	j)	List three foods commonly associated with probiotics.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss the significance of bacterial cell wall structure in microbial classification.	8 Marks	L2	CO1
	b)	Explain the significance of the lag and log phase in the microbial growth curve.	8 Marks	L2	CO1

(OR)

3.	a)	Describe how pH affects microbial growth and provide an example of an organism adapted to acidic environments.	8 Marks	L2	CO1
	b)	Discuss how nutrient availability impacts microbial growth rates.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain how predatory insects act as biocontrol agents in managing pest populations.	8 Marks	L2	CO2
	b)	Describe the role of microbial biocontrol agents in suppressing plant diseases.	8 Marks	L2	CO2

(OR)

5.	a)	Discuss the benefits of using biocontrol agents compared to chemical pesticides.	8 Marks	L2	CO2
	b)	Given a case of fungal disease in crops, how would you select and apply a microbial biocontrol agent to address the problem?	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain how food borne bacteria like Salmonella and E. coli cause illness in humans.	8 Marks	L2	CO3
	b)	Describe the transmission routes for viruses such as Norovirus and Hepatitis A in food borne outbreaks.	8 Marks	L2	CO3

(OR)

7.	a)	Discuss the life cycle of a common food borne parasite, such as Giardia lamblia or Toxoplasma gondii.	8 Marks	L2	CO3
	b)	How would you identify and control the risk of bacterial contamination in a food processing environment?	8 Marks	L3	CO3

MODULE-IV

8.	a)	Compare the effectiveness of SPC with other microbiological methods (e.g., Most Probable Number method) for determining microbial counts in food.	8 Marks	L4	CO4
	b)	Apply the principles of pathogen detection to design a protocol for testing a new food product for common pathogens.	8 Marks	L3	CO4

(OR)

9.	a)	Assess the reliability and cost-effectiveness of using next-generation sequencing (NGS) for comprehensive pathogen detection	8 Marks	L5	CO4
	b)	Investigate how consumer demands for transparency and sustainability are influencing emerging trends in food safety and quality control.	8 Marks	L4	CO4

MODULE-V

10.	a)	Discuss the benefits of using nanobiotechnology for soil and water management.	8 Marks	L2	CO5
	b)	Apply the principles of nanobiotechnology to design a novel crop protection strategy against a specific plant disease.	8 Marks	L3	CO5

(OR)

11.	a)	Explain the role of the soil microbiome in plant health and growth.	8 Marks	L2	CO5
	b)	Describe how microbiome analysis can impact food safety and quality control.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech V Semester (MBU-22) Supplementary Examinations, March – 2026

CYBER SECURITY ESSENTIALS

[Information Technology, Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define cryptography.	2 Marks	L1	CO1
	b)	Identify an example of a symmetric encryption algorithm.	2 Marks	L1	CO1
	c)	Explain why attackers use proxy servers.	2 Marks	L2	CO2
	d)	Describe HTTP tunneling.	2 Marks	L2	CO2
	e)	Define shell code in the context of cyberattacks.	2 Marks	L1	CO3
	f)	Define SQL injection.	2 Marks	L1	CO3
	g)	Define spyware.	2 Marks	L1	CO4
	h)	Define a rootkit.	2 Marks	L1	CO4
	i)	Define memory forensics and explain why it is important in digital investigations.	2 Marks	L2	CO5
	j)	List two capabilities of memory forensics.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Define Information Assurance (IA) and differentiate it from Information Security.	8 Marks	L3	CO1
	b)	Differentiate between symmetric and asymmetric encryption.	8 Marks	L3	CO1

(OR)

3.	a)	Discuss different firewalls used in network security.	8 Marks	L2	CO1
	b)	Explain how a Block Cipher algorithm is used to encrypt data.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain with a neat diagram the phishing mechanism against mobile devices.	8 Marks	L2	CO2
	b)	Distinguish between phishing and spoofing.	8 Marks	L3	CO2

(OR)

5.	a)	Define antiviruses and explain in detail about rogue antivirus.	8 Marks	L2	CO2
	b)	Explain the Pay Per Click (PPC) business model.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain string vulnerability scenario and its risks.	8 Marks	L2	CO3
	b)	Define SQL injection and identify variables (beyond username/password) that are candidates.	8 Marks	L2	CO3

(OR)

7.	a)	Write a short note on :	8 Marks	L2	CO3

		i) Race conditions ii) DoS conditions.			
	b)	Describe how malicious PDF files work and illustrate the structure of a PDF file.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Illustrate with an example and explain Virtual Machine Obfuscation.	8 Marks	L3	CO4
	b)	Discuss the typical components of a VM–obfuscated binary.	8 Marks	L2	CO4
		(OR)			
9.	a)	Define a rootkit and explain different types of rootkits.	8 Marks	L2	CO4
	b)	Discuss the steps spyware creators take to make money.	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss any two intrusion detection systems.	8 Marks	L2	CO5
	b)	Define Volatility and explain it with a Python script.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain an antivirus scan of a typical banking Trojan.	8 Marks	L2	CO5
	b)	Explain passive analysis comparison process with a neat sketch.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech V Semester (MBU-22) Supplementary Examinations, March – 2026

FOUNDATION ENGINEERING

[Civil Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define disturbed and undisturbed soil samples with one example each.	2 Marks	L1	CO1
	b)	State the purpose of Standard Penetration Test (SPT). Give N-value range for dense sand.	2 Marks	L1	CO1
	c)	State Rankine's earth pressure theory assumptions.	2 Marks	L1	CO2
	d)	Define active and passive earth pressure.	2 Marks	L2	CO2
	e)	Define Factor of Safety (FOS) in slope stability	2 Marks	L1	CO3
	f)	What is the critical failure surface in Swedish method?.	2 Marks	L1	CO3
	g)	State Terzaghi's bearing capacity equation for strip footing and circular footing.	2 Marks	L2	CO4
	h)	What is the effect of water table at foundation level and at a mid of the depth of foundation?	2 Marks	L1	CO4
	i)	Name two types of caissons and their typical use.	2 Marks	L2	CO5
	j)	Define negative skin friction in piles. When does it occur?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain auger boring method with a neat sketch. When is it suitable?	8 Marks	L3	CO1
	b)	Borehole SPT N-values: 0–3 m: N=8, 3–6 m: N=15, 6–9 m: N=28. Classify soil layers and recommend safe foundation depth for allowable settlement = 25 mm. Use Q_{all} = 12N (kPa).	8 Marks	L4	CO1

(OR)

3.	a)	Describe Cone Penetration Test (CPT) and its advantages over SPT.	8 Marks	L2	CO1
	b)	Describe the method of wash boring.	8 Marks	L4	CO1

MODULE-II

4.	a)	Derive active earth pressure coefficient K_a for cohesionless soil.	8 Marks	L4	CO2
	b)	A retaining wall 10m height retained a cohesionless soil having an angle of internal friction of 30°. The surface of the soil is level with top of the all. The top 3m of fill has a unit weight of 18 kN/m^3 and that of rest is 20 kN/m^3. Find the magnitude per meter run of wall and point of application of resultant passive thrust.	8 Marks	L3	CO2

(OR)

5.	a)	Explain Coulomb's wedge theory. When is it preferred?	8 Marks	L3	CO2
	b)	Cantilever wall: H = 5 m, c = 20 kPa, ϕ= 25°, γ = 19 kN/m³, δ = 15°. Use Rebhann graphical method to find active thrust and location.	8 Marks	L4	CO2

MODULE-III

6.	a)	An infinite slope is to be constructed in a soil. The effective stress strength parameters of the soil are c' = 0 and ϕ' = 30°. The saturated unit weight of the slope is 22kN/m^3 and the unit weight of water is 9.81kN/m^3. Assuming that seepage is occurring parallel to the slope, find the maximum slope angle for a factor of safety of 1.5.	8 Marks	L4	CO3
	b)	Explain Taylor's stability number and its use.	8 Marks	L4	CO3
		(OR)			
7.	a)	Clay slope: H = 10 m, β = 30°, c' = 50 kPa, γ = 20 kN/m³. Use Taylor's chart to find FOS. Suggest improvement if FOS < 1.5.	8 Marks	L3	CO3
	b)	Derive ordinary method of slices (Fellenius) equation.	8 Marks	L3	CO3

MODULE-IV

8.	a)	A rectangular footing 1 m x 2 m is placed at a depth of 2.50m in a saturated clay having an unconfined compressive strength of 150kN/m^2. Using the Skempton theory determine the net ultimate bearing capacity.	8 Marks	L3	CO4
	b)	Two footing one circular and other square, are founded on the surface of a purely cohesionless soil. The diameter of the circular footing is the same as that of the side of the square footing. What will be the ratio between their ultimate bearing capacities?	8 Marks	L2	CO4
		(OR)			
9.	a)	Explain Meyerhof's bearing capacity factors and advantages.	8 Marks	L2	CO4
	b)	Given Square footing B = 2 m, D_f = 1.5 m, sand: γ = 18 kN/m³, ϕ = 35°, Nγ = 45, Nq = 38. Find q_u using Meyerhof (apply shape & depth factors)	8 Marks	L2	CO4

MODULE-V

10.		Explain static pile capacity formula in cohesionless soil. Explain group efficiency of pile group.	16 Marks	L4	CO5
		(OR)			
11.	a)	Discuss advantages and disadvantages of well foundations.	8 Marks	L3	CO5
	b)	A pile of 0.50 m diameter and of length 10 m is embedded in a deposit of clay. The undrained strength parameters of the clay are c = 60kN/m^2 and ϕ = 0°. Find the skin friction capacity (kN) of the pile for an adhesion factor of 0.6.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech V Semester (MBU-22) Supplementary Examinations, March – 2026

REINFORCED CEMENT CONCRETE STRUCTURES

[Civil Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Distinguish between balanced section and under reinforced sections?	2 Marks	L4	CO1
	b)	What are the assumptions made in limit state of collapse in flexure?	2 Marks	L1	CO1
	c)	What are the types of reinforcement used to resist shear?	2 Marks	L1	CO2
	d)	Determine the development length of 20 mm, Fe 415 bar in tension and compression with M20 grade of concrete.	2 Marks	L4	CO2
	e)	Define the one-way slab.	2 Marks	L1	CO3
	f)	What is maximum thickness of slab?	2 Marks	L1	CO3
	g)	Define slenderness ratio. How columns are classified based on this ratio?	2 Marks	L1	CO4
	h)	Under which condition a column is designed with axial load and biaxial bending.	2 Marks	L1	CO4
	i)	What is the minimum thickness of footing?	2 Marks	L1	CO5
	j)	How do you design a staircase?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Distinguish between under reinforced and over reinforced sections in reinforced concrete beams.	8 Marks	L4	CO1
	b)	A simply supported R.C. beam of rectangular cross section is required to resist a bending moment of 120 KN-m at Service State. Design and detail the suitable dimensions of the cross section and reinforcement for the balanced sections. Take the effective depth as twice the width. Assume M_{20} grade concrete and Fe 415 grade steel, adopt working stress method.	8 Marks	L6	CO1

(OR)

3.	A tee beam slab floor of an office comprises of a slab 150 mm thick spanning between ribs spaced at 3 m apart. The effective span of the beam is 8 m. Live load on floor is 4 kN/m2. Using M20 grade concrete and Fe 415 HYSD bars, design one of the intermediate tee beams.	16 Marks	L6	CO1

MODULE-II

4.	Design a rectangular simply supported beam over a clear span of 6 m, if the super imposed load is 12 kN/m and the support width is 230 mm. Use M20 grade concrete and Fe 415 steel. The beam is to have a width of 300 mm. Design the shear reinforcement and do check for deflection.	16 Marks	L6	CO2
	(OR)			
5.	Design the reinforcements required for a rectangular beam section with following data Size of the beam = 300 x 600 mm Factored Shear force = 100 kN Factored bending moment = 120 kNm Factored twisting moment = 50 kNm M20 grade of concrete and Fe 415 grade of steel Sketch the reinforcements details.	16 Marks	L6	CO2

MODULE-III

6.	A simply supported slab has a clear span of 2.1 m and is supported on walls 400 mm thick along edges. If the live load on the slab 4 kN/m2, and the floor finish weighs 0.6 kN/m^2. Design the slab using M20 grade concrete and Fe 415 HYSD bars.	16 Marks	L6	CO3
	(OR)			
7.	Design an RCC slab for a room 3 m x 4 m clear in size. Use M20 concrete and Fe 415 steel. The live load is 2 kN/m2. The edges are simply supported and the corners are held down. Draw top plan and bottom plan to show the reinforcement detailing.	16 Marks	L6	CO3

MODULE-IV

8.	Design a square column to carry an axial load of 1000 kN. Use M20 concrete and Fe 415 steel. Draw a longitudinal section and a cross section showing the reinforcement.	16 Marks	L6	CO4
	(OR)			
9.	A corner column 400 x 400 mm, is subjected to the factored loads Pu = 1200 kN, Mux = 180 kN-m and Muy = 100 kN-m. Design the reinforcement in the column, assuming M25 concrete and Fe 415 steel and effective cover of 60 mm. Assume it is a short column.	16 Marks	L6	CO4

MODULE-V

10.	Design a suitable footing for a 500 mm x 500 mm square column transferring 100 kN axial load and a moment of 35 KNm. The safe bearing capacity of soil is 190 kN/ m2. Use M20 concrete and Fe 415 steel. Adopt limit state design method.	16 Marks	L6	CO5
	(OR)			
11.	Design a dog-legged stair for a building in which the vertical distance between the floors is 3.6 m. The Stair hall measures 2.5 m x 5 m (inner dimensions). The live load on the stair is 3000 N/m^2. Adopt M20 Grade concrete and Fe 415 grade of steel.	16 Marks	L6	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech V Semester (MBU-22) Supplementary Examinations, March – 2026

IRRIGATION ENGINEERING AND HYDRAULIC STRUCTURES

[Civil Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define Duty and Delta.	2 Marks	L1	CO1
	b)	Define consumptive use of water.	2 Marks	L1	CO1
	c)	Differentiate a weir and barrage.	2 Marks	L1	CO2
	d)	What is the main assumption of Bligh's creep theory	2 Marks	L1	CO2
	e)	List any two causes of failure of gravity dams.	2 Marks	L1	CO3
	f)	What is the purpose of an energy dissipater?	2 Marks	L1	CO3
	g)	What is a canal fall?	2 Marks	L1	CO4
	h)	State any two differences between Kennedy's and Lacey's theories.	2 Marks	L1	CO4
	i)	What is a level crossing in cross drainage works?	2 Marks	L1	CO5
	j)	Define river training works.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss in brief various water application methods with neat sketches.	8 Marks	L1	CO1
	b)	A canal releases 800 m³ at its head. At the farm gate, 640 m³ is received. Of this, 500 m³ reaches the root zone, and 420 m³ is consumptively used by the crop. Calculate: Conveyance efficiency, Application efficiency and Water use efficiency.	8 Marks	L3	CO1

(OR)

3.	Explain the terms duty and delta. Derive the relationship between Duty, Delta and Base period. Discuss factors affecting duty of crop.	16 Marks	L2	CO1

MODULE-II

4.	a)	Analyze seepage process using Bligh's creep theory	8 Marks	L1	CO2
	b)	Explain the causes of failure of weirs and their remedial measures.	8 Marks	L1	CO2

(OR)

5.	A floor of length 64 m retains a head of 4.0 m. At a point 16 m from the upstream end, calculate the uplift head and the required thickness of floor if the specific gravity of concrete is 2.3 and the provided thickness is 0.9 m. Comment whether the section is safe or unsafe.	16 Marks	L2	CO2

MODULE-III

6.	Define elementary profile of gravity dam in detail.Discuss design procedure of elementary profile of gravity dam in detail.	16 Marks	L1	CO3

(OR)

7.		Design an ogee spillway for concrete gravity dam for the following data: Average river bed level = 250.0 m RL of spillway crest = 350.0 m Slope of downstream face of gravity dam = 0.75:1 Design Discharge = 6500 cumecs Length of spillway = 5 span with a clear length of 5 m each Thickness of each Pier = 2 m	16 Marks	L2	CO3

MODULE-IV

8.	a)	What is canal lining and explain the various types of lining with neat sketches.	8 Marks	L2	CO4
	b)	A channel has a discharge of 30 cumecs, silt factor of 1.0 and a side slope of 0.5:1.0. Design the channel using Lacey's theory. Also find the longitudinal slope.	8 Marks	L2	CO4

(OR)

9.		Design a 1.5 m Sarda type fall for a canal having a discharge of 12 cumecs with following data: Bed level upstream = 103.0 m Side slope of channel = 1:1 Bed level downstream = 101.5 m Full supply level = 104.5 Bed level with u/s and d/s soil = 1.0 m Assume Bligh's Coefficient = 6	16 Marks	L2	CO4

MODULE-V

10.		Explain the necessity of river training works in cross-drainage structures. Explain marginal bands or levees.	16 Marks	L2	CO5

(OR)

11.		Design waterways and bed levels at any two sections for a Syphon aqueduct if the following data at the crossing of a canal and a drainage are given: Discharge of canal = 40 cumecs Bed width of canal= 30 Full supply depth of canal = 1.6 m Bed level of canal = 206.4 m Side slope of canal = $1\frac{1}{2}$H:1V High flood discharge of drainage = 450 cumecs High flood level of drainage = 207.0 m Bed level of drainage = 204.5 m General ground level = 206 .5 m.	16 Marks	L2	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech V Semester (MBU-22) Supplementary Examinations, March – 2026

TRANSPORTATION ENGINEERING

[Civil Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Explain the term "road cross-section."	2 Marks	L1	CO1
	b)	Explain the term 'shoulder' in road design.	2 Marks	L1	CO1
	c)	Define flexible pavement and list two advantages of using flexible pavements.	2 Marks	L1	CO2
	d)	What is the significance of the 'Marshall mix design' in asphalt pavement?	2 Marks	L2	CO2
	e)	What is the basic objective of Traffic Engineering?	2 Marks	L1	CO3
	f)	What is meant by 'Traffic Density'?	2 Marks	L1	CO3
	g)	What is the purpose of a railway signal?	2 Marks	L2	CO4
	h)	What is the difference between a ‘loop line’ and a ‘main line’?	2 Marks	L1	CO4
	i)	What is the rose diagram?	2 Marks	L2	CO5
	j)	What are the factors affecting the runway length?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	What are the required surveys to select the best alignment for given road?	6 Marks	L3	CO1
	b)	Design the extra widening required for a pavement of width 7m on a horizontal curve of radius 255 m if the longest wheel base of vehicle expected on the road is 7.0 m. Design speed is 75 kmph.	10 Marks	L4	CO1

(OR)

3.	a)	Write a short note on Jayakar Committee recommendations	8 Marks	L2	CO1
	b)	Design overtaking sight distance for a design speed of 90 KMPH. Assume all other required data as per IRC recommendations.	8 Marks	L3	CO1

MODULE-II

4.	a)	A two lane road at present carrying a traffic of 1500 CVPD. It is to be strengthen for growing traffic needs, VDF=3.75, rate of growth of traffic 7.5% annum, period of construction is 5 years. The pavement is to be designed for a life of 10 years after completion. Calculate the cumulative standard axles used for design.	10 Marks	L4	CO2
	b)	Write a short note on Los Angeles abrasion test and its significance.	6 Marks	L3	CO2

(OR)

5.	a)	Write a short note on ductility test on bitumen and its significance.	6 Marks	L3	CO2
	b)	Calculate the stress at interior, edge and corner regions of a cement concrete pavement using Westergaard's equation. Use the following data Wheel load, P=5500kg; Modulus of elasticity of concrete, E=3.0x10□5 kg/cm²; Pavement thickness, h=15 cm, Poisson's ratio=0.15; Modulus of subgrade reaction=6.0 kg/cm3; Radius of contact area=12 cm	10 Marks	L4	CO2

MODULE-III

6.	a)	What is the need of spot speed studies discuss briefly?	8 Marks	L3	CO3
	b)	Briefly discuss the scope of traffic engineering.	8 Marks	L3	CO3

(OR)

7.	a)	Write a short note road user characteristic.	8 Marks	L3	CO3
	b)	Briefly discuss the latest developments in traffic volume data collection.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Discuss briefly about rail joints with neat sketches.	8 Marks	L3	CO4
	b)	A turnout takes off as a 6º curve with contrary flexure from a BG main line on a 4º curve. The speed on the branch line is restricted to 45 km/hr. Determine the maximum permissible speed on the main line.	8 Marks	L4	CO4

(OR)

9.	a)	Briefly discuss the permanent way with a neat sketch.	8 Marks	L3	CO4
	b)	Determine the quantity of all the materials required for 5 km track laying for BG.	8 Marks	L4	CO4

MODULE-V

10.	a)	Write a short note on Aircraft characteristics.	6 Marks	L2	CO5
	b)	The monthly average of the maximum daily temperature at the proposed site of an airport is 45º C during the hottest month of the year. During the same month, the average daily temperature is 34ºC. Calculate the airport reference temperature. If the site is at MSL and is having an effective gradient of 0.45%. Calculate the actual length to be provided, if basic runway length is 2285 m.	10 Marks	L4	CO5

(OR)

11.		Calculate the length of runway with reference to temperature of 17.20C. (ii) If the bearing of longest line in wind rose is S 450 E, Determine the numbering for the bearing of runway.	16 Marks	L4	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech V Semester (MBU-22) Supplementary Examinations, March – 2026

ENVIRONMENTAL SCIENCE

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What do you mean by sustainable lifestyle?	2 Marks	L2	CO1
	b)	Distinguish between renewable and non-renewable resources.	2 Marks	L4	CO1
	c)	What is meant by ecosystem.	2 Marks	L1	CO2
	d)	What is the concept and value of biodiversity?	2 Marks	L2	CO2
	e)	List the types of pollution.	2 Marks	L2	CO3
	f)	What are the various sources of water pollution?	2 Marks	L1	CO3
	g)	What is meant by sustainable development?	2 Marks	L1	CO4
	h)	List some environmental protection acts?	2 Marks	L1	CO4
	i)	What do you mean by population explosion?	2 Marks	L2	CO5
	j)	What is the role of technology in environmental protection.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss the major causes for conflicts over water?	8 Marks	L1	CO1
	b)	Discuss the merits and demerits of wind energy.	8 Marks	L1	CO1

(OR)

3.	a)	How does the overgrazing contribute to environmental degradation?	8 Marks	L1	CO1
	b)	Discuss the major environmental impacts of mineral extraction.	8 Marks	L2	CO1

MODULE-II

4.	a)	Write a detailed note on grassland ecosystem and its types.	8 Marks	L1	CO2
	b)	Describe the types of ecological pyramids with neat sketches.	8 Marks	L3	CO2

(OR)

5.	a)	Write a detailed note on the types of biodiversity.	8 Marks	L1	CO2
	b)	Explain briefly about values of biodiversity.	8 Marks	L2	CO2

MODULE-III

6.	a)	Describe various methods of controlling of air pollution.	8 Marks	L1	CO3
	b)	How can the solid waste be managed?	8 Marks	L2	CO3

(OR)

7.	a)	How does soil pollution affect soil productivity?	8 Marks	L2	CO3
	b)	Explain various measures for preventing soil pollution.	8 Marks	L2	CO3

MODULE-IV

8.	a)	What are the major measures for sustainable development?	8 Marks	L2	CO4
	b)	Why is urban requirement of energy more than rural requirement?	8 Marks	L2	CO4

(OR)

9.	a)	Explain briefly the major impacts of acid rain.	8 Marks	L2	CO4
	b)	Brief out the measures to be taken to control acid rain.	8 Marks	L1	CO4

MODULE-V

10.	a)	Briefly discuss about HIV/AIDS, mode of its spread and its effects on environment.	8 Marks	L2	CO5
	b)	Discuss various issues and measures for women and child welfare at international and national level.	8 Marks	L2	CO5

(OR)

11.	a)	What are the objectives and elements of value education? How can the same be achieved?	8 Marks	L1	CO5
	b)	Discuss the influence of environmental parameters and pollution on human health.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech V Semester (MBU-22) Supplementary Examinations, March – 2026

OBJECT ORIENTED MODELING AND DESIGN

[Computer Science and Engineering (Artificial Intelligence and Machine Learning)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Name two benefits of modeling in software engineering.	2 Marks	L1	CO1
	b)	What does the term "Concrete Class" refer to in UML?	2 Marks	L1	CO1
	c)	Differentiate Aggregation and Composition.	2 Marks	L2	CO2
	d)	What are stereotypes in UML?	2 Marks	L1	CO2
	e)	Write the purpose of an activity diagram in UML?	2 Marks	L1	CO3
	f)	How is reverse engineering used with activity diagrams?	2 Marks	L1	CO3
	g)	What is the difference between a process and a thread?	2 Marks	L1	CO4
	h)	How can exceptions be handled in a signal-based system?	2 Marks	L1	CO4
	i)	Define Component.	2 Marks	L1	CO5
	j)	Explain the role does 'port' play in component modeling?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe the basic building blocks of UML. How do its core concepts support the development of software systems?	8 Marks	L2	CO1
	b)	Explain the principles of modeling. How do these principles help in creating accurate and useful models?	8 Marks	L2	CO1

(OR)

3.	a)	Discuss the importance of classes in UML. What are the key terms and concepts related to classes?	8 Marks	L2	CO1
	b)	Discuss common mechanisms in UML. How do these mechanisms support the modeling of complex software systems?	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the concept of simple collaboration in UML class diagrams. How does collaboration modeling help in understanding interactions between objects?	8 Marks	L2	CO2
	b)	Create a Object Diagram for a Restaurant Management System. Incorporate classes like MenuItem, Order, Customer, and Table.	8 Marks	L3	CO2

(OR)

5.	a)	Discuss the concepts of types and roles in UML. How do these concepts contribute to defining the responsibilities and behaviors of classes?	8 Marks	L2	CO2
	b)	Design a Class Diagram for a Fitness Tracking Application. Include classes such as User, Activity, Workout, and Goal.	8 Marks	L3	CO2

MODULE-III

6.	a)	State and explain the common modeling techniques of usecase diagrams.	8 Marks	L3	CO3
	b)	Explain the following: i) Links ii) Messages	8 Marks	L2	CO3

(OR)

7.	a)	Compare sequence versus collaboration diagram with suitable example.	8 Marks	L4	CO3
	b)	Explain the process of forward engineering in the context of interaction diagrams. How does it assist in translating design into implementation?	8 Marks	L4	CO3

MODULE-IV

8.	a)	Discuss about sequential substates and history states with an example.	8 Marks	L2	CO4
	b)	Compose the state chart diagram for unified library application	8 Marks	L3	CO4

(OR)

9.	a)	What is an event? What are different types of events?	8 Marks	L3	CO4
	b)	Justify and describe the terms and concepts of Time and Space?	8 Marks	L4	CO4

MODULE-V

10.	a)	How does a component diagram model source code? What are the key components and their interactions?	8 Marks	L2	CO5
	b)	Discuss the impact of versioning on the modeling of executables and libraries. How should versioning be incorporated into models?	8 Marks	L2	CO5
11.	a)	Explain how files are represented in a system model. What are the considerations for modeling file structure and access?	8 Marks	L3	CO5
	b)	Explain the approach to modeling a client/server system in deployment diagrams. What are the key components and interactions?	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

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SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech V Semester (MBU-22) Supplementary Examinations, March – 2026

ANALYTICAL INSTRUMENTATION

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is dissolved oxygen. Mention the techniques involved in measuring dissolved oxygen.	2 Marks	L2	CO1
	b)	Define thermal conductivity.	2 Marks	L1	CO1
	c)	List the detectors used in liquid chromatography.	2 Marks	L2	CO1
	d)	Interpret how chromatogram is formed.	2 Marks	L1	CO2
	e)	Define the following: i) Beer's law ii) Lambert's law iii) Beer-Lambert's law	2 Marks	L2	CO2
	f)	List out IR sources and detectors used in IR spectrophotometer.	2 Marks	L1	CO3
	g)	State the working principle of atomic absorption spectroscopy.	2 Marks	L3	CO3
	h)	Draw the constructional diagram of flame photometer and explain it.	2 Marks	L1	CO4
	i)	Specify the techniques used to measure Nitricoxide.	2 Marks	L2	CO4
	j)	Mention the characteristics of alpha, beta and gamma radiation.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	State the necessity of sodium analyzer in thermal power plants and explain its working principle in detail.	8 Marks	L2	CO1
	b)	Specify the purpose of pH measurement. Discuss the working principle of pH meter with neat block diagram.	8 Marks	L2	CO1

(OR)

3.		Analyze the oxygen concentration by using paramagnetic oxygen analyzer.	16 Marks	L2	CO1

MODULE-II

4.	a)	Discuss photo ionization detector system that is used in gas chromatography.	8 Marks	L2	CO2
	b)	By using a suitable chromatographic technique explain the separation of different gas components in a sample mixture.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the working principle of Fluorescence detector.	8 Marks	L2	CO2
	b)	List the detectors used in liquid chromatography and explain one in detail.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain how beer Lambert's law is implemented in the analysis of chemical solution by using spectrometers.	8 Marks	L2	CO3
	b)	Identify and discuss an appropriate spectroscopic technique to analyze the given sample solution by using UV-ViS spectrophotometer.	8 Marks	L2	CO3

(OR)

7.	a)	Differentiate single beam and double beam spectrophotometers.	8 Marks	L4	CO3
	b)	Classify spectroscopic techniques. Define each classification with example. Discuss any technique in detail	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain the working principle of magnetic deflection mass spectrometer.	8 Marks	L2	CO4
	b)	Mention the significance of flame photometer in analyzing a chemical solution and explain the analysis procedure to find of concentration of a given sample.	8 Marks	L2	CO4

(OR)

9.	a)	Draw the block diagram of NMR spectrometer. Discuss the working principle of NMR spectrometer to diagnose the health of a patient.	8 Marks	L2	CO4
	b)	Define atomic emission method. Analyze a chemical solution by assembling appropriate components to the atomic emission spectrometer.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain how environmental pollution monitoring devices that provides environmental safety.	8 Marks	L2	CO5
	b)	Mention the techniques involved in measurement of H_2S present in a sample. Discuss any two techniques that maintain the environment to be sustained.	8 Marks	L2	CO5

(OR)

11.	a)	Specify how radiation particles are being detected with safety precautions. Also discuss scintillation counter in brief.	8 Marks	L1	CO6
	b)	Explain ionization chamber which is used to measure ionizing radiations in nuclear power plants.	8 Marks	L2	CO6

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc V Semester (MBU-22) Supplementary Examinations, March – 2026

SOFTWARE ENGINEERING

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define software engineering paradigm.	2 Marks	L2	CO1
	b)	What do you mean by spiral model?	2 Marks	L1	CO1
	c)	What is a non-functional requirement? Give an example.	2 Marks	L1	CO2
	d)	What is the purpose of the Software Requirements Document (SRD)?	2 Marks	L1	CO2
	e)	What is the primary goal of the design process in software engineering?	2 Marks	L1	CO3
	f)	What are traditional components present in software design?	2 Marks	L1	CO3
	g)	Define software testing?	2 Marks	L2	CO4
	h)	What is validation testing, and how does it ensure software quality?	2 Marks	L1	CO4
	i)	What is COCOMO model?	2 Marks	L1	CO5
	j)	What are the processes of risk management?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain in detail about Agile model? How Agile model is differ for waterfall model & state its advantages and disadvantages?	10 Marks	L2	CO1
	b)	List and explain the principles of Agile model.	6 Marks	L1	CO1

(OR)

3.	a)	Describe the Extreme Programming (XP) process, including its key practices and principles?	10 Marks	L2	CO1
	b)	Discuss the strengths and weaknesses of the Extreme Programming (XP) methodology.	6 Marks	L2	CO1

MODULE-II

4.	a)	Explain the importance of Requirement Engineering. What are requirement engineering tasks?	8 Marks	L2	CO2
	b)	Differentiate between functional and non-functional requirements in software engineering?	8 Marks	L4	CO2

(OR)

5.	a)	Explain in detail about software requirement specifications with example.	8 Marks	L2	CO2
	b)	What is the difference between requirement inception and elicitation? Why requirement elicitation is difficult?	8 Marks	L1	CO2

MODULE-III

6.	a)	Discuss the software design process, explaining each key stage in detail. How does the design process contribute to the overall success of a software project?	8 Marks	L2	CO3
	b)	Explain the concepts of abstraction and modularity in software design. How do these concepts help in managing the complexity of software systems?	8 Marks	L2	CO3

(OR)

7.	a)	Write short notes on Architectural & component design.	6 Marks	L1	CO3
	b)	What is software architecture ? Describe in detail different types of software architectural styles with illustrations?	10 Marks	L1	CO3

MODULE-IV

8.	a)	Discuss the significance of software testing in the software development lifecycle. Explain how different types of testing contribute to ensuring software quality?	8 Marks	L2	CO4
	b)	Compare and contrast the internal and external views of testing. Discuss the strengths and weaknesses of each approach?	8 Marks	L2	CO4

(OR)

9.	a)	Explain the process of regression testing and its importance in maintaining software quality over time?	8 Marks	L2	CO4
	b)	Discuss the challenges involved in regression testing and how they can be addressed?	8 Marks	L2	CO4

MODULE-V

10.	a)	Analyze the role of CASE tools in software project management and explain the various CASE tools for project management.	8 Marks	L4	CO5
	b)	Define Risk. Discuss the process of risk management in software projects and explain the needs and activities or risk management?	8 Marks	L2	CO5

(OR)

11.	a)	Explain the COCOMO I and COCOMO II models in detail.	8 Marks	L2	CO5
	b)	Explain the importance of scheduling, and the challenges involved in creating and maintaining a project schedule.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc V Semester (MBU-22) Supplementary Examinations, March – 2026

BIG DATA TECHNOLOGIES USING R

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List out challenges of big data.	2 Marks	L1	CO1
	b)	Write about the characteristics of Big Data.	2 Marks	L2	CO1
	c)	What are the benefits of Big Data Analytics?	2 Marks	L1	CO2
	d)	Write about technologies needed to meet challenges of big data.	2 Marks	L2	CO2
	e)	Compare R programming with other programming languages?	2 Marks	L3	CO2
	f)	Why use R programming?	2 Marks	L1	CO3
	g)	Define data frame.	2 Marks	L2	CO4
	h)	List out R functions for data frame.	2 Marks	L1	CO4
	i)	Write about scatter plots charts.	2 Marks	L2	CO5
	j)	Define bar charts and its usage.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain various benefits of big data.	8 Marks	L2	CO1
	b)	Explain the challenges of Big Data.	8 Marks	L2	CO1

(OR)

3.	a)	Compare and contrast the characteristics of structured, unstructured, and semi-structured data.	8 Marks	L3	CO1
	b)	Explain how big data can provide a competitive advantage to businesses.	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain the benefits of Big Data Analytics in detail.	8 Marks	L2	CO2
	b)	Write about various challenges of Big data analytics	8 Marks	L2	CO2

(OR)

5.	a)	Explain the role and the importance of big data analytics.	8 Marks	L3	CO2
	b)	Explain the lifecycle Phases of Big Data Analytics.	8 Marks	L3	CO2

MODULE-III

6.	a)	Define Functions. Explain Different types of functions used in R programming.	8 Marks	L3	CO3
	b)	Discuss about components of functions and how we can create user defined functions in R programming.	8 Marks	L3	CO3

(OR)

7.	a)	Explain about creating and accessing elements in vector.	8 Marks	L3	CO3
	b)	Write about vector operations in detail.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain in detail about how to Access specific rows and columns in a data frame.	8 Marks	L3	CO4
	b)	Evaluate the efficiency of different methods for accessing data in large data frames.	8 Marks	L3	CO4

(OR)

9.	a)	How to Use the nrow() and ncol() functions to determine the dimensions of a data frame.	8 Marks	L3	CO4
	b)	Explain the procedure for Loading data from a table into a data frame using read.table().	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain the procedure for creating, reading, and converting JSON data into a data frame.	8 Marks	L3	CO5
	b)	What is XML file in a R? Explain the procedure to install xml package in R.	8 Marks	L3	CO5

(OR)

11.	a)	Discuss about Create table, Select and drop in R MySql.	8 Marks	L1	CO5
	b)	Discuss about insert, update , delete commands in R Mysql.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc V Semester (MBU-22) Supplementary Examinations, March – 2026

DATA WAREHOUSING AND DATA MINING

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Explain the difference between a two-tier and a three-tier Data Warehouse architecture.	2 Marks	L1	CO1
	b)	How does Data Warehouse architecture support data analysis?	2 Marks	L2	CO1
	c)	What are some major issues faced in Data Mining?	2 Marks	L1	CO2
	d)	Differentiate between a Data Warehouse and a Data Mining system.	2 Marks	L2	CO2
	e)	What is Decision Tree Induction in classification?	2 Marks	L2	CO3
	f)	Define Bayesian Classification.	2 Marks	L1	CO3
	g)	Write about concept of bagging in classification.	2 Marks	L2	CO4
	h)	What is prediction?	2 Marks	L1	CO4
	i)	How can data mining be applied to improve customer service in the telecommunication industry?	2 Marks	L2	CO5
	j)	Write about a data mining application used in the retail industry.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Difference between Database and Data Warehouse	8 Marks	L2	CO1
	b)	Explain principle of data warehousing in detail.	8 Marks	L2	CO1

(OR)

3.	a)	What was the paradigm shift that led to the development of data warehousing?	8 Marks	L3	CO1
	b)	Explain Data Warehouse Design approaches in detail?	8 Marks	L3	CO1

MODULE-II

4.	a)	Discuss in detail about various aspects of design consideration for building a data warehouse.	8 Marks	L3	CO2
	b)	What is the role of predictive analytics in data mining?	8 Marks	L3	CO2

(OR)

5.	a)	What is snow flake schema? Explain in detail about snow flack schema with an example?	8 Marks	L3	CO2
	b)	What are the benefits of tight coupling between a data mining system and a database or data warehouse?	8 Marks	L2	CO2

MODULE-III

6.	a)	What are the different techniques for imputing missing data?	8 Marks	L1	CO3
	b)	How are association rules generated from frequent itemsets? Illustrate.	8 Marks	L3	CO3

(OR)

7.	a)	What are the different dimensionality reduction techniques, and how do they work?	8 Marks	L2	CO3
	b)	What is the role of candidate generation in the Apriori algorithm?	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain in detail about Attribute Selection methods in Classification	8 Marks	L3	CO4
	b)	Define Clustering. Explain about Types of Data in Cluster Analysis?	8 Marks	L3	CO4

(OR)

9.	a)	Write and explain about Classification by Back propagation Algorithm	8 Marks	L3	CO4
	b)	Write K-means clustering algorithm.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain the process and techniques used for mining web page layout structures.	8 Marks	L3	CO5
	b)	Define web usage mining and explain its objectives in detail.	8 Marks	L3	CO5

(OR)

11.	a)	Describe the process of text mining, including text data analysis and informational retrieval.	8 Marks	L3	CO5
	b)	Describe the role of data mining in the retail industry. How does it help in understanding consumer behavior and sales patterns?	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc V Semester (MBU-22) Supplementary Examinations, March – 2026

GROUP THEORY

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Monoid.	2 Marks	L1	CO1
	b)	If every element of group G is its own inverse, prove that G is abelian.	2 Marks	L2	CO1
	c)	State Lagrange's theorem.	2 Marks	L1	CO2
	d)	If H is any subgroup of a group G then show that $H^{-1} = H$.	2 Marks	L2	CO2
	e)	Define Quotient Group.	2 Marks	L1	CO3
	f)	If H is a normal subgroup of a finite group G, then show that $O\left(\frac{G}{H}\right) = \frac{O(G)}{O(H)}$.	2 Marks	L2	CO3
	g)	Define Epimorphism	2 Marks	L1	CO4
	h)	Define Endomorphism.	2 Marks	L1	CO4
	i)	Find the inverse of the permutation $f = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 3 & 4 & 5 & 6 & 1 & 2 \end{pmatrix}$.	2 Marks	L1	CO5
	j)	If a is generator of a cyclic group then show that a^{-1} is also generator of G.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Prove that $G = \{a + b\sqrt{2} : a, b \in Q\}$ is a commutative group under addition.	8 Marks	L4	CO1
	b)	Construct the composition table for cube roots of unity under multiplication.	8 Marks	L3	CO1

(OR)

3.	a)	Prove that the set Z of all integers form an abelian group with respect to the operations defined by $a * b = a + b + 1$, for all $a, b \in Z$.	8 Marks	L4	CO1
	b)	Find the order of each element of the group $(G = \{0,1,2,3,4,5\}, \oplus_6)$.	8 Marks	L2	CO1

MODULE-II

4.	a)	Show that $H_1 \cup H_2$ is a subgroup of G if and only if $H_1 \subseteq H_2$ or $H_2 \subseteq H_1$, where H_1, H_2 are two subgroups of G.	8 Marks	L2	CO2
	b)	If H is a subgroup of a group G, for $a, b \in G$ then show that the relation $a \equiv b(\bmod H)$ is an equivalence relation.	8 Marks	L2	CO2

(OR)

5.	a)	Let H be a subgroup of a group G and $a, b \in G$, then prove that $Ha = Hb \Leftrightarrow ab^{-1} \in H$.	8 Marks	L4	CO2
	b)	Show that the union of two subgroups of a group need not be a subgroup of the group.	8 Marks	L2	CO2

MODULE-III

6.	a)	Show that a sub group H of a group G is a normal subgroup of G iff each left coset of H in G is a right coset of H in G.	8 Marks	L2	CO3
	b)	If M,N are two normal subgroups of a G such that $M \cap N = \{e\}$, then every element M commutes With every element of N.	8 Marks	L2	CO3

(OR)

7.	a)	If G is a group and $a \in G$ then show that the normalizer $N(a)$ of a in G is a subgroup of G.	8 Marks	L2	CO3
	b)	If H_1, H_2 are normal subgroups of G, then show that $H_1.H_2$ is also a normal subgroup of G.	8 Marks	L2	CO3

MODULE-IV

8.	a)	If $f: G \to G'$ is a group homomorphism and e, e' are identity elements in G and G' respectively then show that $f(e) = e'$.	8 Marks	L2	CO4
	b)	The necessary and sufficient condition for a homomorphism f of a group G onto a group G' either kernel K to be an isomorphism of G into G' is that $K = \{e\}$.	8 Marks	L4	CO4

(OR)

9.	a)	Let a be affixed element of a group G then show that the mapping $f_a : G \to G$ defined by $f_a(x) = a^{-1}xa$ fro every $x \in G$, is an automorphism of G.	8 Marks	L2	CO4
	b)	Show that kernel of a homomorphism is a normal subgroup of G.	8 Marks	L2	CO4

MODULE-V

10.	a)	If $f = (2\ 3\ 6), g = (1\ 4\ 6)$ then find $f.g,\ g.f$.	8 Marks	L1	CO5
	b)	Show that every permutation can be uniquely expressed as a product of disjoint cycles.	8 Marks	L2	CO5

(OR)

11.	a)	Show that every subgroup of a cyclic group is a normal subgroup.	8 Marks	L2	CO5
	b)	Prove that the order of a cyclic group is equal to the order of it's generator.	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc V Semester (MBU-22) Supplementary Examinations, March – 2026

LINEAR ALGEBRA

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Find the rank of the matrix $A = \begin{bmatrix} 1 & 0 & 1 \\ 1 & 3 & 3 \\ 3 & 3 & 4 \end{bmatrix}$.	2 Marks	L1	CO1
	b)	Define Echelon form.	2 Marks	L1	CO1
	c)	Define vector subspace.	2 Marks	L1	CO2
	d)	Define linearly independent set of vectors.	2 Marks	L1	CO2
	e)	Write the standard basis of $R^3(R)$ and $R^2(R)$.	2 Marks	L1	CO3
	f)	Define dimension of a vector space.	2 Marks	L1	CO3
	g)	Define range of a linear transformation.	2 Marks	L1	CO3
	h)	Write an example which is not a linear transformation.	2 Marks	L1	CO3
	i)	Calculate the norm of the vector (2,0,-1).	2 Marks	L1	CO4
	j)	Define orthogonal.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Find the rank of matrix $A = \begin{bmatrix} -1 & 2 & -1 & -2 \\ -2 & 5 & 3 & 0 \\ 1 & 0 & 1 & 10 \end{bmatrix}$ by reducing it into Echelon form.	8 Marks	L1	CO1
	b)	Solve the system of equations $x - y + z = 0, x + 2y + z = 0, 2x + y + 3z = 0$.	8 Marks	L3	CO1

(OR)

3.	Solve the equations by LU decomposition method $-3x + 12y - 6z = -33; x - 2y + 2z = 7; y + z = -1$	16 Marks	L3	CO1

MODULE-II

4.	a)	Show that the set of all $m \times n$ matrices forms a vector space with the usual operations matrix addition and matrix scalar multiplication.	8 Marks	L2	CO2
	b)	In vector space P_2, determine whether $r(x) = 1 - 4x + 6x^2$ is in span $(p(x), q(x))$, where $p(x) = 1 - x + x^2$ and $q(x) = 2 + x - 3x^2$.	8 Marks	L3	CO2

(OR)

5.	a)	Examine whether the set of vectors (1,3,2)(1,-7,-8),(2,1,-1) are linear independent or not.	8 Marks	L4	CO2
	b)	Is the set of all vectors in R^2 of the form $\begin{bmatrix} x \\ x \end{bmatrix}$ with usual definition of vector addition and scalar multiplication of vector space?	8 Marks	L2	CO2

MODULE-III

6.	a)	In vector space P_2, determine whether the set of vectors $B = \{1+x, 1+x^2, 1-x+x^2\}$ form a basis or not.	8 Marks	L3	CO3
	b)	State and prove basis extension theorem.	8 Marks	L1	CO3

(OR)

7.		Find the dimension of the vector space W of symmetric 2×2 matrices $\left\{ \begin{bmatrix} 1 & 0 \\ 0 & 0 \end{bmatrix}, \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}, \begin{bmatrix} 0 & 0 \\ 0 & 1 \end{bmatrix} \right\}$.	16 Marks	L1	CO3

MODULE-IV

8.		Define linear transformation $S: R^2 \to M_{22}$ and $T: R^2 \to R^2$ by $S\begin{bmatrix} a \\ b \end{bmatrix} = \begin{bmatrix} a+b & b \\ 0 & a-b \end{bmatrix}$ and $T\begin{bmatrix} c \\ d \end{bmatrix} = \begin{bmatrix} 2c+d \\ -d \end{bmatrix}$. Compute $(S \circ T)\begin{bmatrix} 2 \\ 1 \end{bmatrix}$ and $(S \circ T)\begin{bmatrix} x \\ y \end{bmatrix}$. Can you compute $(T \circ S)\begin{bmatrix} x \\ y \end{bmatrix}$? If so, Compute it.	16 Marks	L1	CO3

(OR)

9.	a)	Define $T: M_{nn} \to M_{nn}$ by $T(A) = A^T$. Show that T is a linear transformation.	8 Marks	L2	CO3
	b)	Define the following terms: i) Linear Transformation ii) Range of a linear transformation iii) Kernel of a transformation.	8 Marks	L1	CO3

MODULE-V

10.	a)	Consider the inner product space $C[0,1]$. Compute the following inner products: i) $\langle 1, x \rangle$ ii) $\langle 1, x^2 \rangle$.	8 Marks	L1	CO4
	b)	Prove that the set $S = \left\{ \left(\frac{1}{3}, -\frac{2}{3}, -\frac{2}{3}\right), \left(\frac{2}{3}, -\frac{1}{3}, \frac{2}{3}\right), \left(\frac{2}{3}, \frac{2}{3}, -\frac{1}{3}\right) \right\}$ is an orthonormal set in R^3 with standard inner product.	8 Marks	L5	CO4

(OR)

11.		Apply Gram-Schmidt process, obtain an orthonormal basis of $R^3(R)$ from the basis (2,1,3), (1,2,3),(1,1,1).	16 Marks	L1	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc V Semester (MBU-22) Supplementary Examinations, March – 2026

WEB TECHNOLOGIES

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define HTML.	2 Marks	L1	CO1
	b)	List any two tags in HTML.	2 Marks	L2	CO1
	c)	List any two difference between HTML and HTML5.	2 Marks	L2	CO2
	d)	Define Offline Web Applications	2 Marks	L1	CO2
	e)	Define CSS?	2 Marks	L1	CO3
	f)	Write syntax of CSS?	2 Marks	L1	CO3
	g)	List any four data types used in PHP.	2 Marks	L2	CO4
	h)	What are PHP functions? Write its syntax.	2 Marks	L1	CO4
	i)	What are cookies?	2 Marks	L1	CO5
	j)	What is a Prepared Statement in MySQL?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss different ways of organizing text in HTML with example.	8 Marks	L2	CO1
	b)	List and explain the tags used for formatting HTML documents with examples.	8 Marks	L2	CO1

(OR)

3.	a)	Explain about HTML multimedia tags and discuss different types in multimedia tags	8 Marks	L1	CO1
	b)	Discuss about different types of List.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the components of HTML5 Document Structure	8 Marks	L1	CO2
	b)	Explain the tags used to create editable content, check spelling mistakes with syntax and examples.	8 Marks	L2	CO2

(OR)

5.	a)	Discuss the procedure of creating desktop notifications in HTML5.	8 Marks	L2	CO2
	b)	Explain the offline web application and web communication.	8 Marks	L1	CO2

MODULE-III

6.	a)	What are style sheets? What are the components of a CSS Style?	8 Marks	L2	CO3
	b)	Discuss the merits and demerits of internal Style Sheets.	8 Marks	L3	CO3

(OR)

7.	a)	Discuss the working procedure of Browser and Document Objects in JavaScript.	8 Marks	L2	CO3
	b)	What is AJAX? How does it work? Create a web page communicates with a web server while a user type characters in an input field.	8 Marks	L2	CO3

MODULE-IV

8.	a)	What is PHP? Explain its syntax with example.	8 Marks	L2	CO4
	b)	List the data types of PHP and explain any two of them with example.	8 Marks	L2	CO4

(OR)

9.	a)	Discuss the procedure to create a database using PHP and MySQL.	8 Marks	L3	CO4
	b)	Write a note on Control Structures in PHP. Discuss different Data types of PHP.	8 Marks	L3	CO4

MODULE-V

10.	a)	What are cookies? Explain how cookies are Set, View, and Deleted?	8 Marks	L2	CO5
	b)	Discuss the procedure of creating a database in SQL console.	8 Marks	L3	CO5

(OR)

11.	a)	What are session variables? Explain how they are handled.	8 Marks	L2	CO5
	b)	Discuss the procedure to connect to a MySQL database with PHP.	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc V Semester (MBU-22) Supplementary Examinations, March – 2026

WORKING WITH A SINGLE DNA SEQUENCE

[Bioinformatics]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define Nucleotide sequence.	2 Marks	L1	CO1
	b)	Write about NCBI.	2 Marks	L1	CO1
	c)	What is ORFs?	2 Marks	L1	CO2
	d)	Write about BLAST.	2 Marks	L1	CO2
	e)	Write about MAFT.	2 Marks	L1	CO3
	f)	What is multiple sequence alignment?	2 Marks	L1	CO3
	g)	Write about Motif.	2 Marks	L1	CO4
	h)	What is MEME?	2 Marks	L1	CO4
	i)	Write about FISH.	2 Marks	L1	CO5
	j)	Write the radio labelled probe.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Identify the Bioinformatics tools for analysis of Sequences.	8 Marks	L2	CO1
	b)	Explain DNA sequences downloading and analysis.	8 Marks	L2	CO1
		(OR)			
3.	a)	Summarize Comparative Genomics.	8 Marks	L2	CO1
	b)	Identify the Genomic process for studying the functions.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain MEME and FIMO.	8 Marks	L2	CO2
	b)	Identify the methods for Variant calling and its analysis.	8 Marks	L2	CO2
		(OR)			
5.	a)	Summarize Regulatory regions of DNA and its identification tools.	8 Marks	L2	CO2
	b)	Explain the coding region.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain in detail steps to process the phylogenetic tree	8 Marks	L2	CO3
	b)	Summarize about rooted and unrooted phylogenetic methods to construct trees.	8 Marks	L2	CO3
		(OR)			
7.	a)	Explain in detail about Clustal Omega and MAFT.	8 Marks	L2	CO3
	b)	Describe the molecular clock dating .	8 Marks	L2	CO3

MODULE-IV

8.	a)	Summarize in detail about Motif discovery and analysis.	8 Marks	L2	CO4
	b)	Describe the prediction of RNA secondary structure.	8 Marks	L2	CO4

(OR)

9.	a)	Summarize detail about features of differential gene expression.	8 Marks	L6	CO4
	b)	Explain in detail about MEME.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain the process of BAC Libraries.	8 Marks	L2	CO5
	b)	Describe the steps involved in FISH.	8 Marks	L2	CO5

(OR)

11.	a)	Explain the about physical mapping methods.	8 Marks	L2	CO5
	b)	Compare and contrast the different coding sequence and non-coding sequences.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc V Semester (MBU-22) Supplementary Examinations, March – 2026

GENOMICS

[Biotechnology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Name one tool commonly used in genomics.	2 Marks	L1	CO1
	b)	What is a genome bank?	2 Marks	L1	CO1
	c)	How does shot-gun sequencing work?	2 Marks	L1	CO2
	d)	What is gene knock-in?	2 Marks	L1	CO2
	e)	What is BLAST used for in bioinformatics?	2 Marks	L1	CO3
	f)	What is the purpose of the FASTA format?	2 Marks	L1	CO3
	g)	What are the main steps in metagenome analysis?	2 Marks	L1	CO4
	h)	What role do microbes play in human health?	2 Marks	L1	CO4
	i)	What is spatial variation in genetics	2 Marks	L1	CO5
	j)	What is genetic drift?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe the process of creating and utilizing transgenes in genetic research.	8 Marks	L2	CO1
	b)	How has the field of genomics evolved over time, and what are its future prospects?	8 Marks	L1	CO1

(OR)

3.	a)	What role does bioinformatics play in analyzing genomic data?	9 Marks	L1	CO1
	b)	Discuss the ethical considerations associated with genomic research and genome editing.	7 Marks	L2	CO1

MODULE-II

4.	a)	Describe the process and applications of gene knock-in techniques in genetic engineering.	8 Marks	L2	CO2
	b)	What is gene knock-out, and how is it used to study gene function?	8 Marks	L1	CO2

(OR)

5.	a)	Discuss the concept of gene therapy and its potential in treating genetic disorders.	9 Marks	L2	CO2
	b)	How did the Human Genome Project change our understanding of genetic diseases?	7 Marks	L1	CO2

MODULE-III

6.	a)	Describe the BLAST tool and its applications in sequence alignment and similarity searches.	8 Marks	L2	CO3
	b)	Explain the purpose and functionality of the FASTA format in bioinformatics.	8 Marks	L2	CO3

(OR)

7.	a)	What are repeatable elements in the genome, and how do they affect genome structure and function?	9 Marks	L1	CO3
	b)	Outline the steps involved in BAC library construction and its use in genome mapping.	7 Marks	L1	CO3

MODULE-IV

8.	a)	How do variations in gut microflora composition affect metabolic processes and immune response?	7 Marks	L1	CO4
	b)	What are the ethical considerations and challenges associated with metagenomics research?	9 Marks	L1	CO4

(OR)

9.	a)	Describe how metagenomics is used to study environmental microbial communities in soil, water, and air.	8 Marks	L2	CO4
	b)	What computational tools are commonly employed for metagenome assembly and analysis?	8 Marks	L1	CO4

MODULE-V

10.	a)	What are the limitations of the McDonald-Kreitman test in differentiating between neutral and adaptive evolution?	7 Marks	L1	CO5
	b)	How do recombination hotspots influence genetic diversity and linkage disequilibrium within populations?	9 Marks	L1	CO5

(OR)

11.	a)	Discuss the relationship between spatial variation and environmental adaptation in populations.	8 Marks	L2	CO5
	b)	What is the significance of temporal variation in monitoring changes in genetic diversity over time?	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc V Semester (MBU-22) Supplementary Examinations, March – 2026

ORGANIC FUNCTIONAL GROUPS

[Biotechnology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is nucleophilic substitution reaction?	2 Marks	L1	CO1
	b)	Define Nucleophile.	2 Marks	L1	CO1
	c)	Write the coupling reaction with phenol.	2 Marks	L1	CO1
	d)	Explain Nitrosation of phenol.	2 Marks	L1	CO1
	e)	What are cyclic ethers?	2 Marks	L1	CO1
	f)	Name two epoxides.	2 Marks	L1	CO1
	g)	Define addition reaction.	2 Marks	L1	CO1
	h)	What is Oxidation?	2 Marks	L1	CO1
	i)	What is photochemistry?	2 Marks	L1	CO1
	j)	Explain Perkin reaction.	2 Marks	L1	CO1

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the nomenclature of aromatic halides.	8 Marks	L2	CO1
	b)	Compare SN_1 and SN_2 reactions.	8 Marks	L2	CO1
		(OR)			
3.	a)	Explain the methods of preparation of aromatic halides.	8 Marks	L2	CO1
	b)	Describe the preparation of alkyl halides : i) Hunds-Diecker method ii) Halogenation of alkanes iii) From alcohols iv) Hydrogen halides.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the preparation of phenols from i. diazonium salts ii. sulphonic acids.	8 Marks	L2	CO1
	b)	Discuss any two preparation methods of aliphatic alcohols and phenols.	8 Marks	L2	CO1
		(OR)			
5.	a)	Explain the reactions of phenol by i.Ether formation ii. Ester formation.	8 Marks	L2	CO1
	b)	Explain the reactions of phenol by i.Riemer-Tiemann reaction ii.Nitrosation.	8 Marks	L2	CO1

MODULE-III

6.	a)	Explain the common and IUPAC nomenclature of ethers.	8 Marks	L2	CO1
	b)	Define ethers. Explain the alkoxy mercuration.	8 Marks	L2	CO1
		(OR)			
7.	a)	Differentiate thermal and photochemical processes.	8 Marks	L2	CO1
	b)	Explain the chemical reactions of epoxides.	8 Marks	L2	CO1

MODULE-IV

8.	a)	Explain the classification of aldehydes and ketones.	8 Marks	L2	CO1
	b)	Discuss: i) Cannizaro reaction ii) Aldol condensation.	8 Marks	L2	CO1
		(OR)			
9.	a)	Explain the reactivity of aldehydes and ketones.	8 Marks	L2	CO1
	b)	Discuss the preparative methods of ketones.	8 Marks	L2	CO1

MODULE-V

10.	a)	Explain: i) Claisen reaction ii) Wittig reaction.	8 Marks	L2	CO2
	b)	Explain: i) Cannizarro reaction ii) Reformatsky reaction.	8 Marks	L2	CO2
		(OR)			
11.	a)	Explain i.Perkin reaction ii. Knoevenagel reaction.	8 Marks	L2	CO2
	b)	Discuss any four reduction reactions of carbonyl compounds.	8 Marks	L2	CO2

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc V Semester (MBU-22) Supplementary Examinations, March – 2026

ENZYMOLOGY

[Microbiology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Active site	2 Marks	L2	CO1
	b)	Define Zymogen	2 Marks	L3	CO1
	c)	Draw the plot of effect of temperature on enzyme activity	2 Marks	L1	CO2
	d)	Explain the effect of pH on enzyme activity in brief	2 Marks	L2	CO2
	e)	Write definition to inhibitor	2 Marks	L3	CO3
	f)	Define reversible inhibition	2 Marks	L2	CO3
	g)	Give examples of enzymes that show acid base catalysis	2 Marks	L1	CO4
	h)	What is the mechanism of proximity and orientation catalysis in an enzyme	2 Marks	L2	CO4
	i)	Give examples of serine proteases	2 Marks	L3	CO5
	j)	Give examples of Isozymes	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the nomenclture and classification of enzymes according to IUB.	8 Marks	L2	CO1
	b)	Explain Zymogen activation in detail.	8 Marks	L3	CO1

(OR)

3.	a)	Write the definitions of Apoenzyme , Coenzyme , Cofactor and Holoenzyme.	8 Marks	L3	CO1
	b)	Explain the enzyme units in detail.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the factors affecting the enzyme activity in detail.	8 Marks	L3	CO2
	b)	Derive the equation of Michaelis - Menten for uni substrate reaction.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the effect of temperature and pH on enzyme activity and add a note on optimal temperature and optimal pH.	8 Marks	L2	CO2
	b)	Explain the effect of substrate concentration and enzyme concentration of enzyme.	8 Marks	L3	CO2

MODULE-III

6.	a)	Define Inhibitor. Explain different types of inhibition in detail.	10 Marks	L2	CO3
	b)	List out differences between Reversible and Irreversible inhibition in detail.	6 Marks	L3	CO3

(OR)

7.	a)	Explain Competitive inhibition and Non competitive inhibition in detail.	10 Marks	L2	CO3
	b)	Explain the uncompetitive inhibition and draw the Line weaver burk plot for uncompetitive inhibition.	6 Marks	L3	CO3

MODULE-IV

8.	a)	Explain the mechanism of General acid- base catalysis in detail.	8 Marks	L2	CO4
	b)	Explain Covalent catalysis in detail.	8 Marks	L3	CO4

(OR)

9.	a)	Explain Metal ion catalysis in detail.	10 Marks	L2	CO4
	b)	Explain the catalysis of enzyme by proximity and orientation in detail.	6 Marks	L3	CO4

MODULE-V

10.	a)	Explain mechanism of reaction catalysed by Chymotrypsin in detail.	8 Marks	L2	CO5
	b)	Explain mechanism of coenzyme Biotin in the reaction in detail	8 Marks	L3	CO5

(OR)

11.	a)	Explain the mechanism of Coenzyme A in the catalysis in detail	8 Marks	L3	CO5
	b)	Explain in detail about coenzyme Thiamine pyrophosphate mechanism in the enzyme	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc V Semester (MBU-22) Supplementary Examinations, March – 2026

ENZYMOLOGY

[Bioinformatics]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Apoenzyme.	2 Marks	L2	CO1
	b)	Define Zymogen.	2 Marks	L3	CO1
	c)	Write equation of Michaelis menten for uni substrate reactions.	2 Marks	L1	CO2
	d)	Write the significance of Km.	2 Marks	L2	CO2
	e)	Define Irreversible Inhibition.	2 Marks	L3	CO3
	f)	Write definition to inhibitor.	2 Marks	L2	CO3
	g)	Explain relation of Km and Vmax in michaelis menten equation.	2 Marks	L1	CO4
	h)	Give examples of Bisubstrate reaction.	2 Marks	L2	CO4
	i)	Give examples of Isozymes.	2 Marks	L3	CO5
	j)	Define Isozyme.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the nomenclture and classification of enzymes according to IUB.	8 Marks	L2	CO1
	b)	Explain Specific activity and catalytic efficiency and add a note on Kcat/Km.	8 Marks	L3	CO1

(OR)

3.	a)	Explain Enzyme units and Katal and the relationship between Katal and enzyme units.	8 Marks	L3	CO1
	b)	Explain Holoenzyme and Apoenzyme with examples	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the factors affecting the enzyme activity in detail.	8 Marks	L3	CO2
	b)	Derive the equation of Michaelis - Menten for uni substrate reaction.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the significance of the Km and Kcat/Km.	8 Marks	L2	CO2
	b)	Explain the effect of substrate concentration and enzyme concentration of enzyme.	8 Marks	L3	CO2

MODULE-III

6.	a)	List out differences between Reversible and Irreversible inhibition in detail.	10 Marks	L2	CO3
	b)	Define Inhibitor. Explain different types of inhibition in detail	6 Marks	L3	CO3

(OR)

7.	a)	Explain Competitive inhibition and Non competitive inhibition in detail.	10 Marks	L2	CO3
	b)	Explain the uncompetitive inhibition and draw the Line weaver burk plot for uncompetitive inhibition.	6 Marks	L3	CO3

MODULE-IV

8.	a)	Explain the mechanism of General acid- base catalysis in detail.	8 Marks	L2	CO4
	b)	Explain Covalent catalysis in detail.	8 Marks	L3	CO4

(OR)

9.	a)	Explain Metal ion catalysis in detail.	10 Marks	L2	CO4
	b)	Explain about Electrostatic catalysis in detail.	6 Marks	L3	CO4

MODULE-V

10.	a)	Explain the mechanism of reaction catalysed by Carboxy peptidase in detail.	8 Marks	L2	CO5
	b)	Explain the mechanism of FAD/FMN in an enzyme catalysed reaction in detail.	8 Marks	L3	CO5

(OR)

11.	a)	Explain aboutIsozymes in detail.	8 Marks	L3	CO5
	b)	Explain aboutSerine Proteases in detail.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc V Semester (MBU-22) Supplementary Examinations, March – 2026

MOLECULAR BIOLOGY

[Bioinformatics]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is chromatin?	2 Marks	L1	CO1
	b)	What are structural genes?	2 Marks	L1	CO1
	c)	What is the role of OriC in DNA replication?	2 Marks	L1	CO2
	d)	What are Okazaki fragments?	2 Marks	L1	CO2
	e)	What is 5' capping, and why is it important?	2 Marks	L1	CO3
	f)	What is polyadenylation?	2 Marks	L1	CO3
	g)	What is a translational inhibitor?	2 Marks	L1	CO4
	h)	What is glycosylation in post-translational modification?	2 Marks	L1	CO4
	i)	What are somatic mutations?	2 Marks	L1	CO5
	j)	Define germinal mutations.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the organization of DNA in eukaryotic cells, including chromatin structure.	7 Marks	L2	CO1
	b)	Compare and contrast the structure of prokaryotic and eukaryotic chromosomes.	9 Marks	L2	CO1

(OR)

3.	a)	Discuss the roles of DNA and RNA as genetic materials.	10 Marks	L2	CO1
	b)	Explain the experiments that demonstrated DNA as the genetic material.	6 Marks	L2	CO1

MODULE-II

4.	a)	Explain the interaction between DNA polymerase III and the ter sequence during replication termination.	8 Marks	L2	CO2
	b)	Describe the functions of DNA polymerases in DNA replication.	8 Marks	L2	CO2

(OR)

5.	a)	Discuss the role of DNA ligase in the replication process.	9 Marks	L2	CO2
	b)	Explain the function of primase in DNA replication.	7 Marks	L2	CO2

MODULE-III

6.	a)	Explain the significance of post-transcriptional modifications in eukaryotic mRNA.	8 Marks	L2	CO3
	b)	Discuss the process and purpose of 5' capping in mRNA.	8 Marks	L2	CO3

(OR)

7.	a)	Explain polyadenylation and its role in mRNA stability and export.	10 Marks	L2	CO3
	b)	Describe the splicing process and the role of spliceosomes in eukaryotic cells.	6 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss the role of phosphorylation as a post-translational modification.	9 Marks	L2	CO4
	b)	Explain the operon concept in bacterial gene regulation.	7 Marks	L2	CO4

(OR)

9.	a)	Describe the negative control mechanism of the Lac Operon.	8 Marks	L2	CO4
	b)	Discuss the positive control mechanism of the Lac Operon.	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss the effects of inversions on chromosome structure and gene expression.	8 Marks	L2	CO5
	b)	Explain the occurrence and impact of tandem duplications in chromosomes.	8 Marks	L2	CO5

(OR)

11.	a)	Describe the role of insertions in causing genetic mutations.	10 Marks	L2	CO5
	b)	Discuss the causes and consequences of spontaneous mutations in the genome.	6 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc V Semester (MBU-22) Supplementary Examinations, March – 2026

MICROBIAL PHYSIOLOGY AND METABOLISM

[Biotechnology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Compare Photolithotroph with Chemolithotroph	2 Marks	L2	CO1
	b)	Define chemotroph	2 Marks	L3	CO1
	c)	What is primary active transport and list out one example?	2 Marks	L1	CO2
	d)	Compare Passive diffusion with facilitative diffusion	2 Marks	L2	CO2
	e)	Define Anaplerotic reactions	2 Marks	L3	CO3
	f)	Give Key regulatory enzymes of TCA cycle	2 Marks	L2	CO3
	g)	Denitrification	2 Marks	L1	CO4
	h)	What is fermentative nitrate reduction	2 Marks	L2	CO4
	i)	Define chemolithotrophy	2 Marks	L3	CO5
	j)	Give examples of bacteria that perform Anoxygenic photosynthesis	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	What is Plasmolysis and give a detail note on it?	8 Marks	L2	CO1
	b)	Discuss Continous culture with suitable methods of maintaining continous cultures in laboratory	8 Marks	L3	CO1

(OR)

3.	a)	Explain pH and pH ranges of growth in detail	8 Marks	L3	CO1
	b)	Discuss effect of Oxygen concentration on microbes	8 Marks	L2	CO1

MODULE-II

4.	a)	Discuss the mechanism of Na+/K+ pump in detail	8 Marks	L3	CO2
	b)	Explain the Differences between Primary and secondary active transport with an example	8 Marks	L2	CO2

(OR)

5.	a)	What is symport ? Explain in detail with Na+/Glucose transport as an example	8 Marks	L2	CO2
	b)	Compare symport and antiport with suitable example	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain EMP pathway and mention the regulatory enzymes of the pathway	10 Marks	L2	CO3
	b)	Explain TCA cycle in detail	6 Marks	L3	CO3

(OR)

7.	a)	Compare mitochondrial ETC in eukaryotes with bacterial ETC	10 Marks	L2	CO3
	b)	Explain differences between Uncouplers and Inhibitors and give examples	6 Marks	L3	CO3

MODULE-IV

8.	a)	Explain Dissimilatory nitrate reduction in detail	8 Marks	L2	CO4
	b)	Explain reactions of Nitrate/Nitrite Respiration	8 Marks	L3	CO4

(OR)

9.	a)	Explain Homolactate fermentation in detail	10 Marks	L2	CO4
	b)	Explain the whole pathway of conversion of Nitrate to Ammonia in detail	6 Marks	L3	CO4

MODULE-V

10.	a)	Compare aerobic Chemolithotrophy with Anaerobic chemolithotrophy	8 Marks	L2	CO5
	b)	Explain Aerobic Chemolithotrophy with an example	8 Marks	L3	CO5

(OR)

11.	a)	Explain Oxygenic photosynthesis in detail	8 Marks	L3	CO5
	b)	Explain the differences between oxygenic and Anoxygenic photosynthesis	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

ORGANIC SYNTHESIS

[Organic Chemistry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What are organo boranes?	2 Marks	L1	CO1
	b)	Give any two examples of phosphorus reagents.	2 Marks	L1	CO1
	c)	Write the structure of stabilized and unstabilized sulfur ylide.	2 Marks	L1	CO2
	d)	Give any two examples of organosilicon reagents.	2 Marks	L1	CO2
	e)	What is quantum yield?	2 Marks	L1	CO3
	f)	Give an example of photosensitization reaction.	2 Marks	L1	CO3
	g)	Recall the various types of pericyclic reactions.	2 Marks	L1	CO4
	h)	What is Ene reaction?	2 Marks	L1	CO4
	i)	What is Cram's rule?	2 Marks	L1	CO5
	j)	List the types of stereo selective reactions.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	Discuss the synthetic applications of organoboranes.	16 Marks	L2	CO1
	(OR)			
3.	Explain the Wittig and Corey-Winter's olefination reaction with suitable examples.	16 Marks	L2	CO1

MODULE-II

4.	Explain Pommerer reaction and Julia reaction of sulphonyl carbanions with suitable examples.	16 Marks	L2	CO2
	(OR)			
5.	What are organosilicon reagents? Explain the preparation methods and influence of trialkyl silyl reagents in electrophilic reactions.	16 Marks	L2	CO2

MODULE-III

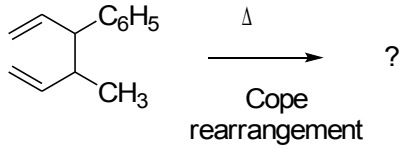
6.	Explain about Norrish type-I and Norrish type-II cleavages with suitable examples.	16 Marks	L2	CO3
	(OR)			
7. a)	Discuss photo-Fries rearrangement of phenyl esters with suitable examples.	8 Marks	L2	CO3
b)	Explain about Barton reaction with suitable examples.	8 Marks	L2	CO3

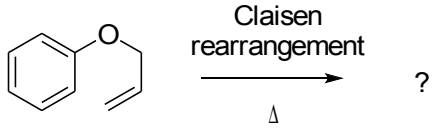
MODULE-IV

8.	Explain the frontier molecular orbital method for analysing an electrocyclic reaction by taking one example.	16 Marks	L2	CO4

(OR)

9. Identify the products and write the mechanism of the following reactions. 16 Marks L3 CO4

i) 

ii) 

MODULE-V

10. Discuss the various types of stratergies of asymmetric synthesis. 16 Marks L2 CO5

(OR)

11. Discuss the topocity and prochirality with suitable examples. 16 Marks L2 CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

ORGANIC SPECTROSCOPY AND ITS APPLICATIONS

[Organic Chemistry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Which type of electronic transition typically occurs at higher energy: $n \rightarrow \pi^*$ or $\pi \rightarrow \pi^*$? Give reason.	2 Marks	L1	CO1
	b)	What is the functional group responsible for the characteristic UV band around 270 nm?	2 Marks	L1	CO1
	c)	What region of the IR spectrum typically shows the C-H stretching vibrations for alkanes?	2 Marks	L1	CO2
	d)	Why a strong hydrogen bond weakens the O-H bond and affects its stretching frequency in an IR spectrum.	2 Marks	L1	CO2
	e)	What type of nuclei are typically NMR-active?	2 Marks	L1	CO3
	f)	Why a stronger magnetic field leads to higher resonance frequencies in NMR.	2 Marks	L1	CO3
	g)	Why is ^{13}C NMR less sensitive compared to ^{1}H NMR?	2 Marks	L1	CO4
	h)	Which functional group is expected to have the most deshielded ^{13}C nucleus?	2 Marks	L1	CO4
	i)	Define the term "metastable peak" in a mass spectrum.	2 Marks	L1	CO5
	j)	What information does the Nitrogen Rule provide about fragmentation patterns in mass spectrometry?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe the characteristic UV bands observed for the following functional groups: i) carbonyl compounds, ii) conjugated dienes, and iii) aromatic hydrocarbons. Explain the reason for the differences in their absorption wavelengths.	10 Marks	L2	CO1
	b)	Describe the types of transitions commonly observed in the UV and visible regions (185-800 nm).	6 Marks	L2	CO1

(OR)

3.	a)	Compare and contrast the UV spectra of an isolated carbonyl compound (C=O) and an α,β-unsaturated carbonyl compound. Explain the reason for the observed differences.	10 Marks	L2	CO1
	b)	Discuss the influence of solvent polarity on the absorption wavelength of a chromophore.	6 Marks	L2	CO1

MODULE-II

4.	a)	Briefly explain the origin of Overtones, Combination Bands, and Fermi Resonance each phenomenon and how they differ in terms of their appearance in an IR spectrum.	10 Marks	L2	CO2
	b)	Explain how IR spectroscopy can be used to identify the functional groups present in the molecule. Provide a step-by-step approach for interpreting the IR spectrum.	6 Marks	L3	CO2

(OR)

5.	a)	Describe the main components of a UV-Vis spectrophotometer and their functions.	10 Marks	L2	CO2
	b)	Identify the functional group(s) responsible for the following characteristic vibrational frequencies in an IR spectrum: i) Broad peak around 3300 cm^{-1}, ii) Sharp peak around 1700 cm^{-1}, iii) Two peaks around 1200-1300 cm^{-1}.	6 Marks	L2	CO2

MODULE-III

6.	a)	Explain the concept of nuclear spin and how it relates to the phenomenon of nuclear magnetic resonance in NMR spectroscopy.	8 Marks	L2	CO3
	b)	How do the electronic interactions between a nucleus and its surrounding electrons influence its chemical shift in an NMR spectrum?	8 Marks	L3	CO3

(OR)

7.	a)	Describe four main factors that can influence the chemical shift (δ) of a proton observed in an NMR spectrum.	8 Marks	L2	CO3
	b)	Explain the phenomenon of spin-spin interactions between neighboring nuclei in NMR spectroscopy.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Explain the concept of chemical shift (δ) in ^{13}C NMR and discuss main factors that influence the observed chemical shift of a carbon atom.	8 Marks	L2	CO4
	b)	Discuss the advantages and limitations of using ^{13}C NMR compared to ^{1}H NMR.	8 Marks	L2	CO4

(OR)

9.	a)	Describe the three main types of 13C NMR spectra and explain how they differ in terms of splitting patterns and information content.	10 Marks	L2	CO4
	b)	Describe two different types of DEPT experiments (e.g., DEPTQ, DEPT-135) and their specific functionalities.	6 Marks	L2	CO4

MODULE-V

10.	a)	Describe three common ionization techniques used in mass spectrometry (EI, CI, FAB) and explain the principles behind each method.	10 Marks	L2	CO5
	b)	Fragmentation patterns in mass spectrometry are influenced by several factors. Explain three key factors that affect how a molecule fragments in the mass spectrometer and how these factors contribute to the observed fragmentation pattern.	6 Marks	L1	CO5

(OR)

11.	a)	Explain the significance of the following peaks in a mass spectrum: i) Molecular Ion Peak (M+) ii) Base Peak iii) Metastable Peak	8 Marks	L4	CO5
	b)	Describe the McLafferty rearrangement, a specific fragmentation pathway observed in mass spectrometry.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

ECOLOGY

[Biotechnology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Environment	2 Marks	L1	CO1
	b)	Recall Pollution.	2 Marks	L1	CO1
	c)	Define Ecology.	2 Marks	L1	CO2
	d)	What are the different types of Ecosystems.	2 Marks	L1	CO2
	e)	Write about the regulation strategies of species.	2 Marks	L1	CO3
	f)	What do you mean by population ecology? Give a suitable example for the same.	2 Marks	L1	CO3
	g)	What is Ecological Succession?	2 Marks	L1	CO4
	h)	Point out about climax community. Give an example of the same.	2 Marks	L1	CO4
	i)	How to measure species diversity?	2 Marks	L1	CO5
	j)	Define diversity indices.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Environmental Science is a Multidisciplinary Science. Justify	12 Marks	L6	CO1
	b)	Outline the different types of Pollution.	4 Marks	L2	CO1

(OR)

3.	a)	Summarize the Global Environmental issues and discuss reasons.	12 Marks	L6	CO1
	b)	Give a brief note on Origin of species.	4 Marks	L2	CO1

MODULE-II

4.	a)	Explain different types of Ecosystems	10 Marks	L2	CO2
	b)	Summarize the ecological variables.	6 Marks	L2	CO2

(OR)

5.	a)	List the different types of Terrestrial ecosystems and explain atleast one in detail.	10 Marks	L2	CO2
	b)	Summarize Fresh water ecosystem.	6 Marks	L2	CO2

MODULE-III

6.	a)	Recall and analyze the concept of biological community, changes and interactions within community.	9 Marks	L4	CO3
	b)	How do different species employ regulation strategies for population control, and what are the implications.	7 Marks	L1	CO3

(OR)

7.	a)	Explain the measures used in population ecology and their	10 Marks	L2	CO3

		significance.			
	b)	How has the history of ecology shaped our current understanding of ecological concepts.	6 Marks	L2	CO3

MODULE-IV

8.	a)	Explain ecological succession and climax.	12 Marks	L2	CO4
	b)	What is Community? Summarize the community gradient.	4 Marks	L1	CO4
		(OR)			
9.	a)	Explain organization and interaction between species in ecosystem.	10 Marks	L2	CO4
	b)	Outline the characters of Community.	6 Marks	L2	CO4

MODULE-V

10.	a)	Discuss the Biodiversity indices.	10 Marks	L4	CO5
	b)	Summarize the Ecoinformatics.	6 Marks	L1	CO5
		(OR)			
11.	a)	Explain Biomass productivity and Estimation techniques.	12 Marks	L2	CO5
	b)	Outline the Biosystematics.	4 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

SOFTWARE TESTING AND QUALITY ASSURANCE

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is a primary goal of software testing?	2 Marks	L2	CO1
	b)	How can cognitive biases affect software testing?	2 Marks	L1	CO1
	c)	What is the primary purpose of Boundary Value Analysis in black box testing?	2 Marks	L1	CO2
	d)	Why is logic coverage important in white-box testing?	2 Marks	L1	CO2
	e)	Why is test planning an essential step in the software testing process?	2 Marks	L1	CO3
	f)	Name two elements typically included in a detailed test design.	2 Marks	L1	CO3
	g)	Name two key benefit of performing regression testing.	2 Marks	L2	CO4
	h)	What is meant by regression testability in software testing?	2 Marks	L1	CO4
	i)	How is software quality generally defined in software engineering?	2 Marks	L1	CO5
	j)	Why are software quality factors important in the development process?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.		Discuss and explain in detail about the various software testing methodologies with neat diagram.	16 Marks	L2	CO1

(OR)

3.	a)	Discuss the major phases of software testing evolution and explain how each phase has contributed to the current practices.	8 Marks	L2	CO1
	b)	List and explain four common myths about software testing?	8 Marks	L2	CO1

MODULE-II

4.	a)	Discuss the need of white box testing in software development. How does it contribute to the identification of defects compared to black box testing?	8 Marks	L2	CO2
	b)	List out the advantages and disadvantages of white box testing?	8 Marks	L1	CO2

(OR)

5.	a)	Explain the concept of equivalence class testing.	6 Marks	L2	CO2
	b)	How does equivalence class testing helps to reduce the number of test cases while ensuring comprehensive coverage?	10 Marks	L2	CO2

MODULE-III

6.		Define software metrics and discuss their importance in the software development lifecycle. Classify software metrics into different categories and explain each category with relevant examples.	16 Marks	L2	CO3

(OR)

7.	a)	Describe the purpose and structure of test specifications.	8 Marks	L2	CO3
	b)	How do test specifications help in the development of effective test cases, and what key information should they contain?	8 Marks	L1	CO3

MODULE-IV

8.		Analyze the costs associated with testing tools, including initial investment, maintenance, training, and potential return on investment (ROI). How can organizations effectively manage these costs?	16 Marks	L4	CO4

(OR)

9.	a)	Explain the reasons for automating software testing and the criteria for selecting appropriate testing tools.	8 Marks	L2	CO4
	b)	Discuss the benefits of automation and how they influence the selection process for testing tools.	8 Marks	L2	CO4

MODULE-V

10.	a)	Define a quality plan and outline its components. How does a well-structured quality plan contribute to achieving software quality goals throughout the project lifecycle?	8 Marks	L2	CO5
	b)	Identify and explain the key factors that contribute to software quality. Discuss how each factor influences the overall quality of the software product.	8 Marks	L3	CO5

(OR)

11.		Define Computer-Aided Software Engineering (CASE) tools and discuss their role in enhancing software quality assurance. What types of CASE tools are available, and how do they contribute to different phases of the software development life cycle?	16 Marks	L2	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

INFORMATION RETRIEVAL TECHNIQUES

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	How does an IRS differ from a DBMS?	2 Marks	L1	CO1
	b)	Explain the role of browse capabilities in an IRS.	2 Marks	L2	CO1
	c)	What is information extraction in the context of indexing?	2 Marks	L3	CO2
	d)	Explain the role of the PAT data structure in efficient information retrieval.	2 Marks	L2	CO2
	e)	Define vector weighting in the context of automatic indexing.	2 Marks	L3	CO2
	f)	What role does clustering play in organizing large document collections?	2 Marks	L1	CO3
	g)	How are similarity measures used to rank search results?	2 Marks	L3	CO4
	h)	How do cognition and perception influence information visualization design?	2 Marks	L1	CO4
	i)	What are the key components of software text search algorithms?	2 Marks	L2	CO5
	j)	Define recall in information system evaluation.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	What are data warehouses, and how do they relate to information retrieval systems?	8 Marks	L2	CO1
	b)	What are the key search capabilities of an IRS? Provide examples of each.	8 Marks	L2	CO1

(OR)

3.	a)	What is term masking in IRS? How does it differ from fuzzy searching?	8 Marks	L2	CO1
	b)	Explain browse capabilities in IRS. How do they complement traditional search features?	8 Marks	L3	CO1

MODULE-II

4.	a)	Discuss the challenges associated with automatic indexing and potential solutions to these challenges.	8 Marks	L3	CO2
	b)	Define a data structure and its importance in information retrieval systems.	8 Marks	L3	CO2

(OR)

5.	a)	What are N-Gram data structures, and how do they assist in information retrieval tasks?	8 Marks	L1	CO2
	b)	Explain the PAT data structure. What are its advantages and limitations in the context of information retrieval?	8 Marks	L1	CO2

MODULE-III

6.	a)	How does natural language processing contribute to automatic indexing? Provide examples of its application.	8 Marks	L2	CO3
	b)	Explain concept indexing. How does it differ from keyword-based indexing?	8 Marks	L2	CO3

(OR)

7.	a)	Explain the complete term relation method in automatic term clustering. How is it applied?	8 Marks	L3	CO3
	b)	Describe the process of clustering using existing clusters. What are its advantages and challenges?	8 Marks	L3	CO3

MODULE-IV

8.	a)	What is the role of ranking algorithms in modern search engines? Provide examples of popular ranking techniques.	8 Marks	L3	CO4
	b)	What is meant by User Search Techniques and Information Visualization?	8 Marks	L3	CO4

(OR)

9.	a)	What are some key technologies used in information visualization? Discuss their applications in various fields.	8 Marks	L3	CO4
	b)	Explain how information visualization can assist users in navigating complex search results or datasets.	8 Marks	L3	CO4

MODULE-V

10.	a)	Write in detail about Information System Evaluation	8 Marks	L3	CO5
	b)	What are the differences between software text search algorithms and hardware text search systems?	8 Marks	L2	CO5

(OR)

11.	a)	Provide an example of how system evaluation is conducted. What are the key steps involved?	8 Marks	L3	CO5
	b)	What are TREC results, and how are they used in the evaluation of information retrieval systems?	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

OBJECT ORIENTED MODELING AND DESIGN

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What are the four main principles of object-oriented programming (OOP)?	2 Marks	L1	CO1
	b)	Describe the role of class diagrams in object-oriented modeling. Explain the concept of an instance variable.	2 Marks	L2	CO1
	c)	Explain the role of abstraction in the conceptual model of UML.	2 Marks	L2	CO2
	d)	What role do interactions play in use case modeling?	2 Marks	L1	CO2
	e)	What is a multiplicity in a relationship?	2 Marks	L1	CO3
	f)	Give an example of a unary relationship.	2 Marks	L1	CO3
	g)	What is a callback mechanism in sequence diagrams?	2 Marks	L2	CO4
	h)	Define an activation bar in a sequence diagram.	2 Marks	L2	CO4
	i)	Explain the term 'artifact' in the context of deployment diagrams.	2 Marks	L2	CO5
	j)	Define a deployment diagram in the context of UML.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss the four core principles of object-oriented programming.	8 Marks	L2	CO1
	b)	Provide examples to illustrate how each principle contributes to effective object-oriented design.	8 Marks	L4	CO1

(OR)

3.	a)	Explain the importance of use case diagrams in the object-oriented design process. How do they help in identifying system requirements and defining the interactions between different objects?	10 Marks	L2	CO1
	b)	Provide examples of how use case diagrams can be used to model real-world scenarios.	6 Marks	L4	CO1

MODULE-II

4.	a)	Analyze the importance of having a conceptual model in UML. How does it help in organizing and simplifying the modeling process?	8 Marks	L2	CO2
	b)	Discuss the components of the conceptual model with examples.	8 Marks	L4	CO2

(OR)

5.	a)	Analyze the differences between interaction use cases and traditional use cases.	8 Marks	L4	CO2
	b)	How do interactions contribute to more detailed and dynamic behavioral modeling?	8 Marks	L1	CO2

MODULE-III

6.	a)	Discuss the role and structure of classes and relationships in UML. How do these elements contribute to the creation of a clear and organized model of a system?	8 Marks	L2	CO3
	b)	Explain the concept of relationships in UML, including examples of different types such as association, aggregation, and composition.	8 Marks	L2	CO3

(OR)

7.	a)	Discuss the significance of interfaces in UML. How do they support the design of flexible and maintainable systems?	8 Marks	L1	CO3
	b)	Compare and contrast class diagrams and object diagrams in UML. What are the key differences and similarities?	8 Marks	L5	CO3

MODULE-IV

8.		Analyze the differences between collaboration diagrams and sequence diagrams, focusing on how each represents the flow of interactions between objects with examples.	16 Marks	L4	CO4

(OR)

9.	a)	Examine the depiction of synchronous messages in sequence diagrams, including the use of priority and callback mechanisms?	8 Marks	L2	CO4
	b)	How do these elements affect the sequence and outcome of interactions?	8 Marks	L1	CO4

MODULE-V

10.	a)	Differentiate between processes and threads in behavioral modeling.	8 Marks	L4	CO5
	b)	Explain how state machines can be extended to model complex behaviors involving nested states and parallel activities?	8 Marks	L2	CO5

(OR)

11.		Describe the key concepts of component diagrams and explain their importance in software architectural design. Provide an example of a component diagram for a library management system, detailing the components and their interactions	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

OPERATION RESEARCH

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Write the mathematical formulation of LPP.	2 Marks	L1	CO1
	b)	Define objective function.	2 Marks	L1	CO1
	c)	Define transportation problem.	2 Marks	L1	CO2
	d)	Define assignment problem.	2 Marks	L1	CO2
	e)	Write the properties of a game.	2 Marks	L1	CO3
	f)	Write the characteristics of Game theory.	2 Marks	L1	CO3
	g)	Define spanning tree.	2 Marks	L1	CO4
	h)	Write the two differences between Kruskal's and Prim's algorithm.	2 Marks	L1	CO4
	i)	What are the characteristics of queueing?	2 Marks	L1	CO5
	j)	What are the assumptions of a single channel queue?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2. a) A factory manufactures two products A and B. To manufacture one unit of A, 1.5 machine hours and 2.5 labour hours are required. To manufacture product B, 2.5 machine hours and 1.5 labour hours are required. In a month, 300 machine hours and 240 labour hours are available. Profit per unit for A is Rs. 50 and for B is Rs. 40. Formulate as LPP. — 8 Marks, L1, CO1

b) By using graphical method, solve the following linear programming problem $\max(Z) = 3x_1 + 4x_2$ — 8 Marks, L3, CO1

Subject to the constraints $4x_1 + 2x_2 \le 80$

$2x_1 + 5x_2 \le 180 \quad x_1, x_2 \ge 0$

(OR)

3. By using simplex method, solve the following LPP — 16 Marks, L3, CO1

$\max(Z) = 12x_1 + 16x_2$

Subject to the constraint $10x_1 + 20x_2 \le 120$

$8x_1 + 8x_2 \le 80 \quad x_1, x_2 \ge 0$

MODULE-II

4. a) Explain in brief three methods of feasible solution of a transportation problem. 8 Marks L1 CO2

b) Determine an initial basic feasible solution to the following transportation problem by using North-West Corner rule. 8 Marks L3 CO2

A	B	C	D	Supply
3	1	7	4	300
2	6	5	9	400
8	3	3	2	500
250	350	400	200	

(OR)

5. A workshop contains four persons available for work on the four jobs. Only one person can work on any one job. The following table shows the cost of assignment each person to each job. The objective is to assign each person to jobs such that the total assignment cost is a minimum. 16 Marks L2 CO2

	1	2	3	4
A	20	25	22	28
B	15	18	23	17
C	19	17	21	24
D	25	23	24	24

MODULE-III

6. a) Explain briefly about payoff matrix. 6 Marks L1 CO3

b) Solve by graphical method $\begin{bmatrix} -2 & 0 \\ 3 & -1 \\ -3 & 2 \end{bmatrix}$. 10 Marks L3 CO3

(OR)

7. Find the optimum quantity for the following EOQ model 16 Marks L1 CO3

Annual Usage	500 Pieces
Cost per piece	Rs.100
Ordering Cost	Rs. 10 per order
Inventory holding Cost	20% of Average inventory

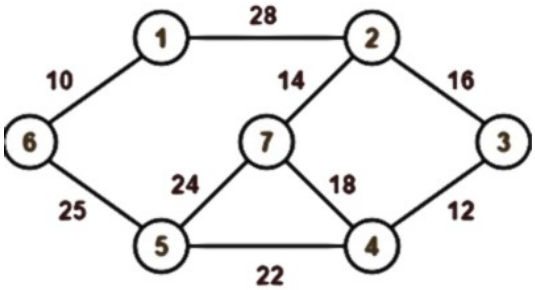
MODULE-IV

8. a) Explain Kruskal's algorithm with an example. 8 Marks L1 CO4

b) Explain Breadth First Search and Depth First Search algorithms to find a spanning tree 8 Marks L1 CO4

(OR)

9. Construct the minimum spanning tree for the given graph using Prim's algorithm 16 Marks L3 CO4



MODULE-V

10.		A bank plans to open a single server drive- in Banking facility at a certain centre. It is estimated that 20 customers will arrive each hour on average. If on average, it requires 2 minutes to process a customer's transaction, determine i) The proportion of time that the system will be idle ii) On the average, how long a customer will have to wait before reaching the server iii) The fraction of customers who will have to wait.	16 Marks	L3	CO5
		(OR)			
11.	a)	Customers arrive at a sales counter manned by a single person according to a Poisson process with mean rate of 20 per hour. The time required to serve a customer has an exponential distribution with a mean of 100 seconds. Find the average waiting time of the customer.	8 Marks	L1	CO5
	b)	Patients arrive at a clinic in a poisson manner at an average rate of 6 per hour. The doctor on average can attend to 8 patients per hour. Assuming that the service time distribution is exponential, find i) Average number of patients waiting in the queue. ii) Average time spent by a patient in the clinic.	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

INTERNET OF THINGS

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What are two key characteristics of IoT?	2 Marks	L1	CO1
	b)	Mention one advantage of using IoT in everyday life.	2 Marks	L2	CO1
	c)	State the data enrichment in the context of IoT.	2 Marks	L1	CO2
	d)	Mention the challenges related to communication technologies in IoT.	2 Marks	L2	CO2
	e)	Define what an API is in the context of IoT.	2 Marks	L1	CO3
	f)	Name the software development tools used for IoT.	2 Marks	L2	CO3
	g)	Explain the identity management in IoT.	2 Marks	L1	CO4
	h)	Mention the key vulnerabilities in IoT systems.	2 Marks	L2	CO4
	i)	List out the future trends in IoT applications.	2 Marks	L1	CO5
	j)	How does IoT support disaster management?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Identify and explain the major challenges faced by IoT implementations.	8 Marks	L2	CO1
	b)	Examine the privacy and security concerns in IoT systems and propose solutions to mitigate these issues.	8 Marks	L3	CO1

(OR)

3.	a)	Discuss the technological trends that have led to the development of IoT.	8 Marks	L2	CO1
	b)	Interpret the history of IoT and how it has evolved over the years.	8 Marks	L3	CO1

MODULE-II

4.	a)	Contrast the differences between various IoT communication protocols.	8 Marks	L2	CO2
	b)	Provide a comprehensive analysis of the data management challenges in IoT and propose strategies for effective data handling.	8 Marks	L3	CO2

(OR)

5.	a)	Explain the different layers of an IoT/M2M system and their functions.	8 Marks	L2	CO2
	b)	Analyse the importance of scalability and flexibility in IoT network design.	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain the process of developing user interfaces for IoT applications and the challenges involved.	8 Marks	L2	CO3
	b)	Illustrate the challenges of maintaining and updating IoT software in a rapidly evolving technological landscape.	8 Marks	L3	CO3
		(OR)			
7.	a)	Discuss the challenges involved in developing software for embedded IoT devices.	8 Marks	L2	CO3
	b)	Interpret the importance of web/cloud services in the development of IoT software.	8 Marks	L3	CO3
		MODULE-IV			
8.	a)	Explain the concept of non-repudiation in IoT security and its significance in secure communications.	8 Marks	L2	CO4
	b)	Provide a comprehensive analysis of the privacy challenges in IoT and propose solutions to enhance user privacy.	8 Marks	L3	CO4
		(OR)			
9.	a)	Describe the process of threat analysis for IoT systems and its significance.	8 Marks	L2	CO4
	b)	Interpret the concept of IoT security tomography and its application.	8 Marks	L3	CO4
		MODULE-V			
10.	a)	Analyze the impact of IoT on healthcare applications.	8 Marks	L3	CO5
	b)	Discuss the use of IoT in predictive maintenance for industrial applications.	8 Marks	L3	CO5
		(OR)			
11.	a)	Describe the application of IoT in smart lighting systems and its benefits.	8 Marks	L2	CO5
	b)	Interpret the role of IoT in enhancing home intrusion detection systems.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

PYTHON PROGRAMMIMG

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is the purpose of identifiers in Python?	2 Marks	L1	CO1
	b)	What are special symbols in Python? Give two examples.	2 Marks	L2	CO1
	c)	How does the continue statement affect loop execution?	2 Marks	L2	CO2
	d)	Explain the use of the pass statement in Python.	2 Marks	L2	CO2
	e)	What is the difference between a list and a tuple?	2 Marks	L2	CO2
	f)	How do you create a set in Python?	2 Marks	L1	CO3
	g)	Define a lambda function.	2 Marks	L2	CO4
	h)	What are Python generators? How do they differ from functions?	2 Marks	L1	CO4
	i)	What is the difference between single and multiple inheritance?	2 Marks	L2	CO5
	j)	Define an abstract class with an example.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	i)What are tokens in Python? List the types of tokens. ii) Differentiate between keywords and identifiers in Python.	8 Marks	L2	CO1
	b)	What are keywords in Python? Why can't they be used as identifiers and list 10 Python keywords and explain their purpose with an example	8 Marks	L2	CO1

(OR)

3.	a)	Write Python code to demonstrate arithmetic and logical expressions.	8 Marks	L3	CO1
	b)	What is type conversion in Python? Explain implicit and explicit conversions with example.	8 Marks	L3	CO1

MODULE-II

4.	a)	Write a Python program using an if-else statement to check if a number is even or odd.	8 Marks	L3	CO2
	b)	What is the purpose of the if-elif-else statement in Python? How is it different from if-else?	8 Marks	L2	CO2

(OR)

5.	a)	Write a Python program that demonstrates the use of the break statement in a loop.	8 Marks	L2	CO2
	b)	What is the continue statement in Python? How does it differ from the break statement?	8 Marks	L2	CO2

MODULE-III

6.	a)	What are nested lists in Python? Explian in detail with an example.	8 Marks	L2	CO3
	b)	Write a Python program to access elements from a nested list	8 Marks	L3	CO3
		(OR)			
7.	a)	Write a Python program to create a dictionary and add, update, and delete key-value pairs.	8 Marks	L3	CO3
	b)	Explain the usage of dictionary methods like get(), items(), keys(), values(), pop(), and popitem() with examples.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain variable lifetime in Python. How does it differ for local and global variables?	8 Marks	L2	CO4
	b)	What is the role of the return statement in Python functions? Can a function return multiple values?	8 Marks	L2	CO4
		(OR)			
9.	a)	Differentiate between text files and binary files. Give examples of each	8 Marks	L3	CO4
	b)	Explain how to open and close a file in Python. Provide the syntax for file operations.	8 Marks	L2	CO4

MODULE-V

10.	a)	What is the difference between instance variables and class variables with an example?	8 Marks	L2	CO5
	b)	Explain how constructors (__init__) work in Python. Write a Python program to demonstrate the use of a constructor.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain how abstract classes are implemented in Python using the abc module with an example.	8 Marks	L3	CO5
	b)	Write a Python program demonstrating the use of an abstract class.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

NoSQL DATABASES

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Impedance Mismatch.	2 Marks	L1	CO1
	b)	Explain Relations and Aggregates.	2 Marks	L1	CO1
	c)	What are different data distributed models?	2 Marks	L1	CO2
	d)	Define a quorum.	2 Marks	L2	CO2
	e)	What is incremental Map-Reduce?	2 Marks	L1	CO3
	f)	List the features of Key-Value Store.	2 Marks	L1	CO3
	g)	Describe the structure of a document in a document database.	2 Marks	L2	CO4
	h)	How do document databases benefit blogging platforms?	2 Marks	L1	CO4
	i)	What is the difference between a clustered and a non-clustered index?	2 Marks	L1	CO5
	j)	How does an index improve query performance in a database?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Differentiate between NOSQL and RDBMS.	8 Marks	L1	CO1
	b)	Explain Impedance Mismatch in detail with example.	8 Marks	L2	CO1

(OR)

3.		What are Aggregate Data Models? Explain Relations and Aggregates in detail with examples.	16 Marks	L2	CO1

MODULE-II

4.	a)	What is Peer to Peer replication? Write a short notes on Single server with an example.	8 Marks	L1	CO2
	b)	Explain the following: i) Relaxing Consistency ii) CAP Theorem iii) Relaxing Durability iv) Quorums	8 Marks	L2	CO2

(OR)

5.	a)	How can Version Stamps essential for ensuring update consistency on multiple nodes ,explain in detail?	8 Marks	L1	CO2
	b)	How do distributed systems ensure atomicity and isolation of transactions? Explain with detail description.	8 Marks	L2	CO2

MODULE-III

6.		Describe the basic Map-Reduce programming model. How do the "map" and "reduce" functions work together to process large datasets? Provide an example to illustrate the concept.	16 Marks	L2	CO3

(OR)

7.	a)	What are the strengths and weaknesses of data relationships?	8 Marks	L2	CO3
	b)	Explain the limitations of querying by data attributes in key-value stores.	8 Marks	L2	CO3

MODULE-IV

8.		Identify and explain the suitable use cases for document databases, including event logging, content management systems, blogging platforms, web analytics, real-time analytics, and e-commerce applications.	16 Marks	L1	CO4

(OR)

9.	a)	Analyze how a document database can be used to store and process real-time analytics data and explain in detail.	10 Marks	L2	CO4
	b)	What are the benefits and challenges of using a document database for real-time analytics ?	6 Marks	L2	CO4

MODULE-V

10.		Define Cluster. Compare and contrast the benefits and drawbacks of using clustered versus and non-clustered indexes in a relational database system. Provide examples to illustrate your points.	16 Marks	L2	CO5

(OR)

11.	a)	Discuss the importance of indexing and ordering in MongoDB for optimizing query performance.	8 Marks	L2	CO5
	b)	How do indexes affect the efficiency of sorting operations? Provide examples of how compound indexes can be used to improve query speed.	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

CHEMISTRY OF NATURAL PRODUCTS

[Organic Chemistry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is Zeisel method?	2 Marks	L1	CO1
	b)	What is isoprene rule? Explain with example.	2 Marks	L1	CO1
	c)	Define an alkaloid. Give an example.	2 Marks	L1	CO2
	d)	Give an example of isoquinoline alkaloid. Draw its structure.	2 Marks	L1	CO2
	e)	Explain isolation of cholesterol.	2 Marks	L1	CO3
	f)	List the colour reactions of cholesterol.	2 Marks	L1	CO3
	g)	Draw the structure of androsterone.	2 Marks	L1	CO4
	h)	Recall the isolation of hormones.	2 Marks	L1	CO4
	i)	List the general methods of structure determination of flavones.	2 Marks	L1	CO5
	j)	Write the structures of Apigenin and Kaempferol.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.		Discuss the structure determination and synthesis of Abietic acid	16 Marks	L2	CO1
		(OR)			
3.		Explain the structure determination and synthesis of Zingiberene.	16 Marks	L2	CO1

MODULE-II

4.		Discuss the structure determination of Reserpine.	16 Marks	L2	CO2
		(OR)			
5.		Explain the synthesis of morphine.	16 Marks	L2	CO2

MODULE-III

6.		Discuss the structure determination of cholesterol.	16 Marks	L2	CO3
		(OR)			
7.	a)	Explain the stereochemistry of steroids.	8 Marks	L2	CO3
	b)	Illustrate biosynthesis of steroids.	8 Marks	L2	CO3

MODULE-IV

8.		Explain the structure determination and synthesis of Testosterone.	16 Marks	L2	CO4
		(OR)			
9.		Discuss structure determination and synthesis of Progesterone.	16 Marks	L2	CO4

MODULE-V

10.		Explain the structure determination and synthesis of Quercetin.	16 Marks	L2	CO5
		(OR)			
11.	a)	Discuss biosynthesis of flavonoids and Isoflavonoids:acetate pathway and shikimic acid pathway.	8 Marks	L2	CO5
	b)	Explain any one method of synthesis of Diadzein.	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

NANO-BIOTECHNOLOGY

[Biotechnology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What are nanorobots?	2 Marks	L1	CO1
	b)	What is the history of nanobiotechnology?	2 Marks	L1	CO1
	c)	What are the principles behind UV spectroscopy?	2 Marks	L1	CO2
	d)	What is the application of atomic force microscopy?	2 Marks	L1	CO2
	e)	What are nanoarrays?	2 Marks	L1	CO3
	f)	Name three types of nanobiosensors.	2 Marks	L1	CO3
	g)	What is the application of nanotechnology in neurology?	2 Marks	L1	CO4
	h)	Define nanotechnology.	2 Marks	L1	CO4
	i)	How is eco-toxicity measured?	2 Marks	L1	CO5
	j)	What is involved in occupational risk assessment and management in nanotechnology?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Analyze the role of government funding, public-private partnerships, and international collaboration in advancing nanobiotechnology research, innovation, and commercialization	8 Marks	L4	CO1
	b)	Discuss the importance of education and public engagement in raising awareness about nanobiotechnology, fostering responsible innovation, and addressing public concerns and misconceptions	8 Marks	L2	CO1

(OR)

3.	a)	Explore the potential challenges and opportunities in scaling up nanobiotechnology production from laboratory-scale to industrial-scale manufacturing, including scalability, reproducibility, and cost-effectiveness.	9 Marks	L3	CO1
	b)	Discuss the future directions and emerging trends in nanobiotechnology research and applications, including advancements in nanomaterial design, fabrication techniques, and integration with other emerging technologies such as artificial intelligence and biotechnology	7 Marks	L2	CO1

MODULE-II

4.	a)	Explain the principle of atomic force microscopy (AFM) and its applications in imaging, surface topography analysis, and mechanical property characterization of nanomaterials at the atomic scale.	8 Marks	L2	CO2
	b)	Discuss the principle of dynamic light scattering (DLS) and its applications in measuring particle size, size distribution, and colloidal stability of nanomaterial suspensions in solution	8 Marks	L2	CO2
		(OR)			
5.	a)	Explore the principle of X-ray diffraction (XRD) and its applications in structural analysis, phase identification, and crystallinity determination of nanomaterials	9 Marks	L3	CO2
	b)	Discuss the challenges and opportunities in the characterization of nanomaterials using various spectroscopic and microscopy techniques, including sample preparation, instrument limitations, and data interpretation.	7 Marks	L2	CO2
		MODULE-III			
6.	a)	Discuss the applications of DNA-based nanostructures beyond DNAorigami, including DNA nanorods, DNA nanotubes, and DNA nanocages, in nanomedicine, biosensing, and molecular computing.	8 Marks	L2	CO3
	b)	Explore the potential of protein-based nanostructures as carriers for targeted drug delivery, including strategies for functionalization, surface modification, and controlled release of therapeutic payloads in cancer therapy and regenerative medicine	8 Marks	L3	CO3
		(OR)			
7.	a)	Analyze the design principles and engineering strategies for developing lipid-based nanostructures with enhanced stability, biocompatibility, and targeting specificity for applications in vaccine delivery, gene therapy, and immunotherapy.	9 Marks	L4	CO3
	b)	Explore the challenges and future directions in the development and commercialization of nanobiotechnologies for biomedical applications, including regulatory considerations, scalability, and clinical translation.	7 Marks	L3	CO3
		MODULE-IV			
8.	a)	Discuss the challenges and opportunities in using nanoparticles for targeted drug delivery in oncology, including tumor targeting strategies, nanoparticle stability in systemic circulation, and overcoming multidrug resistance mechanisms	8 Marks	L2	CO4
	b)	Analyze the applications of nanotechnology in neurology, including targeted drug delivery to the central nervous system, nanomaterial-based implants for neural regeneration, and nanotechnology-enabled diagnostics for neurodegenerative disorders	8 Marks	L4	CO4
		(OR)			
9.	a)	Evaluate the potential of DNA-based nanostructures for biomedical applications, including their programmability, biocompatibility, and self-assembly properties, and challenges in controlling structural stability and functional performance in physiological environments.	9 Marks	L4	CO4
	b)	Discuss the fabrication methods and applications of biomimetic metallic nanowires and networks, including DNA templating techniques, self-assembly processes, and potential applications in electronics, photonics, and sensing.	7 Marks	L2	CO4
		MODULE-V			
10.	a)	Discuss the challenges and opportunities in developing biocompatible	8 Marks	L2	CO5

		and eco-friendly nanomaterials for biomedical and environmental applications, including green synthesis methods, biodegradable nanomaterials, and sustainable manufacturing processes			
	b)	Evaluate the impact of nanotechnology on global health disparities and social justice, including access to nanomedicine, environmental justice issues, and equitable distribution of benefits and risks associated with nanotechnology.	8 Marks	L4	CO5
		(OR)			
11.	a)	Analyze the role of international collaboration and cooperation in addressing global challenges related to nanotoxicology, including harmonizing regulatory standards, sharing data and resources, and promoting responsible innovation and technology transfer	9 Marks	L4	CO5
	b)	Discuss the potential role of nanotechnology in addressing emerging environmental and public health threats, such as antibiotic resistance, emerging infectious diseases, and climate change, through innovative solutions and interventions	7 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

PLANT AND ANIMAL BIOTECHNOLOGY

[Biotechnology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is plant cell culture, and how is it used in biotechnology?	2 Marks	L1	CO1
	b)	Explain the concept of tissue engineering in plants.	2 Marks	L1	CO1
	c)	What is viral-mediated transformation, and what are its advantages and limitations?	2 Marks	L1	CO2
	d)	What is the CRISPR/Cas9 system, and how does it function in gene editing?	2 Marks	L1	CO2
	e)	What role do growth regulators play in plant cell culture?	2 Marks	L1	CO3
	f)	Why is sterilization essential in plant tissue culture?	2 Marks	L1	CO3
	g)	What are terminators, and how do they contribute to transgenic animal production?	2 Marks	L1	CO4
	h)	Give an example of a terminator sequence used in transgenic animal research.	2 Marks	L1	CO4
	i)	What are growth regulators, and how are they used in animal cell culture?	2 Marks	L1	CO5
	j)	Why is sterilization important in animal tissue culture?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss the ethical considerations surrounding the use of genetically modified crops in agriculture	8 Marks	L4	CO1
	b)	Explore the regulatory frameworks governing the development and deployment of genetically modified plants.	8 Marks	L5	CO1

(OR)

3.	a)	Compare and contrast traditional plant breeding methods with modern biotechnological approaches	8 Marks	L4	CO1
	b)	Evaluate the role of plant biotechnology in addressing global food security challenges	8 Marks	L5	CO1

MODULE-II

4.	a)	Explore the potential applications of synthetic biology in crop improvement, such as enhanced nutrient uptake and stress tolerance	8 Marks	L5	CO2
	b)	Evaluate the ethical implications of synthetic biology in plant biotechnology, including concerns about unintended consequences and environmental impacts.	8 Marks	L4	CO2

(OR)

5.	a)	Discuss the role of synthetic biology in developing sustainable agricultural practices and reducing the environmental footprint of crop production.	8 Marks	L2	CO2
	b)	Examine the challenges associated with scaling up synthetic biology approaches for commercialization in plant biotechnology	8 Marks	L6	CO2

MODULE-III

6.	a)	Evaluate the potential of plant cell culture in conserving endangered plant species and preserving genetic diversity.	8 Marks	L4	CO3
	b)	Examine the role of bioreactors in scaling up plant cell culture for commercial production of secondary metabolites	8 Marks	L2	CO3

(OR)

7.	a)	Discuss the challenges associated with optimizing culture conditions for maximum secondary metabolite production.	8 Marks	L4	CO3
	b)	Explore the potential of genetic engineering techniques in enhancing secondary metabolite production in plant cell culture	8 Marks	L6	CO3

MODULE-IV

8.	a)	Discuss the regulatory frameworks governing the creation and use of transgenic animals in agriculture, medicine, and environmental protection.	8 Marks	L5	CO4
	b)	Analyze the economic implications of utilizing transgenic animals in agriculture and pharmaceutical production.	8 Marks	L2	CO4

(OR)

9.	a)	Evaluate the safety concerns associated with consuming products derived from transgenic animals and the measures in place to address them.	8 Marks	L5	CO4
	b)	Explore the challenges and limitations of transgenic animal research and production, including technical hurdles and public perception.	8 Marks	L4	CO4

MODULE-V

10.	a)	Examine the concept of "bioprospecting" and its ethical considerations in the search for novel secondary metabolites from plant and animal sources.	8 Marks	L4	CO5
	b)	Discuss the role of intellectual property rights and patents in plant and animal biotechnology and their impact on access to genetic resources and technologies	8 Marks	L4	CO5

(OR)

11.	a)	Explore the ethical challenges associated with the commercialization of biotechnology products, including considerations of equity, access, and distribution.	8 Marks	L4	CO5
	b)	Discuss the potential for using plant and animal biotechnology to address global challenges, such as food security, environmental sustainability, and human health.	8 Marks	L5	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

PHARMACEUTICAL BIOTECHNOLOGY

[Biotechnology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What are regulatory considerations in pharmaceutical biotechnology?	2 Marks	L1	CO1
	b)	Define enzyme immobilization.	2 Marks	L1	CO1
	c)	What is rational drug design?	2 Marks	L1	CO2
	d)	Explain the purpose of preclinical development studies.	2 Marks	L2	CO2
	e)	Name a commonly used fermentation technology in biopharmaceutical production.	2 Marks	L1	CO3
	f)	What is the purpose of purification methods such as chromatography, filtration, and centrifugation?	2 Marks	L1	CO3
	g)	Give an example of a growth factor used in therapy.	2 Marks	L1	CO4
	h)	Explain the principle of recombinant DNA technology.	2 Marks	L2	CO4
	i)	What do ICH guidelines stand for?	2 Marks	L1	CO5
	j)	Define Good Manufacturing Practices (GMP) in biopharmaceutical production.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss the production process of amylase, including its sources, methods, and industrial applications.	8 Marks	L2	CO1
	b)	Explain the catalytic mechanism of catalase and its industrial uses.	8 Marks	L2	CO1

(OR)

3.	a)	Analyze the production of peroxidase and its applications in various industries.	9 Marks	L4	CO1
	b)	Elaborate on the production process of lipase and its significance in biotechnology.	7 Marks	L4	CO1

MODULE-II

4.	a)	Explain the differences between in vitro and in vivo studies in preclinical drug development, and discuss their complementary roles.	8 Marks	L2	CO2
	b)	Describe each phase of clinical trials in drug development, including objectives, study design, and key considerations.	8 Marks	L2	CO2

(OR)

5.	a)	Analyze the regulatory approval processes for new drugs, considering the roles of regulatory agencies and the criteria for approval.	9 Marks	L4	CO2

	b)	Explore the concept of personalized medicine and its potential applications in improving treatment outcomes and patient care.	7 Marks	L3	CO2

MODULE-III

6.	a)	Discuss the role of filtration and centrifugation in downstream processing of biologics, including their mechanisms of separation and applications in product recovery and purification.	8 Marks	L2	CO3
	b)	Explore the challenges and strategies involved in optimizing fermentation processes for biopharmaceutical production, including media optimization, process control, and metabolic engineering approaches.	8 Marks	L3	CO3

(OR)

7.	a)	Explore the challenges and strategies involved in optimizing fermentation processes for biopharmaceutical production, including media optimization, process control, and metabolic engineering approaches.	9 Marks	L3	CO3
	b)	Describe the fill-finish operations involved in the packaging of biopharmaceutical products, including vial filling, lyophilization, and labeling.	7 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss the role of immunology in vaccine design, including the immune response to vaccines, antigen selection, and formulation strategies to enhance immunogenicity and efficacy.	8 Marks	L2	CO4
	b)	Evaluate the importance of adjuvants in vaccine development, including their mechanisms of action, adjuvant selection criteria, and their role in enhancing vaccine potency and duration of immunity.	8 Marks	L4	CO4

(OR)

9.	a)	Explain the principles and applications of immuno blotting techniques, including ELISA, Western blotting, and Southern blotting, in protein detection, quantification, and characterization.	9 Marks	L2	CO4
	b)	Describe the steps involved in performing an ELISA assay, including antigen coating, antibody detection, and signal detection, and discuss its applications in clinical diagnostics and research	7 Marks	L2	CO4

MODULE-V

10.	a)	Explore the importance of intellectual property protection and patent considerations in biotechnology, including the patenting process, patent infringement issues, and strategies for protecting biopharmaceutical innovations.	8 Marks	L3	CO5
	b)	Discuss the regulatory pathways and considerations for the approval of biosimilars, including comparability assessments, clinical trials, and post-market monitoring, and their impact on the biopharmaceutical market.	8 Marks	L2	CO5

(OR)

11.	a)	Evaluate the potential benefits and challenges of biosimilars in expanding patient access to biologic therapies, reducing healthcare costs, and fostering competition in the biopharmaceutical market.	9 Marks	L4	CO5
	b)	Describe the principles and applications of gene therapies in treating genetic disorders, cancer, and other diseases, including gene delivery methods, gene editing technologies, and clinical trial considerations.	7 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

INTERMEDIARY METABOLISM

[Biotechnology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define Anabolism and Catabolism.	2 Marks	L1	CO1
	b)	Recall Oxidative Phosphorylation.	2 Marks	L1	CO1
	c)	What is Gluconeogenesis?	2 Marks	L1	CO2
	d)	List the disorders of Lactose metabolism.	2 Marks	L1	CO2
	e)	What is α-oxidation of fatty acids?	2 Marks	L1	CO3
	f)	List Ketone bodies.	2 Marks	L1	CO3
	g)	List the Oxalo acetate forming amino acids.	2 Marks	L1	CO4
	h)	What is Phenylketonuria?	2 Marks	L1	CO4
	i)	Recall Salvage reactions of Purine metabolism.	2 Marks	L1	CO5
	j)	What is Gout?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Illustrate the TCA cycle	12 Marks	L2	CO1
	b)	Show the regulatory steps in TCA cycle.	4 Marks	L2	CO1
		(OR)			
3.	a)	Explain the Glycolysis pathway.	12 Marks	L2	CO1
	b)	Identify the regulatory reactions of Glycolytic pathway.	4 Marks	L3	CO1

MODULE-II

4.	a)	Illustrate the Uronic acid pathway.	10 Marks	L2	CO2
	b)	Explain the futile cycles in Carbohydrate metabolism	6 Marks	L2	CO2
		(OR)			
5.	a)	Illustrate the Glyoxylate pathway.	8 Marks	L2	CO2
	b)	Explain Lactose intolerance.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the β-oxidation of fatty acids.	10 Marks	L2	CO3
	b)	Summarize the ATP's formed during the Palmitic acid oxidation.	6 Marks	L2	CO3
		(OR)			
7.	a)	Illustrate steps in the Cholesterol biosynthesis	12 Marks	L2	CO3
	b)	Interpret the derivatives of Cholesterol.	4 Marks	L2	CO3

MODULE-IV

8.	a)	Explain Krebs-Hanslet Urea cycle.	12 Marks	L2	CO4
	b)	List the Pyruvate forming amino acids.	4 Marks	L1	CO4
		(OR)			

9.	a)	Chorismate is the key intermediate in the Aromatic amino acid biosynthesis. Justify.	12 Marks	L2	CO4
	b)	Outline the phenyl alanine degradation pathway	4 Marks	L2	CO4

MODULE-V

10.	a)	Summarize how AMP and GMP are formed from Inosinate.	8 Marks	L2	CO5
	b)	Purine nucleotide synthesis is regulated by Feedback inhibition. Justify.	8 Marks	L5	CO5

(OR)

11.	a)	Summarize how Pyramidines are formed.	12 Marks	L2	CO5
	b)	Summarize the causes of Gout.	4 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

POLYMER CHEMISTRY

[Organic Chemistry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define the term addition polymerization	2 Marks	L1	CO1
	b)	What is the role of a catalyst in radical chain polymerization?	2 Marks	L1	CO1
	c)	What is the difference between number average molecular weight (Mn) and weight average molecular weight (Mw)?	2 Marks	L1	CO2
	d)	In one sentence, describe the principle behind using viscosity measurements to estimate a polymer's molecular weight.	2 Marks	L1	CO2
	e)	What is the key difference between suspension and emulsion polymerization?	2 Marks	L1	CO3
	f)	List two factors to consider when choosing between solution and interfacial polycondensation.	2 Marks	L1	CO3
	g)	Name one industrial application each for polyethylene (PE) and polyvinyl chloride (PVC).	2 Marks	L1	CO4
	h)	What functional group is present in nylon that contributes to its strength?	2 Marks	L1	CO4
	i)	Name one microorganism commonly used in the biodegradation process.	2 Marks	L1	CO5
	j)	Differentiate between natural and synthetic biodegradable polymers.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss the factors that influence the polymerization rate in radical chain polymerization anddiscuss how do initiator concentration, temperature, and solvent choice to impact the process.	10 Marks	L2	CO1
	b)	Discuss the importance of stereochemistry in polymer chemistry.	6 Marks	L2	CO1

(OR)

3.	a)	Explain the concept of tacticity in polymer chemistry. Provide examples of polymers with different levels of tacticity and discuss how it affects their properties.	12 Marks	L2	CO1
	b)	Discuss the advantages and limitations of radical chain polymerization.	4 Marks	L2	CO1

MODULE-II

4.	a)	Analyze how ultracentrifugation can be used to determine the molecular weight distribution of a polymer sample.	10 Marks	L2	CO2
	b)	Explain the significance of accurately determining the molecular weight of polymers in industries such as packaging, biomedical, and automotive.	6 Marks	L3	CO2

(OR)

5.	a)	Describe the principles of gel permeation chromatography (GPC) and how it is used for molecular weight analysis of polymers and analyze the advantages of GPC over other techniques for determining polymer molecular weights.	10 Marks	L2	CO2
	b)	Explain the principle of multi-angle light scattering (MALS) in polymer characterization.	6 Marks	L2	CO2

MODULE-III

6.	a)	State advantages and disadvantages of bulk polymerization.	8 Marks	L2	CO3
	b)	Briefly describe the concept of solid-state polymerization.	8 Marks	L3	CO3

(OR)

7.	a)	Describe the key difference between solution and melt polycondensation.	10 Marks	L2	CO3
	b)	Describe the role of a solvent in solution polymerization.	6 Marks	L1	CO3

MODULE-IV

8.	a)	List the differences of thermoplastics and thermosetting plastics.	8 Marks	L2	CO4
	b)	Provide examples and the structures of each of thermoplastics and thermosetting plastics.	8 Marks	L2	CO4

(OR)

9.	a)	Discuss the advantages of stereospecific polymers over non-stereospecific polymers.	10 Marks	L2	CO4
	b)	Briefly explain why different types of polymers are chosen for various applications.	6 Marks	L2	CO4

MODULE-V

10.	a)	Discuss the industrial applications of each, (i) Olefin polymers (ii) Diene polymers (iii) Nylons (iv) Glyptal resins (v) Urea-formaldehyde resins (vi) Phenol-formaldehyde resins (vii) Melamine resins (viii) Epoxy resins (ix) Ion exchange resins	12 Marks	L2	CO5
	b)	Explain the concept of stereospecificity in polymers.	4 Marks	L1	CO5

(OR)

11.	a)	Discuss two potential applications of conducting polymers.	8 Marks	L4	CO5
	b)	Explain advantages and disadvantages of using biodegradable polymers.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

NANOCHEMISTRY

[Organic Chemistry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	State nanomaterials in the present scenario.	2 Marks	L1	CO1
	b)	Define nanorods and mention any one example.	2 Marks	L1	CO1
	c)	What is bottom-up approach in nanomaterial synthesis?	2 Marks	L1	CO2
	d)	What is PVD in nanochemistry?	2 Marks	L2	CO2
	e)	Write your understanding on EDAX.	2 Marks	L1	CO3
	f)	What is the characterization of nanomaterial?	2 Marks	L2	CO3
	g)	What is matrix in nanocomposites?	2 Marks	L1	CO4
	h)	Define dentrimers.	2 Marks	L1	CO4
	i)	What is electrospun nano web?	2 Marks	L1	CO5
	j)	Mention the future of hydrogen storage cells.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Apply the ideas on the classification of nanomaterials.	8 Marks	L4	CO1
	b)	Evaluate the disadvantages of nanomaterials in the industrial application.	8 Marks	L4	CO1

(OR)

3.	a)	Evaluate the anomalous behavior of nanomaterials in the research field.	8 Marks	L4	CO1
	b)	Write the broad information on nanomaterials in the real life.	8 Marks	L4	CO1

MODULE-II

4.	a)	Explain the solid state reaction route technique of employed to prepare bulk polycrystalline materials.	8 Marks	L4	CO2
	b)	Discuss the principle and applications of sol gel method.	8 Marks	L4	CO2

(OR)

5.	a)	Define Electro deposition method and explain its principle.	8 Marks	L4	CO2
	b)	Describe about sol gel synthesis and hydrothermal growth.	8 Marks	L4	CO2

MODULE-III

6.		Write a detailed on the principle, instrumentation and utility of TEM in the characterization of nanomaterials.	16 Marks	L4	CO3

(OR)

7.		Explain the principle, instrumentation and utility of EDAX in the characterization of nanomaterials.	16 Marks	L4	CO3

MODULE-IV

8.	a)	Discuss the preparation and uses of polymer matrix nanocomposites.	8 Marks	L4	CO4
	b)	Analyze the comparison on metal matrix and ceramics matrix nanocomposites.	8 Marks	L4	CO4

(OR)

9.	a)	Discuss the preparation and uses of metal chalcogenides nanocomposites.	8 Marks	L4	CO4
	b)	Discuss the preparation and uses of dendrimers nanocomposites.	8 Marks	L4	CO4

MODULE-V

10.	a)	Discuss the applications of nanomaterial in hydrogen storage devices set up.	8 Marks	L4	CO5
	b)	Write the principle and working mechanism of piezoelectric nanomaterials.	8 Marks	L4	CO5

(OR)

11.	a)	Write the principle and working mechanism of hydrogen storage cell by using nanomaterials.	8 Marks	L4	CO5
	b)	Role of nanomaterials in water purification – Comment on it.	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

SEPARATION TECHNIQUES

[Organic Chemistry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Differentiate between partition coefficient (K) and resolution (Rs).	2 Marks	L1	CO1
	b)	Is a shorter or longer column preferable for achieving better resolution in chromatography?	2 Marks	L1	CO1
	c)	Briefly define the term "retardation factor" (Rf) in paper chromatography.	2 Marks	L1	CO2
	d)	Which factor would most significantly influence the Rf value of a component in paper chromatography?	2 Marks	L1	CO2
	e)	What is the stationary phase in normal-phase column chromatography?	2 Marks	L1	CO3
	f)	Is ion exchange chromatography a size-based or charge-based separation technique?	2 Marks	L1	CO3
	g)	What is the main advantage of thin-layer chromatography (TLC) over HPLC?	2 Marks	L1	CO4
	h)	What is the stationary phase in affinity chromatography, and how does it achieve selective separation?	2 Marks	L1	CO4
	i)	What is the main limitation of TLC compared to HPLC?	2 Marks	L1	CO5
	j)	What type of chromatography separates components based on their adsorption properties?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe the role of the stationary phase in chromatography. What are some desirable properties of a stationary phase?	8 Marks	L2	CO1
	b)	How can a scientist optimize the efficiency of a chromatographic separation? Discuss two strategies.	8 Marks	L2	CO1

(OR)

3.	a)	Briefly explain how detection methods are used in chromatography to identify and quantify separated components.	12 Marks	L2	CO1
	b)	Discuss the role of solvent selection in optimizing a chromatographic separation. What factors should be considered when choosing a solvent for the mobile phase?	4 Marks	L2	CO1

MODULE-II

4.	a)	Describe the basic principles of the tlc technique in a clear and concise way, using an analogy to illustrate the separation process.	10 Marks	L2	CO2
	b)	Several factors can affect the efficiency of paper chromatography separations. Discuss the role of the following in optimizing separations: i) paper quality and ii) development time.	6 Marks	L3	CO2

(OR)

5.	a)	Two-dimensional paper chromatography (2D-PC) is a technique that can improve the separation of complex mixtures. Describe the basic principles of 2D-PC and its advantages over traditional paper chromatography.	10 Marks	L2	CO2
	b)	Discuss potential safety hazards associated with using solvents in tlc technique and how these hazards can be minimized.	6 Marks	L2	CO2

MODULE-III

6.	a)	Ion exchange chromatography finds extensive use in protein purification. Explain how this technique separates proteins based on their charge properties.	8 Marks	L2	CO3
	b)	The concept of isoelectric point (pI) plays a role in ion exchange chromatography of proteins. Explain the relationship between pI and protein separation using this technique.	8 Marks	L3	CO3

(OR)

7.	a)	Differentiate between normal-phase and reversed-phase chromatography based on the stationary phase used. When would you choose one technique over the other?	12 Marks	L2	CO3
	b)	Explain how the choice of mobile phase can influence the separation of components in column chromatography. Discuss factors to consider when selecting a mobile phase.	4 Marks	L1	CO3

MODULE-IV

8.	a)	Sample preparation is a crucial step for successful HPLC analysis. Discuss the importance of sample preparation and some common techniques used to prepare samples for HPLC injection.	8 Marks	L2	CO4
	b)	The environmental impact of solvents used in HPLC is a growing concern. Discuss some strategies for minimizing solvent waste and promoting greener practices in HPLC laboratories.	8 Marks	L2	CO4

(OR)

9.	a)	Describe common problems encountered during HPLC analysis and potential troubleshooting strategies to address them (e.g., peak tailing, poor resolution).	10 Marks	L2	CO4
	b)	Modern HPLC systems offer automation capabilities. Discuss the benefits of automation in HPLC analysis and some functionalities that can be automated.	6 Marks	L2	CO4

MODULE-V

10.	a)	Safety considerations are important when working with GC instruments. Discuss some potential safety hazards associated with GC analysis, such as flammable solvents and compressed gases. How can these hazards be minimized?	12 Marks	L2	CO5
	b)	Briefly describe the main difference between GLC and GSC.	4 Marks	L1	CO5

(OR)

11.	a)	How is peak area used for quantitative analysis in GC? Explain the concept of peak integration and its role in determining the amount of a component in a sample.	10 Marks	L4	CO5
	b)	Discuss potential future trends in sample preparation techniques for GC analysis, focusing on automation, miniaturization, and green approaches.	6 Marks	L2	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

RETROSYNTHESIS

[Organic Chemistry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Mention the use of alkynes in synthesis.	2 Marks	L1	CO1
	b)	Brief out the Michael addition.	2 Marks	L1	CO1
	c)	Write the characteristics of protective agents.	2 Marks	L1	CO2
	d)	Mention the use of alkynes in synthesis.	2 Marks	L2	CO2
	e)	What is multistep synthesis?	2 Marks	L1	CO3
	f)	Write the starting material in the synthesis of nitro compounds.	2 Marks	L2	CO3
	g)	Write a note on Mannich reaction.	2 Marks	L1	CO4
	h)	Draw the structure of Juvabione.	2 Marks	L1	CO4
	i)	Comment on the structure of starting material in the Strecker synthesis.	2 Marks	L1	CO5
	j)	Write the retrosynthetic approach in the Ugi reaction.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss the synthon approach in retrosynthesis disconnection approach.	8 Marks	L4	CO1
	b)	Write a general note on key intermediates and starting materials in designing a synthesis.	8 Marks	L4	CO1

(OR)

3.		Synthesis of 1,2- and 1,4-dicarbonyl compounds using Two group C-C disconnections.	16 Marks	L4	CO1

MODULE-II

4.	a)	Write the use of alkynes in synthesis of carbonyl compounds.	8 Marks	L4	CO2
	b)	Discuss the two group C-C disconnection with special reference to 1,3-difunctionalized compounds.	8 Marks	L4	CO2

(OR)

5.		Analyze two group C-C disconnection – Diels-Alder reaction and Michael addition.	16 Marks	L4	CO2

MODULE-III

6.		Explain the strategy of alcohol disconnection to synthesis of simple molecule.	16 Marks	L4	CO3

(OR)

7.		How could you plan and execute the retrosynthetic approach in alkyne as functional group.	16 Marks	L4	CO3

MODULE-IV

8.		Write the retrosynthetic analysis and control of longifolene.	16 Marks	L4	CO4
		(OR)			
9.	a)	Compare the retrosynthetic analysis and control of stereochemistry in between Longifolene and Taxol.	8 Marks	L4	CO4
	b)	Compare the retrosynthetic analysis and control of stereochemistry in between Juvabione and Fediricamycine A.	8 Marks	L4	CO4

MODULE-V

10.	a)	Discuss on definition and advantages of aldol reaction.	8 Marks	L4	CO5
	b)	State the advantages of Mannich-cation olefin cyclization.	8 Marks	L4	CO5
		(OR)			
11.		Comment on the following: i) Hantzsch synthesis and ii) Tandem synthesis	16 Marks	L4	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

AGRI-FOOD BIOTECHNOLOGY

[Biotechnology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What are the applications of microbiological examination of water and foods?	2 Marks	L1	CO1
	b)	Name one method for the microbiological examination of water.	2 Marks	L1	CO1
	c)	What are starter cultures used for?	2 Marks	L1	CO2
	d)	Name two types of starter cultures commonly used in food fermentation.	2 Marks	L1	CO2
	e)	What are GMOs?	2 Marks	L1	CO3
	f)	What are some controversies related to GMOs?	2 Marks	L1	CO3
	g)	What are nutraceuticals?	2 Marks	L1	CO4
	h)	Define nutrigenomics	2 Marks	L1	CO4
	i)	What are organic acids commonly used in food production?	2 Marks	L1	CO5
	j)	Name a type of alcoholic beverage.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss the importance of microbiological examination in ensuring the safety and quality of water and food products.	8 Marks	L2	CO1
	b)	Describe the methods used for the microbiological examination of water.	8 Marks	L2	CO1

(OR)

3.	a)	What are the various factors contributing to foodborne illnesses and diseases?	8 Marks	L2	CO1
	b)	Explain the principles and practices involved in controlling microbiological quality and safety in the food industry, including good hygiene practices, sanitation procedures.	8 Marks	L2	CO1

MODULE-II

4.	a)	Discuss the importance of starter cultures in food fermentation.	8 Marks	L2	CO2
	b)	Describe the different types of starter cultures used in food fermentation.	8 Marks	L2	CO2

(OR)

5.	a)	Discuss about strain improvement strategies.	8 Marks	L2	CO2
	b)	Explore the principles and applications of microencapsulation in food technology.	8 Marks	L2	CO2

MODULE-III

6.	a)	Discuss the introduction of GMOs and its necessity.	8 Marks	L2	CO3
	b)	Explore the ethical issues concerning GM foods.	8 Marks	L2	CO3
		(OR)			
7.	a)	Describe the testing methods used for detecting GMOs.	8 Marks	L2	CO3
	b)	Discuss the current guidelines and regulations governing the production, release, and movement of GMOs.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss the concept of nutraceuticals and their role in promoting health and preventing disease, including examples of common nutraceuticals and their potential health benefits.	8 Marks	L2	CO4
	b)	Explore the principles and applications of nutrigenomics, including its role in health.	8 Marks	L2	CO4
		(OR)			
9.	a)	Explain the significance and relevance of nutrigenomics in personalized nutrition and public health.	8 Marks	L2	CO4
	b)	Discuss the role of epigenetics in nutrition and health, including how dietary factors can influence gene expression through epigenetic mechanisms.	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss the production process of organic acids such as vinegar and lactic acid, including fermentation methods, microbial strains used, and applications in food preservation and flavor enhancement.	8 Marks	L2	CO5
	b)	Describe the fermentation process involved in the production of alcoholic beverages, including beer, wine focusing on raw material selection, fermentation conditions, and product characteristics.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explore the role of microbial strains, such as Saccharomyces cerevisiae in the production of vinegar and alcoholic beverages, including their metabolic pathways and contributions to flavor development	8 Marks	L2	CO5
	b)	Analyze the production process of glycerol, including its biosynthesis from carbohydrates	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

MOLECULAR BIOLOGY

[Biotechnology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define pseudogenes	2 Marks	L1	CO1
	b)	Define lethal gene	2 Marks	L1	CO1
	c)	What is deletion?	2 Marks	L1	CO2
	d)	Write about Physical mutagen	2 Marks	L1	CO2
	e)	Write about sos	2 Marks	L1	CO3
	f)	What is Ligase?	2 Marks	L1	CO3
	g)	Write about stop codon	2 Marks	L1	CO4
	h)	What is amino acid tRNA synthetase?	2 Marks	L1	CO4
	i)	Write about micro RNA	2 Marks	L1	CO5
	j)	Write about cosuppression	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Briefly discuss about epistasis	8 Marks	L2	CO1
	b)	Explain about codominance and incomplete dominance	8 Marks	L2	CO1

(OR)

3.	a)	Explain in detail about modern concepts of gene	8 Marks	L2	CO1
	b)	Explain in detail about classical concepts of gene	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain about spontaneous mutation	8 Marks	L2	CO2
	b)	Summarize the induced mutation	8 Marks	L2	CO2

(OR)

5.	a)	Describe the difference between crossing over and linkage	8 Marks	L2	CO2
	b)	Discuss about INDELS, inversion and replacement mutations	8 Marks	L2	CO2

MODULE-III

6.	a)	Summarize about eukaryotic gene architecture	8 Marks	L2	CO3
	b)	Describe the prokaryotic gene architecture	8 Marks	L2	CO3

(OR)

7.	a)	Explain the various enzymes involved in replication	8 Marks	L2	CO3
	b)	Summarize about DNA damage and repair	8 Marks	L2	CO3

MODULE-IV

8.	a)	Describe the process of transcription	8 Marks	L2	CO4
	b)	Explain the process of translation	8 Marks	L2	CO4

(OR)

9.	a)	Explain about translation inhibitors	8 Marks	L2	CO4
	b)	Summarize the genetic code	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain the about small interfering RNA in control of gene expression	8 Marks	L2	CO5
	b)	Compare and contrast the different between antisense RNA and ribozymes in gene silencing	8 Marks	L2	CO5

(OR)

11.	a)	Summarize about dsRNA silencing approaches.	8 Marks	L2	CO5
	b)	Discuss about the importance of gene silencing in gene therapy	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

COMPUTER NETWORK

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Computer Network With Any Two Applications	2 Marks	L1	CO1
	b)	Define: i) Bus ii) Protocol	2 Marks	L2	CO1
	c)	List the drawbacks of simplex protocol.	2 Marks	L1	CO3
	d)	Define error detection and error correction.	2 Marks	L2	CO3
	e)	What are some key design issues that the network layer addresses in computer networks?	2 Marks	L1	CO2
	f)	What is load shedding, and how does it assist in managing congestion during network overload?	2 Marks	L2	CO2
	g)	Explain about the TCP Congestion Control.	2 Marks	L1	CO1
	h)	List out the transport layer service primitives and their meaning.	2 Marks	L2	CO1
	i)	Write short notes on E-Mail.	2 Marks	L1	CO4
	j)	Explain the concept of the DNS name space and how it is organized.	2 Marks	L2	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	With a neat diagram explain ISO - OSI reference model.	8 Marks	L1	CO1
	b)	Compare Optical Fibers and Copper Cable Guided Transmission Mediums	8 Marks	L2	CO1

(OR)

3.	a)	Illustrate data units at different layers of the TCP / IP protocol suite.	8 Marks	L2	CO1
	b)	Summarize the features of Wireless LANs standard 802.11.	8 Marks	L2	CO1

MODULE-II

4.	a)	Suppose we want to transmit the "message 1011 0010 0111 and protect it from errors using the CRC polynomial $x^4 + x^2 + 1$. Use polynomial long division to determine the message that should be transmitted. Suppose the leftmost bit of the message is inverted due to noise on the transmission link. What is the result of the 'receiver's CRC calculation? How does the receiver know that an error has occurred?	10 Marks	L2	CO3
	b)	Differentiate classical ALOHA and slotted ALOHA	6 Marks	L2	CO3

(OR)

5.	a)	How performance is improved in CSMA/CD protocol compared to CSMA protocol? Explain.	8 Marks	L2	CO3
	b)	Describe Selective Repeat Sliding Window Protocol	8 Marks	L1	CO3

MODULE-III

6.	a)	Develop link state routing to find shortest path with an example.	8 Marks	L3	CO2
	b)	Explain Internet Protocol with the neat block diagram of IP header format.	8 Marks	L3	CO2

(OR)

7.	a)	Apply distance vector routing algorithm to compute shortest path routing	8 Marks	L3	CO2
	b)	Distinguish between datagram networks and virtual circuit networks	8 Marks	L1	CO2

MODULE-IV

8.	a)	Evaluate TCP congestion control mechanisms.	8 Marks	L3	CO1
	b)	Explain the real transport protocol of UDP and how will you calculate checksum in UDP?	8 Marks	L3	CO1

(OR)

9.	a)	Elucidate the following Timers in TCP. i) Retransmission Time Out ii) Persistence Timer	8 Marks	L3	CO1
	b)	Explain congestion avoidance techniques in detail.	8 Marks	L1	CO1

MODULE-V

10.	a)	Assess the impact of wired networks in the context of network protocols like HTTP.	8 Marks	L3	CO4
	b)	How is Hypertext Transfer Protocol related to World Wide Web?	8 Marks	L2	CO4

(OR)

11.	a)	Describe the role of the local name server and the authoritative name server in DNS?	8 Marks	L1	CO4
	b)	Differentiate between primary server and secondary server.	8 Marks	L1	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

ORDINARY DIFFERENTIAL EQUATIONS

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Find the degree of the differential equation: $\left[5+\left(\frac{d^2y}{dx^2}\right)^2\right]^{4/5} = 2+\frac{d^3y}{dx^3}$	2 Marks	L2	CO1
	b)	Define Order of the differential equation.	2 Marks	L1	CO1
	c)	Write Clairaut's equation.	2 Marks	L1	CO2
	d)	Solve: $p^2 - 4p + 3 = 0$.	2 Marks	L2	CO2
	e)	Find the complementary solution of $(D^2 - 7D + 12)y = x^2e^{2x}$.	2 Marks	L3	CO3
	f)	Find the general solution of: $(D^2 + D + 1)y = 0$.	2 Marks	L3	CO3
	g)	Find the complementary solution of: $(D^2 + 1)y = \cos 2x$	2 Marks	L4	CO4
	h)	Find the Particular integral of: $(D^2 + 16)y = \sin 2x$	2 Marks	L4	CO4
	i)	Find the complementary function of the differential equation: $(x^2D^2 + xD - 1)y = x^2e^x$.	2 Marks	L4	CO5
	j)	Convert the following into linear ordinary differential equation: $(x^2D^2 + 2xD - 12)y = x^3 \log x$.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Solve: $x^2ydx - (x^3 + y^3)dy = 0$.	8 Marks	L2	CO1
	b)	Solve the differential equation: $\cos^2 x\left(\frac{dy}{dx}\right) + y = \tan x$.	8 Marks	L3	CO1

(OR)

3.	a)	Solve: $x\left(\frac{dy}{dx}\right) + y = y^2 \log x$.	8 Marks	L2	CO1
	b)	Find the orthogonal trajectories of the family of circles $x^2 + y^2 - 2ax = 0$ where 'a' being a parameter.	8 Marks	L6	CO1

MODULE-II

4.	a)	Solve : $(px - y)(py + x) = 2p$, using the transformations: $x^2 = u, y^2 = v$.	8 Marks	L5	CO2
	b)	Solve: $y + px = p^2x^4$.	8 Marks	L3	CO2

(OR)

5.	a)	Solve the differential equation: $p^2 + 2py\cot x = y^2$.	8 Marks	L4	CO2
	b)	Solve: $2px = 2\tan y + p^3\cos^2 y$.	8 Marks	L3	CO2

MODULE-III

6.	a)	Solve: $(D^4 + 3D^2 - 4)y = \cos^2 x - \cosh x$.	10 Marks	L5	CO3
	b)	Solve: $(D^2 - 7D + 12)y = e^{2x} + \cos 2x$.	6 Marks	L2	CO3

(OR)

7.	a)	Solve: $(D^3 - 6D^2 + 11D - 6)y = \sin 3x + e^{2x}$.	8 Marks	L3	CO3
	b)	Solve: $(D^4 - 9D^2)y = \sin^2 x$.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Solve: $(D^2 + 3D + 2)y = xe^x \sin x$.	8 Marks	L5	CO4
	b)	Find the general solution of the differential equation $(D^2 + 1)y = \cosh x \cdot \cos x$.	8 Marks	L4	CO4

(OR)

9.	a)	Solve: $(D^2 + 1)y = x^2 \sin 2x$.	8 Marks	L5	CO4
	b)	Apply the method of variation of parameters, to solve the differential equation $(D^2 + a^2)y = \sec ax$.	8 Marks	L4	CO4

MODULE-V

10.	a)	Solve: $x^2\dfrac{d^2y}{dx^2} + x\dfrac{dy}{dx} + y = \log x \sin(\log x)$.	8 Marks	L4	CO5
	b)	Solve: $(x^2D^2 + 3xD + 1)y = (1 - x)^2$.	8 Marks	L5	CO5

(OR)

11.	a)	Solve: $(1 + x)^2\dfrac{d^2y}{dx^2} + (1 + x)\dfrac{dy}{dx} + y = 2\sin(\log(1 + x))$.	8 Marks	L5	CO5
	b)	Solve: $(3x^2D^2 + xD + 1)y = x$.	8 Marks	L4	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

INTERNET OF THINGS

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Machine-to-Machine (M2M) communication.	2 Marks	L1	CO1
	b)	State one major difference between IoT and M2M.	2 Marks	L2	CO1
	c)	What is the role of IP addressing in IoT devices?	2 Marks	L1	CO2
	d)	Give an example of an application layer protocol in IoT.	2 Marks	L2	CO2
	e)	Mention two advantages of cloud-connected IoT devices.	2 Marks	L1	CO3
	f)	What is an embedded operating system? Give one example.	2 Marks	L2	CO3
	g)	What is service specification in IoT design?	2 Marks	L2	CO4
	h)	What are IoT level specifications? Give an example.	2 Marks	L1	CO4
	i)	What is a layered attacker model?	2 Marks	L2	CO5
	j)	Define identity management in IoT.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe the importance and process of device management at the IoT gateway.	8 Marks	L1	CO1
	b)	Define M2M. Compare and contrast IoT and M2M communication with suitable examples.	8 Marks	L2	CO1

(OR)

3.	a)	Describe IoT applications in environmental monitoring and its impact on sustainability.	8 Marks	L2	CO1
	b)	Explain the role of IoT in healthcare and lifestyle improvement with examples.	8 Marks	L1	CO1

MODULE-II

4.	a)	Explain medium access control (MAC) protocols used in IoT networks.	8 Marks	L2	CO2
	b)	Describe different application layer protocols used in IoT communication.	8 Marks	L3	CO2

(OR)

5.	a)	Discuss the challenges of IPv4 in IoT and how IPv6 addresses them.	8 Marks	L3	CO2
	b)	Explain the importance of Medium Access Control (MAC) protocols in IoT.	8 Marks	L2	CO2

MODULE-III

6.	a)	Discuss the role of Raspberry Pi in IoT prototyping with an example.	8 Marks	L3	CO3
	b)	Compare different embedded prototyping platforms (Arduino, Raspberry Pi, BeagleBone, ESP32).	8 Marks	L2	CO3

(OR)

7.	a)	Explain different connectivity technologies (Wi-Fi, ZigBee, Cellular, LoRa, 5G) for IoT cloud integration.	8 Marks	L2	CO3
	b)	Discuss the security challenges when IoT devices are always connected to the cloud.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain IoT level specifications with examples (e.g., perception layer, network layer, application layer).	8 Marks	L3	CO4
	b)	Explain the functional view specification of IoT design methodology with examples.	8 Marks	L2	CO4

(OR)

9.	a)	Discuss the IoT design methodology applied to home automation with a case study.	8 Marks	L2	CO4
	b)	Explain how requirement, service, and functional specifications are applied in a smart home IoT system.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain how Hadoop MapReduce is used for batch data analysis in IoT.	8 Marks	L3	CO5
	b)	Compare batch data analytics (MapReduce) and real-time stream analytics in IoT applications.	8 Marks	L2	CO5

(OR)

11.	a)	Write notes on security profiles and their importance in IoT.	8 Marks	L2	CO5
	b)	Discuss various security protocols (DTLS, TLS, IPSec, etc.) used in IoT.	8 Marks	L3	CO5

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SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

OBJECT ORIENTED PROGRAMMING WITH JAVA

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is method overloading? Give an example.	2 Marks	L2	CO1
	b)	Define Garbage Collection.	2 Marks	L2	CO1
	c)	What is the `super` keyword used for in Java?	2 Marks	L2	CO2
	d)	What is an abstract class? Provide an example.	2 Marks	L2	CO2
	e)	What are thread priorities in Java?	2 Marks	L2	CO3
	f)	Describe the life cycle of a thread.	2 Marks	L2	CO3
	g)	What is the difference between Queue and Map interfaces?	2 Marks	L2	CO4
	h)	What is serialization in Java?	2 Marks	L2	CO4
	i)	What is the Abstract Window Toolkit (AWT)?	2 Marks	L2	CO5
	j)	How are scroll bars implemented in AWT?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss the concept of method overloading in Java. Write a program to demonstrate method overloading with different parameters and return types.	8 Marks	L3	CO1
	b)	Write a Java program to calculate simple interest.	8 Marks	L4	CO1

(OR)

3.	a)	Explain the different access control levels in Java (public, private, protected, default). Provide examples that illustrate how these modifiers affect accessibility.	8 Marks	L3	CO1
	b)	Write a brief note on classes	8 Marks	L4	CO1

MODULE-II

4.	a)	Explain method overriding in Java. How is it different from method overloading? Write a program to demonstrate method overriding.	8 Marks	L3	CO2
	b)	Write a Java program to create a library management system using inheritance and polymorphism.	8 Marks	L4	CO2

(OR)

5.	a)	Explain how interfaces are applied in Java programming. Write a program that shows the implementation of multiple interfaces by a single class.	8 Marks	L3	CO2
	b)	Write a Java program to demonstrate the use of methods from the `Object` class, such as `equals()`, `hashCode()`, and `toString()`.	8 Marks	L4	CO2

MODULE-III

6.	a)	Create your own java exception subclass	8 Marks	L3	CO3
	b)	Write a Java program to demonstrate chained exceptions.	8 Marks	L4	CO3

(OR)

7.	a)	Discuss the different types of exceptions in Java. How are checked exceptions different from unchecked exceptions? Provide examples to illustrate your explanation.	8 Marks	L3	CO3
	b)	Write a Java program to handle uncaught exceptions in threads using `Thread.UncaughtExceptionHandler`.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Explain the Java Collections Framework. How does it provide a unified architecture for managing and manipulating collections of objects? Provide examples.	8 Marks	L3	CO4
	b)	Differentiate between stack and queue	8 Marks	L4	CO4

(OR)

9.	a)	Explain the role of the Console class in Java's I/O operations. Provide a program that demonstrates how it is used for reading input from the console.	8 Marks	L3	CO4
	b)	Write a Java program to copy the contents of one file to another.	8 Marks	L4	CO4

MODULE-V

10.	a)	Explain how Graphics and Color are handled in AWT. How can you draw shapes and set colors in a Java application?	8 Marks	L3	CO5
	b)	Write a Java program that creates a GUI with a button. When the button is clicked, it displays a message dialog with the text "Button Clicked!" using an `ActionListener`.	8 Marks	L4	CO5

(OR)

11.	a)	Explain the various Applet display methods available in Java. How are these methods used to manage the appearance of an Applet?	8 Marks	L3	CO5
	b)	Write a Java program that demonstrates window event handling by displaying a message when the window is opened, closed, minimized, or maximized.	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

DATABASE MANAGEMENT SYSTEMS

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Write about vendors of DBMS.	2 Marks	L1	CO1
	b)	Define data and information.	2 Marks	L1	CO1
	c)	List the ER model symbols.	2 Marks	L1	CO2
	d)	What is entity clustering?	2 Marks	L1	CO2
	e)	List the mapping cardinalities.	2 Marks	L1	CO3
	f)	Explain about relational terminology in brief.	2 Marks	L1	CO3
	g)	Define view in DBMS.	2 Marks	L1	CO4
	h)	Define and explain about aggregation with a diagram.	2 Marks	L1	CO4
	i)	Discuss normalization.	2 Marks	L1	CO5
	j)	List out transaction properties.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Write about the evolution of Data Base Management systems.	8 Marks	L2	CO1
	b)	Write about the classification of Data Base Management Systems.	8 Marks	L2	CO1
		(OR)			
3.	a)	Discuss about different types of data models.	8 Marks	L2	CO1
	b)	Define data abstraction and Discuss Levels of abstraction.	8 Marks	L2	CO1

MODULE-II

4.	a)	Discuss the generalization and specialization constraints with suitable diagrams.	8 Marks	L2	CO2
	b)	Explain the relationship degree in ER diagrams with suitable examples.	8 Marks	L2	CO2
		(OR)			
5.	a)	Define and explain the ER model in detail.	8 Marks	L2	CO2
	b)	List the building blocks of ER model and explain each.	8 Marks	L2	CO2

MODULE-III

6.	a)	What is relational algebra? Explain in detail about relational algebraic operations.	8 Marks	L2	CO3
	b)	List and explain the advantages and limitations of relational algebra.	8 Marks	L2	CO3
		(OR)			
7.	a)	With an example, explain tuple relational calculus.	8 Marks	L2	CO3
	b)	Explain the domain relational calculus in detail.	8 Marks	L2	CO3

MODULE-IV

8.	a)	List and explain PL/SQL Data types with suitable examples.	8 Marks	L2	CO4
	b)	Discuss iterative PL/SQL Control structures.	8 Marks	L2	CO4
		(OR)			
9.	a)	Discuss Branching control structures in PL/SQL.	8 Marks	L2	CO4
	b)	Define trigger and explain its parts.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain ACID properties and illustrate through examples.	8 Marks	L2	CO5
	b)	Discuss how do you attain atomicity and durability.	8 Marks	L2	CO5
		(OR)			
11.	a)	Define functional dependencies. How are primary keys related to FD's?	8 Marks	L2	CO5
	b)	Illustrate redundancy and the problems that it can cause?	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

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B.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

BASIC REAGENTS AND REACTION MECHANISM

[Biotechnology, Bioinformatics, Microbiology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List the 'rate' of reactions for S_N1 and S_N2 reactions	2 Marks	L1	CO1
	b)	Write the structures of 2-Bromo-2-methylbutane and 6-bromo-4-ehtyl-3-methyloctane.	2 Marks	L1	CO1
	c)	Write the structures of 2-Bromo-3-methyl-but-2-ene-1-ol and 1-phenylpropan-2-ol.	2 Marks	L1	CO2
	d)	The C-O bond is much shorter in phenol than in ethanol. Justify the statement.	2 Marks	L1	CO2
	e)	Explain the role of Zn-Hg in Clemensons reduction.	2 Marks	L1	CO3
	f)	State the hybridization and bond angle of the carbonyl carbon.	2 Marks	L1	CO3
	g)	Name the reagents to convert carboxylic acids to acid chlorides.	2 Marks	L1	CO4
	h)	Write the boiling points of carboxylic acids.	2 Marks	L1	CO4
	i)	Predict the structures of adipic acid and succinic acid.	2 Marks	L1	CO5
	j)	Explain how the presence of active methylene groups influence the acidity of the compounds.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Some alkyl halides undergo substitution whereas some undergo elimination reactions on treatment with bases. Discuss the structural features of alkyl halides with the help of examples that are responsible for this difference	7 Marks	L2	CO1
	b)	S_N1 reactions are accompanied by racemization in optically active alkyl halides. Justify the statement with example.	9 Marks	L2	CO1

(OR)

3.	a)	Why are aryl halides less reactive towards nucleophilic substitution reactions than alkyl halides? How can we enhance the reactivity of aryl halides?	10 Marks	L2	CO1
	b)	Write the differences between S_N1 and S_N2 reactions.	6 Marks	L2	CO1

MODULE-II

4.	a)	Explain, why is phenol more acidic than ethanol.	8 Marks	L2	CO2
	b)	Illustrate the Kolbe's reaction mechanism.	8 Marks	L2	CO2

(OR)

5.	a)	What happens when i). benzene diazonium chloride is heated with water? ii). phenol is on treatment with chloroform in aqueous NaOH?	9 Marks	L2	CO2
	b)	Compound 'A' of molecular formula $C_5H_{11}Br$ gives a compound 'B' of molecular formula $C_5H_{12}O$ when treated with aq. NaOH. On oxidation the compound 'B' followed by on treatment with aq. NaOH yields a mixture of acetic acid & propionic acid as shown below. Deduce the structures of A, B & C.	7 Marks	L2	CO2

$$\underset{(A)}{C_5H_{11}Br} \xrightarrow{aq.NaOH} \underset{(B)}{C_5H_{12}O} \xrightarrow{(oxidation)} \underset{(C)}{\text{Ketone}} \xrightarrow{aq.NaOH} CH_3CH_2COOH + CH_3COOH$$

MODULE-III

6.	a)	Discuss the mechanism of benzoin condensation.	8 Marks	L2	CO3
	b)	Explain the reaction and mechanism of formation of benzoic acid and benzyl alcohol from benzaldehyde.	8 Marks	L2	CO3

(OR)

7.	a)	Explain the nomenclature of aliphatic and aromatic carbonyl compounds in detail, and give examples.	9 Marks	L2	CO3
	b)	Draw the structures of • Acetophenone • Benzaldehyde • Crotonaldehyde • 2-bromopropanal • Butanedione • Benzoic acid • Propanone	7 Marks	L2	CO3

MODULE-IV

8.	a)	Illustrate the common uses of carboxylic acids.	7 Marks	L2	CO4
	b)	Explain the physical properties of carboxylic acids, including the importance of hydrogen bonding.	9 Marks	L2	CO4

(OR)

9.	a)	Discuss the Kole's reaction mechanism.	8 Marks	L2	CO4
	b)	Write the reaction mechanism of acetic acid with acetyl chloride.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain the keto-enol tautomerism of ethyl acetoacetate.	8 Marks	L2	CO5
	b)	Discuss the synthesis of α,β-unsaturated carboxylic acid form melonic ester.	8 Marks	L2	CO5

(OR)

11.	a)	Write the synthesis of butyric acid from ethyl acetoacetate.	10 Marks	L2	CO5
	b)	Discuss the reaction mechanism of succinic acid from melonic ester.	6 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

CYBER CRIME & LAW

[Forensic Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Discuss Cyber Jurisdiction	2 Marks	L2	CO1
	b)	What is computer crime	2 Marks	L1	CO1
	c)	Why is it important to follow computer ethics in a professional setting?	2 Marks	L1	CO2
	d)	What is a common risk associated with digital payments?	2 Marks	L1	CO2
	e)	What is a drive-by attack, and how can users protect themselves from such attacks while browsing the internet?	2 Marks	L1	CO3
	f)	Differentiate between spoofing and spam attacks, and provide an example of each.	2 Marks	L2	CO3
	g)	What is Section 72 of IT ACT	2 Marks	L1	CO4
	h)	What is the Punishment for Punishment for identity theft	2 Marks	L3	CO4
	i)	How often must a license for issuing digital signature certificates be renewed?	2 Marks	L5	CO5
	j)	What power does the Controller have concerning certifying authorities?	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	What are the techniques need to be followed in Cyber Forensics	6 Marks	L1	CO1
	b)	How do the legal definitions and investigative approaches differ between cybercrime and conventional crime, and what implications do these differences have for the prosecution and prevention of these crimes	10 Marks	L1	CO1

(OR)

3.	a)	Explain Section 354D of IT Act	6 Marks	L2	CO1
	b)	Analyze the different categories of cybercrimes, and discuss the social, economic, and legal impacts of these crimes on individuals and organizations	10 Marks	L3	CO1

MODULE-II

4.	a)	Define Output Devices. List out Various types of Output Devices	6 Marks	L5	CO2
	b)	Explain the features and functionalities of various search engines	10 Marks	L1	CO2

(OR)

5.	a)	Evaluate the role of professional codes of conduct in guiding ethical behavior within the IT industry, and discuss how adherence to these codes can impact organizational reputation and employee conduct.	6 Marks	L2	CO2
	b)	Analyze the impact of globalization on the concept of a borderless world.	10 Marks	L5	CO2

MODULE-III

6.	a)	Compare and contrast Denial-of-Service (DoS) and Distributed Denial-of-Service (DDoS) attacks. Discuss their impact on large organizations and the challenges in mitigating these attacks.	8 Marks	L5	CO3
	b)	Analyze how a Man-in-the-Middle (MitM) attack can be combined with other attack vectors, such as Phishing or Spoofing, to increase its effectiveness. Discuss preventive measures that can be implemented to protect against these combined threats.	8 Marks	L4	CO3

(OR)

7.	a)	Evaluate the risks and consequences of Cross-Site Scripting (XSS) attacks for web applications. How do XSS vulnerabilities arise, and what comprehensive strategies can be implemented to prevent them?	8 Marks	L5	CO3
	b)	Explain in detail how a Password Attack might evolve into a broader compromise of an entire network. Include in your discussion the various types of password attacks and their countermeasures.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Evaluate the provisions under Section 66A of the Information Technology Act, 2000,	8 Marks	L3	CO4
	b)	Discuss how Section 79A of IT Act supports the legal process in cases involving digital evidence.	8 Marks	L2	CO4

(OR)

9.		Explain the scope and significance of cyber laws in India, particularly in the context of the Information Technology Act, 2000. How do these laws impact individuals, businesses, and the government?	16 Marks	L2	CO4

MODULE-V

10.	a)	Provide a detailed overview of the appointment process for the Controller of Certifying Authorities. Explain their functions and how they contribute to the management and oversight of digital signature certifications.	10 Marks	L1	CO5
	b)	Explain the role and function of the Appellate Tribunal in resolving disputes related to cyber laws.	6 Marks	L2	CO5

(OR)

11.	a)	Describe the comprehensive procedure that certifying authorities must follow, including the issuance, maintenance, and revocation of digital signature certificates.	10 Marks	L5	CO5
	b)	Explain the procedural requirements that certifying authorities must adhere to under the IT Act, 2000.	6 Marks	L5	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

ADVANCED CHEMISTRY-I

[Biotechnology, Bioinformatics, Microbiology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What are heterocyclic compounds?	2 Marks	L1	CO1
	b)	Explain Diels-alder reaction of furan.	2 Marks	L1	CO1
	c)	State Diazotization.	2 Marks	L1	CO2
	d)	Explain alkylation of alkylamines.	2 Marks	L1	CO2
	e)	Define phosphorescence.	2 Marks	L1	CO3
	f)	State Photosensitization.	2 Marks	L1	CO3
	g)	What is equivalent conductance?	2 Marks	L1	CO4
	h)	Define activation energy.	2 Marks	L1	CO4
	i)	What is a rate of a reaction?	2 Marks	L1	CO5
	j)	Define H_2-O_2 fuel cell.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the reactions of furan : i) Nitration ii) Sulphonation iii) Halogenation iv) Diels-alder reaction.	8 Marks	L2	CO1
	b)	Discuss two methods of preparation of pyrrole, furan and thiophene.	8 Marks	L2	CO1

(OR)

3.	a)	Explain nucleophilic substitution reactions of pyridine.	8 Marks	L2	CO1
	b)	Discuss in brief of aromatic character of heterocyclic compounds.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain i. Carbylamine reaction ii. Hinsberg reaction.	8 Marks	L2	CO2
	b)	Explain the classification of amines.	8 Marks	L1	CO2

(OR)

5.	a)	Explain the synthetic applications of diazonium salts.	8 Marks	L2	CO2
	b)	Describe the electrophilic substitution reactions of amines.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the Grothus-Draper's law and Stark-Einstein's law of photochemical equivalence.	10 Marks	L2	CO3
	b)	Explain in brief of fluorescence.	6 Marks	L2	CO3
		(OR)			
7.	a)	Explain the mechanism of high yield photo chemical reaction.	8 Marks	L2	CO3
	b)	Explain Photosensitized reactions with examples.	8 Marks	L2	CO3

MODULE-IV

8.	a)	What is transport number? Explain the determination of transport number by Hittorf's method.	10 Marks	L2	CO4
	b)	Explain in detail of Kohlrausch's law.	6 Marks	L2	CO4
		(OR)			
9.	a)	Explain the H_2-O_2 fuel cell and solid oxide fuel cell with a neat sketch.	10 Marks	L2	CO4
	b)	Explain the migration of ions in brief.	6 Marks	L2	CO4

MODULE-V

10.	a)	What is first order reaction? Derive the integral rate equation for first order reaction with example.	8 Marks	L2	CO5
	b)	Explain the molecularity and its types.	8 Marks	L1	CO5
		(OR)			
11.	a)	Explain different experimental methods of determination of order of a reaction.	8 Marks	L2	CO5
	b)	Discuss the effect of temperature on the rate of a reaction with an example?	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

BIOCHEMICAL CORRELATIONS IN DISEASE

[Bioinformatics, Microbiology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Describe the clinical features of Albinism.	2 Marks	L1	CO1
	b)	Discuss the Causes and symptoms of Mc Ardle's disease.	2 Marks	L2	CO1
	c)	List out the significant Life style diseases.	2 Marks	L1	CO2
	d)	Name the diagnostic methods of Sickle cell Anemia.	2 Marks	L1	CO4
	e)	What is the cause of Wilson's disease?	2 Marks	L1	CO2
	f)	Categorize the causes of Hyperglycemia.	2 Marks	L4	CO3
	g)	List any two organ specific Autoimmune diseases.	2 Marks	L1	CO3
	h)	What are the types of α- Thalassemia?	2 Marks	L1	CO4
	i)	What are the functions of Tau proteins in neurons?	2 Marks	L1	CO4
	j)	Give any two examples of live attenuated vaccines.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe the causes, symptoms of MSUD & Alkaptonuria.	8 Marks	L2	CO1
	b)	Discuss the basis of Inborn errors of metabolism.	8 Marks	L2	CO1
		(OR)			
3.	a)	Classify and explain the Glycogen storage diseases.	8 Marks	L4	CO1
	b)	List out the clotting disorders. Discuss the diagnostic methods.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain about the causes, symptoms and types of Beriberi.	8 Marks	L2	CO2
	b)	Outline the causes, symptoms and diagnosis of Anemia.	8 Marks	L4	CO2
		(OR)			
5.	a)	Explain about Causes, symptoms of Night blindness and scurvy.	8 Marks	L2	CO2
	b)	Discuss the risk factors of Atherosclerosis.	8 Marks	L2	CO2

MODULE-III

6.	a)	Discuss in detail about Type-I Diabetes. Mellitus (IDDM).	8 Marks	L2	CO3
	b)	Explain in detail about Myasthenia gravis.	8 Marks	L2	CO3
		(OR)			
7.	a)	Describe about causes, clinical features of Hypothyroidism.	8 Marks	L2	CO3
	b)	Write a note on Physiological role of Thyroid hormones.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss the causes and symptoms of Sickle cell Anemia.	8 Marks	L2	CO4
	b)	Describe the causes, clinical manifestations of Alzheimer's disease.	8 Marks	L2	CO4

(OR)

9.	a)	Categorize Thalassemia and add a note on Symptoms of Thalassemia.	8 Marks	L4	CO4
	b)	Describe the inheritance and symptoms of Huntington's disease.	8 Marks	L2	CO4

MODULE-V

10.	a)	Describe about transmission, risk factors and Pathogenesis of Poliomyelitis.	8 Marks	L2	CO5
	b)	Outline the causes, risk factors and vaccination of Tuberculosis.	8 Marks	L4	CO5

(OR)

11.	a)	Describe about the types of parasites. Add a note on factors that influence Host- Parasite interactions.	8 Marks	L2	CO5
	b)	Discuss the causes, symptoms and prevention of Tetanus disease.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

PRINCIPLES OF MICROBIOLOGY

[Biotechnology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Biogenesis.	2 Marks	L2	CO1
	b)	Define Germ Theory.	2 Marks	L3	CO1
	c)	Define Tyndallisation.	2 Marks	L1	CO2
	d)	List out the methods of Sterilization.	2 Marks	L2	CO2
	e)	Define Numerical aperture of a microscope objective.	2 Marks	L3	CO3
	f)	Explain the use of mordant in Gram staining.	2 Marks	L2	CO3
	g)	Explain Endospore.	2 Marks	L1	CO4
	h)	What are the characteristics of Prokaryotes?	2 Marks	L2	CO4
	i)	Define Capsid.	2 Marks	L3	CO5
	j)	Explain characteristics of viruses.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain five kingdom classification in detail.	8 Marks	L2	CO1
	b)	Explain classification of microorganisms based on requirement of Oxygen.	8 Marks	L3	CO1

(OR)

3.	a)	Classify microorganisms based on temperature requirements in detail.	8 Marks	L3	CO1
	b)	Explain identifying characters of classification in detail.	8 Marks	L2	CO1

MODULE-II

4.	a)	Define sterilisation. Explain physical methods of sterilisation in detail.	8 Marks	L3	CO2
	b)	Explain the determination of phenol coefficient of a disinfectant in detail.	8 Marks	L2	CO2

(OR)

5.	a)	Explain chemical methods of sterilisation in detail.	8 Marks	L2	CO2
	b)	Explain disinfection and Fumigation in detail.	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain Light microscopy in detail.	10 Marks	L2	CO3
	b)	Explain Electron microscopy in detail.	6 Marks	L3	CO3

(OR)

7.	a)	Explain mechanism of Gram staining in detail.	10 Marks	L2	CO3
	b)	Explain Acid fast staining in detail.	6 Marks	L3	CO3

MODULE-IV

8.	a)	Explain cytoskeleton in detail.	8 Marks	L2	CO4
	b)	Explain Mechanism of Endospore formation.	8 Marks	L3	CO4
		(OR)			
9.	a)	Explain microbial locomotion in detail.	10 Marks	L2	CO4
	b)	Explain membrane transport systems in detail.	6 Marks	L3	CO4

MODULE-V

10.	a)	List out differences between Bacteria and viruses.	8 Marks	L2	CO5
	b)	Explain general characteristics of Viruses.	8 Marks	L3	CO5
		(OR)			
11.	a)	Explain structure of TMV in detail.	8 Marks	L3	CO5
	b)	Explain structure of Herpes virus in detail.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

PHYCOLOGY AND MYCOLOGY

[Biotechnology, Microbiology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What are the primary pigments found in algae?	2 Marks	L1	CO1
	b)	List three common types of algae found in marine environments.	2 Marks	L1	CO1
	c)	What are the main characteristics used to classify fungi?	2 Marks	L1	CO1
	d)	Name three common types of fungi and their typical habitats.	2 Marks	L1	CO1
	e)	Name the key stages in the life cycle of ***Physarum***.	2 Marks	L1	CO3
	f)	What are oomycetes, and how does ***Saprolegnia*** fit into this classification?	2 Marks	L1	CO3
	g)	What is eutrophication, and how do algae contribute to this process?	2 Marks	L1	CO4
	h)	Name two types of algae commonly involved in bioremediation.	2 Marks	L1	CO4
	i)	What are the primary components of a lichen, and what role does each component play?	2 Marks	L1	CO5
	j)	What are the primary physiological functions of lichens?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain why algae are considered important primary producers in aquatic ecosystems.	8 Marks	L2	CO1
	b)	Describe how the cell structure of algae differs from that of higher plants.	8 Marks	L2	CO1

(OR)

3.	a)	Explain how Fritsch's classification system differentiates between green algae and brown algae.	8 Marks	L2	CO1
	b)	Analyze the similarities and differences between the groups of algae classified under Fritsch's system.	8 Marks	L4	CO1

MODULE-II

4.	a)	Describe the general structure of a fungal thallus and its main components.	8 Marks	L2	CO2
	b)	Explain the role of hyphae in fungal growth and reproduction.	8 Marks	L2	CO2

(OR)

5.	a)	Describe the structure and function of fungal cell walls. How do they differ from those of plants?	8 Marks	L2	CO2
	b)	Explain the main differences between the three major fungal phyla: Ascomycota, Basidiomycota, and Zygomycota.	8 Marks	L2	CO2

MODULE-III

6.	a)	Describe the general life cycle of ***Mucor***, including its major stages and reproductive methods.	8 Marks	L2	CO3
	b)	Explain how ***Mucor*** fungi typically infect and colonize their host.	8 Marks	L2	CO3
		(OR)			
7.	a)	Describe the role of *Saccharomyces cerevisiae* in baking and brewing processes.	8 Marks	L2	CO3
	b)	How does *Saccharomyces cerevisiae* contribute to the production of ethanol?	8 Marks	L2	CO3

MODULE-IV

8.	a)	Describe how algae can both exacerbate and mitigate the effects of eutrophication in aquatic environments.	8 Marks	L2	CO4
	b)	Explain the process of bioremediation and how algae are used to clean up pollutants in contaminated environments.	8 Marks	L2	CO4
		(OR)			
9.	a)	Describe how algae contribute to reducing greenhouse gases in the atmosphere.	8 Marks	L2	CO4
	b)	Explain the concept of carbon sequestration and how algae are involved in this process.	8 Marks	L2	CO4

MODULE-V

10.	a)	Describe how Mycorrhizae enhance plant nutrient absorption. What specific nutrients are they particularly effective at mobilizing?	8 Marks	L2	CO5
	b)	Explain the mutual benefits of the Mycorrhizae relationship for both fungi and plants.	8 Marks	L2	CO5
		(OR)			
11.	a)	How do Mycorrhizae contribute to soil health and structure?	8 Marks	L2	CO5
	b)	Compare the effects of different types of mycorrhizal associations (e.g., arbuscular vs. ectomycorrhizal) on plant growth and soil conditions. What are the key differences and similarities?	8 Marks	L3	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

INDUSTRIAL BIOTECHNOLOGY

[Biotechnology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define fermentation. Name the commonly utilized microorganism for fermentation process.	2 Marks	L1	CO1
	b)	What is the upstream process?	2 Marks	L1	CO1
	c)	Outline the difference between solid state fermentation and submerged fermentation.	2 Marks	L1	CO2
	d)	What is DEL factor? Outline its significance.	2 Marks	L1	CO2
	e)	Recall convective mass transfer	2 Marks	L1	CO3
	f)	How oxygen transfers take place in typical bioreactors?	2 Marks	L1	CO3
	g)	Outline the turbidostat for maintenance continuous fermentation process.	2 Marks	L1	CO4
	h)	Write the Monod equation? What does it signifies?	2 Marks	L1	CO4
	i)	Write the commercial uses of vitamins	2 Marks	L1	CO5
	j)	List out any four industrially useful microorganisms.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Outline any four methods of strain improvement. Discuss any two of them.	8 Marks	L2	CO1
	b)	Provide a detailed flowchart representing the complete bioprocessing steps.	8 Marks	L2	CO1

(OR)

3.	a)	Recall upstream processing sin Bioprocess. Explain the various steps of upstream processing.	8 Marks	L2	CO1
	b)	Describe the classification of fermentation based on the end products.	8 Marks	L2	CO1

MODULE-II

4.	a)	Differentiate between fermenter and bioreactor. Enlist basic functions of fermenter	8 Marks	L2	CO2
	b)	What is fermentation? Discuss the various type of fermentation.	8 Marks	L2	CO2

(OR)

5.	a)	With the help of diagram explain the basic design of fermenter.	8 Marks	L2	CO2
	b)	Explain the classification of bioproducts.	8 Marks	L2	CO2

MODULE-III

6.	a)	What is the effect of medium and culture rheology on K_La?	8 Marks	L2	CO3
	b)	Explain the different fluid rheologies.	8 Marks	L2	CO3
		(OR)			
7.	a)	Outline the concept of the **r**ole of diffusion in bioprocessing with suitable example.	8 Marks	L2	CO3
	b)	What is cellular oxygen demand? Write about the various factors affecting cellular oxygen demand.	8 Marks	L2	CO3

MODULE-IV

8.	a)	What are batch cultures? Describe the various phases of cell growth in batch cultures.	8 Marks	L2	CO4
	b)	Write a note on chemostat culture.	8 Marks	L2	CO4
		(OR)			
9.	a)	Graphically explain the different kinetics patterns of growth and product formation.	8 Marks	L2	CO4
	b)	Describe about the substrate and product inhibition on cell growth and product formation	8 Marks	L2	CO4

MODULE-V

10.	a)	Differentiate between primary metabolites and secondary metabolites with suitable example for each.	8 Marks	L2	CO5
	b)	Explain the Antibiotics production process with an example and discuss its advantages.	8 Marks	L2	CO5
		(OR)			
11.	a)	Comment on the applications of Citric Acid.	8 Marks	L2	CO5
	b)	Write note on Microbial Strains for Citric Acid Production.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

FORENSIC SCIENCES PHYSICS

[Forensic Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Mention two methods used to determine the refractive index of glass.	2 Marks	L1	CO1
	b)	Define mechanical fit in glass analysis.	2 Marks	L1	CO1
	c)	What is the significance of paint chips in a hit-and-run case?	2 Marks	L1	CO2
	d)	Name one destructive and one non-destructive method of paint analysis.	2 Marks	L1	CO2
	e)	How should fiber evidence be preserved during transport?	2 Marks	L1	CO3
	f)	What is the importance of matching torn clothing pieces in forensic analysis?	2 Marks	L1	CO3
	g)	What is the role of comparison microscopes in tool mark analysis?	2 Marks	L1	CO4
	h)	Name one method used to lift tool marks from a surface.	2 Marks	L1	CO4
	i)	What is meant by serial number restoration?	2 Marks	L1	CO5
	j)	What is the role of serial numbers in identifying stolen vehicles?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the steps involved in mechanical fit matching of glass fragments.	6 Marks	L2	CO1
	b)	Discuss in detail the collection, packaging, and chain of custody procedures for glass evidence in forensic investigations.	10 Marks	L2	CO1

(OR)

3.	a)	How is the refractive index of glass determined using the Becke line method?	6 Marks	L1	CO1
	b)	Write a detailed note on the role of mechanical fit in glass fragment comparison with a real-case reference.	10 Marks	L2	CO1

MODULE-II

4.	a)	Explain the use of microscopic examination in analyzing paint layers.	6 Marks	L2	CO2
	b)	Compare and contrast destructive techniques such as solubility tests, pyrolysis, and TLC in forensic paint analysis.	10 Marks	L2	CO2

(OR)

5.	a)	Discuss the importance of color, texture, and layering in paint comparison.	6 Marks	L2	CO2
	b)	Explain in detail the application of non-destructive techniques such as FTIR, SEM-EDS, and microspectrophotometry in paint evidence analysis.	10 Marks	L2	CO2

MODULE-III

6.	a)	Compare and contrast natural and synthetic fibers used in forensic analysis.	6 Marks	L2	CO3
	b)	Write a detailed note on the procedures for matching soil samples from different locations and its significance in legal proceedings.	10 Marks	L2	CO3

(OR)

7.	a)	Outline the collection and preservation procedure for fiber evidence at a crime scene.	6 Marks	L1	CO3
	b)	Compare and contrast artificial fibers such as polyester, nylon, and acrylic in terms of forensic examination.	10 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss the types of tools most commonly associated with burglary cases and their forensic implications.	6 Marks	L2	CO4
	b)	Discuss the admissibility of tool mark evidence in court, highlighting the role of expert testimony.	10 Marks	L2	CO4

(OR)

9.	a)	Explain how tool mark analysis can help in reconstructing the sequence of events at a crime scene.	6 Marks	L2	CO4
	b)	Explain how experimental reproductions are created and used in matching tool marks.	10 Marks	L2	CO4

MODULE-V

10.	a)	Explain the process of restoring erased serial numbers using chemical etching techniques.	6 Marks	L2	CO5
	b)	How are tyre tread marks analyzed and matched to a specific vehicle in a hit-and-run investigation?	10 Marks	L1	CO5

(OR)

11.	a)	Describe the process of estimating vehicle speed using accident reconstruction formulas.	6 Marks	L2	CO5
	b)	Explain the challenges and limitations associated with restoring erased serial numbers and how modern technologies are overcoming them.	10 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

TECHNOLOGICAL METHODS IN FORENSIC SCIENCE

[Forensic Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	In what ways is liquid chromatography (LC) advantageous for forensic analysis?	2 Marks	L1	CO1
	b)	Briefly describe the process of spotting and developing a sample in thin-layer chromatography (TLC).	2 Marks	L2	CO1
	c)	How does infrared (IR) spectroscopy differentiate between different functional groups in a compound?	2 Marks	L1	CO2
	d)	What is the significance of the absorption spectrum in atomic absorption spectroscopy (AAS)?	2 Marks	L1	CO2
	e)	Describe a forensic application where electrophoresis is particularly useful.	2 Marks	L2	CO3
	f)	What types of forensic samples can be analyzed using neutron activation analysis (NAA)?	2 Marks	L1	CO3
	g)	How does the use of polarized light microscopy aid in forensic investigations?	2 Marks	L1	CO4
	h)	In what scenarios would a forensic expert choose to use a comparison microscope?	2 Marks	L1	CO4
	i)	What are the key considerations when capturing photographic evidence at a crime scene?	2 Marks	L2	CO5
	j)	In what situations would a forensic expert use infrared or ultraviolet photography?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	How does liquid chromatography differ from gas chromatography in terms of principles and forensic applications?	6 Marks	L1	CO1
	b)	Compare and contrast thin-layer chromatography (TLC), gas chromatography (GC), and liquid chromatography (LC) in terms of their principles, instrumentation, and forensic applications	10 Marks	L1	CO1

(OR)

3.	a)	List and briefly describe the steps involved in the thin-layer chromatography process, emphasizing its forensic applications.	6 Marks	L4	CO1
	b)	Describe the process of sample preparation for chromatographic and spectroscopic evidence. Discuss its importance in forensic analysis.	10 Marks	L5	CO1

MODULE-II

4.	a)	Discuss the forensic applications of colorimetric analysis in the detection and quantification of substances at crime scenes.	6 Marks	L6	CO2
	b)	Explain the principle of Atomic Emission Spectroscopy (AES) and its application in forensic investigations, focusing on the analysis of trace elements in various samples.	10 Marks	L5	CO2
		(OR)			
5.	a)	Discuss the role of Infrared (IR) spectroscopy in the analysis of fibers, paints, and polymers in forensic investigations.	6 Marks	L1	CO2
	b)	Describe the process of Mass Spectroscopy (MS) and its forensic applications in identifying unknown substances. Discuss the role of MS in drug analysis and environmental forensics.	10 Marks	L2	CO2

MODULE-III

6.	a)	Describe the use of X-ray diffraction (XRD) in the analysis of synthetic drugs and how it helps in identifying the crystalline structure of these substances.	6 Marks	L2	CO3
	b)	Compare and contrast Atomic Absorption Spectroscopy (AAS) and Atomic Emission Spectroscopy (AES) in terms of their principles, instrumentation, and forensic applications.	10 Marks	L5	CO3
		(OR)			
7.	a)	Discuss the role of Neutron Activation Analysis (NAA) in the forensic analysis of gunshot residue and its importance in criminal investigations.	6 Marks	L6	CO3
	b)	Describe the fundamental principles of X-ray spectrometry. Discuss its forensic applications in the analysis of trace elements and materials such as metals, glass, and ceramics.	10 Marks	L4	CO3

MODULE-IV

8.	a)	Discuss the advantages of using electron microscopy over light microscopy in the forensic analysis of trace evidence.	6 Marks	L6	CO4
	b)	Explain the working principles of both scanning electron microscopes (SEM) and transmission electron microscopes (TEM). Compare their capabilities and discuss specific forensic applications where each type of electron microscope is most effectively utilized.	10 Marks	L5	CO4
		(OR)			
9.	a)	Describe how comparison microscopy is utilized in the forensic examination of tool marks and the matching of tools to crime scene evidence.	6 Marks	L2	CO4
	b)	Describe the working principle and instrumentation of a Phase contrast microscope and Fluorescent microscope along with neat diagram explain its forensic applications.	10 Marks	L6	CO4

MODULE-V

10.	a)	Explain the basic principles of photography that are crucial for capturing clear and accurate images at a crime scene.	6 Marks	L5	CO5
	b)	Describe the role of photographic evidence in forensic investigations. How is photographic evidence used to support case documentation and courtroom presentations?	10 Marks	L2	CO5
		(OR)			
11.	a)	Explain the Cardinal Rule.	6 Marks	L6	CO5
	b)	Explain the electromagnetic photographic techniques.	10 Marks	L5	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

DERMATOGLYPHICS

[Forensic Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Fingerprints	2 Marks	L1	CO1
	b)	Explain EGA	2 Marks	L3	CO1
	c)	Describe Poroscopy	2 Marks	L2	CO2
	d)	Explain Classification of fingerprints?	2 Marks	L4	CO2
	e)	List out any 4 optical detection techniques	2 Marks	L4	CO3
	f)	Define small particle reagent	2 Marks	L1	CO3
	g)	Explain the significance of preservation of fingerprints in the crime scene?	2 Marks	L2	CO4
	h)	Explain Detail the Stages of decomposition	2 Marks	L5	CO4
	i)	List out the class & individual characteristics of footprints	2 Marks	L4	CO5
	j)	Explain how Ear prints are used for individualization	2 Marks	L5	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe Formation of whorl, arches and loops in the fingerprints	6 Marks	L2	CO1
	b)	Elaborate how the Friction ridges are formed?	10 Marks	L6	CO1
		(OR)			
3.	a)	Differentiate the Type Lines from Pattern Area	6 Marks	L2	CO1
	b)	Tabulate the formation of Fingerprints	10 Marks	L1	CO1

MODULE-II

4.	a)	Explain the Functions of Fingerprint Bureau.	6 Marks	L2	CO2
	b)	Explain 3 level examination of fingerprints	10 Marks	L5	CO2
		(OR)			
5.	a)	Demonstrate Battley Classification	6 Marks	L2	CO2
	b)	What is the AFIS, Explain its role in forensic science.	10 Marks	L1	CO2

MODULE-III

6.	a)	Interpret how silver nitrate test is used for latent fingerprint visualization	6 Marks	L4	CO3
	b)	Explain the optical detection techniques	10 Marks	L5	CO3
		(OR)			
7.	a)	Tabulate the composition of latent fingerprint.	8 Marks	L1	CO3
	b)	Explain Ninhydrin technique	8 Marks	L5	CO3

MODULE-IV

8.	a)	Describe the techniques used to obtain fingerprints from the deceased. How do methods such as rehydration, digital scanning, and casting address the challenges posed by post-mortem conditions?	8 Marks	L2	CO4
	b)	Examine the potential of infrared photography in revealing fingerprints on deceased skin. How does this technique compare to traditional methods, and in what scenarios is it most effective?	8 Marks	L4	CO4
		(OR)			
9.	a)	Assess the use of vacuum metal deposition in fingerprint development on challenging surfaces like gloves. How does this method work, and what makes it suitable for detecting latent prints on difficult materials?	8 Marks	L5	CO4
	b)	Analyze the ethical considerations surrounding digital fingerprint enhancement. What measures should be taken to ensure the integrity and authenticity of digitally enhanced fingerprint evidence in legal contexts?	8 Marks	L4	CO4

MODULE-V

10.	a)	Evaluate the Identification characteristics of footprints.	6 Marks	L5	CO5
	b)	How foot prints found in the crime scene are analyzed.	10 Marks	L1	CO5
		(OR)			
11.	a)	Describe Anatomy of palm with a labeled Diagram.	6 Marks	L2	CO5
	b)	Explain Gait pattern Analysis.	10 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

QUESTIONED DOCUMENTS

[Forensic Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is ASQDE? Who is the current president of ASQDE?	2 Marks	L1	CO1
	b)	What is GEQD?Who is appointed as first GEQD?	2 Marks	L1	CO1
	c)	Name the individual characteristics of writings.	2 Marks	L1	CO2
	d)	What are the tools used for the forensic document examination?	2 Marks	L1	CO2
	e)	Name one challenge faced in the examination of charred documents.	2 Marks	L1	CO3
	f)	Why is the examination of obliterations important in forensic document analysis?	2 Marks	L1	CO3
	g)	What is normal hand forgery and trickery forgery?	2 Marks	L1	CO4
	h)	Forensic significance of typewriting identification.	2 Marks	L2	CO4
	i)	How do digital signatures differ from handwritten signatures in terms of forensic analysis?	2 Marks	L1	CO5
	j)	What is the purpose of a Video Spectral Comparator in the examination of questioned documents?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Identify and discuss the common types of crimes associated with document forgery and fraud.	6 Marks	L6	CO1
	b)	Describe the process of handling and marking documents during forensic examination. Discuss the potential consequences of mishandling documents.	10 Marks	L6	CO1

(OR)

3.	a)	What are the essential steps in handling and marking documents for forensic examination? Why is this process crucial?	6 Marks	L5	CO1
	b)	Analyze the different classifications of documents used in forensic document examination. How do these classifications assist in the investigation of document-related crimes?	10 Marks	L5	CO1

MODULE-II

4.	a)	Explain basic handwriting characteristics.	6 Marks	L1	CO2
	b)	Describe the tools used in forensic document examination, including microscopes, magnifying glasses, and software for image enhancement and comparison.	10 Marks	L4	CO2

(OR)

5.	a)	Explain the individual characteristics of handwriting in forensic	6 Marks	L1	CO2

		document examination.			
	b)	Explain various tools used in forensic document examination.	10 Marks	L2	CO2

MODULE-III

6.	a)	Explain how indented writings are examined in forensic document analysis.	6 Marks	L2	CO3
	b)	Explain the forensic examination of charred documents. What challenges are faced in this process, and how can they be overcome?	10 Marks	L1	CO3
		(OR)			
7.	a)	What challenges are faced in the examination of charred documents, and how can these be addressed?	6 Marks	L6	CO3
	b)	Describe the techniques used in the decipherment of secret writings and indented writings. How are these methods applied in forensic document examination?	10 Marks	L5	CO3

MODULE-IV

8.	a)	What are the key security features examined in counterfeit currency notes?	6 Marks	L2	CO4
	b)	Explain the examination of fax machine copies and carbon copies.	10 Marks	L6	CO4
		(OR)			
9.	a)	Describe the forensic significance of typewriting identification.	6 Marks	L5	CO4
	b)	List and explain the security features of currency.	10 Marks	L5	CO4

MODULE-V

10.	a)	Briefly discuss the forensic examination of credit cards. What features are typically analyzed?	6 Marks	L1	CO5
	b)	Describe the principles and applications of the Video Spectral Comparator (VSC) in the examination of questioned documents.	10 Marks	L5	CO5
		(OR)			
11.	a)	What is a digital signature, and how is it verified in forensic analysis?	6 Marks	L4	CO5
	b)	Discuss the techniques used to identify and examine electronic typewriter writings. How do they differ from traditional typewriter analysis?	10 Marks	L5	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA V Semester (MBU-22) Supplementary Examinations, March – 2026

ORGANIZATIONAL CHANGE AND DEVELOPMENT

[Management]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define resistance change.	2 Marks	L1	CO1
	b)	What is revolutionary change?	2 Marks	L1	CO1
	c)	List steps in Bruke-Litwin model of change.	2 Marks	L1	CO2
	d)	What is "desire" as per ADKAR model?	2 Marks	L1	CO2
	e)	Define empowerment.	2 Marks	L1	CO3
	f)	Define survey feedback?	2 Marks	L1	CO3
	g)	Write a short note on sensitivity training.	2 Marks	L1	CO4
	h)	Explain inter group interventions.	2 Marks	L1	CO4
	i)	Define career anchors.	2 Marks	L1	CO5
	j)	Write a short note on client system.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Explain the concept of organizational change. Discuss its importance. What are the various types of changes?	16 Marks	L2	CO1

(OR)

3.	Explain the concept of resistance and factors influencing resistance to change with relevant examples.	16 Marks	L2	CO1

MODULE-II

4.	Discuss about the Bridges Transition model of organizational change.	16 Marks	L2	CO2

(OR)

5.	Explain McKinseys' 7s Model of organizational change and give your comments on its applications.	16 Marks	L3	CO2

MODULE-III

6.	a)	Elaborate the need for OD.	8 Marks	L2	CO3
	b)	Discuss about the objectives of OD.	8 Marks	L2	CO3

(OR)

7.	Explain how Organization development program starts in an organization? Also explain phases of OD program	16 Marks	L2	CO3

MODULE-IV

8.	Explain the nature or characteristics of OD interventions. Discuss any two types of Intervention and their significance to the organization.	16 Marks	L2	CO4

(OR)

9.	"OD is more than just reaching into a kit-bag and pulling out an intervention or two". Discuss the statement.	16 Marks	L3	CO4

MODULE-V

10.	Elaborate the steps in OD implementation process.	16 Marks	L2	CO5

(OR)

11.	Explain the frame work of contextual trends and their effects on OD's future.	16 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. III Semester (MBU-22) Supplementary Examinations, March – 2026

DESIGN AND ANALYSIS OF ALGORITHMS

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is an algorithm?	2 Marks	L1	CO1
	b)	Define pseudocode and explain its importance in algorithm design.	2 Marks	L1	CO1
	c)	What are disjoint sets?	2 Marks	L1	CO2
	d)	What is the purpose of the Union operation in disjoint sets?	2 Marks	L2	CO2
	e)	What is the general method in dynamic programming?	2 Marks	L1	CO2
	f)	What is the matrix-chain multiplication problem?	2 Marks	L3	CO3
	g)	What is the greedy method in algorithm design?	2 Marks	L1	CO4
	h)	Explain the 8-queens problem in backtracking.	2 Marks	L2	CO4
	i)	What is the branch and bound method in algorithm design?	2 Marks	L2	CO4
	j)	What is a nondeterministic algorithm?	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Define an algorithm. Explain characteristics of algorithm with an example.	8 Marks	L1	CO1
	b)	What are the features of an efficient algorithm? Give an example.	8 Marks	L2	CO1

(OR)

3.	a)	Explain recursion tree method with an example.	8 Marks	L1	CO1
	b)	Write about Master method with an example.	8 Marks	L2	CO1

MODULE-II

4.	a)	Define disjoint Sets. Explain in detail about the various operations with an example.	8 Marks	L2	CO2
	b)	Explain in detail about union and find algorithms with an example.	8 Marks	L2	CO2

(OR)

5.	a)	Demonstrate merge sort algorithm by applying divide and conquer technique for the given elements 7,5,2,4,1,6,3,0.	8 Marks	L3	CO2
	b)	Explain Strassen's algorithm for matrix multiplication with the help of an example.	8 Marks	L3	CO2

MODULE-III

6.	a)	What is dynamic programming? How Does Dynamic Programming Works. Illustrate with an example.	8 Marks	L2	CO3
	b)	Explain how Matrix – chain Multiplication problem can be solved using dynamic programming with suitable example.	8 Marks	L3	CO3

(OR)

7.	a)	Explain how solution will be provided for all pairs shortest path problem using dynamic programming.	8 Marks	L2	CO3
	b)	Discuss about Floyd-warshall algorithm with an example.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain the general principle of Greedy method and also list the applications of Greedy method.	8 Marks	L2	CO4
	b)	Write a greedy algorithm for sequencing unit time jobs with dead lines and profits.	8 Marks	L2	CO4

(OR)

9.	a)	Define graph coloring and write an algorithm to find Hamiltonian cycles.	8 Marks	L2	CO4
	b)	Give the solution to the 8 queen's problems using backtracking.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain the principles of FIFO Branch- and-Bound.	8 Marks	L2	CO4
	b)	State the concept of branch and bound method and also list its applications.	8 Marks	L2	CO4

(OR)

11.	a)	Explain 0/1 knapsack problem in Branch and Bound technique with an example.	8 Marks	L3	CO4
	b)	Discuss about general method of branch and bound technique with an example.	8 Marks	L3	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com V Semester (MBU-22) Supplementary Examinations, March – 2026

DATAWAREHOUSING AND MINING

[Computer Applications]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is a multidimensional data model?	2 Marks	L1	CO1
	b)	Define "measures" in the context of data warehousing.	2 Marks	L1	CO1
	c)	What are some major issues in data mining?	2 Marks	L1	CO2
	d)	What is data transformation?	2 Marks	L1	CO2
	e)	What is frequent itemset mining?	2 Marks	L1	CO3
	f)	What is rule-based classification?	2 Marks	L1	CO3
	g)	What is the agglomerative hierarchical clustering method?	2 Marks	L1	CO4
	h)	How are outliers detected in clustering?	2 Marks	L1	CO4
	i)	What are some current trends in data mining?	2 Marks	L1	CO5
	j)	How is spatial data mining different from other types of data mining?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the concept of a data warehouse and its key characteristics.	8 Marks	L2	CO1
	b)	Compare operational database systems with data warehouses, highlighting their key differences.	8 Marks	L2	CO1

(OR)

3.	a)	Describe the multi-tier architecture of a data warehouse and its components.	8 Marks	L2	CO1
	b)	Compare and contrast star schema, snowflake schema, and fact constellation schema in data warehousing.	8 Marks	L2	CO1

MODULE-II

4.	a)	Define data mining and discuss its importance. Describe the different kinds of data used in data mining.	8 Marks	L2	CO2
	b)	Describe the concept of pattern evaluation in data mining and its significance.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the data preprocessing techniques: Data Cleaning, Data Integration, Data Reduction, Data Transformation, and Discretization.	8 Marks	L2	CO2
	b)	Discuss the role and challenges of data cleaning in the data mining process.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the basic concepts of associations and classification.	8 Marks	L2	CO3
	b)	Explain the decision tree algorithm in classification. What are the main steps involved in building a decision tree, and how does it handle overfitting?	8 Marks	L2	CO3

(OR)

7.	a)	Explain Bayesian Classification methods, including their key concepts and applications.	8 Marks	L2	CO3
	b)	Describe frequent itemset mining methods and their applications.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss the different types of data used in cluster analysis and their implications for clustering techniques.	8 Marks	L2	CO4
	b)	Describe the DBSCAN algorithm, including its parameters and how it handles noise.	8 Marks	L2	CO4

(OR)

9.	a)	Discuss the k-Medoids algorithm, including its steps, advantages, and limitations.	8 Marks	L2	CO4
	b)	Explain the density-based clustering method DBSCAN. Describe its algorithm, advantages, disadvantages.	8 Marks	L2	CO4

MODULE-V

10.	a)	Describe the differences between spatial data mining and traditional data mining.	8 Marks	L2	CO5
	b)	What is web data mining, and what are its primary techniques?	8 Marks	L2	CO5

(OR)

11.	a)	How are complex data types influencing data mining methodologies?	8 Marks	L2	CO5
	b)	Explain the methods used for mining text data. Discuss the challenges of text data mining and how these methods are applied in real-world scenarios.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MCA III Semester (MBU-22) Supplementary Examinations, March – 2026

ARTIFICIAL INTELLIGENCE

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define a Rational Agent.	2 Marks	L1	CO1
	b)	Who is considered the father of Artificial Intelligence and what key concept did he introduce?	2 Marks	L1	CO1
	c)	What is problem solving agent?	2 Marks	L1	CO2
	d)	List the steps involved in simple problem-solving technique.	2 Marks	L1	CO2
	e)	List the variants of Hill Climbing search.	2 Marks	L1	CO3
	f)	What is a summit point in a search landscape?	2 Marks	L1	CO3
	g)	What is an atomic event in probabilistic reasoning?	2 Marks	L1	CO4
	h)	Define prior probability with an example.	2 Marks	L1	CO4
	i)	Define a robotic agent.	2 Marks	L1	CO5
	j)	List out the limitations of AI	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the foundations of Artificial Intelligence with suitable examples.	8 Marks	L2	CO1
	b)	Discuss the history of Artificial Intelligence and highlight major milestones.	8 Marks	L1	CO1
		(OR)			
3.	a)	Describe the state of the art in AI with reference to recent applications.	8 Marks	L2	CO1
	b)	Explain the risks and benefits of Artificial Intelligence.	8 Marks	L2	CO1

MODULE-II

4.	a)	Differentiate between Breadth-First and Depth first search techniques.	8 Marks	L2	CO2
	b)	Explain about the following Search algorithms i) Breadth First Search. ii) Uniform Cost Search	8 Marks	L2	CO2
		(OR)			
5.	a)	Explain about the following Search algorithms i) Depth First Search. ii) Iterative Depping Search	8 Marks	L2	CO2
	b)	Explain about the following Search algorithms i) A* Search. ii) Greedy Best First Search	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the hill-climbing search algorithm and its working mechanism in solving optimization problems.	8 Marks	L2	CO3
	b)	Discuss about hill-climbing search algorithm advantages and limitations.	8 Marks	L2	CO3

(OR)

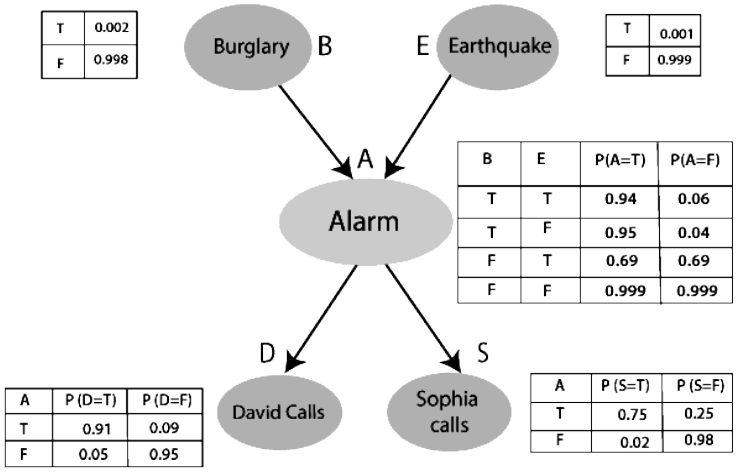
7.	a)	Provide examples of scenarios where hill-climbing may fail to find an optimal solution.	8 Marks	L2	CO3
	b)	Describe the simulated annealing algorithm in detail.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain about the structure and semantics of Bayesian networks in detail.	8 Marks	L2	CO4
	b)	Explain conditional Probability and joint Probability in Bayesian networks	8 Marks	L2	CO4

(OR)

9.		Discuss Bayesian Network in detail. Calculate the probability that alarm has sounded, but there is neither a burglary, nor an earthquake occurred, and David and Sophia both called the Harry.	16 Marks	L2	CO4



T	0.002
F	0.998

T	0.001
F	0.999

B	E	P(A=T)	P(A=F)
T	T	0.94	0.06
T	F	0.95	0.04
F	T	0.69	0.69
F	F	0.999	0.999

A	P (D=T)	P (D=F)
T	0.91	0.09
F	0.05	0.95

A	P (S=T)	P (S=F)
T	0.75	0.25
F	0.02	0.98

MODULE-V

10.	a)	Explain about the ethical implications of using AI in surveillance systems.	8 Marks	L2	CO5
	b)	Discuss the evolution of robotics, its current state, and future prospects.	8 Marks	L2	CO5

(OR)

11.	a)	Explain the interdisciplinary nature of robotics with an example.	8 Marks	L2	CO5
	b)	Explain how the principle of "do no harm" applies to the design and deployment of autonomous robots in healthcare settings.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MCA III Semester (MBU-22) Supplementary Examinations, March-2026

OBJECT ORIENTED MODELING AND DESIGN

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Explain the concept of object identity.	2 Marks	L1	CO1
	b)	Write the purpose of UML.	2 Marks	L2	CO1
	c)	Define Class and object.	2 Marks	L2	CO2
	d)	How to represent generalization relationship in the class diagram.	2 Marks	L2	CO2
	e)	List out the terms used in sequence diagram.	2 Marks	L2	CO3
	f)	Draw the notations used in Use case diagram.	2 Marks	L2	CO3
	g)	Explain the concept of state chart diagram	2 Marks	L2	CO4
	h)	Define the terms Process and thread.	2 Marks	L1	CO4
	i)	What is meant by patterns.	2 Marks	L1	CO5
	j)	Define the term artifact.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the features of Object-oriented modeling.	8 Marks	L2	CO1
	b)	Briefly explain the common mechanisms of UML.	8 Marks	L2	CO1
		(OR)			
3.	a)	Describe in detail about the class diagram.	8 Marks	L3	CO1
	b)	Illustrate the concept of Aggregation and Dependency relationships.	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain the concept of visibility and scope in class diagram.	8 Marks	L2	CO2
	b)	What is an object? Explain the terms used in object diagram.	8 Marks	L2	CO2
		(OR)			
5.	a)	How to define stereotype and constraints in generalization relationship.	8 Marks	L2	CO2
	b)	Explain the concept of forward and reverse engineering in a class diagram.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain about elements of Use case diagram.	8 Marks	L2	CO3
	b)	Illustrate the concept of interaction diagram.	8 Marks	L2	CO3
		(OR)			

7.	a)	Explain various types of events in the use case diagram with a suitable example?	8 Marks	L2	CO3
	b)	Explain the modelling flows of control by organization in collaboration diagram.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss about activity diagram with an example of ATM transaction.	8 Marks	L3	CO4
	b)	Briefly explain the concept of state chart with suitable example.	8 Marks	L3	CO4

(OR)

9.	a)	Explain the concept of swim lane**.**	8 Marks	L2	CO4
	b)	How can you represent process and threads in UML.	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss the significant difference between component and class.	8 Marks	L2	CO5
	b)	Discuss the terms and concept of deployment diagram.	8 Marks	L2	CO5

(OR)

11.	a)	How can you model the tables, files and documents in component diagram.	8 Marks	L2	CO5
	b)	Explain the modeling of processors and devices in deployment diagram.	8 Marks	L2	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com III Semester (MBU-22) Supplementary Examinations, March – 2026

COST ACCOUNTING

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is cost Center?	2 Marks	L1	CO1
	b)	What is a Cost unit?	2 Marks	L1	CO1
	c)	What is the basic idea behind Taylor's differential piece rate system?	2 Marks	L1	CO2
	d)	Discuss various wages incentive plans.	2 Marks	L1	CO2
	e)	Distinguish between Direct cost and Indirect cost.	2 Marks	L1	CO3
	f)	Define cost of production.	2 Marks	L1	CO3
	g)	Give Four such industries where job order costing is employed.	2 Marks	L1	CO4
	h)	Define Batch costing.	2 Marks	L1	CO4
	i)	List out various cost accounting standards.	2 Marks	L1	CO5
	j)	List out various cost audit reports.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	What is cost accounting and why is it important for a businesses?	16 Marks	L1	CO1
	(OR)			
3.	What is the difference between direct costs and indirect costs, and how do they relate to the elements of costing?	16 Marks	L2	CO1

MODULE-II

4.	Distinguish between Bin card and Stores ledger.	16 Marks	L2	CO2
	(OR)			
5.	A company annual consumption 10,000 units of a product. The ordering cost is Rs.50 per order, and the carrying cost per unit per year is Rs.10% price of the product, Price of a product is Rs.20. Calculate the EOQ.	16 Marks	L3	CO2

MODULE-III

6.	Distinguish between fixed and variable overheads	16 Marks	L2	CO3
	(OR)			
7.	Write short notes on the following: i) Define prime cost and what are its elements. ii) Prepare a chart showing different elements of cost iii) What is cost center? iv) Explain factory cost.	16 Marks	L2	CO3

MODULE-IV

8.	The following data related to manufacture a standard product during month of march 2019. Raw materials consumed Rs . 80,000 Direct wages Rs. 48,000 Machine -work hours consumed 8000 Machine hour-rate Rs.4 Office overhead 10% of works cost Selling overhead Rs.1.50 per week Units produced 4000 Units sold 3600 at Rs.50 eah You are required to prepare cost sheet for proper form	16 Marks	L4	CO4
	(OR)			
9.	Explain the components of a cost sheet. Provide examples for each component.	16 Marks	L2	CO4

MODULE-V

10.	How do cost Accounting Standards impact on Financial reporting?	16 Marks	L2	CO5
	(OR)			
11.	What types of documents and records do auditors examine to evaluate CAS compliance?	16 Marks	L3	CO5

CODE No.: 22CM101013 MBU-22

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com III Semester (MBU-22) Supplementary Examinations, March – 2026

GOODS AND SERVICE TAX

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Write about advantages of GST.	2 Marks	L1	CO1
	b)	List out the components of GST.	2 Marks	L1	CO1
	c)	List out the taxe rates.	2 Marks	L1	CO2
	d)	Write about vijay kelkar.	2 Marks	L1	CO2
	e)	What are the invoice features?	2 Marks	L1	CO3
	f)	List out the components of bills.	2 Marks	L1	CO3
	g)	Summerize the distribution of credit.	2 Marks	L1	CO4
	h)	State the issues of matching input tax credit.	2 Marks	L1	CO4
	i)	Write about filling returns.	2 Marks	L1	CO5
	j)	Summarize the composition quarterly filling returns.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	Who are persons eligible to pay to GST? Explain.	16 Marks	L2	CO1
	(OR)			
3.	Explain the origin of GST in India.	16 Marks	L2	CO1

MODULE-II

4.	What is single GST? Explain its importance.	16 Marks	L2	CO2
	(OR)			
5.	What is the Dual GST? Explain its importance.	16 Marks	L2	CO2

MODULE-III

6.	When does the companies are required the invoices? Explain.	16 Marks	L2	CO3
	(OR)			
7.	Describe the composite supply under taxation.	16 Marks	L2	CO3

MODULE-IV

8.	Distinguish between the central GST and state GST under ITC.	16 Marks	L2	CO4
	(OR)			
9.	Describe the availability of credit system in India.	16 Marks	L2	CO4

MODULE-V

10.	Explain the functions of GSTR-9, GSTR 9A.	16 Marks	L2	CO5
	(OR)			
11.	What is GSTR-9? Explain various filling form under GSTR-9.	16 Marks	L2	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com III Semester (MBU-22) Supplementary Examinations, March – 2026

FINANCIAL ACCOUNTING-II

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Payee.	2 Marks	L1	CO1
	b)	Write about the accommodation bill.	2 Marks	L1	CO1
	c)	What is Hire purchase system.	2 Marks	L1	CO2
	d)	Discuss about the features of instalment system.	2 Marks	L1	CO2
	e)	Define Joint stock company.	2 Marks	L1	CO3
	f)	What is a chartered company?	2 Marks	L1	CO3
	g)	Explain about Forfeiture of shares.	2 Marks	L1	CO4
	h)	What do you mean by Preference Shares?	2 Marks	L1	CO4
	i)	State the types of debentures.	2 Marks	L1	CO5
	j)	Definition of Debenture.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Define Bills of Exchange. Give its essentials.	10 Marks	L2	CO1
	b)	Explain the parties to a bill of exchange.	6 Marks	L2	CO1
		(OR)			
3.	a)	Draw the specimen of a bill of exchange.	6 Marks	L2	CO1
	b)	Ajay sold goods of the value of Rs. 2,000 to Bhaskar, taking a bill for three months dated 1st October 2014. On 1st October, Ajay discounted the bill at 10% p.a. with his bankers. At maturity, the bill was returned by the bankers dishonored with Rs. 25 expenses. Bhaskar paid Rs. 500 and expenses of Rs. 25 and gave Ajay another bill at three months for Rs. 1,500 and interest at 10% p.a. Before Maturity Bhaskar had become bankrupt and at maturity his creditors were paid at 50 paise in the rupee. Make the journal entries for recording the above transactions in the books of Ajay.	10 Marks	L3	CO1

MODULE-II

4.	a)	Explain the features of hire purchase system.	4 Marks	L2	CO2
	b)	Distinguish between the hire purchase system and installment system.	12 Marks	L3	CO2
		(OR)			
5.	a)	Discuss about importance of Hire purchase system.	4 Marks	L2	CO2
	b)	X purchased a car from Y costing Rs. 1,50,000 on hire purchase system. Payment was to be made Rs. 30,000 as down payment and remaining balance paid in 3 equal instalments together with interest 5% p.a. X Provides depreciation at 20% p.a. on diminishing balance basis. X paid the first instalment at the end of first year but could not pay the next. Y took possession of the car. He spends Rs. 5,800 on the car and sold it for Rs. 80,000 Show necessary ledger accounts in the books of both the parties.	12 Marks	L3	CO2

MODULE-III

6. Describe the steps involved in promoting a company. 16 Marks L2 CO3

(OR)

7. What is Memorandum of Association? Explain its clauses. 16 Marks L2 CO3

MODULE-IV

8. Unique Pictures Limited was registered with an authorized capital of Rs. 5,00,000 divided into 20,000, 5% preference shares of Rs. 10 each and 30,000 equity shares of Rs. 10 each. The company issued 10,000 preference and 15,000 equity shares for public subscription. Calls on shares were made as under 16 Marks L4 CO4

	Equity Share	Preference Shares
Application	Rs. 2	Rs. 2
Allotment	Rs. 3	Rs. 3
First Call	Rs. 2.50	Rs. 2.50
Second and Final Call	Rs. 2.50	Rs. 2.50

All these shares were fully subscribed. All the dues were received except the second and final call on 100 equity shares and on 200 preference shares. Record these transactions in the journal. You are also required to prepare the cash book and balance sheet

(OR)

9. Sri Krishna Agro Chemical Ltd. was registered with a capital of Rs. 5000000 divided into 50,000 shares of Rs 100 each. It issued 10000 shares at a discount of Rs 10 per share, payable as :Rs 40 per share on application, Rs 30 per share on allotment, Rs 20 per share on call. Company received applications for 15000 shares. Applicants for 12000 shares were allotted 10000 shares and applications for the remaining shares were sent letters of regret and their application money was returned. Call was made. Allotment and call money was duly received. Make journal entries in the books of the company. 16 Marks L2 CO4

MODULE-V

10. Define Debentures. Explain the different types of Debentures. 16 Marks L2 CO5

(OR)

11. Ganga Ltd. issued 2,000 12% debentures of Rs. 100 each at a premium of 10% payable Rs.25 on application; Rs. 40 (including premium) payable on allotment and balance on First and Final Call. In all 3,500 applications were received 500 applications were rejected and allotment was made to applicants to 3,000 debentures on Pro-rata basis. The excess money was adjusted on allotment. Give journal entries. 16 Marks L4 CO5

CODE No.: 22MG101013 MBU-22

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA III Semester (MBU-22) Supplementary Examinations, March – 2026

HUMAN RESOURCE MANAGEMENT

[Management]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is Controlling?	2 Marks	L1	CO1
	b)	Define the term staffing.	2 Marks	L1	CO1
	c)	Define Promotion.	2 Marks	L1	CO2
	d)	What do you mean by employee referrals?	2 Marks	L1	CO2
	e)	Define Placement.	2 Marks	L1	CO3
	f)	What do you mean by Induction?	2 Marks	L1	CO3
	g)	What is Coaching?	2 Marks	L1	CO4
	h)	Define compensation.	2 Marks	L1	CO4
	i)	List the advantages of Quality Circles.	2 Marks	L1	CO5
	j)	State the need of balancing work life and personal life.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	Explain the Role of HR Manager in business organizations with examples.	16 Marks	L2	CO1
	(OR)			
3.	Globalization is a challenge for HRM. Elucidate.	16 Marks	L2	CO1

MODULE-II

4.	Explain the methods of Recruitment with suitable examples.	16 Marks	L2	CO2
	(OR)			
5.	What is Human Resource Planning? Explain the process of HRP.	16 Marks	L2	CO2

MODULE-III

6.	Define Selection. Differentiate between Recruitment and Selection.	16 Marks	L2	CO3
	(OR)			
7.	Explain in detail about Induction and Placement.	16 Marks	L2	CO3

MODULE-IV

8.	Explain the concept Employee welfare and safety.	16 Marks	L2	CO4
	(OR)			
9.	List the advantages and disadvantages of on-the-job training methods.	16 Marks	L2	CO4

MODULE-V

10.	Explain how do you balance work life and personal life.	16 Marks	L2	CO5
	(OR)			
11.	What do you mean by Hybrid Work Culture. Explain its advantages.	16 Marks	L2	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA III Semester (MBU-22) Supplementary Examinations, March – 2026

MARKETING MANAGEMENT

[Management]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Marketing.	2 Marks	L1	CO1
	b)	What are the four P's in marketing?	2 Marks	L1	CO1
	c)	What is Guarantee?	2 Marks	L1	CO2
	d)	What is Warrantee?	2 Marks	L1	CO2
	e)	Define pricing.	2 Marks	L1	CO3
	f)	What are the methods of pricing?	2 Marks	L1	CO3
	g)	Define advertising.	2 Marks	L1	CO4
	h)	Define advertising objective.	2 Marks	L1	CO4
	i)	What is Digital marketing?	2 Marks	L1	CO5
	j)	Explain Online advertising.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Define Marketing? Evaluate the functions of marketing.	8 Marks	L2	CO1
	b)	Write short notes on: i) Targeting ii) Positioning iii) Segmentation	8 Marks	L3	CO1
		(OR)			
3.	a)	Explain the following: i) Sales concept ii) Product concept iii) Production concept iv) Marketing concept	8 Marks	L2	CO1
	b)	Explain the different functions of marketing management.	8 Marks	L3	CO1

MODULE-II

4.	a)	Discuss Product Management.	8 Marks	L2	CO2
	b)	Expound the scope of branding.	8 Marks	L3	CO2
		(OR)			
5.	a)	What is the process of new product development? Explain various steps in detail.	8 Marks	L3	CO2
	b)	Explain the importance of Labelling and Packaging.	8 Marks	L2	CO2

MODULE-III

6.	a)	What is meant by pricing? What are the various types of strategies used in pricing decisions?	8 Marks	L3	CO3
	b)	Differentiate between a Retailer and a Wholesaler.	8 Marks	L2	CO3
		(OR)			
7.	a)	Evaluate the distribution channels and explain its importance in Price.	8 Marks	L2	CO3
	b)	Describe the Initiating and responding to price changes.	8 Marks	L2	CO3

MODULE-IV

8.	a)	What are the different types of Digital Marketing?	8 Marks	L3	CO4
	b)	Differentiate Traditional Marketing Vs Digital Marketing.	8 Marks	L2	CO4
		(OR)			
9.	a)	Describe the Personal Communication with your own example.	8 Marks	L2	CO4
	b)	Explain the role of Communication in Marketing.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain in detail about the Digital networks.	8 Marks	L2	CO5
	b)	Discuss about the Importance and role of social media communities in digital marketing.	8 Marks	L3	CO5
		(OR)			
11.	a)	What is online advertising and explain its advantages?	8 Marks	L3	CO5
	b)	Describe affiliate marketing and its Pros and Cons.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA III Semester (MBU-22) Supplementary Examinations, March – 2026

MANAGEMENT ACCOUNTING

[Management]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Write the meaning of Management Accounting.	2 Marks	L1	CO1
	b)	Explain about accounting users in business.	2 Marks	L1	CO1
	c)	Write about Financial Statement.	2 Marks	L1	CO2
	d)	Discuss about Horizontal Analysis.	2 Marks	L1	CO2
	e)	Explain about marginal costing.	2 Marks	L1	CO3
	f)	Discuss characteristics of Marginal costing.	2 Marks	L1	CO3
	g)	Write the meaning of Fund flow statement.	2 Marks	L1	CO4
	h)	Explain the uses of Funds flow Statement.	2 Marks	L1	CO4
	i)	Write about cash flow statement.	2 Marks	L1	CO5
	j)	Discuss the concept of cash flow statement.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2. Explain the scope of Management Accounting. 16 Marks L2 CO1

(OR)

3. Explain the meaning and nature of Management Accounting. 16 Marks L2 CO1

MODULE-II

4. Explain essential components of Horizontal Analysis. 16 Marks L4 CO2

(OR)

5. Explain major components of Vertical analysis. 16 Marks L4 CO2

MODULE-III

6. Ravi Furniture House before provided following information. 16 Marks L2 CO3

Year	Units	Total Cost	sales
2021	10,000	80,000	1,00,000
2022	12,000	90,000	1,20,000

Calculate Margin of Safety and profit on the basis of Margin of Safety for the year 2021 and 2022.

(OR)

7. Explain Break even analysis with examples. 16 Marks L4 CO3

MODULE-IV

8. From the records of a company the following information has been extracted. 16 Marks L4 CO4

Particulars	Amount
Net Profit after providing for the following items	80,000
Loss on sales of equipment's	15,000
Premium on redemption of debentures	1,000
Discount on issue of debentures	2,000
Depreciation on buildings	15,000
Depletion of wasting assets	5,000
Good will written off	20,000
Interim Dividend	20,000
Profit on sale of Fixed Assets	35,000
Excess taxation provided	20,000
Income from investments	5,000
Transfer to general reserve	6,000
Preliminary expenses written off	1,500
Profit on revaluation of investments	2,000

Calculate Funds from operation.

(OR)

9. Write essential component of Funds flow statement. 16 Marks L3 CO4

MODULE-V

10. Write different activities involved in Cash flow statement. 16 Marks L2 CO5

(OR)

11. From the following information, prepare cash flow statement for the year ended 31.03.2022. 16 Marks L4 CO5

Particulars	Amount
Opening cash Balance	10,000
Closing cash balance	12,000
Decrease in Debtors	5,000
Increase in Creditors	7,000
Sale of Fixed Assets	20,000
Redemption of Debentures	50,000
Net Profit for the year	20,000

Calculate Closing Cash Balance .

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA III Semester (MBU-22) Supplementary Examinations, March – 2026

BUSINESS DECISION MAKING

[Management]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define Accrual Accounting.	2 Marks	L1	CO1
	b)	Explain the significance of Financial statement analysis.	2 Marks	L1	CO1
	c)	Describe SWOT analysis.	2 Marks	L1	CO2
	d)	What is strategic management?	2 Marks	L1	CO2
	e)	Describe about programmed decisions.	2 Marks	L1	CO3
	f)	Describe about demand forecasting.	2 Marks	L1	CO3
	g)	Describe about IRR.	2 Marks	L1	CO4
	h)	What is Pay - back Period?	2 Marks	L1	CO4
	i)	What is uncertainty?	2 Marks	L1	CO5
	j)	Describe about scenario analysis.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2. What are financial statements? Explain the significance of financial statement analysis for decision making. — 16 Marks, L1, CO1

(OR)

3. Describe the following — 16 Marks, L2, CO1
   i) Income statement
   ii) Balance sheet
   iii) Funds Flow statement
   iv) Cash flow statement

MODULE-II

4. Explain the following: — 16 Marks, L2, CO2
   i) Programmed and non - programmed decisions
   ii) Operational and strategic decisions.
   iii) Organizational and personal decisions
   iv) Major and minor decisions.

(OR)

5. What is SWOT analysis? Explain the significance of SWOT analysis for decision making. — 16 Marks, L3, CO2

MODULE-III

6. How do you formulate a strategy at corporate level? Explain it with an example. — 16 Marks, L2, CO3

(OR)

7. Elucidate the decision making process and Explain the steps in decision making process. — 16 Marks, L2, CO3

MODULE-IV

8.	What is a Net Present Value (NPV) analysis, and how does it help in financial decision-making?	16 Marks	L4	CO4
	(OR)			
9.	What is data analytics? Explain the role of data analytics in business decision making.	16 Marks	L2	CO4

MODULE-V

10.	What cognitive biases are most likely to influence decision-making under stress, and how can they be mitigated?	16 Marks	L2	CO5
	(OR)			
11.	What is scenario analysis, and how does it contribute to effective crisis management?	16 Marks	L3	CO5

CODE No.: 22MG101036 MBU-22

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA III Semester (MBU-22) Supplementary Examinations, March – 2026

LEADERSHIP MANAGEMENT

[Management]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Mention the role of leaders.	2 Marks	L1	CO1
	b)	Leaders are born or made, comment.	2 Marks	L1	CO1
	c)	Differentiate Ethical Leader and Manager	2 Marks	L1	CO2
	d)	Recall different types of Leadership Skills.	2 Marks	L1	CO2
	e)	Explain the Concept Process Theory	2 Marks	L1	CO3
	f)	Explain significance of Reinforcement Theory	2 Marks	L1	CO3
	g)	Explain the Concept Verbal Communication	2 Marks	L1	CO4
	h)	Explain significance of Ethical Communication	2 Marks	L1	CO4
	i)	Explain the Concept Negotiation	2 Marks	L1	CO5
	j)	Explain significance of Conflict Resolution Mechanism	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	"Management has been defined as the technique of executive leadership. "Discuss the nature and significance of leadership in industry.	16 Marks	L2	CO1

(OR)

3.	What are the four roles of Leaders and their role in relate to IT Industry.	16 Marks	L2	CO1

MODULE-II

4.	Discuss the process of Leadership and types of leadership skills.	16 Marks	L2	CO2
5.	Explain the Blake and Mouton Leadership with Example.	16 Marks	L2	CO2

MODULE-III

6.	How leadership skills will be useful for the development of organizations. Comment.	16 Marks	L2	CO3

(OR)

7.	What are the considerations to Promote leadership in Organizations. Explain	16 Marks	L2	CO3

MODULE-IV

8.	Determine the reasons of Ethical Communication in Organizations with example.	16 Marks	L2	CO4

(OR)

9.	Explain the barriers of Communication with examples.	16 Marks	L2	CO4

MODULE-V

10.	Elucidate the role of conflict resolution mechanism in Organizations.	16 Marks	L2	CO5

(OR)

11	Explain the role of Groups and Teams in Organizations.	16 Marks	L2	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA III Semester (MBU-22) Supplementary Examinations, March – 2026

BUSINESS RESEARCH

[Management]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	State types of business research.	2 Marks	L1	CO1
	b)	What is Qualitative research?	2 Marks	L1	CO1
	c)	Define Literature Review.	2 Marks	L2	CO2
	d)	Define Type I and II error	2 Marks	L1	CO2
	e)	When is non-probability sampling is preferred?	2 Marks	L1	CO3
	f)	Define Simple and stratified random sampling.	2 Marks	L1	CO3
	g)	Define Nominal Scale.	2 Marks	L1	CO4
	h)	What is Validity, and why is it important in research?	2 Marks	L2	CO4
	i)	Describe Oral Presentation.	2 Marks	L1	CO5
	j)	State the term Research Report.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	What do you mean by research? Explain its significance in modern times.	8 Marks	L2	CO1
	b)	What kind of information is needed for business research? Elucidate.	8 Marks	L2	CO1

(OR)

3.	Illustrate the importance of technology in business research.	16 Marks	L3	CO1

MODULE-II

4.	How do you gather preliminary data with regard to any business problem?	16 Marks	L3	CO2

(OR)

5.	Define Hypothesis. Illustrate its significance in business research.	16 Marks	L3	CO2

MODULE-III

6.	What is Probability sampling? When is it probability sampling is applicable? Explain.	16 Marks	L3	CO3

(OR)

7.	What should be the size of the sample if a simple random sample from a population of 4000 items is to be drawn to estimate the per cent defective within 2 per cent of the true value with 95.5 per cent probability? What would be the size of the sample if the population is assumed to be infinite in the given case?	16 Marks	L3	CO3

MODULE-IV

8.		What difference does it make whether we measure in terms of a nominal, ordinal, interval or ratio scale? Explain giving examples	16 Marks	L3	CO4
		(OR)			
9.	a)	Write short notes on Semantic differential scale	8 Marks	L2	CO4
	b)	Write short notes on Likert-type scale	8 Marks	L2	CO4

MODULE-V

10.		Describe, in brief, the layout of a research report, covering all relevant points	16 Marks	L3	CO5
		(OR)			
11.		Distinguish between structured and unstructured questionnaires with examples.	16 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA V Semester (MBU-22) Supplementary Examinations, March – 2026

BRAND MANAGEMENT

[Management]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is a brand?	2 Marks	L1	CO1
	b)	List any two functions of a brand.	2 Marks	L1	CO1
	c)	What is brand identity?	2 Marks	L1	CO2
	d)	List any two difference between Branding and Co-branding.	2 Marks	L1	CO2
	e)	What is brand positioning?	2 Marks	L1	CO3
	f)	List out the elements of brand Equity	2 Marks	L1	CO3
	g)	Define industrial branding.	2 Marks	L1	CO4
	h)	What is brand loyalty in the retail sector	2 Marks	L1	CO4
	i)	What is the purpose of a brand re-launch?	2 Marks	L1	CO5
	j)	What is brand extension?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Discuss the functions of a brand in detail.	16 Marks	L2	CO1
	(OR)			
3.	Analyze the different types of branding and their relevance in today's market?	16 Marks	L4	CO1

MODULE-II

4.	Explain the Brand Identity Prism and its six facets. How does it help in understanding brand identity?	16 Marks	L2	CO2
	(OR)			
5.	Discuss the concept of brand identity and explain its key elements of brand identity.	16 Marks	L2	CO2

MODULE-III

6.	Explain the cost based and consumer based brand equity with an example.	16 Marks	L2	CO3
	(OR)			
7.	Explain the various types of brand positioning strategy with an example.	16 Marks	L2	CO3

MODULE-IV

8.	How the branding is important in insurance sector?	16 Marks	L3	CO4
	(OR)			
9.	Brand image is very important to customers' Apply this statement to retail sector and justify.	16 Marks	L3	CO4

MODULE-V

10.	Discuss the role of advertising in the brand-building process. How does effective advertising contribute to creating a strong brand image.	16 Marks	L2	CO5
	(OR)			
11.	Explain the different types of brand promotion methods	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA III Semester (MBU-22) Supplementary Examinations, March – 2026

BUSINESS RESEARCH METHODS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define business research.	2 Marks	L1	CO1
	b)	What is preliminary data?	2 Marks	L1	CO1
	c)	What is descriptive research design?	2 Marks	L1	CO2
	d)	List two benefits of probability sampling.	2 Marks	L1	CO2
	e)	Define structured questionnaire.	2 Marks	L1	CO3
	f)	What is secondary data?	2 Marks	L1	CO3
	g)	Define hypothesis and give one example.	2 Marks	L1	CO4
	h)	Write about Chi-square test.	2 Marks	L1	CO4
	i)	State the term research report.	2 Marks	L1	CO5
	j)	Write about two types of reference styles with example.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe various types of business research with relevant examples.	8 Marks	L2	CO1
	b)	Define the term 'Review of literature'. Enumerate the objectives and significance of review of literature.	8 Marks	L2	CO1

(OR)

3.		Explain the research process in detail.	16 Marks	L2	CO1

MODULE-II

4.	a)	Discuss about Exploratory research design in detail.	8 Marks	L2	CO2
	b)	Discuss about Casual research design in detail.	8 Marks	L2	CO2

(OR)

5.		Explain different types of sampling methods in research by giving examples.	16 Marks	L2	CO2

MODULE-III

6.	a)	Explain advantages and disadvantages of primary sources of data.	8 Marks	L2	CO3
	b)	Define data give different types of data with examples.	8 Marks	L2	CO3

(OR)

7.		Discuss about questionnaire and elaborate the guidelines for construction of a questionnaire.	16 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss about cross tabulation and write its significance.	8 Marks	L4	CO4
	b)	Explain the procedure for developing a hypothesis.	8 Marks	L2	CO4

(OR)

9. a) Using actual mean method calculate the karl pearson's coefficient of correlation for the following data — 8 Marks — L4 — CO4

X	12	16	20	24	28	32	36
Y	6	9	12	15	18	21	24

b) Describe the significance of T-test and Z-test — 8 Marks — L2 — CO4

MODULE-V

10. Discuss the rules of report writing and illustrate your answer with examples. — 16 Marks — L2 — CO5

(OR)

11. Elaborate the guidelines for preparing a good research report with examples. — 16 Marks — L2 — CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA III Semester (MBU-22) Supplementary Examinations, March – 2026

LEADERSHIP AND TEAM BUILDING

[Marketing, Human Resource, Finance]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Explain the Concept of Task Management.	2 Marks	L1	CO1
	b)	Explain any two Myths of Leadership.	2 Marks	L1	CO1
	c)	Differentiate Charismatic and Spiritual Leadership.	2 Marks	L1	CO2
	d)	Recall different types of Value based Leadership.	2 Marks	L1	CO2
	e)	Differentiate Charismatic and Spiritual Leadership.	2 Marks	L1	CO3
	f)	List two types Spiritual Leadership.	2 Marks	L1	CO3
	g)	Recall different types of Team Behaviors.	2 Marks	L1	CO4
	h)	List two types Conflict Negotiation System.	2 Marks	L1	CO4
	i)	List two types Team Effectiveness.	2 Marks	L1	CO5
	j)	Explain any two Techniques of Interpersonal Competence.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	Elaborate the challenges associated with Leadership in India.	16 Marks	L2	CO1
	(OR)			
3.	What are the strategies of followed by leader and it differs to other organizations.	16 Marks	L2	CO1

MODULE-II

4.	What are the different components of Leadership skills and its role in Management?	16 Marks	L2	CO2
	(OR)			
5.	Explain the Influencing process and why each leader follows different strategies. Comment.	16 Marks	L3	CO2

MODULE-III

6.	Briefly discuss the methods of Leadership need in an BPO organization.	16 Marks	L2	CO3
	(OR)			
7.	What are the considerations for Leader in Promoting the Organizations globally? Explain.	16 Marks	L2	CO3

MODULE-IV

8.	Discuss Infer various Leadership Strategies followed in Other Countries and how it will impact domestic leadership.	16 Marks	L3	CO4

(OR)

9.	What is Leadership Management? Discuss its need and objectives in today rapidly changing environment.	16 Marks	L2	CO4

MODULE-V

10.	Explain the concept of Decision Making in Teams as per Leadership Styles.	16 Marks	L2	CO5

(OR)

11.	What are the objectives of providing new skills to employees through leadership in an organization? Explain its importance.	16 Marks	L3	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA III Semester (MBU-22) Supplementary Examinations, March – 2026

LEARNING AND DEVELOPMENT

[Marketing, Human Resource, Finance]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List the advantages of social learning theory.	2 Marks	L1	CO1
	b)	State the stages involved in the learning process for employees.	2 Marks	L1	CO1
	c)	List the two characteristics influencing transfer of training.	2 Marks	L1	CO2
	d)	What is the significance of effective training design?	2 Marks	L1	CO2
	e)	State the objectives of training.	2 Marks	L1	CO3
	f)	List three learning activities.	2 Marks	L1	CO3
	g)	State the importance of effective trainer.	2 Marks	L1	CO4
	h)	What is outsourcing agency?	2 Marks	L1	CO4
	i)	What is cross cultural training?	2 Marks	L1	CO5
	j)	State the importance of cross-cultural training.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	Explain the stages in Learning cycle.	16 Marks	L2	CO1
	(OR)			
3.	Describe the Significance of Learning and how it is beneficial at work place.	16 Marks	L2	CO1

MODULE-II

4.	Explain the concept Working Environment in detail.	16 Marks	L2	CO2
	(OR)			
5.	Explain how Training is different from Learning	16 Marks	L2	CO2

MODULE-III

6.	Describe in detail about Learning activities.	16 Marks	L2	CO3
	(OR)			
7.	Explain the significance of training design and development	16 Marks	L2	CO3

MODULE-IV

8.	Explain the implementation process for making and buying decisions.	16 Marks	L2	CO4
	(OR)			
9.	Explain the various methods of training.	16 Marks	L2	CO4

MODULE-V

10.	Explain briefly about competency mapping and discuss its importance.	16 Marks	L2	CO5
	(OR)			
11.	Summarize the career stages in detail with Suitable examples.	16 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA III Semester (MBU-22) Supplementary Examinations, March – 2026

STRESS MANAGEMENT

[Marketing, Human Resource, Finance]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List three environmental factors that can contribute to stress.	2 Marks	L1	CO1
	b)	Differentiate between intrapersonal and interpersonal sources of stress, providing an example of each.	2 Marks	L1	CO1
	c)	How does chronic stress impact memory? Provide a brief explanation.	2 Marks	L1	CO2
	d)	Define cognitive variables in the context of stress management and mention two examples.	2 Marks	L1	CO2
	e)	Discuss the sources of stress experienced across different stages of the lifespan.	2 Marks	L1	CO3
	f)	Identify and explain the common sources of stress specific to college students.	2 Marks	L1	CO3
	g)	What is Emotional Intelligence (EI), and how does it relate to conflict management?	2 Marks	L1	CO4
	h)	Discuss the emotional basis of stress and provide examples.	2 Marks	L1	CO4
	i)	What is meant by "optimal functioning" concerning stress management?	2 Marks	L1	CO5
	j)	Explain how making small changes can lead to large rewards in stress management.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Compare and contrast intrapersonal and interpersonal sources of stress, giving examples of each and discussing their implications.	8 Marks	L2	CO1
	b)	Provide an overview of common somatic and anxiety problems associated with chronic stress, discussing their physiological mechanisms.	8 Marks	L2	CO1

(OR)

3.	a)	Explain the Transactional Model of Stress and Coping, outlining the primary components and their interactions.	8 Marks	L2	CO1
	b)	Define stress-related disorders, such as post-traumatic stress disorder (PTSD), and discuss their symptoms and potential treatments.	8 Marks	L2	CO1

MODULE-II

4.	a)	Investigate the effects of environmental stressors on cognitive performance, considering factors like noise, crowding, and time pressure.	8 Marks	L2	CO2
	b)	Compare and contrast the sympathetic nervous system (SNS) and the parasympathetic nervous system (PNS) in the context of the stress response.	8 Marks	L2	CO2

		(OR)			
5.	a)	Explain the concept of allostatic load and its role in understanding the health effects of chronic stress, citing relevant research.	8 Marks	L2	CO2
	b)	Provide an in-depth overview of the HPA axis, including the release of cortisol and its implications for stress management.	8 Marks	L2	CO2
		MODULE-III			
6.		Explore the role of culture in shaping perceptions of stress, coping mechanisms, and social support systems, citing examples from different cultural contexts.	16 Marks	L2	CO3
		(OR)			
7.		Discuss the key sources of occupational stress, including job demands, work-life balance, and workplace relationships, and suggest strategies for stress reduction in the workplace.	16 Marks	L2	CO3
		MODULE-IV			
8.		Explore the complex relationship between stress and conflict in interpersonal relationships, discussing how stress can both trigger and result from conflicts	16 Marks	L2	CO4
		(OR)			
9.		Provide a comprehensive overview of the components of Emotional Intelligence (EI), including self-awareness, self-regulation, empathy, and social skills. Explain how each component contributes to stress management.	16 Marks	L2	CO4
		MODULE-V			
10.		Analyze the concept of optimal functioning concerning stress management, explaining how it relates to personal well-being and performance.	16 Marks	L2	CO5
		(OR)			
11.		Discuss the concept that making small changes in lifestyle can lead to significant rewards in stress reduction. Provide practical examples.	16 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA III Semester (MBU-22) Supplementary Examinations, March – 2026

SALES AND RETAIL MANAGEMENT

[Marketing, Human Resource, Finance]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Discuss the sales objective of any Organization.	2 Marks	L1	CO1
	b)	Differentiate Supermarket and Hypermarket.	2 Marks	L1	CO1
	c)	List the importance of Sales Organization.	2 Marks	L1	CO2
	d)	Differentiate sales and selling.	2 Marks	L1	CO2
	e)	Define Sales Quota.	2 Marks	L1	CO3
	f)	What is sales report mechanism?	2 Marks	L1	CO3
	g)	Define the process of Recruitment.	2 Marks	L1	CO4
	h)	Explain Sales Budget.	2 Marks	L1	CO4
	i)	Explain accounting system in Retailing.	2 Marks	L1	CO5
	j)	State the functions of a retailor.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe the nature and characteristics of personal selling with example?	8 Marks	L2	CO1
	b)	How to improve sales force Productivity. Explain?	8 Marks	L3	CO1
		(OR)			
3.	a)	Explain Sales and its Need, importance, functions and essentials of sales.	8 Marks	L2	CO1
	b)	Discuss the purpose of sales Quota. Also write the Characteristics of a good Quota system	8 Marks	L3	CO1

MODULE-II

4.	a)	Discuss the types of sales territories highlighting their utility and importance	8 Marks	L2	CO2
	b)	Brief the importance of compensation plan for sales personnel and write the components of a compensation plan.	8 Marks	L3	CO2
		(OR)			
5.	a)	Explain characteristics of a successful sales man?	8 Marks	L3	CO2
	b)	Explain your responsibilities as a store manager of D mart to run a successful business	8 Marks	L2	CO2

MODULE-III

6.	a)	Discuss the concept of Sales Territory. What are the primary bases for establishing sales Territories?	8 Marks	L3	CO3
	b)	Explain the importance of generating sales reports by the field staff.	8 Marks	L2	CO3

(OR)

7.	a)	What do you understand by sales negotiation? How does it differ from selling?	8 Marks	L2	CO3
	b)	What is motivation? Explain the all theory of motivation?	8 Marks	L2	CO3

MODULE-IV

8.	a)	Describe the different types of retailing in India.	8 Marks	L3	CO4
	b)	What are the challenges in retail sector?	8 Marks	L2	CO4

(OR)

9.	a)	What are the tasks in retail sector? How do you overcome?	8 Marks	L2	CO4
	b)	Write a note on store security.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain importance and various visual merchandising techniques in Retail?	8 Marks	L2	CO5
	b)	What is ideal location? What factors must be considered while analyzing a trading area?	8 Marks	L3	CO5

(OR)

11.	a)	How the retail accounting and retail audit play the key role in retailing?	8 Marks	L3	CO5
	b)	Enumerate the space management in retail sector.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA III Semester (MBU-22) Supplementary Examinations, March – 2026

CONSUMER BEHAVIOUR

[Marketing, Human Resource, Finance]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is perception?	2 Marks	L1	CO1
	b)	Define an industrial consumer.	2 Marks	L1	CO1
	c)	What is self image?	2 Marks	L1	CO2
	d)	What are the factors which are influencing consumer behavior?	2 Marks	L1	CO2
	e)	What is Pre-purchase decisions?	2 Marks	L1	CO3
	f)	List out any three models of consumer behavior.	2 Marks	L1	CO3
	g)	Who are opinion leaders?	2 Marks	L1	CO4
	h)	List out the objectives of consumer protection act 1986.	2 Marks	L1	CO4
	i)	What is Global brand image?	2 Marks	L1	CO5
	j)	State about emerging non-store choices of consumer behavior.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	What are the Psychological and personal factors influence consumer behaviour?	16 Marks	L2	CO1
	(OR)			
3.	Why it is important for a successful marketer to clearly understand consumer needs and motivation?	16 Marks	L2	CO1

MODULE-II

4.	Define Sub – Culture and explain its division on its different basis. Explain how culture and Sub culture influence the behavior of consumers.	16 Marks	L2	CO2
	(OR)			
5.	Discuss about the family influences on consumer decision making.	16 Marks	L2	CO2

MODULE-III

6.	Explain the components of Howard- Sheth model of consumer behavior.	16 Marks	L2	CO3
	(OR)			
7.	Explain the Engel Kollat Blackwell Model of consumer behaviour.	16 Marks	L2	CO3

MODULE-IV

8.	Discuss the consumer protection act 1986.	16 Marks	L2	CO4
	(OR)			
9.	Explain the concept of positioning in marketing. How does effective positioning contribute to a company's competitive advantage?	16 Marks	L3	CO4

MODULE-V

10.	What is online consumer behaviour and what are the advantages and disadvantages associated with it?	16 Marks	L4	CO5
	(OR)			
11.	Explain the role of mobile commerce (m-commerce) in shaping consumer buying habits globally.	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA III Semester (MBU-22) Supplementary Examinations, March – 2026

MARKETING OF SERVICES

[Marketing, Human Resource, Finance]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Explain the nature and scope of services.	2 Marks	L1	CO1
	b)	Discuss at least three unique characteristics of services.	2 Marks	L1	CO1
	c)	Discuss the expanded marketing mix (7Ps) in the context of service marketing.	2 Marks	L1	CO2
	d)	Evaluate the role of service marketing in creating and delivering value to customers.	2 Marks	L1	CO2
	e)	Explain the concept of service blueprinting.	2 Marks	L1	CO3
	f)	Analyze the GAP model of service quality.	2 Marks	L1	CO3
	g)	How can service providers optimize their service channels to enhance customer experience and satisfaction?	2 Marks	L1	CO4
	h)	Describe different pricing methods used in services marketing.	2 Marks	L1	CO4
	i)	How do logistics companies utilize marketing strategies to enhance customer satisfaction and loyalty?	2 Marks	L1	CO5
	j)	Explain the role of education in service marketing.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	Discuss the scope of the services.	16 Marks	L1	CO1
	(OR)			
3.	What do you understand by services economy? Explain its importance.	16 Marks	L1	CO1

MODULE-II

4.	What are the benefits of assessing market potential? Explain.	16 Marks	L2	CO2
	(OR)			
5.	Describe the classification of services.	16 Marks	L1	CO2

MODULE-III

6.	Explain in detail about the new service development.	16 Marks	L2	CO3
	(OR)			
7.	Write a short note on service blue print.	16 Marks	L1	CO3

MODULE-IV

8.	How to create an effective market positioning?	16 Marks	L1	CO4
	(OR)			
9.	Explain briefly about Service marketing triangle.	16 Marks	L1	CO4

MODULE-V

10.	Define hospitality service marketing and explain its concept.	16 Marks	L2	CO5
	(OR)			
11.	Write a short note on service strategies.	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com III Semester (MBU-22) Supplementary Examinations, March – 2026

PROGRAMMING WITH C

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is structured programming?	2 Marks	L1	CO1
	b)	What does the conditional operator (`?:`) do in C?	2 Marks	L1	CO1
	c)	Write an `if-else` statement to print "Even" if a number `n` is even and "Odd" otherwise.	2 Marks	L1	CO2
	d)	Write the use of `break` and `continue` statements in loops.	2 Marks	L1	CO2
	e)	What is 2D array? How to declare 2D arrays?	2 Marks	L1	CO3
	f)	What does the `strlen` function do?	2 Marks	L1	CO3
	g)	What are the categories of functions based on their return types?	2 Marks	L1	CO4
	h)	What are enumeration types in C?	2 Marks	L1	CO4
	i)	How do you declare and use an array of pointers in C?	2 Marks	L1	CO5
	j)	How do you read data from a file in C? Provide an example.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain key features of an algorithm. Write an algorithm to find Biggest of Three numbers.	8 Marks	L2	CO1
	b)	Explain various generations of programming languages.	8 Marks	L2	CO1

(OR)

3.	a)	Explain the structure of a C program with an example program.	8 Marks	L2	CO1
	b)	Describe the concepts of overflow and underflow in the context of integer data types.	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain the functions getchar() and putchar() for reading and writing characters in C.	8 Marks	L2	CO2
	b)	Describe the switch statement and its usage. Write a program that uses a switch statement to determine the month of the year based on a number entered by the user.	8 Marks	L3	CO2

(OR)

5.	a)	Explain the while loop and its usage. Write a program that uses a while loop to calculate the sum of numbers from 1 to n, where n is provided by the user.	8 Marks	L2	CO2
	b)	Discuss the break and continue statements in the context of loops. Provide examples showing how to use break to exit a loop and continue to skip an iteration.	8 Marks	L2	CO2

MODULE-III

6.	a)	Discuss the various ways to declare and initialize arrays in C. Include examples for static initialization and dynamic initialization.	8 Marks	L2	CO3
	b)	Discuss common operations on two-dimensional arrays such as matrix addition and multiplication. Provide a program that performs matrix addition.	8 Marks	L2	CO3

(OR)

7.	a)	Explain how to read and write strings in C. Write a program to read a string from the user and then print it.	8 Marks	L2	CO3
	b)	Discuss common string handling functions in C such as strlen, strcpy, strcat, and strcmp. Write a program that demonstrates the use of these functions.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss the scope of variables in C. Provide examples of different types of scopes (local, global, and static).	8 Marks	L2	CO4
	b)	What is recursion in C? Explain with an example how recursion can be used to solve a problem.	8 Marks	L2	CO4

(OR)

9.	a)	Define a union in C and illustrate how to use it with an example.	8 Marks	L2	CO4
	b)	How do you declare and use an array of structures in C? Provide an example.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain the concept of pointers in C with example program and also write the advantages and disadvantages of using pointers in C.	8 Marks	L3	CO5
	b)	Define pointer. Write a C program for swapping of two numbers using pointers.	8 Marks	L2	CO5

(OR)

11.	a)	Discuss how to perform file operations in C, including defining, opening, reading, writing, and closing files. Provide examples for text files and binary files.	8 Marks	L3	CO5
	b)	Explain the concept of command line arguments in C. How are they accessed and used within a C program? Provide an example that demonstrates how to process command line arguments.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA III Semester (MBU-22) Supplementary Examinations, March – 2026

SOFTWARE ENGINEERING

[Computer Applications]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

a)	Define software engineering.	2 Marks	L1	CO1
b)	List the major characteristics of good software.	2 Marks	L2	CO1
c)	What is the purpose of feasibility study in software projects?	2 Marks	L1	CO2
d)	Distinguish between functional and non-functional requirements.	2 Marks	L2	CO2
e)	What is modular design?	2 Marks	L1	CO3
f)	Define coupling with an example.	2 Marks	L1	CO3
g)	What is black-box testing?	2 Marks	L1	CO4
h)	List any two software quality assurance activities.	2 Marks	L1	CO4
i)	What is project risk management?	2 Marks	L1	CO5
j)	Define Agile methodology.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain various software process models with suitable diagrams.	8 Marks	L2	CO1
	b)	Discuss software engineering principles with examples.	8 Marks	L2	CO1
		(OR)			
3.	a)	Explain the role of project feasibility analysis.	8 Marks	L2	CO1
	b)	Write short notes on software project planning activities.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain requirements elicitation techniques with examples.	8 Marks	L3	CO2
	b)	Prepare a sample SRS for an online banking system.	8 Marks	L4	CO2
		(OR)			
5.	a)	Explain requirements validation process in detail.	8 Marks	L3	CO2
	b)	Write about functional and non-functional requirements with examples.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain design concepts and principles with examples.	8 Marks	L3	CO3
	b)	Write short notes on UML diagrams used in system design.	8 Marks	L2	CO3
		(OR)			
7.	a)	What are the different types of architectural styles in software design?	8 Marks	L3	CO3
	b)	Explain modular design and its advantages.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain different software testing strategies.	8 Marks	L3	CO4
	b)	What are the software quality assurance activities?	8 Marks	L2	CO4
		(OR)			
9.	a)	Explain white-box testing techniques with examples.	8 Marks	L3	CO4
	b)	Discuss software reliability and metrics.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain project planning and scheduling activities.	8 Marks	L3	CO5
	b)	Discuss software maintenance process models.	8 Marks	L2	CO5
		(OR)			
11.	a)	Write about risk management in software projects.	8 Marks	L3	CO5
	b)	Explain the role of CASE tools in software project management.	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA V Semester (MBU-22) Supplementary Examinations, March – 2026

USER EXPERIENCE/ INTERFACE (UX/UI) DESIGN

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Name one benefit of good user interface design.	2 Marks	L1	CO1
	b)	What is the significance of the introduction of the Graphical User Interface (GUI)	2 Marks	L1	CO1
	c)	What role does visual acuity play in designing user interfaces?	2 Marks	L1	CO1
	d)	Why is it important to consider the user's previous experience when designing a system?	2 Marks	L1	CO2
	e)	How can designers leverage this knowledge to enhance usability? Provide examples to support your answer.	2 Marks	L1	CO2
	f)	Consider the role of sensory storage in the context of designing interactive systems.	2 Marks	L1	CO3
	g)	Analyze the principles of good screen design with a focus on human considerations.	2 Marks	L1	CO3
	h)	Describe the process and importance of system training and documentation needs	2 Marks	L1	CO4
	i)	Analyze the functions of menus within a graphical user interface. How do menus contribute to usability and navigation?	2 Marks	L1	CO4
	j)	Explain the various kinds of graphical menus used in user interfaces.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe the benefits of good user interface design. How does it contribute to user satisfaction and overall system effectiveness?	8 Marks	L2	CO1
	b)	Provide a brief history of the human-computer interface. Highlight key milestones such as the development of command-line interfaces, graphical user interfaces, and modern touch interfaces.	8 Marks	L2	CO1

(OR)

3.	a)	Discuss the impact of the World Wide Web on user interface design. How did web technologies influence the evolution of web user interfaces?	8 Marks	L2	CO1
	b)	Explain how principles of user interface design can be applied to both graphical and web user interfaces. Provide examples of how these principles improve usability and user experience.	8 Marks	L2	CO1

MODULE-II

4.	a)	Describe one basic property of Homomorphic Filtering	8 Marks	L3	CO2
	b)	Analyze the role of presentation controls in user interface design. How do presentation controls (such as tables, charts, and sliders) contribute to effective data presentation and user interaction? Provide examples of how these controls can enhance or detract from user experience.	8 Marks	L5	CO2

(OR)

5.	a)	examples of how these controls can enhance or detract from user experience	8 Marks	L2	CO2
	b)	Analyze the impact of effective feedback and assistance on user satisfaction and performance. How can feedback mechanisms be designed to be both informative and non-intrusive? Provide examples of best practices in feedback design and discuss common pitfalls.	8 Marks	L5	CO2

MODULE-III

6.	a)	Define 'design standards' and explain their importance in interface design.	8 Marks	L2	CO3
	b)	Define business definition and requirement analysis and Determine basic business functions?	8 Marks	L2	CO3

(OR)

7.	a)	What role does human consideration play in screen design?	8 Marks	L2	CO3
	b)	How do design standards influence the user experience of a software system?	8 Marks	L2	CO3

MODULE-IV

8.	a)	Name two types of graphical menus and briefly describe each.	8 Marks	L2	CO4
	b)	Describe about components of a window and types of window?	8 Marks	L2	CO4

(OR)

9.	a)	Discuss about window operations and Best Practices for Window Operations	8 Marks	L3	CO4
	b)	What is the primary purpose of web systems in user interface design?	8 Marks	L2	CO4

MODULE-V

10.	a)	List out the Characteristics of Device-Based Controls and General Characteristics to Consider	8 Marks	L2	CO5
	b)	Explain the Types of Presentation Controls and Key Characteristics of Effective Presentation Controls	8 Marks	L3	CO5

(OR)

11.	a)	Name two characteristics of effective guidance and assistance in a user interface?	8 Marks	L2	CO5
	b)	Explain about the Principles for Creating Meaningful Graphics and types of Graphics and Their Uses.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA III Semester (MBU-22) Supplementary Examinations, March – 2026

ADVANCED DATABASES

[Computer Applications]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define Vertical Partitioning.	2 Marks	L1	CO1
	b)	List out the categories of Skew.	2 Marks	L1	CO1
	c)	Define multiset	2 Marks	L1	CO2
	d)	List out large object types.	2 Marks	L1	CO2
	e)	List two features of DDBMS	2 Marks	L1	CO3
	f)	What is Vertical Fragmentation?	2 Marks	L1	CO3
	g)	Define hybrid fragmentation	2 Marks	L1	CO4
	h)	Define XML attributes	2 Marks	L1	CO4
	i)	Identify two advantages of mobile databases	2 Marks	L1	CO5
	j)	Define GIS.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2. a) Apply Range Partition Technique, for all employees who left before 1991, the rows are stored in partition **p0**; for those who left in the years 1991 through 1995, in **p1**; for those who left in the years 1996 through 2000, in **p2**; and for any workers who left after the year 2000, in **p3** and the corresponding disk associated with D0, D1, D2, D3 respectively. **Identify the tuples based on the range partition sort technique and illustrate the steps neatly**. — 8 Marks, L3, CO1

   i) Now suppose, the employee **"Manish"** left in 2004 and the corresponding tuple exist in which disk number.

   ii) If the employee **"Ashish"** left in 1997, then the tuple exists in which disk number.

   iii) Apply Round Robin Technique, if there are 100 tuples in the employee database, it has 4 partitions partitioned into 4 available disks named as D0, D1, D2, D3. 64th employee record stored on which disk number.

   b) Explain pipeline parallelism and independent parallelism with neat diagram. — 8 Marks, L2, CO1

(OR)

3.		Summarize the following Concepts i) Partitioned Parallel Hash Join ii) Parallel Nested Loop Join iii) Query optimization iv) Design of parallel systems	16 Marks	L2	CO1

MODULE-II

4.	a)	Construct the query with the following application. Create Structured super type **person** with the attributes name varchar 20, address varchar(20), create a structured sub type **Student** with the attributes department varchar(20), degree varchar(20), and also create the structured type Teacher with the attributes department varchar (20) and salary integer(10). Implement the following concepts, i) Structured Types ii) Arrays iii) Inheritance and Multiple Inheritance.	8 Marks	L3	CO2
	b)	Explain user generated identifier with suitable example.	8 Marks	L2	CO2

(OR)

5.	a)	Summarize persistent Programming languages and compare object oriented and object relational databases.	8 Marks	L2	CO2
	b)	Compare Persistent objects and transient objects.	8 Marks	L4	CO2

MODULE-III

6.	a)	Explain Reference Architecture for Distributed Databases.	8 Marks	L2	CO3
	b)	Explain the advantages & disadvantages of distributed databases	8 Marks	L2	CO3

(OR)

7.	a)	Elaborate the challenges associated with maintaining integrity constraints in a distributed database environment.	8 Marks	L2	CO3
	b)	Explain briefly about Fragmentation with suitable examples.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Explain the structure of XML.	8 Marks	L2	CO4
	b)	Explain DTD for XML Schemas.	8 Marks	L2	CO4

(OR)

9.	a)	Elaborate storage of XML data.	8 Marks	L2	CO4
	b)	Discuss Query and Transformation in XML.	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss the key components of a Geographic Information System (GIS).	8 Marks	L2	CO5
	b)	Discuss different techniques used for extracting and indexing multimedia content for efficient retrieval.	8 Marks	L2	CO5

(OR)

11.	a)	Discuss overview of NoSQL databases.	8 Marks	L2	CO5
	b)	Discuss the key features and requirements of a multimedia database system.	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA III Semester (MBU-22) Supplementary Examinations, March – 2026

INTERNET OF THINGS

[Computer Applications]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define the term Internet of Things (IoT).	2 Marks	L1	CO1
	b)	Explain why IoT is often called a network of smart objects.	2 Marks	L2	CO1
	c)	Define resolution of a D/A converter.	2 Marks	L1	CO2
	d)	What are advantages and disadvantages of dual slope ADC?	2 Marks	L2	CO2
	e)	Define an IoT sensor with one example.	2 Marks	L1	CO3
	f)	Differentiate between sensor and actuator.	2 Marks	L2	CO3
	g)	Define Arduino and list any two of its features	2 Marks	L1	CO4
	h)	What are digital pins in Arduino?	2 Marks	L1	CO4
	i)	How does IoT technology enhance a smart grid?	2 Marks	L2	CO5
	j)	What are the main applications of IoT wearables?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the concept of Internet of Things (IoT) with a neat diagram.	8 Marks	L1	CO1
	b)	Analyze the technological trends that have led to the development of IoT	8 Marks	L3	CO1

(OR)

3.	a)	Illustrate with examples how IoT is transforming different sectors such as healthcare, education, and transportation.	8 Marks	L4	CO1
	b)	Explain the working of IoT architecture with reference to sensing, communication, data processing, and application layers.	8 Marks	L2	CO1

MODULE-II

4.		Draw a weighted resistor DAC and obtain the transfer characteristics of a 3-bit DAC.	16Marks	L4	CO2

(OR)

5.		Explain the working principles of R-2R ladder DAC	16Marks	L1	CO2

MODULE-III

6.	a)	Explain the working principles of temperature, moisture, and light sensors with neat diagrams.	8 Marks	L1	CO3
	b)	Illustrate the applications of proximity and motion sensors in smart homes and smart cities.	8 Marks	L3	CO3

(OR)

7.	a)	Compare acoustic, chemical, and image sensors in terms of features and applications.	8 Marks	L2	CO3
	b)	Discuss actuator technologies used in IoT with examples.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain the architecture of Arduino UNO with neat diagram	8 Marks	L1	CO4
	b)	Discuss step-by-step interfacing of a temperature sensor with Arduino.	8 Marks	L2	CO4

(OR)

9.	a)	Compare Arduino UNO, Arduino Mega, and Arduino Nano in terms of hardware features, applications, and cost.	8 Marks	L1	CO4
	b)	Explain the programming model of Arduino with examples for sensor and actuator interfacing.	8 Marks	L1	CO4

MODULE-V

10.	Explain about smart city with its components in detail with aid of neat sketches.	16 Marks	L1	CO5

(OR)

11.	Discuss about Industrial Internet and its components in detail with aid of neat sketches.	16 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA V Semester (MBU-22) Supplementary Examinations, March – 2026

DATA ANALYTICS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is Big Data Analytics?	2 Marks	L1	CO1
	b)	Define Data Science?	2 Marks	L1	CO1
	c)	What are the three main "Vs" of Big Data?	2 Marks	L1	CO2
	d)	What is the primary function of data ingestion in Big Data architecture?	2 Marks	L2	CO2
	e)	List one key advantage of Big Data for businesses?	2 Marks	L1	CO3
	f)	What is one challenge faced by Big Data systems?	2 Marks	L2	CO3
	g)	What is Hadoop's parallel processing, and why is it important?	2 Marks	L1	CO4
	h)	Define data discovery in the context of Big Data analytics?	2 Marks	L1	CO4
	i)	Open Source Technology for Big Data Analytics?	2 Marks	L1	CO5
	j)	What are the benefits of using cloud computing for Big Data?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks
5 x 16 = 80 Marks

MODULE-I

2.	a)	What is Big Data Analytics? List its primary objectives and uses?	8 Marks	L2	CO1
	b)	Explain the difference between Big Data Analytics and traditional data analysis methods. Why is Big Data Analytics important in today's data-driven world?	8 Marks	L2	CO1

(OR)

3.	a)	How would you use Big Data Analytics to improve customer satisfaction in an online retail business? Provide a general outline of the process?	8 Marks	L3	CO1
	b)	Analyze the role of Big Data Analytics in healthcare. What are the potential benefits and challenges when implementing it in patient care?	8 Marks	L2	CO1

MODULE-II

4.	a)	Analyze the role of parallel processing in Hadoop's architecture. How does Hadoop's approach to parallelism differ from traditional data processing methods? Discuss the advantages and potential limitations of Hadoop's parallel processing capabilities in managing large-scale data operations?	8 Marks	L2	CO2
	b)	Explanation of parallel processing in Hadoop (MapReduce framework, HDFS)?	8 Marks	L2	CO2

(OR)

5.	a)	Critically evaluate the process of data discovery in Big Data analytics. Discuss the tools and techniques involved and how they contribute to uncovering hidden patterns and insights. What are the main challenges faced during the data discovery process, and how can these be mitigated?	8 Marks	L1	CO2
	b)	Assess the impact of open-source technologies on the evolution of Big Data analytics. Discuss the benefits and drawbacks of using open-source tools for data analytics. Provide examples of popular open-source tools and analyze their contributions to the field?	8 Marks	L1	CO2

MODULE-III

6.	a)	Analyze the characteristics and challenges of Big Data. Discuss how the 5Vs (Volume, Velocity, Variety, Veracity, and Value) influence Big Data management and analytics. Provide examples to illustrate how these characteristics impact real-world applications?	8 Marks	L1	CO3
	b)	Definition of Big Data and its significance?	8 Marks	L2	CO3

(OR)

7.	a)	Evaluate the components of the Apache Hadoop ecosystem and their roles in Big Data processing. How do these components work together to provide a comprehensive solution for data storage, processing, and analysis? Discuss the advantages and limitations of using Hadoop and its ecosystem.	8 Marks	L1	CO3
	b)	Discuss the various methods and tools for moving data into and out of Hadoop. Analyze the factors that influence the choice of data ingestion and export techniques. Evaluate the challenges associated with data transfer in Hadoop environments and suggest strategies to overcome them?	8 Marks	L2	CO3

MODULE-IV

8.	a)	What is Hadoop, and what are its primary components?	8 Marks	L2	CO4
	b)	What are the key differences between RDBMS (Relational Database Management Systems) and Hadoop?	8 Marks	L2	CO4

(OR)

9.	a)	What are the main features of Hadoop that make it suitable for big data applications?	8 Marks	L2	CO4
	b)	What are some popular Hadoop distributors, and how do they differ from each other?	8 Marks	L2	CO4

MODULE-V

10.	a)	What are the key components of the HDFS architecture?	8 Marks	L3	CO5
	b)	What are the primary configuration files in Hadoop, and what do they control?	8 Marks	L2	CO5

(OR)

11.	a)	What are the two main phases of the MapReduce framework?	8 Marks	L3	CO5
	b)	Analyze the advantages and disadvantages of using the MapReduce framework for processing large-scale data. How does it compare to other parallel processing frameworks?	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) Supplementary Examinations, March – 2026

ELECTRONIC CIRCUIT ANALYSIS AND DESIGN

[Electronics and Communication Engineering,
Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Mention one advantage of using RC coupling in multistage amplifiers.	2 Marks	L1	CO1
	b)	Name the configuration used in a Darlington pair.	2 Marks	L1	CO1
	c)	In which criterion the hybrid-π model is valid?	2 Marks	L2	CO2
	d)	Differentiate between CE and CB amplifier configurations.	2 Marks	L2	CO2
	e)	What is negative feedback in an amplifier?	2 Marks	L1	CO3
	f)	Write the general expression for closed-loop gain with negative feedback.	2 Marks	L3	CO3
	g)	Why are heat sinks used in power amplifiers?	2 Marks	L1	CO4
	h)	What is the main advantage of a push-pull Class B power amplifier?	2 Marks	L2	CO4
	i)	Write the expression for bandwidth in terms of Q-factor.	2 Marks	L3	CO5
	j)	What is a tuned amplifier?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss the effect of a coupling and by pass capacitors effects on CE amplifier.	8 Marks	L2	CO1
	b)	Show the circuit diagram, equivalent circuit of a Darlington pair and derive expressions for overall voltage gain and input impedance.	8 Marks	L4	CO1

(OR)

3.	a)	Explain the diffusion and transition capacitance.	8 Marks	L2	CO1
	b)	Explain the simplified hybrid model of a BJT with neat diagram.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the mathematical analysis of the common drain FET amplifier using circuit diagram.	8 Marks	L3	CO2
	b)	Describe hybrid-π conductance and capacitances.	8 Marks	L1	CO2

(OR)

5.	a)	Explain the effect of coupling and bypass capacitors in an amplifier circuit with the help of a neat diagram.	8 Marks	L2	CO2
	b)	Define frequency response and bandwidth product of single stage CE amplifier.	8 Marks	L1	CO2

MODULE-III

6.	a)	Find out the voltage gain and analyze it with feedback and without feedback conditions.	8 Marks	L4	CO3
	b)	Analyze the voltage gain expression of the current series feedback amplifier.	8 Marks	L2	CO3

(OR)

7.	a)	Explain current shunt and voltage shunt feedback amplifiers?	8 Marks	L2	CO3
	b)	Compare the four feedback topologies (voltage series, voltage shunt, current series, current shunt.	8 Marks	L5	CO3

MODULE-IV

8.	a)	Derive the efficiency of a class A power amplifier with necessary diagram.	8 Marks	L2	CO4
	b)	Explain the principle of push-pull class AB power amplifiers?	8 Marks	L1	CO4

(OR)

9.	a)	Explain the working of a transformer-coupled power amplifier with neat diagram.	8 Marks	L2	CO4
	b)	Derive the expression for the maximum efficiency of a Class-B push-pull amplifier.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain the operation of a Class-C tuned amplifier with neat diagram.	8 Marks	L4	CO5
	b)	Analyze the effect of cascading single tuned amplifiers on bandwidth.	8 Marks	L4	CO5

(OR)

11.	a)	Derive the expression for the Q-factor and explain its significance in tuned amplifiers.	8 Marks	L5	CO5
	b)	Explain stagger tuning method and show how it improves bandwidth performance.	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) Supplementary Examinations, March – 2026

SIGNALS AND NETWORKS

[Electrical and Electronics Engineering]

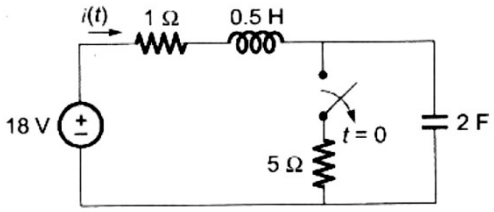
Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Sketch the waveform for the continuous time signal: $x(t) = u(t) - u(t-2)$.	2 Marks	L3	CO1
	b)	Evaluate $\int_0^{\infty} t^3 \delta(t-2)\,dt$ and $\sum_{n=-\alpha}^{n=\alpha} \delta(n-2)\cos 3n$.	2 Marks	L3	CO1
	c)	Find the Fourier transform of the function: $x(t) = te^{-t}\sin 2t\, u(t)$ using the properties of Fourier transforms.	2 Marks	L3	CO2
	d)	Find the inverse Fourier transforms of the following function: $F(w) = \frac{100}{(jw+10)}$..	2 Marks	L2	CO2
	e)	Obtain the z-transform of $x(n) = \left(\frac{1}{2}\right)^n u(n)$..	2 Marks	L2	CO3
	f)	Find the z-transform of an impulse signal,	2 Marks	L3	CO3
	g)	Determine the initial conditions of inductor and capacitor shown in the circuit.	2 Marks	L3	CO4



	h)	A DC voltage of 20 V is applied to an R-L circuit where R=5 Ohms and L=10 H. Find the Time constant.	2 Marks	L3	CO4
	i)	State the condition of symmetry and reciprocity in terms of transmission parameters.	2 Marks	L2	CO5
	j)	A two two-port networks have the following parameters $T_A = \begin{bmatrix} 4 & 6 \\ 1 & 2 \end{bmatrix}$ and $T_B = \begin{bmatrix} 2 & 5 \\ 6 & 4 \end{bmatrix}$ determine the equivalent parameters if the networks are connected in cascaded form.	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

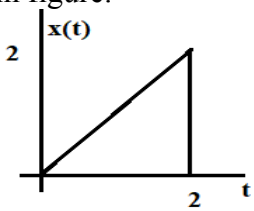
5 x 16 = 80 Marks

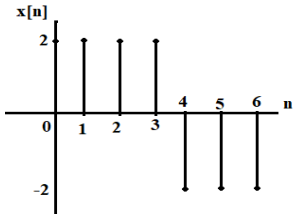
MODULE-I

2. a) State the properties of impulse signal and compute the following integrals: 8 Marks L3 CO1

i) $\int_{-\alpha}^{\infty} e^{-at2}\,\delta(t-5)dt$ ii) $\sum_{n=0}^{\alpha} \delta[n+1]4^n$

b) Sketch the odd and even components of the following signals shown in figure: 8 Marks L4 CO1





(OR)

3. a) Check whether the system given by $y[n] = 2n^2 u[n] + nu[n-4] + 0.5$ is. 8 Marks L3 CO1

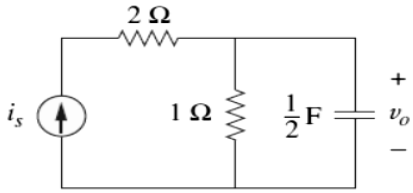
i) Linear or Nonlinear,
ii) Time variant or Time invariant.

b) Investigate whether the signal $x(t) = u(t) - u(t-1)$ is energy signal or power signal. 8 Marks L4 CO1

MODULE-II

4. a) Find the Fourier transform of the function $\cos\varpi_o t$. 8 Marks L3 CO2

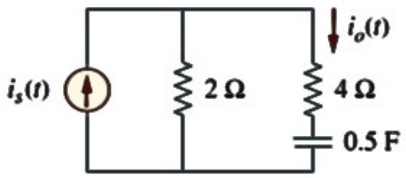
b) Find the voltage v(t) in the circuit shown in the figure, if the current is: $i_s(t) = 8e^{-t}u(t)\,A$. 8 Marks L3 CO2



(OR)

5. a) What do you mean by Orthogonal signal and determine the integral product of two orthogonal signals? 8 Marks L2 CO2

b) Using the Fourier transform method, find $i_0(t)$ shown in the figure if $i_s(t) = 10\sin 2t\ A$. 8 Marks L3 CO2



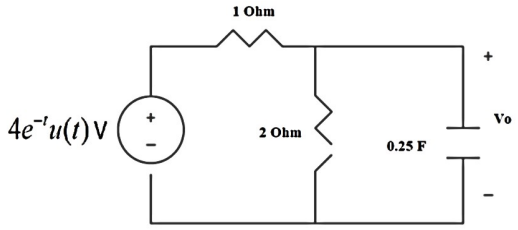
MODULE-III

6. a) Explain initial and final value theorems. 8 Marks L3 CO3

b) Find the impulse response of the system whose difference equation is described as $y(n) = 0.5y(n-1) + 2x(n)$. 8 Marks L4 CO3

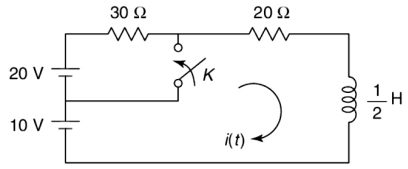
(OR)

7.	a)	Determine the z-transform and its ROC for the following discrete signal $x[n] = -u[-n-1] + \left(\frac{1}{2}\right)^n u[n]$..	8 Marks	L3	CO3
	b)	Using Laplace transformation, find $v_0(t)$ in the circuit in figure.	8 Marks	L4	CO3



MODULE-IV

8.	a)	Explain the transient properties of a capacitor for DC and AC excitations.	8 Marks	L3	CO4
	b)	For the given network, a steady state is reached with the switch K open. At t=0, the switch K is closed. Find the current i(t) for t >0.,	8 Marks	L4	CO4

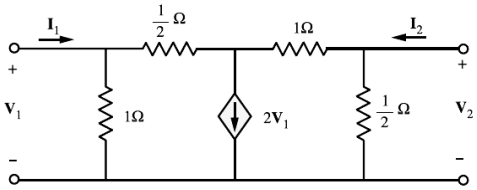


(OR)

9.	a)	What is the significance of time constant of R-L circuit? What are the different ways of defining time constant?	8 Marks	L2	CO4
	b)	A series RLC circuit with R=2 ohms, L=1H and C= 1F has a sinusoidal voltage source v(t) = 250 Sin 500t applied at time t=0. Determine the transient current i(t) using time domain approach. Assume zero initial conditions	8 Marks	L4	CO4

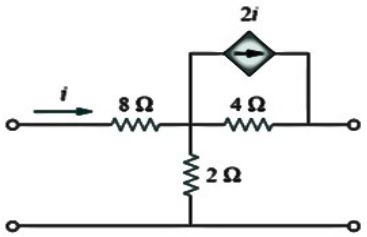
MODULE-V

10.	a)	Express *h* parameters in terms of admittance parameters for a generalized network.	8 Marks	L2	CO5
	b)	Find the transmission parameters for the two-port network shown in Figure.	8 Marks	L3	CO5



(OR)

11.	a)	Z-parameters for a two port network are given as Z_{11}=25, Z_{12}=Z_{21}=20, Z_{22}=50. Design an equivalent T and Pi networks.	8 Marks	L2	CO5
	b)	Obtain the *y* parameters for the two-port shown in Figure:	8 Marks	L4	CO5



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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) Supplementary Examinations, March – 2026

SOFTWARE ENGINEERING

[Computer Science and Engineering (Data Science), Information Technology
Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List out and define the different types of Software Myths.	2 Marks	L2	CO1
	b)	Sketch Software engineering layered technology.	2 Marks	L2	CO1
	c)	Define Requirement Engineering.	2 Marks	L2	CO2
	d)	Draw and describe the Flow Modelling notations.	2 Marks	L2	CO2
	e)	List out the relationships in UML with Notation.	2 Marks	L2	CO3
	f)	What is the role of design pattern?	2 Marks	L2	CO3
	g)	Define Alpha and Beta Testing.	2 Marks	L2	CO4
	h)	Write the purpose of verification and validation testing.	2 Marks	L2	CO4
	i)	Define Measures of Reliability and Availability with Formulae.	2 Marks	L2	CO5
	j)	Write the SQA Activities of Software.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe five activities of a generic process framework for Software Engineering.	8 Marks	L2	CO1
	b)	Illustrate and Explain Incremental Model.	8 Marks	L2	CO1

(OR)

3.	a)	Discuss the process of Extreme Programming (XP) in detail.	8 Marks	L2	CO1
	b)	State and explain the principles defined in Agile Process.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain in detail about four activities involved in Requirement Engineering Process.	8 Marks	L3	CO2
	b)	What is the use case technique of requirement elicitation? Describe its component.	8 Marks	L3	CO2

(OR)

5.	a)	Compare and contrast Functional and Non-Functional requirements with example.	8 Marks	L3	CO2
	b)	Discuss Flow-Oriented Modeling Concepts of Requirements modeling with Example.	8 Marks	L3	CO2

MODULE-III

6.	a)	Discuss various design concepts.	8 Marks	L4	CO3
	b)	Design a sequence diagram that models the data processing involved when a customer withdraws cash from the bank ATM machine.	8 Marks	L4	CO3

(OR)

7.	a)	Discuss in detail about Metrics in the process and project domains.	8 Marks	L4	CO3
	b)	Describe in detail about class-based modelling.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Compare between white-box testing and black-box testing.	8 Marks	L4	CO4
	b)	Explain the steps involved in Debugging Process with a neat sketch.	8 Marks	L4	CO4

(OR)

9.	a)	Discuss the analysis of two types of test strategies for object-oriented software.	8 Marks	L4	CO4
	b)	Explain Basis Path Testing with Example.	8 Marks	L4	CO4

MODULE-V

10.	a)	How Software Quality Assurance is useful to enhance quality? List out all the activities of it.	8 Marks	L3	CO5
	b)	Why do we use Defect Amplification Model?	8 Marks	L3	CO5

(OR)

11.	a)	Discuss the steps involved in Business process engineering model with a neat sketch.	8 Marks	L3	CO5
	b)	Explain the RMMM Plan and Risk Information Sheet with neat Diagram.	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA V Semester (MBU-22) Supplementary Examinations, March – 2026

PERSONALITY DEVELOPMENT

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is emotional intelligence in the context of leadership?	2 Marks	L1	CO1
	b)	Define personality analysis in psychology.	2 Marks	L2	CO1
	c)	List one benefit of high self-esteem.	2 Marks	L1	CO2
	d)	Name one common strategy for self-development.	2 Marks	L1	CO2
	e)	How can a leader's attitude impact team morale?	2 Marks	L2	CO1
	f)	Name one method for changing a negative attitude.	2 Marks	L1	CO3
	g)	What is open communication?	2 Marks	L1	CO1
	h)	Define grapevine communication.	2 Marks	L1	CO1
	i)	What is time management?	2 Marks	L2	CO4
	j)	List two strategies for balancing work and personal life?	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss the importance of communication skills in effective leadership. Provide examples.	8 Marks	L2	CO1
	b)	What is the impact of cultural intelligence on a leader's ability to manage diverse teams.	8 Marks	L1	CO1

(OR)

3.	a)	Discuss the vedantic concept of personality as presented by Swami Vivekananda	8 Marks	L2	CO1
	b)	How does vedantic concept differ from Western psychological theories?	8 Marks	L1	CO1

MODULE-II

4.	a)	Examine the concept of accountability in personal development.	8 Marks	L1	CO3
	b)	How can adopting a growth mindset enhance personal growth?	8 Marks	L1	CO3

(OR)

5.	a)	Illustrate the relationship between self-esteem and mental health.	8 Marks	L3	CO1
	b)	How can being accountable to others enhance commitment to goals?	8 Marks	L1	CO1

MODULE-III

6.	a)	Discuss strategies to cultivate a positive mindset.	8 Marks	L2	CO3
	b)	Explain the importance of positive attitudes in fostering effective communication and collaboration.	8 Marks	L2	CO3

(OR)

7.	a)	Discuss the role of attitude in shaping behavior.	8 Marks	L3	CO2
	b)	Illustrate how attitudes can influence decision-making	8 Marks	L1	CO2

MODULE-IV

8.	a)	Elucidate the impact of trust on communication relationships	8 Marks	L2	CO1
	b)	How can trust be built and maintained in a professional setting?	8 Marks	L1	CO1

(OR)

9.	a)	Explain how cultural differences can influence communication relationships.	8 Marks	L2	CO1
	b)	List out the strategies for improving communication in a diverse workplace.	8 Marks	L2	CO1

MODULE-V

10.	a)	Discuss the relationship between time management and stress management.	8 Marks	L2	CO4
	b)	How effective time management will reduce stress?	8 Marks	L1	CO4

(OR)

11.	a)	Explain the ethical implications of being judgmental in the workplace.	8 Marks	L2	CO4
	b)	Analyze the importance of creativity in problem-solving.	8 Marks	L1	CO4

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) Supplementary Examinations, March – 2026

ENGINEERING THERMODYNAMICS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define isolated system.	2 Marks	L1	CO1
	b)	Explain about quasistatic process.	2 Marks	L2	CO1
	c)	Define the term source, sink and heat reservoir	2 Marks	L1	CO2
	d)	Define COP of heat pump?	2 Marks	L1	CO2
	e)	List out application of entropy	2 Marks	L2	CO3
	f)	Define availability	2 Marks	L1	CO3
	g)	Define the terms 'Boiling point 'and 'Melting point' .	2 Marks	L1	CO4
	h)	Define latent heat of ice?	2 Marks	L1	CO4
	i)	Define Mean Effective pressure	2 Marks	L2	CO5
	j)	Draw the P-V and T-S diagrams of Joules cycle	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	To a closed system 150 kJ of work is supplied. If the initial volume is 0.6 m^3 and pressure of the system changes as p = 8 – 4V, where p is in bar and V is in m^3, determine the final volume and pressure of the system.	16 Marks	L3	CO1

(OR)

3.	Two streams of air, one at 1 bar, 27 ^{0}C and velocity of 30 m/s and the other at bar, 227 ^{0} C and velocity of 50 m/s mix in equal proportion in a chamber from which heat at the rate of 100 kJ/kg is removed. The mixture is then passed through an adiabatic nozzle. Find the velocity of the stream issuing out of the nozzle. The temperature of the air leaving the nozzle is 27 ^{0}C and its Cp = 1.005 kJ/kgK	16 Marks	L3	CO1

MODULE-II

4.	Derive an expression for Carnot cycle with PV and TS diagram.	16 Marks	L2	CO2

(OR)

5.	A carnot engine absorbs 200J of heat from a reservoir at the temperature of the normal boiling point of water and rejects heat to reservoir at the temperature of the triple point of water. Find the heat rejected, the work done by the engine and the thermal efficiency	16 Marks	L3	CO2

MODULE-III

6.	Discuss the concept of principle of entropy increases.	16 Marks	L2	CO3
	(OR)			
7.	In a turbine the air expands from 7 bar, 600 ^{0}C to 1 bar, 250^{0}C. During expansion 9 kJ/kg of heat is lost to surroundings which is at 1 bar, 15^{0}C. neglecting kinetic and potential energy changes, determine per kg of air: i) The decrease in availability; ii) The maximum work; iii) The irreversibility. For air , take Cp = 1.005 kJ/kgK, h= CpT where Cp is constant.	16 Marks	L3	CO3
	MODULE-IV			
8.	Steam at 10 bar and 0.95 dryness is available. Determine the final condition of steam in each of the following operations : i) 160 kJ of heat is removed at constant pressure ; ii) It is cooled at constant volume till the temperature inside falls to 140°C. iii) Steam expands isentropically in a steam turbine developing 300 kJ of work per kg of steam when the exit pressure of steam is 0.5 bar	16 Marks	L3	CO4
	(OR)			
9.	Following is the gravimetric analysis of air: Oxygen-23.14%, Nitogen-75.53%, Argon- 1.28% , Carbon dioxide -0.05% Calculate analysis by volume and the partial pressure of each constituent when total pressure is 1bar.	16 Marks	L3	CO4
	MODULE-V			
10.	Derive an expression for the thermal efficiency of Duel Cycle and draw P-V and T- S diagrams	16 Marks	L2	CO5
	(OR)			
11.	In a Diesel cycle, the compression ratio is 15. Compression begins at 0.1 MPa, 400C. The heat added is 1.675 MJ/kg. Find i) the maximum temperature in the cycle, ii) work done per kg of air iii) the cycle efficiency iv) the temperature at the end of the isentropic expansion v) the cut-off ratio	16 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) Supplementary Examinations, March – 2026

KINEMATICS OF MACHINERY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define a kinematic link with examples.	2 Marks	L1	CO1
	b)	What is meant by a completely constrained motion?	2 Marks	L1	CO1
	c)	State Kennedy's theorem.	2 Marks	L1	CO2
	d)	Write the condition for Coriolis component of acceleration.	2 Marks	L2	CO2
	e)	Name two exact straight-line motion mechanisms.	2 Marks	L1	CO3
	f)	State the condition for correct steering.	2 Marks	L2	CO3
	g)	Define "Law of Gearing".	2 Marks	L1	CO4
	h)	What is meant by "Contact Ratio" in gears?	2 Marks	L2	CO4
	i)	List the types of followers used in cams.	2 Marks	L1	CO5
	j)	What is meant by SHM follower motion?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Define the following terms: i) Element or link, ii) Kinematic chain, iii) Lower pair and iv) Higher pair	8 Marks	L1	CO1
	b)	Sketch and explain double slider crank mechanism	8 Marks	L2	CO1

(OR)

3.	a)	What is a machine? Differentiate between machine and structure?	6 Marks	L1	CO1
	b)	Sketch and explain single slider crank chain.	10 Marks	L2	CO1

MODULE-II

4.	In a four-bar chain ABCD, AD is fixed and is 150 mm long. The crank AB is 40 mm long and rotates at 120 r.p.m. clockwise, while the link CD = 80 mm oscillates about D. BC and AD are of equal length. Find the angular velocity of link CD when angle BAD = 60°.	16 Marks	L4	CO2

(OR)

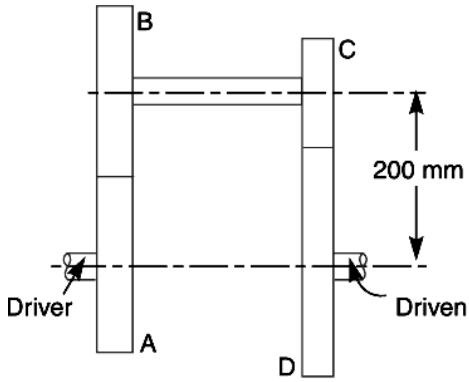
5.	The crank and connecting rod of a theoretical steam engine are 0.5 m and 2 m long respectively. The crank makes 180 r.p.m. in the clockwise direction. When it has turned 45° from the inner dead centre position, determine: i) velocity of piston, ii) angular velocity of connecting rod, iii) velocity of point E on the connecting rod 1.5 m from the gudgeon pin.	16 Marks	L4	CO2

MODULE-III

6.	Sketch and explain Peaucellier straight-line mechanism. Prove that it generates exact straight line.	16 Marks	L2	CO3
	(OR)			
7.	Draw the neat sketch of Davis steering gear and show that exactly satisfies the condition for correct steering.	16 Marks	L4	CO3

MODULE-IV

8.	A pinion having 30 teeth drives a gear having 80 teeth. The profile of the gears is involute with 20° pressure angle, 12 mm module and 10 mm addendum. Find the length of path of contact, arc of contact and the contact ratio.	16 Marks	L3	CO4
	(OR)			
9.	The speed ratio of the reverted gear train, as shown in Fig is to be 12. The module pitch of gears A and B is 3.125 mm and of gears C and D is 2.5 mm. Calculate the suitable numbers of teeth for the gears. No gear is to have less than 24 teeth.	16 Marks	L3	CO4



MODULE-V

10.	A cam is to give the following motion to a knife-edged follower: 1. Outstroke during 60° of cam rotation; 2. Dwell for the next 30° of cam rotation; 3. Return stroke during next 60° of cam rotation, and 4. Dwell for the remaining 210° of cam rotation. The stroke of the follower is 40 mm and the minimum radius of the cam is 50 mm. The follower moves with uniform velocity during both the outstroke and return strokes. Draw the profile of the cam when (a) the axis of the follower passes through the axis of the cam shaft.	16 Marks	L4	CO5
	(OR)			
11.	A cam is to be designed for a knife edge follower with the following data: 1. Cam lift = 40 mm during 90° of cam rotation with simple harmonic motion. 2. Dwell for the next 30°. 3. During the next 60° of cam rotation, the follower returns to its original position with simple harmonic motion. 4. Dwell during the remaining 180°. Draw the profile of the cam when (a) the line of stroke of the follower passes through the axis of the cam shaft. The radius of the base circle of the cam is 40 mm. Determine the maximum velocity and acceleration of the follower during its ascent and descent, if the cam rotates at 240 r.p.m.	16 Marks	L4	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) Supplementary Examinations, March – 2026

STRENGTH OF MATERIALS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Sketch the Engineering stress vs. strain diagram for steel	2 Marks	L2	CO1
	b)	An alloy specimen has a modulus of elasticity of 120 GPa and modulus of rigidity of 45 GPa. Determine the Poisson's ratio of the material	2 Marks	L1	CO1
	c)	Define the terms shear force and bending moment.	2 Marks	L2	CO2
	d)	What are the different types of a loads on a beam?	2 Marks	L1	CO2
	e)	A simply supported beam of width 100 mm, height 200 mm and length 4 m is carrying a uniformly distributed load of intensity 10 kN/m. The maximum bending stress (in MPa) in the beam is _____	2 Marks	L1	CO3
	f)	Why is a hollow shaft preferred over a solid shaft?	2 Marks	L1	CO3
	g)	Sketch the Mohr Circle for a bi-axial system subjected to Like stresses σ_1 and σ_2	2 Marks	L2	CO4
	h)	Define the term torsional rigidity and write the equation of it.	2 Marks	L1	CO4
	i)	What is Macaulay's method for finding the slope and deflection of a beam?	2 Marks	L2	CO5
	j)	A simply supported laterally loaded beam was found to deflect more than a specified value. By which measure will reduce the deflection?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Define the term factor of safety and its importance.	8 Marks	L1	CO1
	b)	An axial pull of 40 kN is applied on a steel bar of diameter 12 mm and length 2.5 m. Calculate the change in length, diameter and volume of the bar if the Poisson's ratio is 0.25. Also find the work done in stretching the bar. Take E = 2 x 105 N/mm2.	8 Marks	L4	CO1

(OR)

3.		A rigid block of mass M is supported by three symmetrically spaced rods as shown in Fig 1. Each copper rod has an area of 900 mm2; length of 160 mm; E = 120 GPa; and the allowable stress is 70 MPa. The steel rod has an area of 1200 mm2; length of 240 mm; E = 200 GPa; and the allowable stress is 140 MPa. Determine the largest mass M which can be supported.	16 Marks	L4	CO1

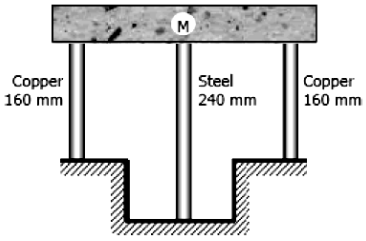

Fig. 1

MODULE-II

4. Draw the shear force and bending moment diagram for the beam shown in Fig 2. Locate the points of contraflexure, if any. Also find the point of maximum bending moment. — 16 Marks — L4 — CO2

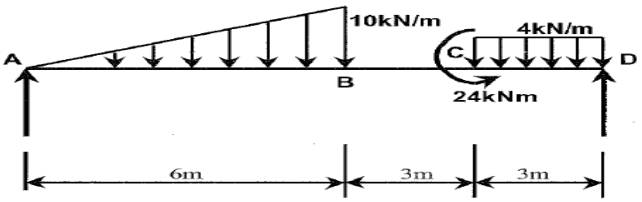

Fig.2

(OR)

5. a) Is the point of contraflexure and point of inflexion same? Justify. — 8 Marks — L1 — CO2

b) A beam ABC of 10 meters length is simply supported at A and B and has overhanging portion BC such that AB = 8 m and BC = 2 m. The beam carries uniformly distributed load of 2 kN/m over a length of 4 m from A, two concentrated loads of 4 kN and 2 kN at a distance of 6 m from A and at the free end C respectively. Draw bending moment and shear force diagrams for the beam mentioning all the salient points. Also locate its point of contraflexure. — 8 Marks — L3 — CO2

MODULE-III

6. a) Derive the expression for shear stress at any point (or in a fibre) in the cross-section of a beam. — 8 Marks — L2 — CO3

b) An equilateral triangular cross section beam with base 250 mm is subjected to a shear force of 150 kN. Draw the shear stress distribution across the section and also determine the average shear stress. — 8 Marks — L3 — CO3

(OR)

7. State the assumptions in the theory of simple bending. Also derive the bending equation from first principles. — 16 Marks — L2 — CO3

MODULE-IV

8. a) State the assumptions involved in deriving the torsion equation. — 8 Marks — L1 — CO4

b) A solid shaft transmits 250 kW at 100 rpm. If the shear stress is not to exceed 75 MPa. What should be the diameter of the shaft? If this shaft is replaced by a hollow one whose inside diameter is 0.6 times outside diameter. Determine the size and percentage saving in weight, the maximum shearing stress being the same. — 8 Marks — L3 — CO4

(OR)

9. a) Explain in brief about principal planes and principal stresses. — 8 Marks — L1 — CO4

b) The principal stresses at a point in a bar are 50 MPa tensile and 30 MPa compressive. Calculate the normal stress, shear stress and the resultant stress on a plane inclined at 500 to the axis of the major principal stress. Also find the maximum shear stress at the point. — 8 Marks — L4 — CO4

MODULE-V

10. A cantilever of 3 m length and of uniform rectangular cross-section 150 mm wide and 300 mm deep is loaded with a 30 kN load at its free end. In addition to this, it carries a uniformly distributed load of 20 kN/m run over its entire length. Calculate maximum slope and maximum deflection
slope and deflection at 2 m from fixed end.
Take E = 210 GN/m2. — 16 Marks — L4 — CO5

(OR)

11. Derive the relations for slope and deflection of a simply supported beam of span 'L' subjected to the following loads when a concentrated load 'W' acts at mid of span When a UDL of intensity w per unit run act over entire span — 16 Marks — L3 — CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) Supplementary Examinations, March – 2026

MACHINE TOOLS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define depth of cut	2 Marks	L2	CO1
	b)	State the principal Machining	2 Marks	L1	CO1
	c)	List four coolant used in machining	2 Marks	L2	CO2
	d)	What is BUE?	2 Marks	L1	CO2
	e)	Which axis the carriage of a lathe travel along?	2 Marks	L3	CO3
	f)	Which method is suitable for turning steep taper?	2 Marks	L1	CO3
	g)	What are the parts involved in the planer?	2 Marks	L2	CO4
	h)	List the mechanism involved in the planer.	2 Marks	L3	CO4
	i)	Name some natural abrasives.	2 Marks	L2	CO5
	j)	List different types of Knee and Column type milling machines.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	Explain the importance of machining in manufacturing.	16 Marks	L2	CO1
	(OR)			
3.	What is rake angle? Explain the types of rake angle and their salient features.	16 Marks	L1	CO1

MODULE-II

4.	Derive of Mathematical Expressions for Cutting Forces Using MCD.	16 Marks	L2	CO2
	(OR)			
5.	Explain formulation of chip in case machining ductile materials.	16 Marks	L1	CO2

MODULE-III

6.	What are the differences between a Turret and a Capstan lathe?	16 Marks	L2	CO3
	(OR)			
7.	What are the different types of taper turning methods? Discuss any one method with suitable diagram.	16 Marks	L4	CO3

MODULE-IV

8.	Explain with neat sketches any one of the following: i) Radial drilling machine ii) Sensitive drilling machine iii) Gang drilling machine.	16 Marks	L2	CO4
	(OR)			
9.	What do you understand by the term "Boring"? How are boring machines classified?	16 Marks	L2	CO4

MODULE-V

10.	How grinding machines are classified? Explain plain cylindrical grinding machine with neat sketch.	16 Marks	L1	CO5
	(OR)			
11.	With a neat sketch, explain construction and working of tool and cutter grinding machine.	16 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) Supplementary Examinations, March – 2026

NUMERICAL METHODS PROBABILITY AND STATISTICS

[Civil Engineering, Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define transcendental and algebraic equation with one example each.	2 Marks	L1	CO1
	b)	State the Bisection method formula for finding a root of an equation.	2 Marks	L1	CO1
	c)	Write Newton's forward difference formula for the first derivative.	2 Marks	L1	CO2
	d)	State the trapezoidal rule for numerical integration.	2 Marks	L2	CO2
	e)	Define a random variable with an example.	2 Marks	L1	CO3
	f)	What is a probability density function (PDF)?	2 Marks	L1	CO3
	g)	State the large sample Z-test formula for a single mean.	2 Marks	L1	CO4
	h)	What is the level of significance?	2 Marks	L1	CO4
	i)	What is type I and type II errors in hypothesis testing?	2 Marks	L1	CO5
	j)	Write the formula for chi-square statistic in a goodness-of-fit test.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2. a) Perform six iterations of Bisection method to find a real root of $f(x) = x^3 + x^2 + x + 7 = 0$. 8 Marks L3 CO1

b) Construct the backward difference table for the data and find $f(1.2)$ 8 Marks L3 CO1

x	-1	0	1	2
$y = f(x)$	-8	3	1	12

(OR)

3. a) The following data represents the function $f(x) = \cos(x+1)$ 8 Marks L3 CO1

x	0.0	0.2	0.4	0.6
$y = f(x)$	0.5403	0.3624	0.1700	– 0.0292

Estimate the value of $f(0.5)$ and Compare with the exact value.

b) Construct a second degree polynomial passes through the points (0,1) (1,3) and (3,55) by using Lagrange's interpolation formula. Hence, find the value at 1.5. 8 Marks L2 CO1

MODULE-II

4.	a)	Evaluate $\int_0^1 x^3 dx$ with 5 sub intervals by Trapezoidal rule	8 Marks	CO2	L3
	b)	Evaluate $\int_0^1 x^3 dx$ with 5 sub intervals by Simpson's 3/8 rule.	8 Marks	CO2	L3
		(OR)			
5.	a)	Given that $\sin 15^0 = 0.2588190$, $\sin 20^0 = 0.3420201$, $\sin 25^0 = 0.4226183$, $\sin 30^0 = 0.4226183$, $\sin 35^0 = 0.5$, $\sin 40^0 = 0.5735764$, $\sin 45^0 = 0.6427876$. Determine $\sin 38^0$ by using appropriate numerical method.	8 Marks	L3	CO2
	b)	Evaluate $\int_{0.2}^{0.6} \left(x^2 + 3x\right) dx$ by using Trapezoidal rule.	8 Marks	L2	CO2
		MODULE-III			
6.	a)	Suppose a continuous R.V. x has the probability density $f(x) = \begin{cases} k(1-x^2), & \text{for } 0 < x < 1 \\ 0, & \text{elsewhere} \end{cases}$ .Find the value of k and also find $P(0.1 < x < 0.2)$	8 Marks	L3	CO3
	b)	Find the mean and variance of the Binomial distribution.	8 Marks	L2	CO3
		(OR)			
7.	a)	Suppose a continuous R.V. x has the probability density $f(x) = \begin{cases} k(1-x^2), & \text{for } 0 < x < 1 \\ 0, & \text{elsewhere} \end{cases}$ .Find the value of k and calculate mean for the probability density function.	8 Marks	L3	CO3
	b)	Derive mean and variance of Poisson distribution.	8 Marks	L2	CO3
		MODULE-IV			
8.	a)	A researcher claims that the average lifetime of a certain type of electric bulb is 1200 hours. A random sample of 25 bulbs gives a mean lifetime of 1180 hours with a standard deviation of 80 hours. Formulate the null and alternative hypotheses, identify the critical region at the 5% level of significance, and conclude whether the researcher's claim is acceptable.	8 Marks	L2	CO4
	b)	A machine is supposed to fill packets with 500 g of flour on average. A random sample of 100 packets has a mean weight of 495 g and a standard deviation of 10 g. Test, at the 5% level of significance, whether the machine is working correctly.	8 Marks	L2	CO4
		(OR)			
9.	a)	Explain the concepts of null hypothesis, critical region, and level of significance with suitable examples. Using these, test the hypothesis that the proportion of defective items produced in a factory is not more than 5%, given that in a random sample of 200 items, 16 are found defective. Take the level of significance as 1%.	8 Marks	L3	CO4
	b)	Two different fertilizers are applied to test their effect on crop yield. From sample I ($n_1 = 64$), the mean yield is 525 kg/acre with standard deviation 8 kg. From sample II ($n_2 = 81$), the mean yield is 539 kg/acre with standard deviation 10 kg. Test, at the 1% level of significance, whether there is a significant difference between the mean yields of the two fertilizers.	8 Marks	L2	CO4

MODULE-V

10.	a)	A random sample of 10 students has an average test score of 56 with a standard deviation of 8. Test, at the 5% level of significance using the Student's t-test, whether the average score of the population of students can be considered as 60.	8 Marks	L3	CO5
	b)	What are the assumptions of the F-test for equality of variances?	8 Marks	L2	CO5
		(OR)			
11.	a)	A manufacturer claims that the mean breaking strength of a type of thread is 5.0 kg. A random sample of 16 pieces of thread gives a mean breaking strength of 4.7 kg with a standard deviation of 0.5 kg. Test this claim at the 1% level of significance using the Student's t-test.	8 Marks	L3	CO5
	b)	State the procedure of the F-test for testing equality of two population variances.	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) Supplementary Examinations, March – 2026

NUMERICAL METHODS PROBABILITY AND STATISTICS

[Computer Science and Engineering (Artificial Intelligence and Machine Learning), Computer Science and Engineering (Data Science), Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	If $f(x)=x^3-3x+1=0$, a=1 & b=2. Find x_2 by using bisection method.	2 Marks	L1	CO1
	b)	Express the formula to find the root of equation by using Newton-Raphson method.	2 Marks	L2	CO1
	c)	Define algebraic equation and transcendental equation and give an example.	2 Marks	L1	CO1
	d)	Express the Newton's forward and backward interpolation formula.	2 Marks	L2	CO1
	e)	Define Discrete Random Variable.	2 Marks	L1	CO3
	f)	Define Normal Distribution.	2 Marks	L1	CO3
	g)	Define Hypothesis.	2 Marks	L1	CO4
	h)	Write Test Statistic for Single mean.	2 Marks	L3	CO4
	i)	Define t-distribution.	2 Marks	L1	CO5
	j)	Briefly Explain Chi-square test for goodness of fit.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Using method of false position, estimate an approximate root correct to three decimal places for the equation $x^3 - 2x - 5 = 0$.	8 Marks	L3	CO1
	b)	Derive a recurrence formula for evaluating $\sqrt{N}$ by Newton-Raphson method and hence estimate $\sqrt{10}$ correct to three decimal places.	8 Marks	L3	CO1

(OR)

3.	a)	Construct an interpolating polynomial for the following data using Newton's forward interpolation formula.	8 Marks	L3	CO1

x	0	1	2	3	4
y	3	6	11	18	27

	b)	Estimate the value of y(2) from the following data using Lagrange's interpolation formula.	8 Marks	L5	CO1

x	0	1	3	4
y	5	6	50	105

MODULE-II

4. a) Choose the appropriate interpolation formula and estimate $\frac{dy}{dx}$ *and* $\frac{d^2y}{dx^2}$ *at* $x = 1.2$ from the following table . 8 Marks L1 CO2

x	1.0	1.2	1.4	1.6	1.8	2.0	2.2
y	2.7183	3.3201	4.0552	4.9530	6.0496	7.3891	9.0256

b) State Simpson's 3/8 rule and applying it to evaluate $\int_0^1 \sqrt{1+x^4}\, dx$ *for* $n = 6$. 8 Marks L3 CO2

(OR)

5. a) Evaluate $\int_0^1 \frac{1}{1+x}\, dx$ by Trapezoidal rule. 8 Marks L3 CO2

b) Evaluate $\int_0^{\pi} \frac{1}{1+x}\, dx$ by Trapezoidal rule, taking $h = \pi/6$. 8 Marks L3 CO2

MODULE-III

6. a) If X and Y are discrete random variables and K is a constant, show that i) E(X + K) = E (X) + K ii) E(X+Y) = E(X) + E(Y). 8 Marks L1 CO3

b) A continuous variable X has the distribution function 8 Marks L3 CO3

$$F(x) = \begin{cases} 0, & if\ x \le 1 \\ K(x-1)^4, & if\ 1 < x \le 3 \\ 1, & if\ x > 3 \end{cases}$$ Determine

i) The probability density function of X ii) K.

(OR)

7. a) A random variable X has the following probability distribution function 8 Marks L1 CO3

$X = x$	-2	-1	0	1	2	3
$P(X=x)$	0.1	k	0.2	$2k$	0.3	k

Find i) k ii) mean iii) variance.

b) For the continuous probability function 8 Marks L3 CO3

$$f(x) = \begin{cases} c\,x(2-x), & if\ 0 \le x \le 2 \\ 0, & otherwise \end{cases}$$ Calculate the value of c and also obtain the mean and variance of X.

MODULE-IV

8. a) Average number of accidents on any day on a national highway is 1.8. Determine the probability that the number of accidents is i) at least one ii) at most one. 8 Marks L3 CO4

b) In Sampling a large number of parts manufactured by a machine, the mean number of defectives in a sample of 20 is 2. Out of 1000 such samples, how many would be expected to contain at least 3. 8 Marks L1 CO4

(OR)

9. a) Construct a binomial distribution to the following data and find the expected frequencies — 8 Marks — L1 — CO4

x	0	1	2	3	4	5
f(x)	2	14	20	34	22	8

b) The marks obtained in statistics in a certain examination found to be normally distributed. If 15% of students got greater than or equal to 60 marks, 40 % of students got less than 30 marks, Estimate the mean and standard deviation. — 8 Marks — L5 — CO4

MODULE-V

10. a) Explain about i) Null hypothesis ii) Type-I and type-II errors. — 8 Marks — L2 — CO5

b) A random sample of 6 steel beams has a mean compressive strength of 58,392 *p.s.i* (pounds per square inch) with a standard deviation of 648 *p.s.i.* Use this information and the level of significance $\alpha = 0.05$ to test whether the true average compressive strength of the steel from which this sample came is 58,000 *p.s.i.* Assume normality. — 8 Marks — L4 — CO5

(OR)

11. a) In a big city 325 men out of 600 men were found to be smokers. Does this information support the conclusion that the majority of the men in this city are smokers? Analyze the given information and conclude. — 8 Marks — L4 — CO5

b) Given the following contingency table for hair colour and eye colour. — 8 Marks — L4 — CO5

		Hair colour		
		Fair	Brown	Black
Eye colour	Blue	15	5	20
	Grey	20	10	20
	Brown	25	15	20

Test whether there is any good association between two colours at 0.05 level.

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) Supplementary Examinations, March – 2026

SPECIAL FUNCTIONS AND COMPLEX ANALYSIS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Beta function.	2 Marks	L1	CO1
	b)	Write the relationship between Beta and Gamma function.	2 Marks	L1	CO1
	c)	Define analytic function.	2 Marks	L1	CO2
	d)	Separate the real and imaginary parts of $\sin z$.	2 Marks	L1	CO2
	e)	Define conformal mapping.	2 Marks	L1	CO3
	f)	Find the fixed points of the transformation $w = \dfrac{6z-9}{z}$	2 Marks	L1	CO3
	g)	State Cauchy integral theorem.	2 Marks	L1	CO4
	h)	Write the Taylor's series expansion of $f(z)$ about $z = a$	2 Marks	L1	CO4
	i)	State Cauchy Residue theorem.	2 Marks	L1	CO4
	j)	Find the poles of the function $\cot z$.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Show that $\int_0^1 \frac{x^2}{\sqrt{1-x^4}}dx \times \int_0^1 \frac{1}{\sqrt{1-x^4}}dx = \frac{\pi}{4}$	8 Marks	L2	CO1
	b)	Evaluate $\int_0^\infty x^2 e^{-x^2} dx$	8 Marks	L5	CO1

(OR)

3.	a)	Show that $B(m,n) = \int_0^\infty \frac{x^{m-1}}{(1+x)^{m+n}}dx$	8 Marks	L2	CO1
	b)	Evaluate $\int_0^{\pi/2} \sin^2\theta \cos^4\theta \, d\theta$ using B-Γ functions.	8 Marks	L5	CO1

MODULE-II

4.	a)	Find whether the function $f(z) = \sin z$ is analytic or not.	6 Marks	L1	CO2
	b)	Derive C-R equations as necessary conditions for a function $w = f(z)$ to be analytic.	10 Marks	L3	CO2

(OR)

5.	a)	Show that the function $f(z) = \sqrt{\lvert xy \rvert}$ is not analytic at the origin	8 Marks	L2	CO2

although Cauchy- Riemann equations are satisfied at the origin.

	b)	Verify the function $u = x^2 - y^2 - y$ is harmonic in the whole complex plane and find its harmonic conjugate	8 Marks	L2	CO2

MODULE-III

6.	a)	Find the image of the circle $\lvert z\rvert = 2$ by the transformation $w = z + 3 + 2i$.	8 Marks	L1	CO3
	b)	Determine the bilinear transformation that maps the points (-1,0,1) in Z-plane onto the points (-1,-i,1) respectively.	8 Marks	L3	CO3

(OR)

7.	a)	Discuss the transformation $w = z^2$.	8 Marks	L2	CO3
	b)	Determine the bilinear transformation whose fixed points are 1,-1.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Evaluate $\int_c (x+y)\,dx + x^2 y\,dy$ along $y = 3x$ between (0,0) and (3,0).	8 Marks	L5	CO4
	b)	Find the Taylor's series expansion of the function $f(z) = \dfrac{1}{z^2 - z - 6}$ about the point $z = -1$.	8 Marks	L1	CO4

(OR)

9.	a)	Use Cauchy's integral formula to evaluate $\int_C \dfrac{z^3 e^{-z}}{(z-1)^3}\,dz$, where C is the circle $\lvert z-1\rvert = \dfrac{1}{2}$.	8 Marks	L3	CO4
	b)	Find the Laurent expansion of the function $f(z) = \dfrac{1}{z^2 - 4z + 3}$, for $1 < \lvert z\rvert < 3$.	8 Marks	L1	CO4

MODULE-V

10.	a)	Determine the poles and residues of the function $f(z) = \dfrac{z e^z}{(z-1)^3}$.	8 Marks	L3	CO4
	b)	Evaluate $\int_C \dfrac{e^{2z}}{(z-1)(z-2)}\,dz$, where C is the circle $\lvert z\rvert = 3$.	8 Marks	L5	CO4

(OR)

11.		Using Residue theorem, show that $\int_0^{2\pi} \dfrac{d\theta}{a + b\sin\theta} = \dfrac{2\pi}{\sqrt{a^2 - b^2}}$ $a > b > 0$.	16 Marks	L3	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) Supplementary Examinations, March – 2026

OPERATING SYSTEMS

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is a Process Control Block (PCB)?	2 Marks	L1	CO1
	b)	Explain the challenges associated with scheduling in multiprocessor systems.	2 Marks	L2	CO1
	c)	Describe the function of synchronization hardware in process management.	2 Marks	L2	CO2
	d)	Define the system model used to understand deadlocks.	2 Marks	L1	CO2
	e)	Name and describe a common disk scheduling algorithm.	2 Marks	L1	CO3
	f)	What causes thrashing in a virtual memory system?	2 Marks	L1	CO3
	g)	What is a tree-structured directory?	2 Marks	L1	CO4
	h)	Define Contiguous, Linked & Indexed allocation.	2 Marks	L1	CO4
	i)	Define virus and Define bus.	2 Marks	L1	CO5
	j)	What is cache? and Define spooling.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe operating system structure and operations in detail.	8 Marks	L2	CO1
	b)	Discuss the concept of multithreading and the different multithreading models available.	8 Marks	L2	CO1

(OR)

3.	a)	Explain inter-process communication (IPC) and the different mechanisms used for IPC.	8 Marks	L2	CO1
	b)	Consider the following set of precess with the length of CPU burst time given in milliseconds:	8 Marks	L2	CO1

Process	Arrival Time	Burst Time	Priority
P1	2	2	3
P2	3	3	2
P3	0	1	4
P4	4	2	1
P5	3	2	3

Draw the four gantt charts illustrating the execution of these preocesses using FCFS, SJF, Preemptive Priority and Round robin (Quantum=2) scheduling and calculate waiting and turn around time of each process for each scheduling algorithm.

MODULE-II

4. a) Explain the role of synchronization hardware in process synchronization. Give examples of hardware mechanisms used for synchronization. 8 Marks L3 CO2

   b) How does Peterson's solution work to resolve the critical section problem for two processes? Detail the algorithm and its key components. 8 Marks L3 CO2

(OR)

5. a) What is a semaphore? Explain the operations wait() and signal() and how they are used to manage synchronization between processes. 8 Marks L3 CO2

   b) Apply Banker's Algorithm and determine whether the system is in safe state or not? 8 Marks L3 CO2

Process	Allocation	Max	Available
	A B C	A B C	A B C
P_0	0 1 0	7 5 3	3 3 2
P_1	2 0 0	3 2 2	
P_2	3 0 2	9 0 2	
P_3	2 1 1	2 2 2	
P_4	0 0 2	4 3 3	

MODULE-III

6. a) Explain contiguous memory allocation and its advantages and disadvantages. 8 Marks L2 CO3

   b) What is paging in memory management? How does it address issues related to contiguous memory allocation? 8 Marks L2 CO3

(OR)

7. a) What is the need of Page replacement? Consider the following reference string 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1 Find the number of Page Faults with FIFO, Optimal Page replacement and LRU with four free frames which are empty initially. Which algorithm gives the minimum number of page faults? 8 Marks L3 CO3

   b) Describe how disk management is handled in modern operating systems. What are the key responsibilities and challenges? 8 Marks L2 CO3

MODULE-IV

8. a) Explain the different file access methods, such as sequential and direct access. How do these methods impact file operations? 8 Marks L2 CO4

   b) What is an inode in a file system? Describe its purpose and the information it typically stores. 8 Marks L2 CO4

(OR)

9. a) Explain the application I/O interface. How does it provide a bridge between application programs and the I/O subsystem? 8 Marks L2 CO4

   b) Describe the role of I/O schedulers in managing I/O operations. What are the common scheduling algorithms used? 8 Marks L3 CO4

MODULE-V

10. a) Define system threat. Give example of system threats. 8 Marks L2 CO5

    b) What is the purpose of I/O system calls and device-driver? How do the devices vary? 8 Marks L2 CO5

(OR)

11. a) What is access matrix? Describe how it can be implemented effectively. 8 Marks L2 CO5

    b) Describe the services provided by the Kernel I/O subsystem in detail. 8 Marks L2 CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. I Semester (MBU-22) Supplementary Examinations, May – 2026

FUNDAMENTALS OF CRIME, CRIMINOLOGY AND POLICE

[Forensic Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What are the main historical perspectives on the origin of crime?	2 Marks	L1	CO1
	b)	Explain the nature and scope of criminology.	2 Marks	L1	CO1
	c)	Name one key philosopher associated with the Classical school.	2 Marks	L1	CO2
	d)	What is biological positivism primarily concerned with in explaining crime?	2 Marks	L1	CO2
	e)	What are conventional crimes?	2 Marks	L1	CO3
	f)	Define white collar crime with one example.	2 Marks	L1	CO3
	g)	In which year was the Indian Police Act enacted to modernize policing?	2 Marks	L1	CO4
	h)	What is the role of the State Crime Records Bureau (SCRB)?	2 Marks	L1	CO4
	i)	What is a case diary used for during investigation?	2 Marks	L1	CO5
	j)	Differentiate between cognizable and non-cognizable offences.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Briefly explain the scope of criminology.	6 Marks	L2	CO1
	b)	Describe the origin, nature, and development of criminology as a scientific discipline. Include key milestones and thinkers.	10 Marks	L2	CO1

(OR)

3.	a)	What is delinquency? Mention its major types and give two examples.	6 Marks	L1	CO1
	b)	Critically evaluate criminology's interdisciplinary nature. Discuss its connections with sociology, psychology, law, anthropology, and political science.	10 Marks	L5	CO1

MODULE-II

4.	a)	What is Biological Positivism in criminology? Mention any two key proponents.	6 Marks	L1	CO2
	b)	Discuss Cesare Lombroso's theory of the "Born Criminal" and evaluate its impact and criticisms in modern criminology.	10 Marks	L2	CO2

(OR)

5.	a)	Write a short note on the Cartographic School of Criminology.	6 Marks	L1	CO2
	b)	Analyze the methods and findings of the Cartographic School. How did statistical mapping contribute to understanding crime distribution?	10 Marks	L4	CO2

MODULE-III

6.	a)	Define conventional crimes and provide examples.	6 Marks	L1	CO3
	b)	Examine the nature and characteristics of conventional crimes in India.	10 Marks	L2	CO3

(OR)

7.	a)	What is white collar crime? Give two examples.	6 Marks	L1	CO3
	b)	Critically evaluate the causes, impact, and challenges in controlling white collar crime.	10 Marks	L5	CO3

MODULE-IV

8.	a)	Mention the general administrative hierarchy of the state police.	6 Marks	L1	CO4
	b)	Describe the organizational structure and functions of the state police, including ranges and administrative setup.	10 Marks	L2	CO4

(OR)

9.	a)	What is the CID and what is its primary function?	6 Marks	L1	CO4
	b)	Explain the organization and functions of various branches of the CID, including Economic Crime Wing, Cyber Division, Intelligence Wing, Training Wing, and Technical Services.	10 Marks	L2	CO4

MODULE-V

10.	a)	Differentiate between cognizable and non-cognizable offences.	6 Marks	L4	CO5
	b)	Describe the steps involved in the investigation of cognizable offences.	10 Marks	L2	CO5

(OR)

11.	a)	What are the general powers of police during investigation?	6 Marks	L2	CO5
	b)	Critically examine the legal provisions governing police powers of investigation in India.	10 Marks	L3	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) Supplementary Examinations, March – 2026

COMPUTER NETWORKS

[Computer Science and Engineering (Artificial Intelligence and Machine Learning)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define computer networks.	2 Marks	L1	CO1
	b)	Mention any two differences between packet and Circuit switching.	2 Marks	L1	CO1
	c)	List the various error detection and correction methods.	2 Marks	L1	CO3
	d)	Define Flow control.	2 Marks	L1	CO3
	e)	List the different types of routing algorithms.	2 Marks	L1	CO2
	f)	Define shortest path algorithm.	2 Marks	L1	CO2
	g)	List various flags in TCP header.	2 Marks	L1	CO1
	h)	Define source port and destination port address.	2 Marks	L1	CO1
	i)	Draw the scenario of Electronic mail.	2 Marks	L1	CO4
	j)	What are the 3 main divisions of Domain Name space?	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	With a neat diagram explain ISO-OSI reference model.	10 Marks	L2	CO1
	b)	Compare Optical fibers and Copper cable Guided Transmission mediums.	6 Marks	L2	CO1

(OR)

3.	a)	Elaborate the uses of Computer Networks.	6 Marks	L3	CO1
	b)	Analyze the concept of packet switching in detail, including how it works and why it has become the dominant switching technology in modern networks.	10 Marks	L3	CO1

MODULE-II

4.	a)	For a 12-bit data string of 101100010010, determine the number of Hamming bits required, arbitrarily place the Hamming bits into the data string, determine the logic condition of each Hamming bit, assume an arbitrary single-bit transmission error, and prove that the Hamming code will successfully detect the error.	10 Marks	L4	CO3
	b)	Write short notes about Bridges, routers and gateways.	6 Marks	L2	CO3

(OR)

5.	a)	Suppose we want to transmit the “message 1011 0010 0111 and protect it from errors using the CRC polynomial x4 +x2+1. Use polynomial long division to determine the message that should be transmitted. Suppose the leftmost bit of the message is inverted due to noise on the transmission link. What is the result of the ‘receiver's CRC calculation? How does the receiver know that an error has occurred?	10 Marks	L4	CO3
	b)	Compare pure aloha and slotted aloha in terms of efficiency.	6 Marks	L2	CO3

MODULE-III

6.	a)	Compare IPV4 and IPV6 protocols.	8 Marks	L2	CO2
	b)	Demonstrate the process of updating the routing table in distance vector routing and list down the limitations.	8 Marks	L4	CO2

(OR)

7.	a)	Summarize the concept of Token Bucket algorithm with example.	8 Marks	L3	CO2
	b)	Write a short note on OSPF and BGP protocols.	8 Marks	L2	CO2

MODULE-IV

8.	a)	With a neat diagram explain Remote Procedure Call.	8 Marks	L2	CO1
	b)	Sketch TCP and UDP header. List and explain its fields.	8 Marks	L3	CO1

(OR)

9.	a)	Summarize the concept of AIMD in TCP.	8 Marks	L2	CO1
	b)	Sketch the state transition diagram of TCP connection establishment,data transfer and termination and explain it.	8 Marks	L2	CO1

MODULE-V

10.	a)	Analyze How Hypertext Transfer Protocol is related to WWW?	8 Marks	L3	CO4
	b)	Explain in detail how electronic mail applications are carried out in a network. Also explain the protocols used in this application.	8 Marks	L2	CO4

(OR)

11.	a)	Briefly explain the Domain Name Service protocol with an example.	8 Marks	L2	CO4
	b)	Explain File Transfer Protocol in detail.	8 Marks	L2	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) Supplementary Examinations, March – 2026

FIRE ENGINEERING

[Civil Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is the basic mechanism of fire spread?	2 Marks	L1	CO1
	b)	Do you need oxygen for combustion?	2 Marks	L2	CO1
	c)	What actions will extinguish a fire?	2 Marks	L2	CO2
	d)	How does fire detector and alarm system work?	2 Marks	L2	CO2
	e)	Compare the flammable and combustible liquids	2 Marks	L4	CO3
	f)	List out the various fire suppression system	2 Marks	L2	CO3
	g)	What are the fire resistance materials in building?	2 Marks	L1	CO4
	h)	Name the different classification of buildings based on occupancy	2 Marks	L2	CO4
	i)	What is the importance of inert gas	2 Marks	L2	CO5
	j)	Name the explosion parameters that causes fire	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Give a brief account on chemical fire.	8 Marks	L2	CO1
	b)	Discuss about the toxicity of products of combustion for fire safety.	8 Marks	L2	CO1

(OR)

3.		Write short notes on: i) Unconfined vapour cloud explosion ii) Boiling liquid expanding vapour explosion	16 Marks	L3	CO1

MODULE-II

4.	a)	Write the principles of fire extinguishing.	8 Marks	L2	CO2
	b)	Explain in detail about various fires, classify in detail.	8 Marks	L4	CO2

(OR)

5.	a)	Discuss on escape from fire rescue operations	8 Marks	L4	CO2
	b)	How will you maintain the fire trucks in fire station. Discuss in brief about the various aspects involved in it.	8 Marks	L4	CO2

MODULE-III

6.		Explain in detail the design features, installation, maintenance and operation of explosion detection and control systems.	16 Marks	L4	CO3

(OR)

7.		Explain the Halon system and its needs for industrial building.	16 Marks	L4	CO3

MODULE-IV

8.	a)	Explain the importance of structural fire protection.	8 Marks	L4	CO4
	b)	Write the structural integrity of the building fire.	8 Marks	L4	CO4
		(OR)			
9.		Briefly explain the concept of egress design for residential building.	16 Marks	L6	CO4

MODULE-V

10.	a)	Mention the principles of explosion.	8 Marks	L2	CO5
	b)	Discuss the importance of Flame Arrestors.	8 Marks	L2	CO5
		(OR)			
11.		Analyze the functioning of Rupture disc in process vessels and lines explosion and mention its advantages	16 Marks	L6	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) Supplementary Examinations, March – 2026

MECHANICS OF SOLIDS

[Civil Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Give the maximum shear force and bending moment of a simply supported beam of length 'l' carrying a uniformly distributed load of w per unit run throughout the span.	2 Marks	L1	CO1
	b)	What is point of contraflexure?	2 Marks	L1	CO1
	c)	Write the bending equation.	2 Marks	L1	CO2
	d)	Sketch the shear stress distribution of a circular and I section.	2 Marks	L2	CO2
	e)	What are the assumptions made in the theory of pure torsion?	2 Marks	L1	CO3
	f)	Mention the different functions of springs.	2 Marks	L1	CO3
	g)	What is the intensity of normal and tangential stresses on an inclined plane of a block subjected to two mutual perpendicular stresses?	2 Marks	L1	CO4
	h)	In a steel member, at a point the major principal stress is 180 MN/m^2 and the minor principal stress is compressive. If the tensile yield point of the steel is 225 MN/m^2, find the value of the minor principal stress at which yielding will commence, according to maximum shearing stress.	2 Marks	L4	CO4
	i)	Define equivalent length.	2 Marks	L1	CO5
	j)	What are the stresses induced in short, medium and long column?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Determine the maximum shear force and bending moment of a cantilever beam carrying load whose intensity varies uniformly from zero at the free end to w per unit run at the fixed end. Draw SFD and BMD.	8 Marks	L2	CO1
	b)	Analyse the cantilever beam of span 5 m subjected to a point load of 10 kN at the free end. Draw SFD and BMD.	8 Marks	L4	CO1

(OR)

3.		A beam AB 10 m long is simply supported at its ends A and B, it carries uniformly distributed load of 10 kN/m for a distance of 4m from the left end A and a concentrated load of 40 kN and 20 kN at a distance of 2 m from either ends of the beam respectively. Determine the maximum shear force and bending moment. Draw SFD and BMD.	16 Marks	L4	CO1

MODULE-II

4.	a)	The T shaped beam with flange having a width of 200 mm and a depth of 50 mm and web having a width 50 mm and depth 200 mm is subjected to vertical shear force of 100 kN. Calculate the shear stress at the neutral axis and at the junction of the web and the flange and draw the shear stress distribution diagram.	8 Marks	L4	CO2

	b)	A hollow circular bar having outside diameter twice the inside diameter is used as a beam. The beam is subjected to a maximum bending moment of 40 kN-m. If the allowable safe stress in the beam is to limited to 100 N/mm^2, find the diameters of the bar.	8 Marks	L4	CO2
		(OR)			
5.		A short column of I section 25 cm x 2 cm has a cross sectional area of 52 cm^2 and maximum radius of gyration of 10.7 cm. A vertical load 'W' acts through the centroid of the section together with a parallel load of 'W/4' acting through a point on the centre line of web distant 6 cm from the centroid. Calculate the greatest allowable value of 'W' if the maximum stress should not exceed 65 MN/m^2. What is the value of minimum stress then?	16 Marks	L4	CO2
		MODULE-III			
6.	a)	In a tensile test, The test piece 20 mm in diameter, 200 mm gauge length stretched 0.0975 mm under a pull of 50,000 N. In a torsion test the same rod twisted 0.025 radian over a length of 200 mm, when a torque of 400 N-m was applied. Evaluate the Poisson's Ratio and the three elastic moduli for the material and verify with the safe limits.	8 Marks	L4	CO3
	b)	A hollow shaft is to transmit 300 kW at 80 r.p.m. If the shear stress is not to exceed 60 MN/m^2 and internal diameter is 0.6 of the external diameter, find the external and internal diameters assuming that the maximum torque is 1.4 times the mean.	8 Marks	L4	CO3
		(OR)			
7.	a)	A composite spring has two closed coiled springs connected in series; one spring has 12 coils of a mean diameter of 25 mm and wire diameter 2.5 mm. Design the wire diameter of the other spring, if it has 15 coils of mean diameter 40 mm. The stiffness of the composite spring is 1.5 kN/m. Determine the greatest load that can be carried by the composite spring and the corresponding extension if maximum stress is 250 MN/m^2. Take C= 80 GN/m^2.	8 Marks	L4	CO3
	b)	A helical spring B is placed inside the coil of a second helical spring A, having the same number of coils and free axial length and of same material. The two springs are compressed by an axial load of 210 N which is shared between them. The mean coil diameters of A and B are 90 mm and 60 mm and the wire diameters are 12 mm and 7 mm respectively. Calculate the load taken and the maximum stress in each spring.	8 Marks	L4	CO3
		MODULE-IV			
8.	a)	At a point in a strained material the normal stresses on two planes at right angles are 100 N/mm^2 and 50 N/mm^2 and both are compressive. Find the resultant intensity of stress on a plane inclined at 60° to the axis of maximum stress.	8 Marks	L4	CO4
	b)	At a point in a strained material the resultant intensity of stress across a plane is 56.56 N/mm^2 in tensile inclined at 45° to its normal. The normal component of the intensity across planes at right angles is 20 N/mm^2 compressive. Find the position of principal planes and stresses across them. Also determine the value of maximum shear at that point.	8 Marks	L4	CO4
		(OR)			
9.		A shaft is subjected to a maximum torque of 10 kNm and a maximum bending moment of 7.5 kNm at a particular section. If the allowable equivalent stress in simple tension is 160 MN/m^2, find the diameter of the shaft according to maximum shear stress theory.	16 Marks	L4	CO4

MODULE-V

10.	a)	List out the assumptions made in Euler's theory. Derive the Euler's formula when both ends of the column are hinged.	8 Marks	L2	CO5
	b)	Calculate the safe compressive load on a hallow cast iron column (one end is fixed and the other is hinged) of 150 mm external diameter and 10 m length. Use Euler's formula with a factor of safety of 5 and E = 95 GN/m^2.	8 Marks	L4	CO5

(OR)

11.	A 1.5 m long C.I column has a circular cross-section of 5 cm diameter. One end of the column is fixed in the direction and position and the other end is free. Taking factor of safety as 3, calculate the safe load, using: i) Rankine – Gordon formula; take yield stress 560 MN/m^2, and a = 1/1600 for pinned ends ii) Euler's formula. Young's modulus for C.I. = 120 GN/m^2.	16 Marks	L4	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) Supplementary Examinations, March – 2026

ENVIRONMENTAL ENGINEERING

[Civil Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define per capita demand. State typical value for a city	2 Marks	L1	CO1
	b)	What is population forecasting? Name one method.	2 Marks	L1	CO1
	c)	Define coagulation. Name one coagulant	2 Marks	L1	CO2
	d)	What is the purpose of aeration in water treatment?	2 Marks	L2	CO2
	e)	Define BOD and COD. Give units.	2 Marks	L1	CO3
	f)	What is self-purification of streams?	2 Marks	L1	CO3
	g)	Name two types of sewer appurtenances.	2 Marks	L2	CO4
	h)	What is a trickling filter?	2 Marks	L1	CO4
	i)	Define sludge digestion. Name one type.	2 Marks	L2	CO5
	j)	What is sewage farming?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain factors affecting per capita demand with examples	8 Marks	L3	CO1
	b)	Population: 2021 = 50,000; 2031 = 75,000; 2041 = 1,10,000. Forecast population for 2051 using arithmetic increase method. Design water demand for 2051 (per capita = 135 lpcd).	8 Marks	L4	CO1

(OR)

3.	a)	Explain Hardy Cross method for pipe network analysis	8 Marks	L2	CO1
	b)	A town has design population = 80,000. Per capita demand = 150 lpcd. Peak factor = 2.5. Design intake capacity and pump capacity.	8 Marks	L4	CO1

MODULE-II

4.	a)	Explain design of rapid sand filter with sketch.	8 Marks	L3	CO2
	b)	Design a coagulation tank for Q = 10 MLD. Detention time = 30 min, Depth = 3 m. Find dimensions and alum dose if turbidity = 50 NTU (dose = 20 mg/L).	8 Marks	L4	CO2

(OR)

5.	a)	Explain break point chlorination with graph.	8 Marks	L3	CO2
	b)	Water has chlorine demand = 1.2 mg/L. Desired residual = 0.3 mg/L. Find chlorine dose. If flow = 5 MLD, find daily chlorine required.	8 Marks	L4	CO2

MODULE-III

6.	a)	Explain BOD equation and its significance.	8 Marks	L3	CO3
	b)	Sewage flow = 100 lpcd, BOD = 250 mg/L, population = 60,000. Find total BOD load (kg/day). If river flow = 10 cumec, DO = 8 mg/L, find initial DO deficit if k = 0.1/day.	8 Marks	L4	CO3

(OR)

7.	a)	Explain hydraulic design of sewers using Manning's formula.	8 Marks	L3	CO3
	b)	Design a circular sewer for Q = 0.5 m^3/s, n = 0.013, slope = 1 in 500. Check velocity and self-cleansing.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain working of trickling filter with sketch.	8 Marks	L3	CO4
	b)	Design a trickling filter for BOD load = 1200 kg/day. Recirculation ratio = 1.5, depth = 2 m, efficiency = 85%. Find volume and diameter.	8 Marks	L2	CO4

(OR)

9.	a)	Explain activated sludge process with flow diagram.	8 Marks	L2	CO4
	b)	ASP: Influent BOD = 200 mg/L, volume = 5000 m^3, MLSS = 3000 mg/L, F/M = 0.3. Find food and sludge production (kg/day).	8 Marks	L2	CO4

MODULE-V

10.		Explain anaerobic sludge digestion process.	16 Marks	L4	CO5

(OR)

11.		Design a septic tank for 50 users. Per capita sewage = 100 lpcd, detention = 24 hr, L:B = 3:1, depth = 1.5 m. Find dimensions and sludge accumulation (70 L/person/year)	16 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) Supplementary Examinations, March – 2026

DATABASE MANAGEMENT SYSTEMS

[Computer Science and Engineering, Information Technology, Computer Science and Engineering (Artificial Intelligence and Machine Learning), Computer Science and Engineering (Data Science), Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define a data model.	2 Marks	L1	CO1
	b)	List the steps in designing a database?	2 Marks	L1	CO1
	c)	Recall database schema	2 Marks	L1	CO2
	d)	Define a tuple variable in tuple relational calculus	2 Marks	L1	CO2
	e)	Write the basic form of SQL query.	2 Marks	L1	CO3
	f)	Discuss nested query and write one example for it.	2 Marks	L1	CO3
	g)	What are functional dependencies (FDs) in the context of database design?	2 Marks	L1	CO4
	h)	Define a database transaction in the context of database management.	2 Marks	L1	CO4
	i)	Define the term "lock" in the context of concurrency control.	2 Marks	L1	CO5
	j)	Discuss Indexed sequential Access Method.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain main functional components of the DBMS	8 Marks	L3	CO1
	b)	What are the different types of database archtectures? Explain	8 Marks	L2	CO1
		(OR)			
3.	a)	Explain the difference between a weak and a strong entity set.	8 Marks	L2	CO1
	b)	Discuss Database Management Systems architecture.	8 Marks	L2	CO1

MODULE-II

4.	a)	Provide the suitable example for the Relational Calculus.	8 Marks	L2	CO2
	b)	What are the basic relational algebra operators, and how are they combined to write complex queries?	8 Marks	L3	CO2
		(OR)			
5.	a)	Discuss Relational Algebra operators with an example.	8 Marks	L2	CO2
	b)	What is relational calculus, and why is it important?	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the brief introduction of triggers.	8 Marks	L2	CO3
	b)	Discuss the concept and the purpose of the active databases.	8 Marks	L2	CO3
		(OR)			
7.	a)	Illustrate control structures in PL/SQL.	8 Marks	L2	CO3
	b)	Write a PL/SQL function to test whether a given number is prime or not.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Draw the state diagram of a transaction and explain the states.	8 Marks	L2	CO4
	b)	Illustrate the procedure for achieving the transaction atomivity and durability.	8 Marks	L2	CO4

(OR)

9.	a)	Define precedence graph, illustrate serializability order and topological sorting.	8 Marks	L3	CO4
	b)	Differentiate between BCNF and 3 NF.	8 Marks	L2	CO4

MODULE-V

10.		What are lock Based Protocols?Discuss various types of lock-based protocols with relevant examples.	16 Marks	L2	CO5

(OR)

11.	a)	Write a detailed note on indexing with relevant examples.	8 Marks	L2	CO5
	b)	State the difference between static hashing and dynamic hashing.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) Supplementary Examinations, March – 2026

SIGNALS AND SYSTEMS

[Electronics and Communication Engineering,
Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Discrete system.	2 Marks	L1	CO1
	b)	Define a system.	2 Marks	L1	CO1
	c)	What are the Dirichlet conditions?	2 Marks	L1	CO2
	d)	Find the Fourier transform of step function.	2 Marks	L1	CO2
	e)	What is the relationship between Autocorrelation function and Power Spectral Density?	2 Marks	L1	CO3
	f)	State Parseval's power theorem.	2 Marks	L1	CO3
	g)	Differentiate over sampling and under sampling.	2 Marks	L1	CO4
	h)	Define Nyquist rate.	2 Marks	L1	CO4
	i)	Find the Laplace Transform of unit impulse function.	2 Marks	L2	CO5
	j)	Define the Region Of Convergence of Z-transform?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

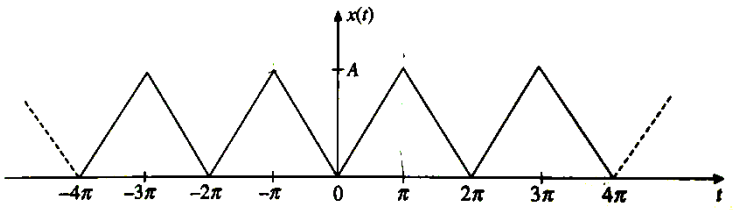
2.	a)	Evaluate convolution of the following signals $x1(t) = e^{-3t}\,u(t)$ and $x2(t) = t\,u(t)$..	8 Marks	L3	CO1
	b)	Check whether the following system is causal or non-causal and time variant or invariant. $y(t) = t\,x(t)$.	8 Marks	L2	CO1

(OR)

3.	a)	Determine the response of a continuous LTI system for the following signals $x(t) = e^{-2t}u(t)$ and $x(t) = e^{-4t}u(t)$	8 Marks	L3	CO1
	b)	Classify signals based on periodicity, stability and symmetry with examples.	8 Marks	L1	CO1

MODULE-II

4.		Find the trigonometric Fourier series expansion for the waveform shown below.	16 Marks	L3	CO2



(OR)

5.	a)	Sketch the magnitude and phase spectrum of Fourier transform of double sided exponential signal	10 Marks	L4	CO2
	b)	State and prove any two properties of Fourier transform.	6 Marks	L2	CO2

MODULE-III

6	a)	List the properties of Auto-correlation.	8 Marks	L4	CO3
	b)	Find ESD of the output, y(t) of a filter that has an input x(t) = u(t) and the impulse response h(t) = e^{at}	8 Marks	L4	CO3

(OR)

7.	a)	State the properties of auto correlation function.	8 Marks	L2	CO3
	b)	Discuss the Extraction of signal from noise by filtering.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Define sampling theorem for time limited signal and find the Nyquist rate for the following signals. i) $\sin c20t$ ii) $4\sin c2100t$	8 Marks	L4	CO4
	b)	Explain the following sampling techniques i) Natural sampling ii) Flat top sampling.	8 Marks	L2	CO4

(OR)

9.		Explain any two Sampling techniques with the block diagram and mathematical equations. Mention the advantages and disadvantages of each technique.	16 Marks	L3	CO4

MODULE-V

10.	a)	Find the signal x(t) whose bilateral Laplace transform is $X(s) = \frac{1}{(s+1)(s+5)}$ for the ROC: $-5 < \mathrm{Re}(s) < 1$	8 Marks	L3	CO5
	b)	Determine the Laplace transform and sketch the pole-zero plot of the signal $x(t) = e^{-2t}\cos(2t)$	8 Marks	L3	CO5

(OR)

11.	a)	Find the Z-transform & sketch ROC of the sequence $x(n) = \left(\frac{1}{3}\right)^n u(n) + \left(\frac{1}{2}\right)^n u(-n-1)$	8 Marks	L3	CO5
	b)	Find the inverse Z-transform of $X(Z) = \frac{z(z^2 - 4z + 5)}{(z-3)(z-1)(z-2)}$ for ROC $\lvert Z \rvert > 3$	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) Supplementary Examinations, March – 2026

DIGITAL DESIGN

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Subtract $(111001)_2$ from $(101011)_2$ using 1's complement.	2 Marks	L2	CO1
	b)	Convert the following to binary and then to gray code $(AB33)_{16}$.	2 Marks	L2	CO1
	c)	Define K-Map method and specify its role in representing in Boolean functions.	2 Marks	L1	CO1
	d)	Reduce the expression using K-Map $F(x,y,z,w)=x(y+z')(x+y')(y+z+w')$	2 Marks	L2	CO1
	e)	Draw the circuit diagram of 4×2 encoder.	2 Marks	L1	CO2
	f)	Design half adder circuit by applying suitable logic gates.	2 Marks	L3	CO2
	g)	Define the following: (i) Characteristic table (ii) Excitation table (iii) State table (iv) Truth table.	2 Marks	L1	CO3
	h)	Analyze the operation of SR flip-flop.	2 Marks	L2	CO3
	i)	Distinguish between combinational & sequential circuits.	2 Marks	L2	CO4
	j)	List the various types of RAM's and define each type of RAM.	2 Marks	L2	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Convert the following to Decimal and then to Octal i) $(1234)_{16}$ ii) $(12EF)_{16}$ iii) $(10110011)_2$	8 Marks	L2	CO1
	b)	Convert the following numbers to gray code. i) $(1111)_{16}$ ii) $(BC54)_{16}$ iii) $(237)_8$	8 Marks	L2	CO1

(OR)

3.	a)	Simplify the following Boolean expressions to minimum no. of literals. i) $ABC+A'B+ABC'$ ii) $(BC'+A'D)(AB'+CD')$	8 Marks	L3	CO1
	b)	Obtain the dual of the following Boolean Expressions i) $AB'C+AB'D+AB'$ ii) $A'B'C'+ABC'+A'B'C'D$	8 Marks	L2	CO1

MODULE-II

4.		Simplify the following Boolean expressions using K-map $F(W,X,Y,Z)=XZ+W'XY'+WXY+W'YZ+WY'Z$ Implement the same using NAND gates.	16 Marks	L3	CO1

(OR)

5.	a)	Reduce the expression $f(x,y,z,w)= \prod M(0,2,7,8,9,10,11,15).d\ (3,4)$ using K-Map.	10 Marks	L3	CO1
	b)	Implement the following Boolean equation using only NAND gates $Y=AB+CDE+F$.	6 Marks	L1	CO1

MODULE-III

6.	a)	Implement a 2-bit Magnitude comparator and write down its design procedure.	8 Marks	L2	CO2
	b)	Implement full adder using logic gates.	8 Marks	L5	CO2
		(OR)			
7.	a)	Implement the following Boolean function using 8:1 multiplexer. F(A,B,C,D)=A′BD′+ACD+B′CD+A′C′D	8 Marks	L3	CO2
	b)	Design 32:1 Mux using two 16:1 Muxs and one 2:1 Mux	8 Marks	L3	CO2

MODULE-IV

8.	a)	Explain the operation of JK flip flop with necessary functional table.	8 Marks	L2	CO3
	b)	Differentiate a Latch and a Flip flop.	8 Marks	L2	CO3
		(OR)			
9.	a)	Explain the working of the following i) S- R flip-flop ii) D flip-flop	8 Marks	L3	CO3
	b)	Design Johnson counter and discuss its operation.	8 Marks	L4	CO3

MODULE-V

10.	a)	Design PAL for a combinational circuit that squares a 3 bit number.	8 Marks	L2	CO4
	b)	Implement the following functions using PLA. A(x,y,z)=∑m(1,2,4,6) B(x.y.z)=∑(0,1,6,7) C(x,y,z)=∑(2,6)	8 Marks	L2	CO4
		(OR)			
11.	a)	Implement the following Boolean functions using PAL. w(A,B,C,D)=∑m(0,2,4,8,10,12,13) x(A,B,C,D)=∑m(0,1,6,7,8,9,11,13,14) y(A,B,C,D)=∑m(2,3,7,9,10,12,14)	8 Marks	L5	CO4
	b)	Differentiate among ROM, PROM, DROM, EPROM, EEPROM, RAM.	8 Marks	L1	CO4

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) Supplementary Examinations, March – 2026

ANALOG ELECTRONICS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Compare small signal amplifier with power amplifier (any four)	2 Marks	L1	CO1
	b)	Define : i) Amplification ii) Bandwidth	2 Marks	L2	CO1
	c)	A feedback amplifier has an open loop gain of 600 and feedback factor $\beta = 0.01$. Find the closed loop gain with Negative feedback.	2 Marks	L4	CO2
	d)	Explain different types of feedbacks used in amplifier circuits.	2 Marks	L3	CO2
	e)	What are the advantages of introducing negative feedback?	2 Marks	L2	CO2
	f)	Write down the advantages, disadvantages and applications of colpitt's oscillator.	2 Marks	L3	CO2
	g)	What is the drawback of class B amplifier? How it is minimized?	2 Marks	L2	CO3
	h)	What is a heat sink? Give its advantages.	2 Marks	L3	CO3
	i)	Define a filter?	2 Marks	L2	CO4
	j)	What are the characteristics of filters?	2 Marks	L3	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	With the help of circuit diagram explain direct and transformer coupling schemes used in multi stage amplifiers.	8 Marks	L2	CO1
	b)	Apply cascoding concept to get large voltage gain.	8 Marks	L2	CO1

(OR)

3.	a)	Analyze a two stage RC coupled amplifier with h-parameter model.	8 Marks	L1	CO1
	b)	List types of amplifiers and explain the distortion in transistor amplifiers.	8 Marks	L2	CO1

MODULE-II

4.	a)	Apply voltage series feedback to the Emitter follower to increase input impedance and to decrease output impedance.	8 Marks	L2	CO2
	b)	Select a two Stage CE amplifier circuit and explain current-shunt feedback concept.	8 Marks	L1	CO2

(OR)

5.	a)	Calculate the gain, input impedance and output impedance of	8 Marks	L3	CO2

		voltage series feedback amplifier having gain A = -300, R**in** = 1.5 k-ohms and R**out** = 50 k-ohms, **β**= 0.05.			
	b)	Select a Trans-conductance amplifier and prove its input and output impedances are very large compared to CE amplifier.	8 Marks	L2	CO2
		MODULE-III			
6.	a)	Compare Hartley and Colpitt's oscillator**.**	8 Marks	L1	CO2
	b)	Give the two Barkhausen conditions required in order for sinusoidal oscillations to be sustained**.**	8 Marks	L1	CO2
		(OR)			
7.	a)	Derive the generalized form of an LC oscillator.	8 Marks	L3	CO2
	b)	Select a RC phase shift Oscillator using FET to get low frequency sine wave and derive the expression for the frequency of oscillations.	8 Marks	L2	CO2
		MODULE-IV			
8.	a)	What is cross over distortion? How can it be eliminated in case of a transformer coupled class- B push pull power amplifier? Explain with a neat circuit diagram.	8 Marks	L1	CO3
	b)	A push pull amplifier utilizes a transformer whose primary has a total of 160 turns and whose secondary has 40 turns. It must be capable of delivering 40W to an 8 Ω load under maximum power conditions	8 Marks	L3	CO3
		(OR)			
9.	a)	Design a class B power amplifier to obtain the maximum conversion efficiency is 78.5%.	8 Marks	L1	CO3
	b)	A class - B push pull power amplifier drives a load of 16Ω connected to the secondary of an ideal transformer. If the number of turns on the primary is 200 and that on the secondary is 50, calculate the maximum power output, dc power input, efficiency and maximum power dissipated per transistor if the supply voltage is 25Volts.	8 Marks	L4	CO3
		MODULE-V			
10.	a)	Write notes on all pass filter. Draw the suitable circuit diagram and discuss about phase shift between input and output voltages.	8 Marks	L1	CO4
	b)	Design a first-order Butterworth low-pass active filter having upper cutoff frequency of 1.5 KHz	8 Marks	L3	CO4
		(OR)			
11.	a)	Design a second order high pass filter with low cut off frequency 2KHz and pass band gain 3.	8 Marks	L2	CO4
	b)	Why active filters are preferred compared to passive filters?	8 Marks	L1	CO4

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. I Semester (MBU-22) Supplementary Examinations, May – 2026

TELUGU

[Forensic Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	శకుంతల తల్లి పేరు ఏమి?	2 Marks	L1	CO1
	b)	భారతంలో ఆది, సభాపర్వాలను రచించనది ఎవరు?	2 Marks	L1	CO1
	c)	పోతన ఎవరి ప్రేరణతో భాగవతం రచించాడు?	2 Marks	L3	CO2
	d)	రాక్షస గురువు ఎవరు?	2 Marks	L1	CO2
	e)	ముత్యాల సరాలు రచించిన కవి ఎవరు?	2 Marks	L3	CO2
	f)	పూర్ణమ్మను ఎవరికిచ్చి పెళ్లి జరిపించారు?	2 Marks	L1	CO2
	g)	మురికి కాలువ ప్రక్కన కవికి ఏమి కనపడినది?	2 Marks	L2	CO1
	h)	ఈ రాత్రికి నేను పాడలేను అని పలికినది ఎవరు?	2 Marks	L3	CO1
	i)	యనాదేశ సంధికి ఒక ఉదాహరణ?	2 Marks	L3	CO1
	j)	మధ్యాహ్నము విగ్రహ వాక్యం వ్రాయండి?	2 Marks	L3	CO1

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	శకుంతలోపాఖ్యానం పాఠ్యబాగ సారాంశాన్ని వివరించండి?	8 Marks	L2	CO1
	b)	పుత్రుని యొక్క గొప్పతనం గురించి నన్నయ ఎలా వివరించాడు?	8 Marks	L3	CO1
		(OR)			
3.	a)	"నావిని నారదుండు నరనాథున కిట్లను నీ కుమారుడా" గణ విభజన చేసి ఏ పద్య పాదమో తెలిపి లక్షణాలను వివరించండి??	8 Marks	L1	CO1
	b)	ఉపమా, ఉత్ప్రేక్ష అలంకారాలను వివరించండి?	8 Marks	L4	CO1

MODULE-II

4.	a)	వామనావతారం పాఠ్యబాగ సారాంశాన్ని వివరించండి?	8 Marks	L4	CO2
	b)	గురజాడ రచించిన పాఠ్యభాగ సందేశం ఏమిటి?	8 Marks	L2	CO2
		(OR)			
5.	a)	బలి చక్రవర్తి వామనుని గురించి సభలో ఏమని పలికాడు?	8 Marks	L2	CO2
	b)	పూర్ణమ్మ సమాజానికి ఏమని సందేశమిచ్చింది?	8 Marks	L2	CO2

MODULE-III

6.	a)	అమ్మను, అయ్యను కానండీ! నాపేరొకసారి తలవండి! సందర్భాలను వివరించండి?	10 Marks	L3	CO3
	b)	ఆర్తగీతం పాఠ్యభాగ సారాంశాన్ని వివరించండి?	6 Marks	L2	CO3
		(OR)			
7.	a)	ఇది ఏ నాగరికతకు ఫలశ్రుతి? ఏ బుద్ధ దేవుని జన్మభూమికి గర్వ స్మృతి? సందర్భాలను వివరించండి?	10 Marks	L3	CO3
	b)	ముదుసలి మొగుడికి ముడివేసిరి! పసుపు రాసిరి బంగరు మేనికి! సందర్భాలను వివరించండి?	6 Marks	L2	CO3

MODULE-IV

8.	a)	నా యెద మోడైన దుస్థితి, సిగ్గుతో రెండుగా చీలిన వెదురు బొంగును సందర్భాలను వివరించండి?	8 Marks	L2	CO4
	b)	సిగ్గులేని ముఖాన్ని చూపించలేను! ఈ కలలు కాగితపు పేలికలై రాలినవి! సందర్భాలను వివరించండి?	8 Marks	L2	CO4
		(OR)			
9.	a)	"వలవదు బుద్ధిమంతులు నవప్రియు లైనధరాధినాథులన్" గణ విభజన చేసి ఏ పద్య పాదమో తెలిపి లక్షణాలను వివరించండి?	8 Marks	L2	CO4
	b)	మత్తేభం పద్య లక్షణాలను వివరించండి?	8 Marks	L2	CO4

MODULE-V

10.	a)	తలపగ నాడు వల్కినవి ధం, బెడ దప్పగ వీడెనొక్కొ చూడ్కులు విరసంబు లై కరము క్రూరము లైననిమిత్త మేమియో కలయగ బల్కరించి రుప కారులు నై రని నమ్మి యుండగా వలవదు బుద్ధిమంతులు నవప్రియు లైనధరాధినాథులన్	8 Marks	L3	CO5
	b)	విమలయశోనిధీ పురుష వృత్త మెఱుంగుచు నుండు జూవె వే దములును బంచభూతములు ధర్మువు సంధ్యలు నంతరాత్మయున్ యముడును జంద్రసూర్యులు నహంబును రాత్రియు నన్మహాపదా ర్థము లివి యుండగా నరుడు దక్కొన నేర్చునె తన్ను మ్రుచ్చిలన్	8 Marks	L3	CO5
		(OR)			
11.	a)	కులము రాజ్యము తేజము నిలుపు మీ కుబ్జుండు విశ్వంభరుం డలతిం బోడు త్రివిక్రమన్ఫురణవాడై నిండు బ్రహ్మాండము గలడే మాన్ప నొకండు నా పలుకు లాకరింపు కర్ణంబుల వలదీ దానము గీనము బనుపుమా వర్ణి వదాన్యోత్తమా!	8 Marks	L3	CO5
	b)	నిరయం బైన నిబంధమైన ధరణీ నిర్మూలనం బైన దుర్మరణం బైన గులాంతమైన నిజము రానిమ్ము కానిమ్ము పో హరుడైన హరియైన నీరజభవుం డభ్యాగతుం డైన నౌ దిరుగ న్నేరదు నాదు జిహ్వ వినుమా ధీవర్య! వేయేటికిన్.	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. I Semester (MBU-22) Supplementary Examinations, May – 2026

GENERAL ENGLISH

[Forensic Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What brings the neighbours together in the lesson "A Snake in the Grass"?	2 Marks	L1	CO1
	b)	What does the snake represent symbolically in the story, "A Snake in the Grass"?	2 Marks	L1	CO1
	c)	What was the conductor's reaction to the rude passenger in "On Saying Please"?	2 Marks	L1	CO1
	d)	State any two features of a formal letter.	2 Marks	L1	CO2
	e)	What natural images does Neruda use in *If You Forget Me*?	2 Marks	L1	CO1
	f)	How does the poet convey both affection and warning in the poem?	2 Marks	L1	CO1
	g)	Fill in the blank with the correct tense: He _____ (work) here since 2020.	2 Marks	L1	CO2
	h)	Choose the correct verb form: Neither of the boys_____ (are/is)interested in playing cricket.	2 Marks	L1	CO2
	i)	Complete the sentence with a suitable preposition: The children are fond _____ chocolates.	2 Marks	L1	CO2
	j)	Give the antonym of *authentic*.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss the use of irony and humour in R. K. Narayan's "*A Snake in the Grass*".	8 Marks	L2	CO1
	b)	Write a paragraph summarizing the story in your own words.	8 Marks	L2	CO1
		(OR)			
3.	a)	Evaluate the author's portrayal of Dasa's character.	8 Marks	L5	CO1
	b)	Compose a paragraph on *"Honesty as a Core Value."*	8 Marks	L1	CO4

MODULE-II

4.	a)	Analyze how A. G. Gardiner uses humour to discuss manners.	8 Marks	L4	CO1
	b)	Write a formal complaint letter to a courier service.	8 Marks	L1	CO4
		(OR)			
5.	a)	Evaluate the contemporary relevance of the lesson 'On Saying Please" in workplace ethics.	8 Marks	L5	CO1
	b)	Draft a formal letter applying for part-time employment.	8 Marks	L1	CO4

MODULE-III

6.	a)	Describe how imagery from nature and objects helps Neruda depict the intensity of love in *If You Forget Me.*	8 Marks	L2	CO1
	b)	Write a descriptive paragraph on a technical product.(e.g. Microscope)	8 Marks	L2	CO4

(OR)

7.	a)	How symbolism transforms personal emotion into universal experience in Neruda's poem.	8 Marks	L2	CO1
	b)	Draft a short process description explaining the installation of a software application.	8 Marks	L1	CO4

MODULE-IV

8.	a)	Discuss how Bhoopal creates suspense in the lesson "After the Sunset".	8 Marks	L2	CO1
	b)	Complete the following sentences using the correct forms of verbs/tenses. i) The report _____ (submit) by evening. ii) She _____ (work) here since 2018. iii) Neither of them _____ (correct). iv) By next month, we _____ (complete) our project.	8 Marks	L1	CO2

(OR)

9.	a)	Evaluate the ending of the lesson "After the Sunset" for its emotional impact.	8 Marks	L4	CO1
	b)	Fill in the blanks with appropriate prepositions: i) He is addicted _____ coffee. ii) They met _____ the airport. iii) She was angry _____ her friend. iv) Don't laugh _____ poor people.	8 Marks	L1	CO2

MODULE-V

10.	a)	Analyze Bertrand Russell's persuasive techniques in "Man's Peril".	8 Marks	L4	CO1
	b)	Give the meanings of the following idioms or use each in a sentence: i) in a nutshell ii) spill the beans iii) on thin ice iv) at the drop of a hat	8 Marks	L1	CO4

(OR)

11.	a)	Evaluate the relevance of thelesson "Man's Peril" in today's world.	8 Marks	L4	CO1
	b)	Write synonyms for the following words: i) courage ii) beauty iii) rapid iv) difficult	8 Marks	L1	CO4

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. I Semester (MBU-25) Supplementary Examinations, May – 2026

INTRODUCTION TO CLASSICAL BIOLOGY

[Biotechnology, Bioinformatics]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	How prokaryotic cells differ from eukaryotic cells in terms of their genetic material?	2 Marks	L1	CO1
	b)	List two organelles that are unique to plant cells.	2 Marks	L1	CO1
	c)	Recall classification of plant kingdom.	2 Marks	L1	CO2
	d)	What is differentiation, dedifferentiation and redifferentiation?	2 Marks	L1	CO2
	e)	What is the function of a promoter in gene regulation?	2 Marks	L1	CO3
	f)	Name two enzymes that are essential for recombinant DNA technology.	2 Marks	L1	CO3
	g)	How is a nerve impulse transmitted across a neuromuscular junction?	2 Marks	L1	CO4
	h)	What is the role of neurotransmitters in synaptic transmission?	2 Marks	L1	CO4
	i)	How does Photo system II (PS II) contribute to the splitting of water molecules?	2 Marks	L1	CO5
	j)	What is the difference between cyclic and non cyclic photo phosphorylation?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	What are membrane proteins and transport proteins? Explain lipid bilayer of plasma membrane.	10Marks	L2	CO1
	b)	Describe Golgi complex and nucleolus.	6 Marks	L2	CO1
		(OR)			
3.	a)	Describe chromatin and microtubules.	8 Marks	L2	CO1
	b)	Explain centrioles and channel proteins.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain morphology of Wucheriria bancrofti and Plasmodium.	8 Marks	L2	CO2
	b)	Elaborate life cycle of Taenia solium.	8 Marks	L2	CO2
		(OR)			
5.	a)	Outline how an animal kingdom is classified into phyla and give examples for each phyla.	8 Marks	L2	CO2
	b)	Elaborate life cycle of Fasciotopsis buski.	8 Marks	L2	CO2

MODULE-III

6.	a)	Outline the process of transcription in eukaryotes. Include the roles of RNA polymerase, transcription factors, and the promoter region in your explanation.	6 Marks	L2	CO3
	b)	Describe in detail the Hershey-Chase experiment. How did this experiment confirm that DNA, and not protein, is the genetic material in organisms?	10 Marks	L2	CO3

(OR)

7.	a)	Describe the mechanism of translation in protein synthesis. Include the role of mRNA, tRNA, ribosomes, and explain how the process occurs in three stages: initiation, elongation, and termination.	6 Marks	L2	CO3
	b)	Explain the double-helix model of DNA proposed by Watson and Crick. Discuss the significance of the base pairing rules, the role of hydrogen bonds, and the antiparallel nature of the strands.	10 Marks	L2	CO3

MODULE-IV

8.	a)	What is a synapse, and how is a nerve impulse transmitted across a chemical synapse? Explain the role of synaptic vesicles, neurotransmitters, and receptors.	6 Marks	L2	CO4
	b)	Describe the complete process of digestion and absorption of carbohydrates, proteins, and fats in the digestive system. Discuss the roles of the stomach, pancreas, liver, and small intestine in this process.	10 Marks	L2	CO4

(OR)

9.	a)	Describe the ABO blood group system and its importance in blood transfusion. What are the consequences of mismatched blood transfusions?	6 Marks	L2	CO4
	b)	Explain the mechanics of breathing (inspiration and expiration) in the human body. Include the roles of the diaphragm, intercostal muscles, and lung elasticity in your explanation.	10 Marks	L2	CO4

MODULE-V

10.	a)	Differentiate between cyclic and noncyclic photophosphorylation. Discuss how each process contributes to the production of ATP and NADPH in the light-dependent reactions.	6 Marks	L2	CO5
	b)	Explain the differences between oxygenic and anoxygenic photosynthesis in terms of their mechanisms, organisms involved, and environmental significance.	10 Marks	L2	CO5

(OR)

11.	a)	Explain the function of Photosystem II (PS II) in the process of photolysis of water. How does it contribute to oxygen production in photosynthesis?	6 Marks	L2	CO5
	b)	Discuss the structure and function of chlorophyll in photosynthesis. How does it absorb light, and what role do other pigments play in capturing solar energy?	10 Marks	L5	CO5

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Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. I Semester (MBU-25) Supplementary Examinations, May – 2026

GENERAL CHEMISTRY

[Biotechnology, Bioinformatics]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What are semi-conductors? Give an example.	2 Marks	L1	CO1
	b)	Write a note on electrical conductivity.	2 Marks	L1	CO1
	c)	What are ceramics?	2 Marks	L1	CO2
	d)	What are metals?	2 Marks	L1	CO2
	e)	State mobile phase.	2 Marks	L1	CO3
	f)	Define R^f.	2 Marks	L1	CO3
	g)	Explain VBT.	2 Marks	L1	CO4
	h)	What is atomic orbital?	2 Marks	L1	CO4
	i)	Define Tyndall effect.	2 Marks	L1	CO5
	j)	What is a colloid?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss briefly on conductors, semi-conductors and insulators with examples.	8 Marks	L2	CO1
	b)	Define intrinsic semiconductor. Compare p-type and n-type semi-conductors.	8 Marks	L2	CO1

(OR)

3.	a)	Explain free electron theory and its thermal and electrical properties.	8 Marks	L2	CO1
	b)	Describe the band formation in band theory.	8 Marks	L2	CO1

MODULE-II

4.	a)	Discuss intrinsic and extrinsic conducting polymers with examples.	8 Marks	L2	CO2
	b)	Discuss the classification of ceramics.	8 Marks	L2	CO2

(OR)

5.	a)	Explain Particle and fiber reinforced composites in detail.	8 Marks	L2	CO2
	b)	Discuss the advantages and applications of composites.	8 Marks	L2	CO2

MODULE-III

6.	a)	What is R_f? Explain factors effecting R_f value.	8 Marks	L2	CO3
	b)	Explain the procedure of paper chromatography with its applications.	8 Marks	L2	CO3
		(OR)			
7.	a)	Explain the classification of chromatography.	8 Marks	L2	CO3
	b)	Differentiate column chromatography with HPLC.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain SP, SP^2 and SP^3 hybridization.	8 Marks	L2	CO4
	b)	What is a chemical bond? Explain the types in it.	8 Marks	L2	CO4
		(OR)			
9.	a)	Explain the molecular orbital diagram of homo nuclear diatomic molecules N_2 and O2.	8 Marks	L2	CO4
	b)	Explain the molecular orbital diagram of hetero nuclear diatomic molecules CO and NO.	8 Marks	L2	CO4

MODULE-V

10.	a)	Write a note on gold number. Explain the gold sol preparation.	8 Marks	L2	CO5
	b)	Derive Langmuir adsorption isotherm.	8 Marks	L2	CO5
		(OR)			
11.	a)	What is adsorption? Explain the different types of adsorptions.	8 Marks	L2	CO5
	b)	What are emulsifiers? Give its significance.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. I Semester (MBU-25) Supplementary Examinations, May – 2026

BIOMOLECULES

[Biotechnology, Bioinformatics]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define Epimers among monosaccharides.	2 Marks	L1	CO1
	b)	Show the structures of Melizitose and Ribose.	2 Marks	L1	CO1
	c)	Recall glutathione and its significance.	2 Marks	L1	CO2
	d)	What is iso- electric precipitation of proteins?	2 Marks	L1	CO2
	e)	Recall the structure of Lecithin.	2 Marks	L1	CO3
	f)	Define Acid Value of fats.	2 Marks	L1	CO3
	g)	Classify Nitrogen bases of DNA.	2 Marks	L1	CO4
	h)	What is the importance of β-N glycosidic bond in nucleotides?	2 Marks	L1	CO4
	i)	Recall the biological importance of pyrrole.	2 Marks	L1	CO5
	j)	What are the types of Porphyrins?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the Classification of Oligosaccharides.	8 Marks	L2	CO1
	b)	Summarize the Structure and functions of Structural Polysaccharides.	8 Marks	L2	CO1

(OR)

3.	a)	Show structure and function of Heparin and Chondroitin sulphate.	8 Marks	L2	CO1
	b)	Summarize the oxidation of Monosaccharides.	8 Marks	L2	CO1

MODULE-II

4.	a)	Outline the titration curve of Glycine. How is pI value calculated?	9 Marks	L2	CO2
	b)	Describe the peptide bond formation between two amino acids.	7 Marks	L4	CO2

(OR)

5.	a)	Explain the primary structure of Proteins.	10 Marks	L2	CO2
	b)	Outline the structure and function of Myoglobin.	6 Marks	L2	CO2

MODULE-III

6.	a)	How are Lipids classified? Give examples for different classes.	8 Marks	L2	CO3
	b)	Explain different essential fatty acids and their significance.	8 Marks	L2	CO3

(OR)

7.	a)	Outline the structural difference of Lecithin and Cephalin.	10 Marks	L2	CO3
	b)	List out lipoproteins and explain their functions.	6 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss the Watson and Crick DNA structure.	8 Marks	L2	CO4
	b)	Compare among different RNA's.	8 Marks	L2	CO4

(OR)

9.	a)	How is Hyperchromic effect analysed during DNA melting?	10 Marks	L2	CO4
	b)	Differentiate the Nucleotides of DNA and RNA.	6 Marks	L2	CO4

MODULE-V

10.	a)	Discuss the structure and functions of Chlorophyll.	8 Marks	L2	CO5
	b)	Identify the steps in synthesis of Heme.	8 Marks	L3	CO5

(OR)

11.	a)	Analyze methods for the detection of Chlorophyll and other pigments.	8 Marks	L4	CO5
	b)	Illustrate the structure and function of Cytochromes.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. I Semester (MBU-25) Supplementary Examinations, May – 2026

INORGANIC AND PHYSICAL CHEMISTRY

[Biotechnology, Bioinformatics]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What are silicones?	2 Marks	L1	CO1
	b)	Give the similarities between halogen and pseudo halogens.	2 Marks	L1	CO1
	c)	What are f-block elements?	2 Marks	L1	CO2
	d)	State any two differences between lanthanides and actinides.	2 Marks	L1	CO2
	e)	What are abnormal colligative properties?	2 Marks	L1	CO3
	f)	Differentiate ideal and non-ideal solutions.	2 Marks	L1	CO3
	g)	Name two applications of liquid crystals.	2 Marks	L1	CO4
	h)	State Henry's law. What are the conditions under which it holds good?	2 Marks	L1	CO4
	i)	What is lattice point?	2 Marks	L1	CO5
	j)	Comment on unit cell.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss the structure of tetraborane and write the preparation methods.	8 Marks	L2	CO1
	b)	Write any two methods for the preparation of B_5H_9 and discuss its structure.	8 Marks	L2	CO1

(OR)

3.	a)	Describe Ionic, Covalent and Interstitial nitrides.	8 Marks	L2	CO1
	b)	Explain the reactivity of hydrolysis action of nitrides.	8 Marks	L2	CO1

MODULE-II

4.	a)	Discuss the catalytic properties and complex formation ability of d-block elements.	8 Marks	L2	CO2
	b)	Explain the stability of various oxidation states of d-block elements.	8 Marks	L2	CO2

(OR)

5.	a)	What are actinides? Evaluate the actinide contraction.	8 Marks	L2	CO2
	b)	Discuss the causes and consequences of lanthanide contraction.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the Cotrell's method of determination of elevation in boiling point.	8 Marks	L2	CO3
	b)	Derive a relationship between depression in freezing point and the molecular weight of a non-volatile solute.	8 Marks	L2	CO3

(OR)

7.	a)	Derive a relationship between molecular weight and elevation in boiling point.	8 Marks	L2	CO3
	b)	Explain the concept of experimental determination of Osmotic pressure.	8 Marks	L2	CO3

MODULE-IV

8.	a)	What are liquid crystals? Discuss their applications.	8 Marks	L2	CO4
	b)	Discuss the structural differences between solid, liquid and gaseous state.	8 Marks	L2	CO4

(OR)

9.	a)	Describe steam distillation method for the separation of immiscible liquids.	8 Marks	L2	CO4
	b)	Explain Nernst distribution law. Using the law ascertain the molecular association of benzoic acid when distributed between water and benzene.	8 Marks	L2	CO4

MODULE-V

10.	a)	State and explain the centre of symmetry with suitable examples.	8 Marks	L2	CO5
	b)	Derive Bragg's equation to determine the crystal structure.	8 Marks	L2	CO5

(OR)

11.	a)	Discuss the following: i) Lattice point ii)Space lattice and iii) Unit cell.	8 Marks	L2	CO5
	b)	Explain the classification of crystals by shape.	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. I Semester (MBU-25) Supplementary Examinations, May – 2026

PROGRAMMING FOR PROBLEM SOLVING

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define token. Name any two types of tokens.	2 Marks	L1	CO1
	b)	What is an operator? Give two examples.	2 Marks	L1	CO1
	c)	Write the syntax of the for loop.	2 Marks	L1	CO2
	d)	What is a nested loop?	2 Marks	L1	CO2
	e)	How are strings stored in memory?	2 Marks	L1	CO3
	f)	Write the syntax for declaring a 2D array.	2 Marks	L1	CO3
	g)	What is a void pointer?	2 Marks	L1	CO4
	h)	Define NULL pointer.	2 Marks	L1	CO4
	i)	What is a union?	2 Marks	L1	CO5
	j)	Define an array of structures.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Write a detailed note on Tokens in C.	8 Marks	L3	CO1
	b)	What are Operators in C? Explain different types of operators with examples.	8 Marks	L1	CO1

(OR)

3.	a)	Explain how data is stored in memory. Discuss variable declaration and initialization with examples.	8 Marks	L3	CO1
	b)	What is Type Conversion? Explain implicit and explicit conversions with examples.	8 Marks	L1	CO1

MODULE-II

4.	a)	Explain the working of for, while, and do-while loops with examples.	8 Marks	L3	CO2
	b)	Explain if, if-else, and nested if-else statements with examples.	8 Marks	L2	CO2

(OR)

5.	a)	Explain why flowcharts are useful. Draw a flowchart to find the factorial of a number.	8 Marks	L1	CO2
	b)	What is an algorithm? Write any five characteristics of a good algorithm.	8 Marks	L5	CO2

MODULE-III

6.	a)	Describe two-dimensional arrays and explain how to store and access elements with suitable examples.	8 Marks	L3	CO3
	b)	Explain declaration, initialization, input and output of strings with examples.	8 Marks	L1	CO3

(OR)

7.	a)	Explain array of strings with declaration, initialization and manipulation.	8 Marks	L3	CO3
	b)	Explain the concept of Call by Value and passing arrays to functions with examples.	8 Marks	L1	CO3

MODULE-IV

8.	a)	How are arrays related to pointers? How to create arrays using pointers? Explain.	8 Marks	L3	CO4
	b)	How do you declare and initialize pointer variables in C? Illustrate with examples of pointers.	8 Marks	L1	CO4

(OR)

9.	a)	Explain pointer to an array and its usage with examples.	8 Marks	L3	CO4
	b)	Explain the concept of pointers with two-dimensional arrays with examples.	8 Marks	L3	CO4

MODULE-V

10.		Explain the different modes in which a file can be opened in c program? Explain about command line arguments with an example.	16 Marks	L4	CO5

(OR)

11.	a)	Explain arrays of structures and structure within a structure with suitable examples.	8 Marks	L1	CO5
	b)	Explain structures and pointers. Write a program using pointer to structure.	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. I Semester (MBU-25) Supplementary Examinations, May – 2026

GENERAL ENGLISH

[Biotechnology, Bioinformatics, Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is the main conflict in R.K. Narayan's *A Snake in the Grass*?	2 Marks	L1	CO1
	b)	Why do the neighbours blame Dasa in the story?	2 Marks	L2	CO1
	c)	What was the conductor's reaction to the rude passenger in On Saying Please?	2 Marks	L1	CO1
	d)	State any two features of a formal letter.	2 Marks	L1	CO2
	e)	What attitude toward death does Emily Dickinson express in her poem?	2 Marks	L1	CO1
	f)	What does the journey in the poem symbolize?	2 Marks	L2	CO1
	g)	Fill in the blank with the correct tense: She _____ (read) the novel before it was discussed in class.	2 Marks	L1	CO2
	h)	Choose the correct verb form: Every student and teacher _____(are / is) excited about the event.	2 Marks	L1	CO2
	i)	What are the parts of a formal email?	2 Marks	L1	CO4
	j)	Give the antonym of *victory*	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Analyze the theme of social pretence in *A Snake in the Grass.*	8 Marks	L4	CO1
	b)	Write a paragraph summarizing the story in your own words.	8 Marks	L1	CO1

(OR)

3.	a)	Discuss R.K. Narayan's use of humour to highlight human nature.	8 Marks	L2	CO1
	b)	Compose a paragraph on *"Honesty as a Core Value."*	8 Marks	L1	CO4

MODULE-II

4.	a)	Analyze Gardiner's essay as a reflection on urban courtesy.	8 Marks	L4	CO1
	b)	Write a formal complaint letter to a courier service.	8 Marks	L1	CO4

(OR)

5.	a)	Evaluate *On Saying Please* as a moral essay for youth.	8 Marks	L5	CO1
	b)	Draft a formal letter applying for part-time employment.	8 Marks	L1	CO4

MODULE-III

6.	a)	Analyze how the poem reflects acceptance of mortality in *Because I Could Not Stop for Death.*	8 Marks	L4	CO1
	b)	Write a descriptive paragraph on a technical product (e.g., smartphone).	8 Marks	L1	CO4

(OR)

7.	a)	Evaluate the theme of eternity in Because I Could Not Stop for Death.	8 Marks	L4	CO1
	b)	Draft a short process description explaining the installation of a software application.	8 Marks	L1	CO4

MODULE-IV

8.	a)	Analyze how Bhoopal creates suspense in After the Sunset.	8 Marks	L4	CO1
	b)	Complete the following sentences using the correct forms of verbs/tenses. i) By tomorrow, she _____ (finish) her assignment. ii) The mail _____ (send) yesterday. iii) If he _____ (study) harder, he will pass. iv) The guests _____ (arrive) at 6 p.m.	8 Marks	L1	CO2

(OR)

9.	a)	Evaluate the ending of *After the Sunset* for its moral lesson.	8 Marks	L5	CO1
	b)	Fill in the blanks with appropriate prepositions: i) He is addicted _____ coffee. ii) They met _____ the airport. iii) She was angry _____ her friend. iv) Don't laugh _____ poor people.	8 Marks	L1	CO2

MODULE-V

10.	a)	Analyze Bertrand Russell's persuasive techniques in Man's Peril.	8 Marks	L4	CO1
	b)	Give the meanings of the following idioms: i) in a nutshell ii) spill the beans iii) on thin ice iv) at the drop of a hat	8 Marks	L1	CO4

(OR)

11.	a)	Evaluate the relevance of Man's Peril in today's world.	8 Marks	L4	CO1
	b)	Use the following idioms in your own sentences i) once in a blue moon ii) keep an eye on iii) a blessing in disguise iv) the ball is in your court	8 Marks	L1	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. I Semester (MBU-25) Supplementary Examinations, May – 2026

INTRODUCTION TO DATA COMMUNICATION AND NETWORKS

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is the difference between broadcast and point-to-point networks?	2 Marks	L1	CO1
	b)	Define network topology.	2 Marks	L1	CO1
	c)	What is network hardware?	2 Marks	L1	CO2
	d)	Define network software.	2 Marks	L1	CO2
	e)	What is transmission media?	2 Marks	L1	CO3
	f)	Define guided and unguided transmission media.	2 Marks	L1	CO3
	g)	What are network connectivity devices?	2 Marks	L1	CO4
	h)	Define a hub.	2 Marks	L1	CO4
	i)	What is a Network Interface Card (NIC)?	2 Marks	L1	CO5
	j)	Mention any two functions of a NIC.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Compare broadcast and point-to-point networks with examples.	8 Marks	L3	CO1
	b)	Explain any four types of network topologies with diagrams and advantages.	8 Marks	L1	CO1

(OR)

3.	a)	What are network standards? Explain their purpose and importance.	8 Marks	L3	CO1
	b)	Explain the term Protocols. Why are protocols necessary in communication?	8 Marks	L1	CO1

MODULE-II

4.	a)	Explain the Physical Layer in detail with its functions and role in data transmission.	8 Marks	L3	CO2
	b)	Discuss guided transmission media and explain different types (Twisted Pair, Coaxial, Fiber Optic).	8 Marks	L2	CO2

(OR)

5.	a)	Describe the TCP/IP Reference Model and explain the role of each layer.	8 Marks	L1	CO2
	b)	Explain Connection-Oriented and Connectionless services with suitable examples.	8 Marks	L5	CO2

MODULE-III

6.	a)	Explain twisted pair cable, comparing UTP and STP, their connectors, and applications.	8 Marks	L3	CO3
	b)	Describe fiber optic cable with physical structure, propagation modes, fiber sizes, connectors, and applications.	8 Marks	L1	CO3

(OR)

7.	a)	Describe the MAC sub-layer, frame format, and frame types in Wireless LAN.	8 Marks	L3	CO3
	b)	Explain Wireless LANs (IEEE 802.11) along with its architecture.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Describe repeaters in detail. Explain their working, advantages, and limitations.	8 Marks	L3	CO4
	b)	Explain bridges with their working principle and advantages in network communication.	8 Marks	L1	CO4

(OR)

9.	a)	Explain the working and role of a firewall in securing networks.	8 Marks	L3	CO4
	b)	Write a detailed note on network security devices.	8 Marks	L3	CO4

MODULE-V

10.		Describe the Network Interface Card (NIC) in detail. Explain its components, functions, and types with neat diagrams wherever necessary.	16 Marks	L4	CO5

(OR)

11.	a)	Describe the Internet Addressing System: IP Address, DNS, and URL.	8 Marks	L1	CO5
	b)	Describe the working of a Search Engine with examples.	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. I Semester (MBU-25) Supplementary Examinations, May – 2026

SINGLE VARIABLE CALCULUS

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define Sequence and give an example.	2 Marks	L1	CO1
	b)	Write the sequence whose nth term is(12+5n/11n +12)	2 Marks	L1	CO1
	c)	State p- series test.	2 Marks	L2	CO2
	d)	State limit comparison test.	2 Marks	L2	CO2
	e)	State Sandwich Theorem statement.	2 Marks	L2	CO3
	f)	Write any two Limits of standard functions..	2 Marks	L1	CO3
	g)	State Rolle's Theorem.	2 Marks	L2	CO4
	h)	State Lagrange's Mean value Theorem.	2 Marks	L2	CO4
	i)	Define Upper and Lower Riemann Integrals.	2 Marks	L1	CO5
	j)	Define the Riemann integral	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Prove that the below Sequence is increasing and bounded above S_n= [(3n-1)/(n+2)]	8 Marks	L2	CO1
	b)	Prove that the sequence $\{S_n\}$ where S_n= 1/1.2 +1/2.3 +1/3.4 +… 1/n(n+1) is convergent.	8 Marks	L2	CO1

(OR)

3.	a)	Using Sandwich Theorem prove that Lt $n \to \infty \sqrt{n^2} + n - n = \frac{1}{2}$.	8 Marks	L2	CO1
	b)	Prove the sequence S_n = 1 + ½ +1/3 +….+1/n is not convergent.	8 Marks	L2	CO1

MODULE-II

4.		State and prove Cauchy's root test.	16 Marks	L2	CO2

(OR)

5.	a)	Show that the series 1 +2 +3 +4 +….is divergent.	8 Marks	L1	CO2
	b)	Show that an infinite series 1 + ½ + $½^2$ + $½^3$ +….is convergent.	8 Marks	L1	CO2

MODULE-III

6.	a)	Prove that $\lim_{x\to\infty}\left(x+\frac{1}{x}\right)^{x} = e$	8 Marks	L2	CO3
	b)	If $f(x) = \frac{e^{\frac{1}{x}}}{1+e^{\frac{1}{x}}}$, find whether $\lim_{x\to\infty} f(x)$ exists or not.	8 Marks	L1	CO3

(OR)

7.		Show that f: R $\rightarrow$ R defined by f(x) =x if x $\in$ R-Q and f(x) = -x if x$\in$ Q is continuous only at '0'.	16 Marks	L1	CO3

MODULE-IV

8.	a)	Discuss the derivability of f(x) = |x| +|x-1| in R.	8 Marks	L2	CO4
	b)	Evaluate $\lim_{x\to 0}\frac{\cosh x - \cos x}{x\,\mathrm{Sin}x}$.	8 Marks	L5	CO4

(OR)

9.	a)	Show that x sin (1/x) , x≠0;f(x) = 0, x = 0 is continuous but not derivable at x = 0.	8 Marks	L2	CO4
	b)	Discuss the applicability of Lagrange's mean value theorem for f(x) = x (x-1) (x-2) on [0 , ½]	8 Marks	L2	CO4

MODULE-V

10.		Show that f(x)= 3x+1 is integrable on [1,2] and $\int_1^2 (3x+1)\,dx = \frac{11}{2}$.	16 Marks	L2	CO5

(OR)

11.	a)	A constant function is Riemann integrable on [a, b].Prove it.	8 Marks	L1	CO5
	b)	If f:[a , b]→ R is a bounded function then show that $\underline{\int_a^b} f(x)\,dx = \overline{\int_a^b} f(x)\,dx$	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. I Semester (MBU-25) Supplementary Examinations, May – 2026

DISCRETE MATHEMATICS FOR COMPUTER SCIENCE

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	State the Associative laws.	2 Marks	L2	CO1
	b)	Write the negation of the statement, "If the processor is fast then the printer is slow."	2 Marks	L1	CO1
	c)	What is the Cartesian product of two sets?	2 Marks	L1	CO2
	d)	Describe the concept of a disjoint set.	2 Marks	L1	CO2
	e)	What are the conditions for a relation to be an equivalence relation?	2 Marks	L1	CO3
	f)	What is a partition of a set?	2 Marks	L1	CO3
	g)	How many distinct arrangements can be made from the letters in the word BANANA?	2 Marks	L2	CO4
	h)	If 100 people are seated in 15 rooms, prove that at least one room has at least seven people.	2 Marks	L2	CO4
	i)	Explain the Handshaking Theorem.	2 Marks	L1	CO4
	j)	What is the difference between finite and infinite graphs?	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.		Discuss the types of connectives with truth table for suitable example.	16 Marks	L3	CO1
		(OR)			
3.	a)	Write the following proposition in symbolic form, and find its negation: "If all triangles are right angled, then no triangle is equiangular"	8 Marks	L2	CO1
	b)	Write conditional proposition and logical equivalence with suitable examples.	8 Marks	L3	CO1

MODULE-II

4.	a)	If A = {x : x is an even natural number}, B = {x : x is a natural number and multiple of 5} and C = {x : x is a natural number and multiple of 10}, then what is the value of (A U(B∩C))	8 Marks	L3	CO2
	b)	State and Prove De Morgan's laws in set theory using Venn diagram.	8 Marks	L2	CO2
		(OR)			
5.		By principle of mathematical induction show that sum of $a, a+d, a+2d, \ldots a+(n-1)d$ is $\frac{n}{2}[2a+(n-1)d]$.	16 Marks	L3	CO2

MODULE-III

6.	a)	Let X = {1,2,3,4,…} and R = {(x,y) : xy > 0 }be a relation defined on X. Show that R is an equivalence relation.	8 Marks	L3	CO3
	b)	Let $X = \{1,2,3,4,5\}$ and relation $R = \{(x,y)/x > y\}$.Find relation matrix.	8 Marks	L3	CO3

(OR)

7.	Show that the function $f : N \to Z$ given by $$f(n) = \begin{cases} n/2, & \text{if } n \text{ is even} \\ (1-n)/2, & \text{if } n \text{ is odd} \end{cases}$$ is a one-one and onto function.	16 Marks	L2	CO3

MODULE-IV

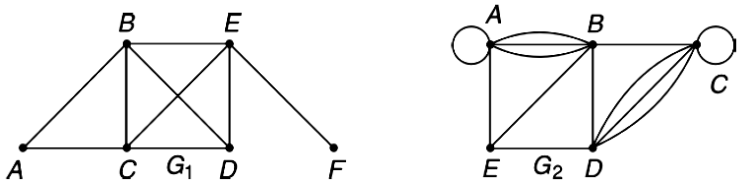
8.	How many 6-element RNA sequences i) do not contain U? ii) end with GU? iii) start with C? iv) contain only A or U?	16 Marks	L2	CO4

(OR)

9.	a)	Prove that at a party where there are at least two people, there are two people who know the same number of other people there.	8 Marks	L3	CO4
	b)	For any sets A, B, $\|A \cup B\| = \|A\| + \|B\| - \|A \cap B\|$.	8 Marks	L2	CO4

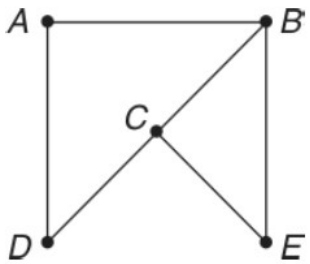
MODULE-V

10.	Find the number of vertices, the number of edges and the degree of each vertex in the following undirected graphs. Verify also the handshaking theorem in each case.	16 Marks	L3	CO4



(OR)

11.	Find the number of paths of length 4 from the vertex D to the vertex E in the undirected graph shown in below, analytically. Identify those paths from the graphs.	16 Marks	L3	CO4



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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. I Semester (MBU-22) Supplementary Examinations, May – 2026

FUNDAMENTALS OF COMPUTERS

[Forensic Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is the basic function of a computer?	2 Marks	L1	CO1
	b)	Name the four main components of a computer system.	2 Marks	L1	CO1
	c)	What is a computer network?	2 Marks	L1	CO2
	d)	Define intranet in simple terms.	2 Marks	L1	CO2
	e)	What is the primary function of a computer power supply?	2 Marks	L1	CO3
	f)	Name any two main components found on a motherboard.	2 Marks	L1	CO3
	g)	What is the first step to follow before assembling a computer?	2 Marks	L1	CO4
	h)	Name any one tool commonly used during computer assembly.	2 Marks	L1	CO4
	i)	What is preventive maintenance in computer systems?	2 Marks	L1	CO5
	j)	Mention one benefit of performing preventive maintenance regularly.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Define computer organization and list its basic components.	6 Marks	L1	CO1
	b)	Discuss in detail the various types of computers and their uses.	10 Marks	L2	CO1

(OR)

3.	a)	What are the main components of a computer system?	6 Marks	L1	CO1
	b)	Explain the functions of each component of a computer with examples.	10 Marks	L2	CO1

MODULE-II

4.	a)	Define a computer network and give one example.	6 Marks	L1	CO2
	b)	Discuss the different types of computer networks and their applications.	10 Marks	L2	CO2

(OR)

5.	a)	What is an intranet?	6 Marks	L1	CO2
	b)	Explain the structure, advantages, and uses of intranet in organizations.	10 Marks	L2	CO2

MODULE-III

6.	a)	Define computer hardware with one example.	6 Marks	L1	CO3
	b)	Discuss the major components of computer hardware and their functions.	10 Marks	L2	CO3

(OR)

7.	a)	What is the function of a power supply unit in a computer?	6 Marks	L1	CO3
	b)	Explain different types of power supplies and their role in computer operation.	10 Marks	L2	CO3

MODULE-IV

8.	a)	What are the basic steps involved in assembling a computer?	6 Marks	L1	CO4
	b)	Discuss in detail the procedure for assembling a computer system from scratch.	10 Marks	L2	CO4

(OR)

9.	a)	Why is computer disassembly sometimes required?	6 Marks	L1	CO4
	b)	Explain the step-by-step process of safely disassembling a computer.	10 Marks	L2	CO4

MODULE-V

10.	a)	What is preventive maintenance in computers?	6 Marks	L1	CO5
	b)	Discuss the importance and objectives of preventive maintenance in computer systems.	10 Marks	L2	CO5

(OR)

11.	a)	List any three benefits of preventive maintenance.	6 Marks	L1	CO5
	b)	Explain in detail the various benefits of preventive maintenance for computer systems and organizations.	10 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. I Semester (MBU-22) Supplementary Examinations, May – 2026

VARIOUS DIVISIONS IN FORENSIC SCIENCE

[Forensic Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Mention one forensic significance of examining building materials.	2 Marks	L2	CO1
	b)	Define ballistics and its types?	2 Marks	L1	CO1
	c)	What are the common chemical components found in explosive residues?	2 Marks	L1	CO2
	d)	What is the significance of plant-based narcotics in forensic investigations, and how are they identified?	2 Marks	L1	CO2
	e)	What are biological samples?	2 Marks	L1	CO3
	f)	Explain the significance of fiber comparison in forensic investigations.	2 Marks	L2	CO3
	g)	What factors can affect the accuracy of a polygraph examination?	2 Marks	L1	CO4
	h)	What is the primary purpose of a polygraph examination?	2 Marks	L1	CO4
	i)	Define IICT.	2 Marks	L1	CO5
	j)	Define NIN.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the forensic examination of glass fractures and its significance.	6 Marks	L5	CO1
	b)	Evaluate the forensic significance of paint evidence in criminal investigations. Discuss the methods used for collecting, analyzing, and comparing paint samples. How do factors such as layers, color, and chemical composition contribute to identifying the source of the paint and linking it to a crime scene?	10 Marks	L5	CO1

(OR)

3.	a)	Explain the examination of cartridge and cartridge cases.	6 Marks	L3	CO1
	b)	Describe the correct procedure for collecting and packaging glass evidence from a crime scene. Include the steps to ensure the integrity of the evidence, the types of tools and containers used, and how the handling of glass fragments can help in maintaining their forensic value. Discuss the challenges involved in this process and how to overcome them.	10 Marks	L2	CO1

MODULE-II

4.	a)	Explain the forensic methods used to identify suspected petrol or diesel residues in arson cases.	6 Marks	L5	CO2
	b)	Explain the various forms of adulteration in narcotic liquids and powders. Discuss the methods used for detecting these adulterants in a forensic laboratory setting.	10 Marks	L5	CO2

(OR)

5.	a)	What are viscera samples?	6 Marks	L1	CO2
	b)	Discuss how suspected poisonous substances in plant materials can be identified. What analytical techniques are typically employed for this purpose?	10 Marks	L6	CO2

MODULE-III

6.	a)	What is the role of forensic entomology in estimating the time of death?	6 Marks	L1	CO3
	b)	Discuss the forensic analysis of liquid blood samples and bloodstains. How are they used to establish timelines and reconstruct crime scenes?	10 Marks	L6	CO3

(OR)

7.	a)	What are the steps involved in the identification of bones at a forensic laboratory?	6 Marks	L1	CO3
	b)	What role does saliva play in forensic DNA analysis? Explain the techniques used to detect and analyze saliva at a crime scene.	10 Marks	L1	CO3

MODULE-IV

8.	a)	What is the role of a polygraph test in criminal investigations involving suspects?	6 Marks	L1	CO4
	b)	Describe the techniques used to detect forged signatures and the challenges faced in identifying forged signatures in legal cases.	10 Marks	L2	CO4

(OR)

9.	a)	Discuss the main factors forensic experts consider when analyzing signatures.	6 Marks	L6	CO4
	b)	Examine the role of computer forensics in investigating cybercrimes involving malicious software.	10 Marks	L5	CO4

MODULE-V

10.	a)	Define Centre for Cellular and Molecular Biology	6 Marks	L5	CO5
	b)	How National Investigation Agency is related to Forensic Science?	10 Marks	L4	CO5

(OR)

11.	a)	Define Central Finger print Bureau.	6 Marks	L1	CO5
	b)	What are the roles of fingerprint expert in investigation of crime?	10 Marks	L5	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. I Semester (MBU-22) Supplementary Examinations, May – 2026

FUNDAMENTALS TO FORENSIC SCIENCES

[Forensic Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Write about Police Academies.	2 Marks	L1	CO1
	b)	Discuss the role of police dogs and their training in assisting various types of criminal cases.	2 Marks	L1	CO1
	c)	Who is the father of forensic science and write the definition of forensic science?	2 Marks	L1	CO2
	d)	What is the Locard's Exchange Principle?	2 Marks	L1	CO2
	e)	Name two international organizations related to forensic science.	2 Marks	L1	CO3
	f)	Define the code of conduct in forensic science.	2 Marks	L1	CO3
	g)	Write two differences between CFSL and SFSL.	2 Marks	L1	CO4
	h)	What is the role of the Government Examiner of Questioned Documents (GEQD)?	2 Marks	L1	CO4
	i)	Define a Mobile Crime Laboratory.	2 Marks	L1	CO5
	j)	What is the role of the Directorate of Forensic Science?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Define : i) Chain of custody ii) Contamination iii) Circumstantial evidence.	6 Marks	L1	CO1
	b)	Discuss the historical development of forensic science in India.	10 Marks	L2	CO1

(OR)

3.	a)	Write the definition of forensic science and explain the concepts.	6 Marks	L1	CO1
	b)	Explain the functions of forensic science.	10 Marks	L2	CO1

MODULE-II

4.	a)	Explain the need and importance of forensic science in criminal investigations.	6 Marks	L2	CO2
	b)	Write briefly about the various branches of forensic science	10 Marks	L1	CO2

(OR)

5.	a)	Write the difference between the Frye standard and Daubert standard.	6 Marks	L1	CO2
	b)	Discuss in detail the basic principles of forensic science and their forensic importance.	10 Marks	L2	CO2

MODULE-III

6.	a)	Explain the major duties and responsibilities of a forensic scientist.	6 Marks	L2	CO3
	b)	Elaborate on the setup, structure, and functions of INTERPOL in forensic investigations.	10 Marks	L6	CO3

(OR)

7.	a)	Write short notes on the ethical code of conduct for forensic scientists.	6 Marks	L2	CO3
	b)	Elaborate on the setup, structure, and functions of FBI in forensic investigations.	10 Marks	L6	CO3

MODULE-IV

8.	a)	Write about CFSL and SFSL	6 Marks	L1	CO4
	b)	Explain the structure, objectives, and major contributions of the National Crime Records Bureau (NCRB).	10 Marks	L2	CO4

(OR)

9.	a)	Explain the Organizational set up of Forensic Science Laboratories in India.	6 Marks	L2	CO4
	b)	Discuss the history, hierarchy, and services provided by the Fingerprint Bureaus in India.	10 Marks	L2	CO4

MODULE-V

10.	a)	Describe the establishment and functions of the Directorate of Forensic Science.	6 Marks	L2	CO5
	b)	Elaborate on the structure, functions, and contributions of BPR&D in improving police and forensic services.	10 Marks	L6	CO5

(OR)

11.	a)	Write about services of crime laboratories.	6 Marks	L1	CO5
	b)	Explain basic services and optional services.	10 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MCA I Semester (MBU-25) Supplementary Examinations, May – 2026

ESSENTIALS OF CYBER SECURITY

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Information Assurance.	2 Marks	L1	CO1
	b)	Write two differences between plaintext and cipher text.	2 Marks	L1	CO1
	c)	Define anti-forensics.	2 Marks	L1	CO2
	d)	What is a proxy server and one basic purpose it serves?	2 Marks	L1	CO2
	e)	Define shell code in the context of exploitation.	2 Marks	L1	CO3
	f)	Give a brief definition of a numeric wrap-around (integer overflow).	2 Marks	L1	CO3
	g)	What is a computer virus?	2 Marks	L1	CO4
	h)	State the goal of obfuscation in mal ware.	2 Marks	L1	CO4
	i)	Name two capabilities provided by memory analysis.	2 Marks	L1	CO5
	j)	Identify a common framework used for memory analysis.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the five pillars of Information Assurance with examples.	8 Marks	L2	CO1
	b)	Describe the main goals of cryptography.	8 Marks	L1	CO1
		(OR)			
3.	a)	Explain the working of the RSA algorithm with a simple example.	8 Marks	L2	CO1
	b)	Discuss common DNS vulnerabilities and their impact on security.	8 Marks	L1	CO1

MODULE-II

4.	a)	Define anti-forensics and state three methods used by attackers to conceal or erase evidence.	8 Marks	L1	CO2
	b)	What are the four common steganography carriers, and how can each be used to hide information?	8 Marks	L1	CO2
		(OR)			
5.	a)	Describe HTTP tunneling operates and explain one legitimate and one malicious use case.	8 Marks	L2	CO2
	b)	Explain rogue antivirus programs trick users and mention one method to prevent such scams.	8 Marks	L2	CO2

MODULE-III

6.	a)	Define shell code and state its main purpose in an exploit.	8 Marks	L1	CO3
	b)	Illustrate how secure coding practices reduce the risk of memory corruption vulnerabilities.	8 Marks	L2	CO3
		(OR)			
7.	a)	Identify the role of integer overflow in software vulnerabilities.	8 Marks	L1	CO3
	b)	Discuss how hybrid attacks combine brute-force and dictionary techniques for faster cracking.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Illustrate how virtual machine obfuscation conceals malicious code behavior.	8 Marks	L2	CO4
	b)	Discuss how persistence mechanisms enable long-term system compromise.	8 Marks	L2	CO4

(OR)

9.	a)	Describe how token kidnapping can be used to impersonate privileged users.	8 Marks	L2	CO4
	b)	Explain how malware detects sandbox or virtual machine environments.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain memory forensics is crucial in modern digital investigations.	8 Marks	L2	CO5
	b)	Describe how memory forensics capabilities assist in detecting advanced malware.	8 Marks	L2	CO5

(OR)

11.	a)	Discuss how memory analysis frameworks facilitate forensic investigations.	8 Marks	L2	CO5
	b)	Explain the process of dumping physical memory safely.	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA I Semester (MBU-25) Supplementary Examinations, May – 2026

BUSINESS ENVIRONMENT

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Write about the external environment.	2 Marks	L1	CO1
	b)	List out the techniques of environment.	2 Marks	L1	CO1
	c)	What is business environment?	2 Marks	L1	CO2
	d)	What is economic planning?	2 Marks	L1	CO2
	e)	List out the types of interventions.	2 Marks	L1	CO3
	f)	Write about business interface.	2 Marks	L1	CO3
	g)	What is social responsibility?	2 Marks	L1	CO4
	h)	Write about business responsibility.	2 Marks	L1	CO4
	i)	List out the strategies of global environment.	2 Marks	L1	CO5
	j)	What is EXIM policy?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Explain the concept and nature of business environment.	16 Marks	L2	CO1

(OR)

3.	Explain about scope and significance of business environment.	16 Marks	L2	CO1

MODULE-II

4.	What is the meaning economic planning? Explain features of economic planning.	16 Marks	L2	CO2

(OR)

5.	Describe the features and objectives of political institutions.	16 Marks	L2	CO2

MODULE-III

6.	Explain the features of legal environment.	16 Marks	L2	CO3

(OR)

7.	Demonstrate about rationale and extent of state intervention.	16 Marks	L2	CO3

MODULE-IV

8.	Discuss the elements of socio-cultural environment.	16 Marks	L2	CO4

(OR)

9.	Discuss about impact of cultural environment.	16 Marks	L2	CO4

MODULE-V

10.	Sketch the benefits and problems of MNCs.	16 Marks	L2	CO5

(OR)

11.	Discuss about EXIM policy in global environment.	16 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA I Semester (MBU-25) Supplementary Examinations, May – 2026

FUNDAMENTALS OF ACCOUTING

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define Book Keeping.	2 Marks	L1	CO1
	b)	List out the branches of accounting.	2 Marks	L1	CO1
	c)	What is sales book?	2 Marks	L1	CO2
	d)	Define Contra entry.	2 Marks	L1	CO2
	e)	What is cash book?	2 Marks	L1	CO3
	f)	List out the reasons for preparing BRS.	2 Marks	L1	CO3
	g)	What is accrual depreciation?	2 Marks	L1	CO4
	h)	What is written down value of fixed asset?	2 Marks	L1	CO4
	i)	List out the current liabilities.	2 Marks	L1	CO5
	j)	Give examples of outstanding expenses.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2. Explain briefly about Generally Accepted Accounting Principles. 16 Marks L2 CO1

(OR)

3. Prepare the trial balance from the following and find out the suspense account. 16 Marks L3 CO1

Capital - Rs.1,14,000
Interest paid - Rs.1200
Wages - Rs.3400
Rent - Rs.1200
Postage & Telegram - Rs.1200
Plant & Machinery - Rs.60,000
Furniture - Rs.25,000
Debtors - Rs.14,000
Drawings - Rs.6000
Creditors - Rs.12,000
Sales returns - Rs.5600
Purchase returns - Rs.600
Discount - Rs.400
Opening Stock - Rs.6000
Purchases - Rs.14,600
Sales - Rs.84,600

MODULE-II

4. What is Subsidiary Book? Explain the different types of subsidiary books. 16 Marks L2 CO2

(OR)

5. Prepare a purchase book form the following transactions of Shobharam, a general merchant. 16 Marks L3 CO2

2020, Jan, 1, purchased from Ram prasad:
3dozens of Wilson 81 pens @15/- per pen
2 Gross Parker ink bottles @15/- per dozen
Jan 10, bought from Banwarlal:
50 reams of ruled paper @11/- per ream
Jan 15, Purchased form Din Dayal:
6 doz. Packets parle Gluco biscuits @2.50 per packet
20 doz. Packets salto biscuits @1.30 per packet
Jan 20, Bought of Bholanath Furniture house on credit:
6 Godrej chairs @ 80/- per chair and 2office tables @500/- per table for office use
Jan 30, sold to Ram Gopal on credit 2 doz. Wilson 81 pens @18 per pen.

MODULE-III

6. Distinguish between Receipts and Payments Account and Income and Expenditure account. 16 Marks L3 CO3

(OR)

7. From the following trial balance of the city club Hyderabad, prepare income and expenditure account for the year ended 30th June, 2013 and a balance sheet as that date. 16 Marks L3 CO3

Particulars	Rs	Particulars	Rs
Printing & stationery	7,500	Annul subscriptions	15,000
Repairs	2,300	Entrance fee (capitalised)	5,000
Cost of entertainment	1,400	Sale of ticket of entertainment	3,000
News papers	1,500	Interest on investments	4,000
Rent & rates	2,250	Sale of ticket for annul dinner	1,750
Salaries	4,750	Rent of hall	3,500
Cost of annual dinner	1,300	Profit on sale of liquor	2,350
Audit fees	400	Interest on bank deposits	500
Cash on hand	600	Receipts form billiards	4,500
Cash at bank	4,500	Sundre creditors	2,800
Fixed deposit	10,000	Capital fund	26,300
Investment	9,000		
	6,200		
Library books			
Furniture	9,500		
Stock of liquor on 30th June 2013	4,200		
	65,100		**65,100**

Of the subscriptions Rs.400/- is paid in advance and there is also Rs.350/- in arrears. Depreciate library books and furniture at 10%. Stock of stationary on 30th June, Rs. 1800/-. Salaries to staff has accrued due Rs. 450/-

MODULE-IV

8. What are the causes of depreciation? Explain. 16 Marks L2 CO4

(OR)

9. A company whose accounting year is the calendar year on 01.04.2007 purchased a machinery costing Rs.30000, it further purchased machinery on 01.10.2007 costing Rs.20000, on 01.07.2008 costing Rs10000. On 01.01.2009 1/3rd of the machinery which was installed on 01.04.2007 became absolute & sold Rs3000. Show how the machinery account appear in the company books of accounts. The depreciation to be 10% per annum on written down method. 16 Marks L4 CO4

MODULE-V

10. From the following Trail balance of Mr. Swaroop & company. 16 Marks L2 CO5

Particulars	Debit (Rs)	Credit (Rs)
Capital		7,610
Cash in hand	30	
Purchases	8,990	
Sales		11,060
Cash at Bank	885	
Fixtures and Fittings	225	
Free hold Premises	1,500	
Lighting and Heating	65	
Bills Receivable	825	
Returns inwards	30	
Salaries	1,075	
Creditors		1,950
Debtors	5,700	
Stock on January 1-2013	3,000	
Printing	225	
Bills Payable		1,875
Rates, taxes, and insurance	190	
Discount received		445
Discount allowed	200	
Total	22,940	22,940

Adjustments:

Stock on 31st Dec 2013 was valued at Rs. 1,80

You are required to prepare the Trading and Profit & Loss Account and Balance Sheet for the year ended Dec 31, 2013.

(OR)

11. The following Trial Balance is extracted from the books of Mr. Rajesh as on March 31, 2007. Prepare Trading and Profit and Loss account for the year ended 31.3.2007 and a Balance Sheet as on that date: 16 Marks L2 CO5

Drawings	72,000	Capital	3,00,000
Buildings	60,000	12% Bank Loan	60,000
Furniture and fittings	30,000	Sales	4,50,000
Motor Van	1,00,000	Commission	20,000
Interest on Bank loan	3,600	Creditors	80,000
Purchases	2,50,000		
Opening Stock	1,00,000		
Establishment Exp	50,000		
Wages	8,000		
Insurance	4,000		
Debtors	1,52,400		

Cash at Bank	80,000		
	8,90,000		**8,90,000**

Adjustments:

i) Closing stock was Rs. 2, 28,000/-

ii) Outstanding wages Rs. 4,000/- and Prepaid Insurance Rs.2,200/-

iii) Depreciate buildings @ 5%, Furniture @ 15% and Motor Van @ 20%.

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc & B.Com I Semester (MBU-25) Supplementary Examinations, May – 2026

TELUGU

[Biotechnology, Bioinformatics, Computer Science, B.Com (Computer Application)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	కృష్ణ ద్వైపాయనుడు అనగా ఎవరు?	2 Marks	L1	CO1
	b)	సురైక విడదీసి సంధి పేరు వ్రాయండి?	2 Marks	L1	CO1
	c)	తిలక్ రచించిన పాఠం పేరుఏమి?	2 Marks	L3	CO2
	d)	పురుషోత్తముడు విడదీసి సంధి పేరు వ్రాయండి?	2 Marks	L1	CO2
	e)	యణాదేశ సంధికి ఒక ఉదాహరణ తెలపండి?	2 Marks	L3	CO2
	f)	ముత్యాల సరాలు రచించిన కవి ఎవరు?	2 Marks	L1	CO2
	g)	సహజ పండితుడు అని ఎవరికి బిరుదు?	2 Marks	L2	CO1
	h)	కమల గర్భుడు అనగా ఎవరు?	2 Marks	L3	CO1
	i)	వాగను శాసనుడు అను ఎవరికి బిరుదు?	2 Marks	L3	CO1
	j)	వామనావతారం రచించిన కవి ఎవరు?	2 Marks	L3	CO1

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	శకుంతల గుణ శీలాలు తెలపండి?	8 Marks	L2	CO1
	b)	మరచిరే ఇక్కాలమున్ భార్గవా? కాయము నాపాయంబే సందర్భాలను వివరించండి?	8 Marks	L3	CO1

(OR)

3.	a)	సిగ్గు లేని ముఖాన్ని నీకు చూపించలేను? ఈ నాగరికతారణ్య వాసం భరించలేను సందర్భాలను వివరించండి?	8 Marks	L1	CO1
	b)	"వలవదు బుద్ధిమంతులు నవప్రియు లైనధరాధినాథులన్" గణవిభజన చేసి పద్యలక్షణాలను వివరించండి?	8 Marks	L4	CO1

MODULE-II

4.	a)	తలపగ నాడు వల్కినవి ధం, బెడ దప్పగ వీడెనొక్కొ చూ డ్కులు విరసంబు లై కరము క్రూరము లైననిమిత్త మేమియో కలయగ బల్కరించి రుప కారులు నై రని నమ్మి యుండగా వలవదు బుద్ధిమంతులు నవప్రియు లైనధరాధినాథులన్! ప్రతిపధార్థం వ్రాయండి.	8 Marks	L4	CO2
	b)	ద్విగు సమాసం, బహువ్రీహి సమాసం ససూత్రంగా వివరించండి?	8 Marks	L2	CO2

(OR)

5.	a)	కారే రాజులు రాజ్యముల్ గలుగవే గర్వోన్నతిం బొందరే వా రేరీ సిరి మూటగట్టుకొని పోవంజాలిరే భూమిపై బే రైనం గలదే శిబిప్రముఖులం బ్రీతి యశ:కాములై యీరే కోర్కులు వారల మఱచిరే యి క్కాలము భార్గవా! ప్రతిపధార్థం వ్రాయండి	8 Marks	L2	CO2
	b)	ఉత్పలమాల, శార్దూలం పద్య లక్షణాలను వివరించండి?	8 Marks	L2	CO2

MODULE-III

6.	a)	కులము రాజ్యము నిలుపు మీ కుబ్జుండు విశ్వంభరుం డలతిం బోడు త్రివిక్రమన్ఫురణవాడై నిండు బ్రహ్మాండము గలడే మాన్ప నొకండు నా పలుకు లాకర్ణింపు కర్ణంబుల వలదీ దానము గీనము బనుపుమా వర్ణి వదాన్యోత్తమా! ప్రతి పదార్థం వివరించండి ?	10 Marks	L3	CO3
	b)	ఆర్త గీతం పాఠ్యభాగ సారాంశాన్ని వివరించండి?	6 Marks	L2	CO3

(OR)

7.	a)	విపరీతప్రతిభాష లేమిటికి నుర్వీనాథ యీపుత్త్రగా త్రపరష్వంగసుఖంబు సేకొనుము ముక్తాహారకర్పూరసాం ద్రపరాగప్రసరంబు జందనము జంద్రజ్యోత్స్నయుం బుత్త్రగా త్రపరిష్వంగమునట్లు జీవులకు హృద్యంబే కడున్ శీతమే"!పద్యమునకు ప్రతి పదార్థం రాయండి?	10 Marks	L3	CO3
	b)	"వినిచె ధరాధినాథునకు విస్మయ మందగ దత్సభాసదుల్" గణ విభజన చేసి పద్య లక్షణాలను వివరించండి?	6 Marks	L2	CO3

MODULE-IV

8.	a)	యణాదేశ సంధి, అనునాసిక సంధి లను ససూత్రంగా వివరించండి?	8 Marks	L2	CO4
	b)	ఆవులు పెయ్యలు మందలు చేరెను, ఇంకనన్ను విసిగించకు సందర్భాలను వివరించండి?	8 Marks	L2	CO4

(OR)

9.	a)	ద్వంద్వ, సంభావన పూర్వపద కర్మధారయ సమాసాలను వివరించండి?	8 Marks	L2	CO4
	b)	గురజాడ రచించిన పూర్ణమ్మ పాఠ సారాంశాన్ని వివరించండి?	8 Marks	L2	CO4

MODULE-V

10.	a)	'తరువగ జాచ్చినంబెరు గుతాలి మినీయ దెవెన్న భాస్కరా' పాదాన్ని గణ విభజన చేసి, చందోలక్షణాలు తెలపండి.?	8 Marks	L3	CO5
	b)	విభక్తులను తెలపండి?	8 Marks	L3	CO5

(OR)

11.	a)	చంపకమాల, మత్తేభం పద్య లక్షణాలను వివరించండి?	8 Marks	L3	CO5
	b)	ముదుసలి మొగుడికి ముడివేసిరి! ఇంకదైవంబు కాని వొండు శరణంబు లేదు! సందర్భాలను వివరించండి?	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc & B.Com I Semester (MBU-25) Supplementary Examinations, May – 2026

SANSKRIT

[Biotechnology, Bioinformatics, Computer Science, B.Com (Computer Application)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	रामस्यमाताका ?	2 Marks	L1	CO1
	b)	दशरथस्य कति पुत्राः ?	2 Marks	L1	CO1
	c)	रामस्य पत्नी का ?	2 Marks	L1	CO1
	d)	महाभरतस्य लेखकः कः ?	2 Marks	L1	CO1
	e)	आकाशात् उन्नतः कः ?	2 Marks	L2	CO2
	f)	यक्षस्य उत्तराणि कः ददाति ?	2 Marks	L2	CO2
	g)	चम्पूरामायणस्य लेखकः कः ?	2 Marks	L2	CO2
	h)	गङ्गां भोलोकं प्रति कः आनीतवान् ?	2 Marks	L3	CO3
	i)	मोहापनोदः पाठे राजा कः ?	2 Marks	L3	CO3
	j)	गुरुपत्न्याः नाम किम् ?	2 Marks	L3	CO3

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	आर्यपादुकाभिषेकः पाठ्यभागस्य साराशं लिखत ?	8 Marks	L1	CO1
	b)	आर्यपादुकाभिषेकः इति शीर्षिकायाः औचित्यं विवृणुत ?	8 Marks	L1	CO1

(OR)

3.	a)	धर्मराजःसोदरान्उद्दिश्यकिम्अपृच्छत्?	8 Marks	L1	CO1
	b)	यक्षप्रश्नाःविषयेलिखत?	8 Marks	L1	CO1

MODULE-II

4.	a)	भगीरथःकिंनिमित्तीकृत्यघोरंतपस्तेपे?	8 Marks	L3	CO2
	b)	गङ्गायाःमाहात्म्यंलिखत?	8 Marks	L3	CO2

(OR)

5.	a)	मोहापनोदःपाठस्यसारंलिखत?	8 Marks	L3	CO2
	b)	राजकुमार्याःसुनन्दायाःमोहःकथम्अपनीतः?	8 Marks	L3	CO2

MODULE-III

6.	a)	शृगालःवञ्चितबुद्धिःलिखत।	8 Marks	L3	CO3
	b)	काकमृगस्यमैत्रीवर्णयत।	8 Marks	L3	CO3
		(OR)			
7.	a)	अत्युत्कटैःपापपुण्यैःइहैवफलमश्नुतेपाठंविवृणत।	8 Marks	L3	CO3
	b)	काकेनोत्तंगृध्रमार्जारकथांविशदयत।	8 Marks	L3	CO3
		MODULE-IV			
8.	a)	पाणिनिःकविरुद्दिश्यलिखत।	8 Marks	L3	CO4
	b)	कौटिल्यःविषयेविवृणत।	8 Marks	L3	CO4
		(OR)			
9.	a)	माघःउद्दिश्यवर्णयत।	8 Marks	L3	CO4
	b)	शङ्कराचार्यःउद्दिश्यलिखत।	8 Marks	L3	CO4
		MODULE-V			
10.	a)	उकारान्तःपुंलिङ्गदेवशब्दः।	8 Marks	L3	CO5
	b)	ऋकारान्तःपुंलिङ्गपितृशब्दः।	8 Marks	L3	CO5
		(OR)			
11.	a)	आकारान्तःस्त्रीलिङ्गःरमाशब्दः।	8 Marks	L3	CO5
	b)	उकारान्तःपुंलिङ्गभानुशब्दः।	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA I Semester (MBU-25) Supplementary Examinations, May – 2026

BUSINESS COMMUNICATION

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define communication.	2 Marks	L1	CO1
	b)	What is feedback?	2 Marks	L1	CO1
	c)	Define business correspondence.	2 Marks	L1	CO2
	d)	What is a quotation letter?	2 Marks	L1	CO2
	e)	Define a report.SS	2 Marks	L1	CO3
	f)	What is a formal report?	2 Marks	L1	CO3
	g)	Define meeting.	2 Marks	L1	CO4
	h)	What is an agenda?	2 Marks	L1	CO4
	i)	Define e-communication.	2 Marks	L1	CO5
	j)	What is VoIP?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Explain the communication process with a diagram and discuss its importance in business.	16 Marks	L2	CO1
	(OR)			
3.	Describe various types of communication barriers with examples.	16 Marks	L2	CO1

MODULE-II

4.	Explain the various types of business letters in detail. Discuss their purpose, features, and importance in modern business communication with suitable examples.	16 Marks	L2	CO2
	(OR)			
5.	Describe the standard format of a business letter. Explain each component (heading, inside address, salutation, body, complimentary close, etc.) with a well-structured example.	16 Marks	L2	CO2

MODULE-III

6.	Explain the various types of reports used in business and academics. Classify them based on purpose, frequency, structure, and origin with suitable examples.	16 Marks	L2	CO3
	(OR)			
7.	Describe the basic format of a formal report. Explain each component such as Title Page, Table of Contents, Executive Summary, Introduction, Body, Findings, Conclusion, Recommendations, and References.	16 Marks	L2	CO3

MODULE-IV

8.	Explain the different types of business meetings in detail with suitable examples.	16 Marks	L2	CO4
	(OR)			
9.	Discuss the importance of business meetings in organizational communication and decision-making.	16 Marks	L2	CO4

MODULE-V

10.	Explain the strategic importance of technology in modern business communication. How has it transformed organizational productivity and connectivity?	16 Marks	L2	CO5
	(OR)			
11.	Discuss the role of e-communication in business. Explain how digital tools improve speed, accuracy, collaboration, and decision-making.	16 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA I Semester (MBU-25) Supplementary Examinations, May – 2026

BUSINESS ECONOMICS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What do you mean by Optimization in Business Economics?	2 Marks	L1	CO1
	b)	Define Marginal Revenue.	2 Marks	L1	CO1
	c)	State the Law of Diminishing Marginal Utility.	2 Marks	L2	CO2
	d)	What is meant by Cardinal Utility?	2 Marks	L1	CO2
	e)	What is a Demand Curve?	2 Marks	L1	CO3
	f)	Define Supply.	2 Marks	L1	CO3
	g)	Define Total Fixed Cost.	2 Marks	L1	CO4
	h)	What do you mean by Returns to Scale? List the types.	2 Marks	L2	CO4
	i)	Define Monopolistic Competition.	2 Marks	L1	CO5
	j)	What is an Oligopoly Market?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.		Explain the Nature and Scope of Business Economics.	16 Marks	L2	CO1
		(OR)			
3.		Explain the concept of Marginalism and illustrate its application in pricing, production and resource allocation decisions.	16 Marks	L2	CO1

MODULE-II

4.		Explain the Law of Equi-Marginal Utility and Illustrate how consumers allocate income across different goods.	16 Marks	L2	CO2
		(OR)			
5.	a)	Outline the Law of Equi-Marginal Utility and its assumptions.	8 Marks	L2	CO2
	b)	Demonstrate how a consumer allocates income optimally using the Equi-Marginal Principle.	8 Marks	L2	CO2

MODULE-III

6.		Summarize the concept of Demand and show how it affects business decisions-making.	16 Marks	L2	CO3
		(OR)			
7.		Define supply and Explain the supply curve, highlighting its characteristics and significance for producers.	16 Marks	L2	CO3

MODULE-IV

8.	a)	Explain returns to scale. Distinguish between increasing, constant, and decreasing returns to scale?	8 Marks	L2	CO4
	b)	Explain the various cost concepts fixed cost, variable cost, total cost, average cost, and marginal cost?	8 Marks	L2	CO4

(OR)

9.	Explain the concept of a production function and Illustrate how it shows the relationship between inputs and output?	16 Marks	L2	CO4

MODULE-V

10.	Explain the structure and features of Monopoly and Demonstrate the process of price determination in the short run and long run.	16 Marks	L2	CO5

(OR)

11.	Classify the pricing strategies used across different market structures and explain with an example.	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com & BBA I Semester (MBU-25) Supplementary Examinations, May – 2026

BUSINESS STATISTICS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Mention any two features of statistics.	2 Marks	L1	CO1
	b)	State any two limitations of statistics.	2 Marks	L1	CO1
	c)	Write the formula for the arithmetic mean of grouped data.	2 Marks	L1	CO2
	d)	What is Median?	2 Marks	L1	CO2
	e)	What is Coefficient of Variation?	2 Marks	L1	CO3
	f)	Distinguish between absolute and relative measures of dispersion.	2 Marks	L1	CO3
	g)	What is a scatter diagram?	2 Marks	L1	CO4
	h)	Name the three types of correlation based on direction.	2 Marks	L1	CO4
	i)	What is a singular matrix?	2 Marks	L1	CO5
	j)	What is a non-singular matrix?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	What are different types of variables? Explain: i) qualitative vs quantitative, ii) discrete vs continuous, iii) nominal, ordinal, interval, and ratio scales with examples.	8 Marks	L1	CO1
	b)	Define primary and secondary data. Explain their differences and describe situations where each type is more appropriate.	8 Marks	L2	CO1

(OR)

3.	a)	Explain the different sources of secondary data. How would you verify the reliability of secondary data?	8 Marks	L2	CO1
	b)	Write detailed notes on classification of data. Explain chronological, geographical, qualitative, quantitative and textual classification with examples.	8 Marks	L1	CO1

MODULE-II

4.	a)	A company is planning to improve plant safety. For this, accident data for the last 50 weeks was compiled. These data are grouped into the frequency distribution as shown below. Calculate the A.M. of the number of accidents per week. Number of accidents : 0–4 5–9 10–14 15–19 20–24 Number of weeks : 5 22 13 8 2	8 Marks	L3	CO2
	b)	The following distribution gives the pattern of overtime work done by 100 employees of a company. Calculate the average overtime work done per employee. Overtime hours : 10–15 15–20 20–25 25–30 30–35 35–40 Number of employees : 11 20 35 20 8 6	8 Marks	L3	CO2

(OR)

5. a) A survey was conducted to determine the age (in years) of 120 automobiles. The result of such a survey is as follows: — 8 Marks — L3 — CO2

Age of auto	0–4	4–8	8–12	12–16	16–20
Number of autos	13	29	48	22	8

What is the median age for the autos?

b) What is a statistical average? What are the desirable properties for an average to possess? — 8 Marks — L2 — CO2

MODULE-III

6. a) Explain kurtosis. Discuss platykurtic, mesokurtic, and leptokurtic distributions with diagrams. — 8 Marks — L2 — CO3

b) Mean and Standard Deviation of the following continuous series are 31 and 15.9 respectively. The distribution after taking step deviation is as follows: — 8 Marks — L3 — CO3

dx:	– 3	– 2	– 1	0	1	2	3
f:	10	15	25	25	10	10	5

Determine the actual class intervals.

(OR)

7. a) After settlement the average weekly wages in a factory has increased from Rs. 8000 to Rs. 12000 and the Standard Deviation. has increased from Rs. 100 to Rs. 150. After settlement, the wages have become higher and more uniform. Do you agree? — 8 Marks — L3 — CO3

b) Mean and Standard Deviation. of 100 items are found by a student as 50 and 0.1. If at the time of calculation, two items are wrongly taken as 40 and 50 instead of 60 and 30. find correct mean and Standard Deviation. — 8 Marks — L3 — CO3

MODULE-IV

8. a) Define correlation. Explain its significance in business forecasting and decision making. — 8 Marks — L3 — CO4

b) Construct a scatter diagram for a dataset and interpret the nature and direction of correlation. — 8 Marks — L2 — CO4

(OR)

9. Find the coefficient of correlation between price and sales from the following data. — 16 Marks — L3 — CO4

Price (Rs.)	103	98	85	92	90	84	88	90	94	95
Sales (units)	500	610	700	630	670	800	800	570	700	680

MODULE-V

10. Expand the determinant $\begin{vmatrix} a & b & c \\ b & c & a \\ c & a & b \end{vmatrix}$. — 16 Marks — L3 — CO5

(OR)

11. Find the rank of $A = \begin{pmatrix} 2 & 4 & 3 \\ 1 & 2 & -1 \\ -1 & -2 & 6 \end{pmatrix}$ — 16 Marks — L3 — CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA I Semester (MBU-25) Supplementary Examinations, May – 2026

FINANCIAL MATHEMATICS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Find the accumulated value at 6% effective interest after 4 years on Rs 2,500.	2 Marks	L3	CO1
	b)	Define cost price and selling price with examples.	2 Marks	L1	CO1
	c)	What is deferred annuity?	2 Marks	L1	CO2
	d)	Define equation of payment.	2 Marks	L1	CO2
	e)	What is reserve value of a policy?	2 Marks	L1	CO3
	f)	What is an amortization schedule?	2 Marks	L1	CO3
	g)	What is par value?	2 Marks	L1	CO4
	h)	Define risk-free rate.	2 Marks	L1	CO4
	i)	Define book value of equity.	2 Marks	L1	CO5
	j)	What is constant-growth dividend?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the concept of "effective yield" and show how investors use it.	8 Marks	L2	CO1
	b)	A principal amount doubles in 6 years under compound interest. Find the rate of interest.	8 Marks	L3	CO1

(OR)

3.	a)	A principal of Rs 80,000 grows to Rs 1,05,000 in 3 years. Find the compound interest rate.	8 Marks	L3	CO1
	b)	Interest rate is 8% nominal compounded monthly. Compute accumulated value of Rs 40,000 for 3.5 years.	8 Marks	L3	CO1

MODULE-II

4.	a)	Pay Rs 10,000 now or Rs 16,000 after 5 years at 8% interest. Which is better?	8 Marks	L3	CO2
	b)	Find the present value of an uneven stream: Year 1 – Rs 5,000, Year 2 – Rs 7,000, Year 4 – Rs 10,000 at 6%.	8 Marks	L3	CO2

(OR)

5.	a)	Rs 12,000 now OR Rs 18,000 after 4 years at 8%. Which one is better?	8 Marks	L3	CO2
	b)	A deposit grows to Rs 1,50,000 in 7 years at 11%. Find present value.	8 Marks	L3	CO2

MODULE-III

6.	a)	Find present value of deferred annuity of Rs 4,000 for 12 years deferred 5 years @ 7%.	8 Marks	L3	CO3
	b)	Detailed analysis: principal and interest components for the 2nd and 6th installments of a loan of Rs 80,000 @ 12% for 6 years.	8 Marks	L3	CO3

(OR)

7.	a)	Determine the capital and interest portions of a loan instalment of Rs 15,000 at 12%.	8 Marks	L3	CO3
	b)	A loan of Rs 1,20,000 is repaid in 8 equal installments at 9%. Find the installment amount.	8 Marks	L3	CO3

MODULE-IV

8.	a)	A 7-year bond paying 9% coupon annually has YTM 11%. Compute price.	8 Marks	L3	CO4
	b)	A perpetual bond pays Rs 250 yearly. Value it at discount rates: 8%, 10%, and 12%.	8 Marks	L3	CO4

(OR)

9.	a)	A 5-year bond with face value 1,000 and coupon 8% has YTM 10%. Compute price.	8 Marks	L3	CO4
	b)	A 10-year bond pays semi-annual coupon 6%. Find price at 7% yield.	8 Marks	L3	CO4

MODULE-V

10.	a)	A share has dividends: 3, 4, 5 for first 3 years then grows at 6% forever. Value at 12%.	8 Marks	L3	CO5
	b)	A stock just paid dividend 4. Growing 15% for 2 years then 6%	8 Marks	L3	CO5

(OR)

11.	a)	A stock just paid dividend Rs 3. Dividends grow at 8% for 5 years then 4% thereafter. Required return = 11%. Compute price.	8 Marks	L3	CO5
	b)	Dividend stream: Rs 4, Rs 5.5, Rs 7 for 3 years, then growing at 6% forever. Value at 12%.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA I Semester (MBU-25) Supplementary Examinations, May – 2026

BUSINESS STATISTICS

[Marketing, Human Resource, Finance]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Calculate the quartile deviation to given data 8,9,10,7,6,12,4.	2 Marks	L3	CO1
	b)	Give the properties of arithmetic mean	2 Marks	L2	CO1
	c)	Explain briefly about the regression coefficients	2 Marks	L1	CO2
	d)	Give properties of correlation coefficient's	2 Marks	L1	CO2
	e)	Define normal distribution.	2 Marks	L1	CO3
	f)	State bayes theorem.	2 Marks	L1	CO3
	g)	Define Paasche's price index number with formulae.	2 Marks	L1	CO4
	h)	Give the merits of least square method.	2 Marks	L2	CO4
	i)	Define type-2 error.	2 Marks	L1	CO5
	j)	Give the uses of F- test.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2. a) Explain diagrammatic representation of data — 8 Marks, L2, CO1

b) Calculate mean deviation about median to the following data: — 8 Marks, L3, CO1

Class Interval	10-20	20-30	30-40	40-50	50-60
Frequency	5	10	15	10	5

(OR)

3. a) Give the advantages and disadvantages of median — 8 Marks, L2, CO1

b) Calculate Quartile Deviation to the following data. — 8 Marks, L3, CO1

Class Interval	15-25	25-35	35-45	45-55	55-65	65-75	75-85
Frequency	8	15	20	25	15	28	18

MODULE-II

4. a) A computer while calculating the correlation coefficient between the variable X and Y obtained the following results: — 8 Marks, L3, CO2

N = 30; ∑X = 120 ∑X2 = 600 ∑Y = 90 ∑Y2 = 250 ∑XY = 335

It was, however, later discovered at the time of checking that it had copied down two pairs of observations as : (X, Y) : (8, 10) (12, 7)

While the correct values were : (X, Y) : (8, 12) (10, 8)

Obtain the correct value of the correlation coefficient between X and Y.

b) The following data gives the age and blood pressure (BP) of 10 sports persons. — 8 Marks, L3, CO2

Name :	A	B	C	D	E	F	G	H	I	J
Age (X) :	42	36	55	58	35	65	60	50	48	51
BP (Y) :	98	93	110	85	105	108	82	102	118	99

i) Find regression equation of Y on X and X on Y Find the correlation coefficient (r) using the regression coefficients. (Use the method of deviation from arithmetic mean)

ii) Estimate the blood pressure of a sports person whose age is 45.

(OR)

5. a) Find the rank correlation for the following data. 8 Marks L3 CO2

X	65	63	67	64	68	62	70	66	68	67	69	71
Y	68	66	68	65	69	66	68	65	71	67	68	70

b) Compute the coefficient of correlation and the two lines of regression for the following data. 8 Marks L3 CO2

Price X:	14	16	17	18	19	20	21	22	23
Demand Y:	84	78	70	75	66	67	62	58	60

MODULE-III

6. a) State and prove multiplication of probability. 8 Marks L3 CO3

b) Obtain Boole's inequality. 8 Marks L3 CO3

(OR)

7. a) A manufacturer of cotter pins knows that 5% of his product is defective. If he sells cotter pins in boxes of 100 and guarantees that not more than 10 pins will be defective, what is the approximate probability that a box will fail to meet the guaranteed quality? 8 Marks L3 CO3

b) In a sample of 1000 cases, the mean of a certain test is 14 and standard deviation is 2.5. Assuming the distribution to be normal, find i) how many students score between 12 and 15? ii) how many score above 18? iii) how many score below 18? 8 Marks L3 CO3

MODULE-IV

8. a) Explain construction of weighted price index numbers. 8 Marks L2 CO4

b) Using the following data, construct Fisher's Ideal index and show how it satisfies Factor Reversal Test and Time Reversal Test? 8 Marks L3 CO4

Commodity	Price		Quantity	
	Base year	Current year	Base year	Current year
A	6	10	50	56
B	2	2	100	120
C	4	6	60	60
D	10	12	50	24
E	8	12	40	36

(OR)

9. a) Explain graphical method. 8 Marks L2 CO4

b) Explain method of moving averages. 8 Marks L3 CO4

MODULE-V

10. a) Explain test for single mean. 8 Marks L2 CO5

b) Explain two-way classification of ANOVA. 8 Marks L3 CO5

(OR)

11. a) Below are given the gain in weights (in lbs) of pigs fed on two diets A and B: 8 Marks L3 CO5

Diet-A	25	32	30	34	24	14	32	24	30	31	35	25	-	-	-
Diet-B	44	34	22	10	47	31	40	30	32	35	18	21	35	29	22

Test, if the two diets differ significantly as regards their effect on increase in weight.(5% Level of significant)

b) A sample of heights of 6400 English men has a mean of 67.85 inches and S.D. 2.56 inches, while another sample of heights of 1600, Australians has a mean of 68.55 inches and a S.D. of 2.52 inches. Do the data indicate that Australians are on the average, taller than Englishmen? 8 Marks L3 CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA I Semester (MBU-25) Supplementary Examinations, May – 2026

ECONOMICS FOR MANAGERS

[Marketing, Human Resource, Finance]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Discuss role of economist in firm.	2 Marks	L1	CO1
	b)	Write about positive economics.	2 Marks	L1	CO1
	c)	Explain importance of demand in the economy.	2 Marks	L1	CO2
	d)	Write types of measurements of elasticity of demand.	2 Marks	L1	CO2
	e)	Explain about ISO-Costs.	2 Marks	L1	CO3
	f)	Explain about Cobb-Douglas Production Function.	2 Marks	L1	CO3
	g)	Explain about Skimming pricing.	2 Marks	L1	CO4
	h)	Discuss about Penetration Pricing.	2 Marks	L1	CO4
	i)	Write about Business Cycles.	2 Marks	L1	CO5
	j)	Explain characteristics of Business Cycle.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Discuss about Scarcity of resources and choice for the selection of resources.	16 Marks	L2	CO1

(OR)

3.	Discuss about positive and normative economics.	16 Marks	L2	CO1

MODULE-II

4.	Explain significance of Elasticity of Demand.	16 Marks	L2	CO2

(OR)

5.	Explain Demand Forecasting Methods.	16 Marks	L2	CO2

MODULE-III

6.	Discuss about Cobb-Douglas Production Function.	16 Marks	L2	CO3

(OR)

7.	Write about Returns to Scale and its factors.	16 Marks	L2	CO3

MODULE-IV

8.	Explain oligopoly market with graphical representation.	16 Marks	L3	CO4

(OR)

9.	Discuss about Price discrimination in the market.	16 Marks	L3	CO4

MODULE-V

10.	Define Business cycle. Explain different phases of Business cycle.	16 Marks	L2	CO5

(OR)

11.	Discuss about Anti-inflationary methods.	16 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA I Semester (MBU-25) Supplementary Examinations, May – 2026

MANAGEMENT AND ORGANIZATION BEHAVIOUR

[Marketing, Human Resource, Finance]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What do you mean by Organizing?	2 Marks	L1	CO1
	b)	What is Unity of Command?	2 Marks	L1	CO1
	c)	Recall the Reinforcement theory with example.	2 Marks	L1	CO2
	d)	Relate the example of Social Learning theory.	2 Marks	L1	CO2
	e)	What are social needs?	2 Marks	L1	CO3
	f)	What are Esteem needs?	2 Marks	L1	CO3
	g)	Name two steps in the implementation of Change.	2 Marks	L1	CO4
	h)	What do you mean by Communication?	2 Marks	L1	CO4
	i)	Name two key managerial interpersonal styles.	2 Marks	L1	CO5
	j)	Define stress and burnout in the organizational context.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	Classify the functions of Management in detail.	16 Marks	L2	CO1
	(OR)			
3.	Define Decision Making. Explain the process of Decision Making.	16 Marks	L2	CO1

MODULE-II

4.	What is Personality? Explain the various theories of Personality.	16 Marks	L2	CO2
	(OR)			
5.	Outline the concept Trait theory.	16 Marks	L2	CO2

MODULE-III

6.	Explain the classification of Groups with diagram.	16 Marks	L2	CO3
	(OR)			
7.	Classify the Group Development Stages.	16 Marks	L2	CO3

MODULE-IV

8.	Define Change. Explain the steps in the process of change.	16 Marks	L2	CO4
	(OR)			
9.	Explain the steps in the implementation of change.	16 Marks	L2	CO4

MODULE-V

10.	Interpret the impact of stress and burnout on employee performance and suggest coping strategies.	16 Marks	L2	CO5
	(OR)			
11.	Summarize the key factors that determine organizational effectiveness and relate them to business outcomes.	16 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA I Semester (MBU-25) Supplementary Examinations, May – 2026

INFORMATION TECHNOLOGY FOR MANAGERIAL APPLICATIONS

[Marketing, Human Resource, Finance]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is data?	2 Marks	L1	CO1
	b)	What does ALU stand for?	2 Marks	L1	CO1
	c)	Describe how synchronous DRAM improves memory performance.	2 Marks	L3	CO2
	d)	Explain the purpose of cache memory in a computer system.	2 Marks	L3	CO2
	e)	Explain the purpose of the Page Layout tab.	2 Marks	L2	CO3
	f)	How does the Insert Tab help in document enhancement?	2 Marks	L2	CO3
	g)	What is the difference between relative and absolute cell references in Excel?	2 Marks	L5	CO4
	h)	Analyze the role of macros in automating repetitive tasks in Excel.	2 Marks	L5	CO4
	i)	Compare Slide Show View with Slide Sorter View in PowerPoint.	2 Marks	L4	CO5
	j)	Analyze the advantages of using Slide Master in large presentations.	2 Marks	L4	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe the characteristics of microcomputers and give examples.	8 Marks	L1	CO1
	b)	What are some common examples of secondary storage media?	8 Marks	L1	CO1

(OR)

3.	a)	Describe the structure and function of the CPU.	8 Marks	L3	CO1
	b)	How did the invention of the microprocessor revolutionize computing in the fourth generation?	8 Marks	L3	CO1

MODULE-II

4.	a)	Compare and contrast different types of operating systems used in mobile devices and personal computers.	8 Marks	L4	CO2
	b)	Analyze the impact of SSDs on modern computing compared to traditional HDDs.	8 Marks	L4	CO2

(OR)

5.	a)	What is an input/output device, and how do these devices contribute to computer functionality?	8 Marks	L1	CO2
	b)	What are the different types of primary memory, and how do they function in a computer system?	8 Marks	L1	CO2

MODULE-III

6.	a)	What are the benefits of using the Style feature in Word documents?	8 Marks	L2	CO3
	b)	How does the Table of Contents tool work in MS Word?	8 Marks	L2	CO3

(OR)

7.	a)	How do you set page margins in MS Word?	8 Marks	L3	CO3
	b)	Describe the process of creating a bulleted list in MS Word.	8 Marks	L3	CO3

MODULE-IV

8.	a)	What are the key elements of the Excel interface?	8 Marks	L1	CO4
	b)	List five common functions used in Excel.	8 Marks	L1	CO4

(OR)

9.	a)	How do you insert a hyperlink in Excel?	8 Marks	L3	CO4
	b)	How does Goal Seek work in Excel?	8 Marks	L3	CO4

MODULE-V

10.	a)	Evaluate the pros and cons of using PowerPoint for corporate presentations.	8 Marks	L5	CO5
	b)	Evaluate the advantages and limitations of using templates in PowerPoint presentations.	8 Marks	L5	CO5

(OR)

11.	a)	How do charts enhance presentations in PowerPoint?	8 Marks	L2	CO5
	b)	What is the difference between Normal View and Slide Show View in PowerPoint?	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA I Semester (MBU-25) Supplementary Examinations, May – 2026

FINANCIAL ACCOUNTING FOR MANAGERS

[Marketing, Human Resource, Finance]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Write Dual Aspect concept.	2 Marks	L1	CO1
	b)	What is GAAP?	2 Marks	L1	CO1
	c)	What is Trading account?	2 Marks	L1	CO2
	d)	Define Revenue Expenditure.	2 Marks	L1	CO2
	e)	List out the Current Liabilities.	2 Marks	L1	CO3
	f)	Name any two liquidity ratios.	2 Marks	L1	CO3
	g)	List out the classification of cash flows.	2 Marks	L1	CO4
	h)	List any two examples of sources of funds.	2 Marks	L1	CO4
	i)	What is computerized accounting?	2 Marks	L1	CO5
	j)	State any two features of Tally.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2. How do you classify the accounts? Explain the rules of debit and credit with respect to different types. 16 Marks L2 CO1

(OR)

3. Prepare the trial balance from the following and find out the suspense account. 16 Marks L2 CO1

Capital - Rs.1,14,000
Interest paid - Rs.1200
Wages - Rs.3400
Rent - Rs.1200
Postage & Telegram - Rs.1200
Plant & Machinery - Rs.60,000
Furniture - Rs.25,000
Debtors - Rs.14,000
Drawings - Rs.6000
Creditors - Rs.12,000
Sales returns - Rs.5600
Purchase returns - Rs.600
Discount - Rs.400
Opening Stock - Rs.6000
Purchases - Rs.14,600
Sales - Rs.84,600

MODULE-II

4. From the following Trail balance of Mr. Swaroop & company. 16 Marks L2 CO2

Particulars	Debit (Rs)	Credit (Rs)
Capital		7,610
Cash in hand	30	
Purchases	8,990	
Sales		11,060
Cash at Bank	885	
Fixtures and Fittings	225	
Free hold Premises	1,500	
Lighting and Heating	65	
Bills Receivable	825	
Returns inwards	30	
Salaries	1,075	
Creditors		1,950
Debtors	5,700	
Stock on January 1-2013	3,000	
Printing	225	
Bills Payable		1,875
Rates, taxes, and insurance	190	
Discount received		445
Discount allowed	200	
Total	**22,940**	**22,940**

Adjustments:

Stock on 31st Dec 2013 was valued at Rs. 1,80

You are required to prepare the Trading and Profit & Loss Account and Balance Sheet for the year ended Dec 31, 2013.

(OR)

5. Draw a neat pro-forma of Balance sheet. 16 Marks L2 CO2

MODULE-III

6. Discuss about various types of financial ratios. 16 Marks L2 CO3

(OR)

7. From the following, you are required to calculate the Gross Profit Ratio, Operating Ratio, and Operating Profit Ratio. Sales-Rs 20,00,000, Cost of goods sold- Rs 16,00,000, Selling expenses- Rs 1,20,000, Administrative expenses- Rs 80,000, Loss on sale of machinery- Rs 4,000, Interest received on investments- Rs 10,000. 16 Marks L4 CO3

MODULE-IV

8. Draw a neat pro-forma of Statement of Changes in Working capital. 16 Marks L2 CO4

(OR)

9. B.M traders presents the following information and you are required to calculate funds from operations: 16 Marks L4 CO4

Profit and loss account

Particulars	Rs	Particulars	Rs.
To expenses:		By gross profit	2,00,000
Operations	1,00,000	By gain on sale of plant	20,000
Depreciation	40,000		
To loss on sale of building	10,000		
To advertisement suspense a/c	5,000		
To discount to customers)	500		
To discount on issue of shares written off	500		
To goodwill	12,000		
	52,000		
	2,20,000		**2,20,000**

To net profit

MODULE-V

10.	Discuss the brief history of computerized accounting.	16 Marks	L2	CO5
	(OR)			
11.	Explain the advantages and disadvantages of Tally.	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA I Semester (MBU-25) Supplementary Examinations, May – 2026

APTITUDE TRAINING

[Marketing, Human Resource, Finance]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define whole numbers.	2 Marks	L1	CO1
	b)	What is the condition for divisibility of 9?	2 Marks	L1	CO1
	c)	What is formula to find the average of first n even numbers?	2 Marks	L1	CO1
	d)	Write the formulas for Gain and Loss percentages.	2 Marks	L1	CO2
	e)	Define simple interest.	2 Marks	L1	CO2
	f)	Write the formula to calculate time when distance and speed are given.	2 Marks	L1	CO3
	g)	Define Venn diagrams give the example.	2 Marks	L1	CO3
	h)	Define qualitative data.	2 Marks	L1	CO3
	i)	What is coding and decoding.	2 Marks	L1	CO4
	j)	Find the next term in the series i) AB, EF, JK, PQ, …….. ii) 1,2,3,5,8,13,21,34,55,……..	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5X16 = 80 Marks

MODULE-I

2.	a)	Two students appeared at an examination. One of them secured 9 marks more than the other and his marks was 56% of the sum of their marks. The marks obtained by them are?	8 Marks	L3	CO1
	b)	A car owner buys petrol at Rs.7.50, Rs. 8 and Rs. 8.50 per litre for three successive years. What approximately is the average cost per litre of petrol if he spends Rs. 4000 each year?	8 Marks	L3	CO1

(OR)

3.	a)	A grocer has a sale of Rs. 6435, Rs. 6927, Rs. 6855, Rs. 7230 and Rs. 6562 for 5 consecutive months. How much sale must he have in the sixth month so that he gets an average sale of Rs. 6500?	8 Marks	L3	CO1
	b)	Present ages of Sameer and Anand are in the ratio of 5:4 respectively. Three years hence, the ratio of their ages will become 11:9 respectively. What is Anand's present age in years?	8 Marks	L3	CO1

MODULE-II

4.	a)	A box contains 2 white balls, 3 black balls and 4 red balls. In how many ways can 3 balls be drawn from the box, if at least one black ball is to be included in the draw?	8Marks	L4	CO2
	b)	A person crosses a 600 m long street in 5 minutes. What is his speed in km per hour?	8 Marks	L3	CO2

(OR)

5. a) A bag contains 2 red, 3 green and 2 blue balls. Two balls are drawn at random. What is the probability that none of the balls drawn is blue? — 8 Marks — L4 — CO2

b) The ratio between the speeds of two trains is 7 : 8. If the second train runs 400 km in 4 hours, then the speed of the first train is? — 8 Marks — L3 — CO2

MODULE-III

6. Study the following table and answer the questions based on it.Expenditures of a Company (in Lakh Rupees) per Annum Over the given Years. — 16 Marks — L4 — CO3

Year	Item of Expenditure				
	Salary	Fuel and Transport	Bonus	Interest on Loans	Taxes
1998	288	98	3.00	23.4	83
1999	342	112	2.52	32.5	108
2000	324	101	3.84	41.6	74
2001	336	133	3.68	36.4	88
2002	420	142	3.96	49.4	98

i) Total expenditure on all these items in 1998 was approximately what percent of the total expenditure in 2002?

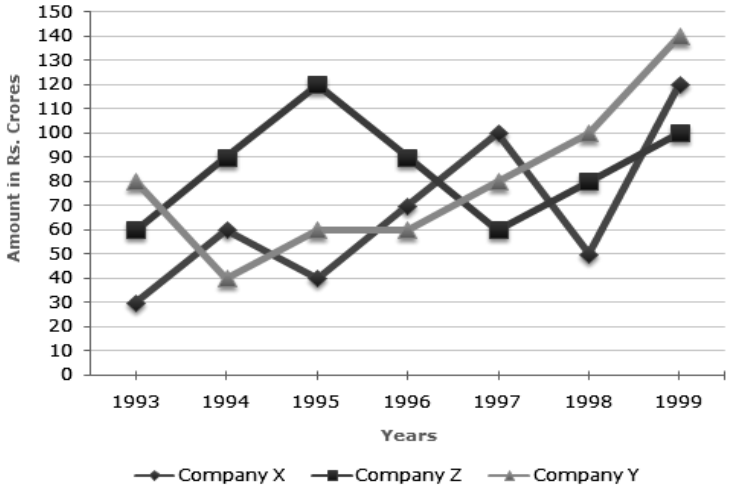
ii) The ratio between the total expenditure on Taxes for all the years and the total expenditure on Fuel and Transport for all the years respectively is approximately?

iii) What is the average amount of interest per year which the company had to pay during this period?

iv) The total amount of bonus paid by the company during the given period is approximately what percent of the total amount of salary paid during this period?

(OR)

7. Study the following line graph and answer the questions. Exports from Three Companies Over the Years (in Rs. crore) — 16 Marks — L2 — CO3



i) For which of the following pairs of years the total exports from the three Companies together are equal?

ii) Average annual exports during the given period for Company Y is approximately what percent of the average annual exports for Company Z?

iii) In which year was the difference between the exports from Companies X and Y the minimum?

iv) In how many of the given years, were the exports from Company Z more than the average annual exports over the given years?

MODULE-IV

8.	a)	Five girls are sitting on a bench to be photographed. Seema is to the left of Rani and to the right of Bindu. Mary is to the right of Rani. Reeta is between Rani and Mary. i) Who is sitting immediate right to Reeta ? ii) Who is second from the right ? iii) Who is second from the left in photograph ? iv) Who is in the middle of the photograph ?	8 Marks	L4	CO4
	b)	Santosh walks 10 meters towards the South. Turning to the left, he walks 20 meters and then moves to his right. After moving a distance of 20 meters, he turns to the right and walks 20 meters. Finally, he turns to the right and moves a distance of 10 meters. How far and in which direction is he from the starting point?	8 Marks	L3	CO4
		(OR)			
9.	a)	If P $ Q means P is the brother of Q; P # Q means P is the mother of Q; P * Q means P is the daughter of Q in A # B $ C * D, who is the father?	8 Marks	L2	CO4
	b)	One morning Sujata started to walk towards the Sun. After covering some distance, she turned to right then again to the right and after covering some distance she again turns to the right. Now in which direction is she facing?	8 Marks	L3	CO4

MODULE-V

10.	a)	A car owner buys petrol at Rs.7.50, Rs. 8 and Rs. 8.50 per litre for three successive years. What approximately is the average cost per litre of petrol if he spends Rs. 4000 each year?	8 Marks	L2	CO1
	b)	A man on tour travels first 160 km at 64 km/hr and the next 160 km at 80 km/hr. The average speed for the first 320 km of the tour is:	8 Marks	L2	CO2
		(OR)			
11.	a)	i) 121, 144, 169, 196, 225, _____ ii) 3, 11, 35, 107, 323, 971, _____ iii) 1, 3, 9, 31, 129, _____ iv) A, CD, GHI, MNOP,_____ v) AY, CW, FT, JP,_____	8 Marks	L3	CO4
	b)	The cost price of 20 articles is the same as the selling price of x articles. If the profit is 25%, then the value of x is?	8 Marks	L2	CO2

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-22) Supplementary Examinations, June – 2026

DATA ANALYTICS

[Computer Science and Engineering (Artificial Intelligence and Data Science)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Data Analytics and its applications.	2 Marks	L1	CO1
	b)	Explain the difference between structured and unstructured data.	2 Marks	L2	CO1
	c)	What is the purpose of data wrangling in analytics?	2 Marks	L2	CO3
	d)	Differentiate between correlation and regression.	2 Marks	L2	CO3
	e)	Explain the concept of stationarity in time series analysis.	2 Marks	L2	CO4
	f)	What are the common techniques used for text normalization?	2 Marks	L1	CO4
	g)	Why is storytelling important in data visualization?	2 Marks	L2	CO5
	h)	List two types of visualizations used in exploratory data analysis.	2 Marks	L1	CO5
	i)	What is Named Entity Recognition (NER) in text mining?	2 Marks	L2	CO6
	j)	Define network density in social network analysis.	2 Marks	L1	CO6

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the role of exploratory data analysis in analytics.	8 Marks	L3	CO1
	b)	Compare and contrast data warehouses and data lakes.	8 Marks	L3	CO1
		(OR)			
3.	a)	How is missing data handled in R? Provide examples.	8 Marks	L3	CO2
	b)	Discuss the different data manipulation techniques in R.	8 Marks	L3	CO2

MODULE-II

4.	a)	Explain the importance of statistical inference in analytics.	8 Marks	L3	CO3
	b)	How do probability distributions impact data analysis?	8 Marks	L3	CO3
		(OR)			
5.	a)	Describe the Kruskal-Wallis test and its significance.	8 Marks	L4	CO3
	b)	What is logistic regression? Explain its implementation in R.	8 Marks	L3	CO3

MODULE-III

6.	a)	Explain the importance of trend and seasonality in time series forecasting.	8 Marks	L4	CO4
	b)	How is model evaluation performed in time series analysis?	8 Marks	L4	CO4
		(OR)			
7.	a)	Describe the process of text tokenization with examples.	8 Marks	L3	CO4
	b)	Discuss the advantages and limitations of topic modeling.	8 Marks	L4	CO4

MODULE-IV

8.	a)	What are the key elements of an effective data presentation?	8 Marks	L4	CO5
	b)	Explain the role of interactive visualizations in analytics.	8 Marks	L3	CO5
		(OR)			
9.	a)	How can insights be communicated effectively to stakeholders?	8 Marks	L4	CO5
	b)	Discuss the challenges in designing a compelling data report.	8 Marks	L4	CO5

MODULE-V

10.	a)	Explain different classification techniques in web mining.	8 Marks	L3	CO6
	b)	Compare content-based and hybrid recommender systems.	8 Marks	L4	CO6
		(OR)			
11.	a)	How is social network analysis applied in cybersecurity?	8 Marks	L4	CO6
	b)	Discuss the role of network clustering in social network analysis.	8 Marks	L4	CO6

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-22) Supplementary Examinations, June – 2026

DATA MINING

[Computer Science and Engineering (Artificial Intelligence and Data Science)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List the basic data types used in data mining.	2 Marks	L1	CO1
	b)	What is the streaming scenario in data mining?	2 Marks	L2	CO1
	c)	What is the difference between Frequent Itemset Mining and Association Rule Mining?	2 Marks	L2	CO2
	d)	What is the significance of the Apriori algorithm in association rule mining?	2 Marks	L2	CO2
	e)	What is the main limitation of the k-Means algorithm?	2 Marks	L1	CO3
	f)	How does k-Means determine the number of clusters?	2 Marks	L2	CO3
	g)	What is a probabilistic classifier? Give an example.	2 Marks	L1	CO3
	h)	Define Bayes' Theorem in the context of classification.	2 Marks	L2	CO3
	i)	List two probabilistic models used for outlier detection.	2 Marks	L1	CO4
	j)	How does clustering help in outlier detection?	2 Marks	L2	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	What is the streaming scenario in data mining? How does it differ from traditional data mining?	8 Marks	L2	CO1
	b)	Compare and contrast different data mining techniques used in real-world applications.	8 Marks	L4	CO1
		(OR)			
3.	a)	Explain the role of data warehouses in data mining.	8 Marks	L4	CO1
	b)	What are the major challenges in data mining?	8 Marks	L2	CO1

MODULE-II

4.	a)	Discuss the Association Rule Generation Framework and its importance in data mining.	8 Marks	L4	CO2
	b)	Explain the working of the FP-Growth algorithm with an example	8 Marks	L3	CO2
		(OR)			
5.	a)	Compare and contrast the Apriori algorithm and the FP-Growth algorithm.	8 Marks	L4	CO2
	b)	Describe the Eclat algorithm and how it differs from other frequent pattern mining methods.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the working of the k-Means algorithm with an example.	8 Marks	L2	CO3
	b)	What are the main drawbacks of the k-Means algorithm? How can they be addressed?	8 Marks	L4	CO3

(OR)

7.	a)	Compare k-Means with k-Medoids clustering. Which one is more robust and why?	8 Marks	L4	CO3
	b)	Explain the Agglomerative Hierarchical Clustering process with a suitable example.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Describe Naïve Bayes classification with an example.	8 Marks	L2	CO3
	b)	Compare and contrast Naïve Bayes and Decision Trees.	8 Marks	L4	CO3

(OR)

9.	a)	What are Support Vector Machines? Explain their working with an example.	8 Marks	L2	CO3
	b)	Discuss different types of kernels used in SVMs.	8 Marks	L2	CO3

MODULE-V

10.	a)	Describe the Distance-Based Outlier Detection method with its advantages and disadvantages.	8 Marks	L2	CO4
	b)	Explain Density-Based Outlier Detection methods with a relevant algorithm.	8 Marks	L2	CO4

(OR)

11.	a)	What are Information-Theoretic Models, and how are they used in outlier analysis?	8 Marks	L2	CO4
	b)	Explain the concept of Outlier Validity and its significance.	8 Marks	L2	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-22) Supplementary Examinations, June – 2026

BIG DATA FRAMEWORKS

[Computer Science and Engineering (Artificial Intelligence and Data Science)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Hadoop Ecosystem.	2 Marks	L1	CO1
	b)	What is Heart beat mechanism?	2 Marks	L1	CO1
	c)	What are the key components of a MapReduce job?	2 Marks	L1	CO2
	d)	How is benchmarking used in Hadoop operations?	2 Marks	L2	CO2
	e)	What is the role of the Worker in Spark?	2 Marks	L2	CO3
	f)	How is data partitioning handled in Spark?	2 Marks	L1	CO3
	g)	How can Spark cache be used to improve job performance?	2 Marks	L1	CO4
	h)	What factors affect the efficiency of data shuffling?	2 Marks	L1	CO4
	i)	What is the role of streaming in Spark fault tolerance?	2 Marks	L1	CO5
	j)	How does Spark differentiate between internal and external faults?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the advantages and disadvantages of using Hadoop over traditional databases.	8 Marks	L2	CO1
	b)	What were the initial challenges that Hadoop was designed to address?	8 Marks	L4	CO1

(OR)

3.	a)	Describe the process of data read and write operations in Hadoop Distributed File System.	8 Marks	L2	CO1
	b)	What are the key classes and methods provided by the Hadoop Java API for working with HDFS?	8 Marks	L2	CO1

MODULE-II

4.	a)	Discuss in detail about two-level network architecture for a Hadoop cluster.	8 Marks	L2	CO2
	b)	Describe the steps involved in setting up a development environment for MapReduce.	8 Marks	L3	CO2

(OR)

5.	a)	How do you handle dependencies and data flow between jobs in a MapReduce workflow?	8 Marks	L3	CO2
	b)	What are the advantages of chaining MapReduce jobs together in a workflow?	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain how does dynamic resource allocation impact the performance and efficiency of Spark applications.	8 Marks	L4	CO3
	b)	Discuss the architecture of YARN and how it decouples resource management from job scheduling.	8 Marks	L2	CO3

(OR)

7.	a)	What are the steps to set up Spark to run on an Apache Mesos cluster?	8 Marks	L2	CO3
	b)	Write short notes on Workers and Executors.	8 Marks	L2	CO3

MODULE-IV

8.	a)	What are the key stages in Spark's execution model and how are they determined?	8 Marks	L4	CO4
	b)	Describe the different types of shared variables in Spark.	8 Marks	L2	CO4

(OR)

9.	a)	Write short notes on memory management in Spark.	8 Marks	L2	CO4
	b)	What is the role of serialization for distributed processing in Spark?	8 Marks	L4	CO4

MODULE-V

10.	a)	Outline the typical life cycle of a Spark job from submission to completion. What are the key stages involved.	8 Marks	L2	CO5
	b)	Describe the responsibilities of a Spark Worker in the job execution process.	8 Marks	L2	CO5

(OR)

11.	a)	What is fault tolerance in Spark and why is it critical for large-scale data processing?	8 Marks	L4	CO5
	b)	Discuss in detail about Service Level Agreements.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-22) Supplementary Examinations, June – 2026

DEEP LEARNING

[Computer Science and Engineering (Artificial Intelligence and Data Science)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is a local optimum?	2 Marks	L2	CO1
	b)	Define spurious optima.	2 Marks	L1	CO1
	c)	How does weight decay help improve RBM training?	2 Marks	L1	CO2
	d)	How does a Hopfield network store patterns?	2 Marks	L1	CO2
	e)	Compare vanishing and exploding gradients.	2 Marks	L2	CO3
	f)	How does an LSTM network handle long-term dependencies in sequences?	2 Marks	L2	CO3
	g)	How are convolutional neural networks applied to content-based image retrieval?	2 Marks	L1	CO4
	h)	What is the key innovation introduced by the VGG network architecture?	2 Marks	L1	CO4
	i)	How does the generator in a GAN differ from the discriminator?	2 Marks	L2	CO5
	j)	Why is the loss function critical in GAN training?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.		Illustrate the step-by-step process of back propagation with an example.	16 Marks	L3	CO1

(OR)

3.	a)	Compare and contrast the performance of shallow and deep neural networks for complex tasks.	8 Marks	L2	CO1
	b)	What are the benefits and challenges associated with each?	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain how Restricted Boltzmann Machines (RBMs) are stacked to create Deep Belief Networks .	8 Marks	L2	CO2
	b)	Discuss the advantages of layer-wise pretraining in DBNs .	8 Marks	L2	CO2

(OR)

5.	a)	Discuss the vanishing and exploding Gradient Problems in detail.	8 Marks	L2	CO2
	b)	Explain simple perceptron model with an example.	8 Marks	L2	CO2

MODULE-III

6.	a)	Discuss the application of Recurrent Neural Networks in sequence-to-sequence learning.	8 Marks	L2	CO3
	b)	Discuss the primary challenges in training Recurrent Neural Networks.	8 Marks	L2	CO3

(OR)

7.	a)	Compare Gated Recurrent Units (GRUs) with Long Short-Term Memory (LSTM) networks .	8 Marks	L2	CO3
	b)	Discuss the similarities and differences in GRU and LSTM architecture and performance on sequence learning tasks.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss the challenges in training CNNs.	8 Marks	L2	CO4
	b)	Explain the architecture of VGG networks .	8 Marks	L2	CO4

(OR)

9.	a)	Discuss the architectures of VGG, GoogleLeNet, and ResNet in detail.	8 Marks	L2	CO4
	b)	Discuss how each architecture introduced innovations to improve deep learning models.	8 Marks	L2	CO4

MODULE-V

10.	a)	Compare and contrast the additive and multiplicative attention mechanisms used in machine translation.	8 Marks	L2	CO5
	b)	Discuss their computational efficiency and performance .	8 Marks	L2	CO5

(OR)

11.	a)	Assess the role of attention mechanisms in modern AI architectures.	8 Marks	L3	CO6
	b)	How have they transformed applications in computer vision and natural language processing?	8 Marks	L2	CO6

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-22) Supplementary Examinations, June – 2026

COMPUTER VISION

[Computer Science and Engineering (Artificial Intelligence and Data Science)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	In what situations would you use SIFT for feature matching between two images?	2 Marks	L3	CO1
	b)	What is a homography in the context of image mapping?	2 Marks	L1	CO1
	c)	Explain how stereo images are used to extract depth information from a scene.	2 Marks	L2	CO2
	d)	What is multiple view reconstruction, and why is it important in computer vision?	2 Marks	L1	CO2
	e)	What are the primary goals of clustering in image analysis?	2 Marks	L1	CO3
	f)	Explain the concept of "image signatures" and their importance in image retrieval and clustering.	2 Marks	L2	CO3
	g)	What does the K-Nearest Neighbors algorithm classify data based on?	2 Marks	L1	CO4
	h)	What is Optical Character Recognition (OCR) used for in image processing?	2 Marks	L1	CO4
	i)	Define optical flow in the context of object tracking.	2 Marks	L1	CO5
	j)	How can optical flow be used to track objects across consecutive frames in a video?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe the steps involved in implementing the Harris Corner Detector and explain the role of the response function.	8 Marks	L2	CO1
	b)	Design an algorithm to match features between two geotagged images taken from different cameras and at different times of the day.	8 Marks	L3	CO1, CO6

(OR)

3.	a)	Explain the concept of Scale-Invariant Feature Transform (SIFT). How does SIFT handle scale changes in images?	8 Marks	L1	CO1
	b)	Discuss the challenges of matching geotagged images from different sources and how to overcome these challenges using feature detection techniques.	8 Marks	L3	CO1

MODULE-II

4.	a)	How does the pin-hole camera model relate to real-world cameras, despite being an idealized model?	8 Marks	L2	CO2
	b)	Explain the process of overlaying virtual objects onto real-world images in augmented reality.	8 Marks	L2	CO2
		(OR)			
5.	a)	How would you apply the SIFT descriptor to recognize objects in a scene? Provide an example.	8 Marks	L3	CO2
	b)	Explain the relationship between corresponding points in two different views of the same scene using epipolar geometry	8 Marks	L2	CO2
		MODULE-III			
6.	a)	Describe the working principle of agglomerative and divisive hierarchical clustering techniques. How are they applied in image clustering?	8 Marks	L2	CO3
	b)	Apply the concept of visual words to a set of images. Describe how a vocabulary of visual words can be created and utilized in image retrieval.	8 Marks	L3	CO3
		(OR)			
7.	a)	Explain the concept of image indexing in the context of image retrieval. What are the key features that make image indexing effective?	8 Marks	L1	CO3
	b)	Explain the impact of the number of clusters on the performance and results of the K-means clustering algorithm.	8 Marks	L2	CO3
		MODULE-IV			
8.	a)	Illustrate how Bayes' Theorem is applied in image classification using the Bayes classifier.	8 Marks	L2	CO4
	b)	Demonstrate how Support Vector Machines can be used to classify handwritten digits in an image dataset.	8 Marks	L3	CO4
		(OR)			
9.	a)	In the context of OCR, explain how image preprocessing improves recognition accuracy.	8 Marks	L2	CO4
	b)	Provide an example of how the K-NN algorithm can be used in medical image classification.	8 Marks	L3	CO4
		MODULE-V			
10.	a)	Explain how variational methods can be applied to enhance video quality, such as denoising or frame interpolation.	8 Marks	L2	CO5
	b)	Explain the limitations of the Lucas-Kanade method, especially in terms of handling large motion and noise in video sequences.	8 Marks	L2	CO5
		(OR)			
11.	a)	Implement a basic graph cut algorithm for binary image segmentation and explain each step of the process.	8 Marks	L3	CO5
	b)	Compare the Lucas-Kanade algorithm with other optical flow methods, such as Horn-Schunck or Farnebäck methods, in terms of accuracy and computational complexity.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-22) Supplementary Examinations, June – 2026

INNOVATION AND INTELLECTUAL PROPERTY RIGHTS

[Computer Science and Engineering,
Computer Science and Engineering (Artificial Intelligence and Data Science),
VLSI and Embedded Systems]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define innovation and provide an example.	2 Marks	L1	CO1
	b)	Explain how obstacles to innovation can be overcome.	2 Marks	L2	CO1
	c)	What is the importance of international IPR organizations?	2 Marks	L1	CO1
	d)	Define design and its relevance to IPR.	2 Marks	L2	CO1
	e)	Explain the role of trademarks in business.	2 Marks	L1	CO2
	f)	What are the steps in the trademark registration process?	2 Marks	L3	CO2
	g)	State the rights of public performance in copyright law.	2 Marks	L3	CO3
	h)	Discuss the copyright ownership issues.	2 Marks	L2	CO3
	i)	What are the legal implications of trade secret misappropriation?	2 Marks	L1	CO4
	j)	List the any two new developments in patent law	2 Marks	L2	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Differentiate between creativity and innovation. Provide examples.	8 Marks	L2	CO1
	b)	Discuss the role of international treaties in protecting IPR.	8 Marks	L2	CO1
		(OR)			
3.	a)	Explain the concept of geographical indication with examples.	8 Marks	L4	CO1
	b)	Describe the blocks for creativity and ways to overcome them.	8 Marks	L2	CO1

MODULE-II

4.	a)	How are trademark rights acquired?	8 Marks	L3	CO1
	b)	Explain the trademark registration process	8 Marks	L3	CO1
		(OR)			
5.	a)	Discuss the purpose and function of trademarks.	8 Marks	L2	CO1
	b)	Evaluate the criteria for selecting and evaluating trademarks.	8 Marks	L2	CO1

MODULE-III

6.	a)	Discuss originality in copyright law. Why is it essential?	8 Marks	L4	CO2
	b)	Explain the copyright registration process in detail.	8 Marks	L2	CO2
		(OR)			
7.	a)	Analyze the role of patent searches in the innovation process.	8 Marks	L3	CO2
	b)	Discuss the ownership rights in patent law.	8 Marks	L2	CO2

MODULE-IV

8.		Discuss the liability for misappropriation of trade secrets.	16 Marks	L2	CO3
		(OR)			
9.	a)	State and explain the trade secret Law. Explain the liability for misappropriations of trade secrets.	8 Marks	L2	CO4
	b)	Explain about the remedies for misappropriation in Trade Secrets	8 Marks	L1	CO4

MODULE-V

10.		Discuss new developments in copyright law.	16 Marks	L3	CO4
		(OR)			
11.		Provide an international overview of intellectual property law.	16 Marks	L3	CO4

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Supplementary Examinations, May– 2026

MATRIX THEORY AND LINEAR ALGEBRA

[Computer Science and Engineering, Computer Science and Engineering (Cyber Security), Information Technology, Computer Science and Engineering (Cloud Computing), Computer Science and Engineering (DevOps), Computer Science and Engineering (Artificial Intelligence and Data Science), Computer Science and Engineering (Data Science), Computer Science and Engineering (Artificial Intelligence and Machine Learning)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Explain the procedure of nature of the solution for non-homogeneous equations.	2 Marks	L1	CO1
	b)	Explain what is Homogeneous Linear Equations?	2 Marks	L1	CO1
	c)	Find the eigen values of the matrix A^{-1}, where $A = \begin{bmatrix} 1 & 1 & 3 \\ 0 & 5 & 1 \\ 0 & 0 & 1 \end{bmatrix}$	2 Marks	L1	CO2
	d)	What are Linearly independent vectors?	2 Marks	L1	CO2
	e)	Check whether the set of all natural numbers N forms a commutative group under addition.	2 Marks	L1	CO3
	f)	Define Linear span of a subset of a vector space.	2 Marks	L1	CO3
	g)	Explain types of Linear Transformation.	2 Marks	L1	CO3
	h)	Define a basis of a vector space.	2 Marks	L1	CO3
	i)	Evaluate the angle between 1 and x^2 in $c[-1,1]$.	2 Marks	L1	CO4
	j)	Find a unit vector orthogonal to $(4,2,3)$ in R^3.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Show that the system $x - 4y + 7z = 14, 3x + 8y - 2z = 13$ and $7x - 8y + 26z = 5$ is not consistent.	8 Marks	L3	CO1
	b)	Find the rank of matrix $A = \begin{bmatrix} 1 & 2 & 2 & 0 \\ 0 & 4 & 3 & 2 \\ 3 & 2 & 1 & 3 \\ 6 & 8 & 7 & 5 \end{bmatrix}$ by reducing it into echelon form.	8 Marks	L3	CO1

(OR)

3.	a)	For what values of λ and μ the system	8 Marks	L3	CO1

$x+y+z=6, x+2y+3z=10$ and $x+2y+\lambda z=\mu$ have
i) no solution ii) a unique solution iii) an infinite solution .

b) Solve the system of equation by triangularization method. 8 Marks L2 CO1
$2x-3y+10z=3, -x+4y+2z=20, 5x+2y+z=-12.$

MODULE-II

4. a) Find the eigen values of the matrices A^3 and A^{-1}, where 8 Marks L2 CO2

$$A=\begin{bmatrix}3 & 2 & -3\\ 0 & 0 & 5\\ 0 & 0 & -2\end{bmatrix}.$$

b) State cayley Hamilton theorem and Illustrate an Example. 8 Marks L3 CO2

(OR)

5. a) Find the eigenvectors of the matrix $3A^3+5A^2-6A+2I$, 8 Marks L3 CO2

where $A=\begin{bmatrix}1 & 2 & -3\\ 0 & 3 & 2\\ 0 & 0 & -2\end{bmatrix}$.

b) Find Diagonalize the square matrix 8 Marks L2 CO2

$$A=\begin{bmatrix}1 & 1 & 3\\ 1 & 5 & 1\\ 3 & 1 & 1\end{bmatrix}$$

MODULE-III

6. a) Check whether the set of integers Z with addition and scalar multiplication form a real vector space. 8 Marks L3 CO3

b) Show that the set W of symmetric matrices form a subspace of the vector space V of all square matrices over the field R. 8 Marks L2 CO3

(OR)

7. a) Show that, $R^3=\{(x,y,z):x,y,z\in Q\}$ is vector space over the field R. Is the set $W=\{(x,y,z):x,y,z\in Q\}$ a subspace of R^3 ? 8 Marks L3 CO3

b) We consider, $S=\{x^2-x+1, -3x^2+x+2\}\subseteq P_2$ the vector space of all polynomial of degree less or equal to 2. Show that, the polynomial $r(x)=6x^2-4x+1$ is in $L(S)$. 8 Marks L2 CO3

MODULE-IV

8. a) Let $T:M_{2x2}\to R$ be a linear transformation for which 8 Marks L2 CO3

$$T\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}=1, T\begin{bmatrix}1 & 1\\ 0 & 0\end{bmatrix}=2, T\begin{bmatrix}1 & 1\\ 1 & 0\end{bmatrix}=3. T\begin{bmatrix}1 & 1\\ 1 & 1\end{bmatrix}=4$$

Find $T\begin{bmatrix}1 & 3\\ 4 & 2\end{bmatrix}$ and $T\begin{bmatrix}a & b\\ c & d\end{bmatrix}$.

b) Let $S:P_1\to R$ be the linear transformation defined by, 8 Marks L2 CO3

$S(p(x))=\int_0^1 p(x)dx$. Find the kernel and range of S.

(OR)

9. a) Explain Kernel of a Linear Transformation and Range of Linear Transformation and illustrate an example for Linear 8 Marks L3 CO3

Transformations.

b) Define $S:\tau[a,b]\to R$ by, $S(f)=\int_a^b f(x)dx$ 8 Marks L2 CO3

Show that S is a linear transformation.

MODULE-V

10. a) Let f and g be in $c[a,b]$,the vector space of all continuous functions on the closed interval $[a,b]$. Prove that $\langle f,g\rangle=\int_a^b f(x)g(x)dx$ defines an inner product on $c[a,b]$. 8 Marks L3 CO4

b) Find the angle between x and x^2 in $C[-1,1]$. 8 Marks L2 CO4

(OR)

11. a) Explain the working process of Gram-Schmidt orthogonalization. 8 Marks L3 CO4

b) In R^3 with the usual dot product, evaluate an orthogonal basis for the span $\left\{\begin{bmatrix}1\\1\\0\end{bmatrix},\begin{bmatrix}0\\1\\1\end{bmatrix}\right\}$. 8 Marks L3 CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Supplementary Examinations, May– 2026

MULTIVARIABLE CALCULUS AND DIFFERENTIAL EQUATIONS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Electronics and Computer Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Find $\frac{\partial(x,y)}{\partial(r,\theta)}$ when $x = r^2\cos\theta$, $y = r^2\sin\theta$.	2 Marks	L1	CO1
	b)	Find $\frac{\partial^2 f}{\partial x \partial y}$ if $f(x,y) = x^2y^2 + x^3y^3$.	2 Marks	L1	CO1
	c)	Evaluate $\int_{y=0}^{2}\int_{x=0}^{3}(x+y)dydx$.	2 Marks	L1	CO2
	d)	What is the geometrical meaning of triple integration of a function $f(x,y,z)$ under a region D?	2 Marks	L1	CO2
	e)	What is solenoidal vector? Give one example.	2 Marks	L1	CO3
	f)	Find ∇u if $u = x^2 + y^2 + z^2$.	2 Marks	L2	CO3
	g)	Find complementary function of $(D^3 - 1)y = 0$.	2 Marks	L1	CO4
	h)	Define degree and order of an ODE. Give one example.	2 Marks	L1	CO4
	i)	What is homogeneous partial differential equation? Give one example.	2 Marks	L1	CO5
	j)	Construct a partial differential equation by eliminating the arbitrary constants a and b from $z = ax + by + a^2 + b^2$.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks.

5 x 16 = 80 Marks

MODULE-I

2.	a)	Show that the functions $u = xy + yz + zx$, $v = x^2 + y^2 + z^2$ and $w = x + y + z$ are functionally related. Find the relation between them.	8 Marks	L3	CO1
	b)	Find three positive numbers whose sum is 100 and whose product is maximum.	8 Marks	L2	CO1

(OR)

3.	a)	Determine $\frac{\partial(x,y,z)}{\partial(u,v,w)}$, when $u = \frac{2yz}{x}$, $v = \frac{3zx}{y}$, $w = \frac{4xy}{z}$.	8 Marks	L3	CO1
	b)	Show that the functions $u = \frac{x}{y}$, $v = \frac{x+y}{x-y}$ are functionally dependent and hence obtain the relation between them.	8 Marks	L3	CO1

MODULE-II

4.	a)	Evaluate $\iint_R xy\,dx\,dy$ where R is the region by x-axis, $x = 2a$ and $x^2 = 4ay$.	8 Marks	L2	CO2
	b)	Apply change of order of integration to evaluate $\int_0^\infty \int_x^\infty \frac{e^{-y}}{y}\,dy\,dx$.	8 Marks	L2	CO2

(OR)

5.	a)	Evaluate $\int_1^e \int_1^{\log y} \int_1^{e^x} \log z\,dz\,dx\,dy$.	8 Marks	L3	CO2
	b)	Evaluate $\int_0^1 \int_0^{\sqrt{1-x^2}} \int_0^{\sqrt{1-x^2-y^2}} xyz\,dz\,dy\,dx$	8 Marks	L3	CO2

MODULE-III

6.	a)	Show that the vector $(x^2 - yz)\bar{i} + (y^2 - zx)\bar{j} + (z^2 - xy)\bar{k}$ is irrotational and find its scalar potential.	8 Marks	L2	CO3
	b)	Verify Green's theorem for $\int_C (xy + y^2)\,dx + x^2\,dy$, where c is bounded by $y = x$, $y = x^2$.	8 Marks	L3	CO3

(OR)

7.	a)	Find $div\bar{F}$ and $curl\bar{F}$ where $\bar{F} = grad(x^3 + y^3 + z^3 - 3xyz)$.	8 Marks	L2	CO3
	b)	Find directional derivative of the field $xy + yz + zx$ at the point $(1,1,1)$ in the direction of $\bar{i} + \bar{j} + \bar{k}$.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Solve the differential equation $\frac{d^2y}{dx^2} - 5\frac{dy}{dx} + 6y = e^x \sin x$.	8 Marks	L3	CO4
	b)	Applying the method of variation of parameters, solve the differential equation $\frac{d^2y}{dx^2} + a^2 y = \sec ax$.	8 Marks	L2	CO4

(OR)

9.	a)	Applying the method of variation of parameters, to solve the differential equation $(D^2 + 1)y = x\sin x$.	8 Marks	L2	CO4
	b)	Solve the differential equation $(D^2 + 4)y = e^x + \sin 2x + \cos 2x$.	8 Marks	L3	CO4

MODULE-V

10.	a)	Solve $x(z^2 - y^2)p + y(x^2 - z^2)q = z(y^2 - x^2)$.	8 Marks	L2	CO5
	b)	Solve the partial differential equation $x^2(y - z)p + y^2(z - x)q = z^2(x - y)$.	8 Marks	L3	CO5

(OR)

11.	a)	Construct a partial differential equation by eliminating the arbitrary functions from $z = f(x - it) + g(x - it)$.	8 Marks	L2	CO5
	b)	Find the general solution of the linear partial differential equation $x(y - z)p + y(z - x)q = z(x - y)$.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Supplementary Examinations, May– 2026

ENGINEERING PHYSICS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Electronics and Computer Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Name list two applications of polarization?	2 Marks	L1	CO1
	b)	In a newtons rings experiment the diameter of the 15th ring was found to be 0.59 cm and that of the 5th ring is 0.336 cm. if the radius of the curvature of the lens id 100 cm, find the wavelength of the light.	2 Marks	L3	CO1
	c)	Recall the definition of a sensor.	2 Marks	L1	CO2
	d)	List any two advantages of using optical fiber.	2 Marks	L3	CO2
	e)	Name the applications of LED.	2 Marks	L1	CO3
	f)	What is the principle of a photodiode?	2 Marks	L1	CO3
	g)	What is a dielectric material?	2 Marks	L2	CO4
	h)	Define magnetic susceptibility (χ).	2 Marks	L1	CO4
	i)	Mention two properties of nanomaterials.	2 Marks	L1	CO5
	j)	Give two examples of superconducting materials.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the theory behind Newton's rings and derive the expressions that determine the fringe patterns.	10 Marks	L2	CO1
	b)	The diameter of the 9th dark ring in Newton's rings experiment is 0.28 cm. Then, find the diameter of the 16th dark ring. Given that the wavelength light source is 5500 Å.	6 Marks	L3	CO1

(OR)

3.	a)	Explain how Fraunhofer diffraction occurs in a double-slit experiment and describe the nature of the resulting pattern.	11 Marks	L2	CO1
	b)	What is interference of light? Summarizing the importance conditions to get interference.	5 Marks	L2	CO1

MODULE-II

4.	a)	What does the divergence of a magnetic field represent according to Maxwell's equations?	10 Marks	L1	CO2
	b)	Define numerical aperture (NA).	6 Marks	L1	CO2

(OR)

5.	a)	Classify the optical fibers based on their refractive index profiles and explain the propagation of light wave through them.	12 Marks	L3	CO2
	b)	Obtain an expression for acceptance angle of an optical fiber.	4 Marks	L1	CO2

MODULE-III

6.	a)	Explain the energy band structure of intrinsic and extrinsic semiconductors. Discuss how doping affects their conductivity.	10 Marks	L2	CO3
	b)	Explain Fermi level position in intrinsic and extrinsic semiconductors.	6 Marks	L2	CO3

(OR)

7.	a)	What is the principle of a photodiode? Describe the construction and working of the photodiode with a neat diagram. Recall the application of photodiodes?	8 Marks	L2	CO3
	b)	Explain carrier concentration of intrinsic semiconductors?	8 Marks	L2	CO3

MODULE-IV

8.	a)	What is ferroelectricity?	4 Marks	L1	CO4
	b)	Explain hysteresis loop and its significance in ferroelectric materials	12 Marks	L2	CO4

(OR)

9.	a)	Describe different types of polarization mechanisms in dielectric materials.	8 Marks	L4	CO4
	b)	Discuss their frequency dependence.	8 Marks	L4	CO4

MODULE-V

10.	a)	Describe Pulsed Laser Deposition (PLD) method for nanomaterial preparation.	9 Marks	L2	CO5
	b)	Discuss factors influencing film quality.	7 Marks	L4	CO5

(OR)

11.		Explain the BCS theory of superconductivity qualitatively.	16 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Supplementary Examinations, May– 2026

PHYSICS FOR COMPUTING

[Computer Science and Engineering, Computer Science and Engineering (Cyber Security) Information Technology, Computer Science and Engineering (Cloud Computing), Computer Science and Engineering (DevOps), Computer Science and Engineering (Artificial Intelligence and Data Science) Computer Science and Engineering (Data Science)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is coherence?	2 Marks	L1	CO1
	b)	Define the negative crystal.	2 Marks	L1	CO1
	c)	Explain significance of wave function.	2 Marks	L2	CO2
	d)	Recall matter waves.	2 Marks	L1	CO2
	e)	Describe degeneracy in quantum mechanics.	2 Marks	L2	CO3
	f)	What is tunneling effect?	2 Marks	L1	CO3
	g)	Find the wavelength of GaAs laser associated with E_g= 1.68 eV.	2 Marks	L1	CO4
	h)	Recall the forward and reverse bias.	2 Marks	L1	CO4
	i)	Define acceptance angle.	2 Marks	L1	CO5
	j)	List any two Engineering applications of sensors.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the phenomenon for interference in the thin film by reflection. Derive the equation for dark and bright fringes.	12 Marks	L2	CO1
	b)	Distinguish between interference and diffraction	4 Marks	L4	CO1
		(OR)			
3.	a)	Describe the features of single slit Fraunhofer diffraction.	12 Marks	L2	CO1
	b)	Explain the construction and working of Nicol's Prism.	4 Marks	L2	CO1

MODULE-II

4.	a)	Derive the expression of de Broglie's wavelength of an electron which can be applied potential of V volt.	8 Marks	L1	CO2
	b)	Discuss in detail Davisson and Germer's experiment to verify the existence of matter waves.	8 Marks	L3	CO2
		(OR)			
5.	a)	Derive the expression for time-independent Schrödinger wave equation.	10 Marks	L3	CO2
	b)	Explain the physical significance of the wave function.	6 Marks	L2	CO2

MODULE-III

6.	a)	Describe the phenomenon of tunneling that occurs when a beam of particles is incident on a potential barrier of finite width.	10 Marks	L2	CO3
	b)	Explain the motion of an electron in a periodic lattice.	6 Marks	L2	CO3
		(OR)			
7.	a)	Describe the Kronig-Penny model to study the behavior of electrons in varying periodic potential.	8 Marks	L2	CO3
	b)	Explain the origin of the energy band structure in solids	8 Marks	L2	CO3

MODULE-IV

8.	a)	Define Hall effect. Derive an expression for the Hall coefficient	8 Marks	L1	CO4
	b)	Describe the construction and working mechanism of photodioide. Recall the application of photodoide.	8 Marks	L2	CO4
		(OR)			
9.	a)	Derive an expression for the density of electrons in intrinsic semiconductors.	10 Marks	L3	CO4
	b)	Distinguish the direct and indirect band gap semiconductors with a neat sketch.	6 Marks	L4	CO4

MODULE-V

10.	a)	Discuss the classification of an optical fiber on the basis of refractive index profile and modes of propagation with neat sketches.	12 Marks	L2	CO5
	b)	Illustrate any four applications of optical fibers.	4 Marks	L2	CO5
		(OR)			
11.	a)	Describe the structure of an optical fiber.	8 Marks	L2	CO5
	b)	Derive an expression for acceptance angle of an optical fiber.	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA I Semester (MBU-25) Supplementary Examinations, May – 2026

COMPUTER FUNDAMENTALS AND ORGANIZATION

[Computer Applications]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define an algorithm.	2 Marks	L1	CO1
	b)	Write any two functions of the input unit.	2 Marks	L1	CO1
	c)	What is the difference between ROM and RAM?	2 Marks	L1	CO2
	d)	Explain the machine language.	2 Marks	L2	CO2
	e)	What is floating-point representation?	2 Marks	L1	CO3
	f)	Define Boolean function.	2 Marks	L1	CO3
	g)	Define instruction code.	2 Marks	L1	CO4
	h)	Define addressing mode.	2 Marks	L1	CO4
	i)	Define interleaving in memory systems.	2 Marks	L1	CO5
	j)	Define block size in cache memory.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the simple model of a computer with a neat diagram.	8 Marks	L2	CO1
	b)	Describe the characteristics of a computer in detail.	8 Marks	L2	CO1

(OR)

3.	a)	What are error detecting codes? Explain with examples.	8 Marks	L2	CO1
	b)	Describe the working of a touch screen and its applications.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the working principles of flat-panel display technology?	8 Marks	L2	CO2
	b)	Describe how an E-ink display works. Discuss its advantages and applications ?	8 Marks	L2	CO2

(OR)

5.	a)	Explain the memory hierarchy in detail with a neat diagram.	8 Marks	L2	CO2
	b)	Describe the structure of instructions in a processor and explain its components.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain binary addition and subtraction with suitable examples.	8 Marks	L2	CO3
	b)	Discuss signed number representations in binary systems.	8 Marks	L2	CO3

(OR)

7.	a)	Explain and illustrate the duality principle in Boolean algebra.	8 Marks	L2	CO3
	b)	Design a logic circuit for a half adder and full adder using logic gates.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain instruction codes and their components with examples.	8 Marks	L2	CO4
	b)	Describe the various types of computer registers and their functions.	8 Marks	L2	CO4
		(OR)			
9.	a)	Explain stack organization and its role in instruction execution.	8 Marks	L2	CO4
	b)	Illustrate different types of instruction formats with examples.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain semiconductor memory technologies and their types.	8 Marks	L2	CO5
	b)	Describe the concept and importance of memory hierarchy in computer systems.	8 Marks	L2	CO5
		OR)			
11.	a)	Evaluate the performance of different cache replacement policies.	8 Marks	L2	CO5
	b)	Explain the different write policies used in cache memory systems.	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA I Semester (MBU-25) Supplementary Examinations, May – 2026

DATABASE MANAGEMENT SYSTEMS

[Computer Applications]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is the purpose of a database system ?	2 Marks	L1	CO1
	b)	What is database design ?	2 Marks	L1	CO1
	c)	What is a NULL value in SQL?	2 Marks	L2	CO2
	d)	What is the difference between a base table and a view?	2 Marks	L1	CO2
	e)	What is the purpose of the GROUP BY clause in SQL ?	2 Marks	L1	CO3
	f)	Explain any two comparison operators ?	2 Marks	L1	CO3
	g)	What is the main goal of the BCNF?	2 Marks	L1	CO4
	h)	Define the term schema refinement ?	2 Marks	L2	CO4
	i)	What is concurrency control in database systems?	2 Marks	L2	CO5
	j)	What is a clustered index?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the three-tier database architecture. How does it improve performance and security compared to a single-tier or two-tier architecture?	8 Marks	L2	CO1
	b)	Explain the process of database design. How does the Entity-Relationship (ER) model help in conceptual database design?	8 Marks	L4	CO1

(OR)

3.	a)	What are the different types of database users? Describe their roles and how they interact with the database system.	8 Marks	L2	CO1
	b)	Describe entities, attributes, and entity sets in the context of the ER model. Provide examples to explain how they are used in database design.	8Marks	L2	CO1

MODULE-II

4.	a)	How can tables and views be altered or destroyed in a relational database? Provide SQL commands and examples?	8 Marks	L2	CO2
	b)	Discuss the process of destroying (dropping) and altering tables and views in a relational database. What are the implications of these operations, and how are they handled in SQL?	8 Marks	L3	CO2

(OR)

5.	a)	Describe the use of UNION, INTERSECTION, and DIFFERENCE operators in relational algebra. Provide examples of their use in queries?	8 Marks	L2	CO2

	b)	Discuss the Cartesian product and its role in relational algebra. How is it different from a join operation, and in what scenarios is it used? Provide examples.	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain the concept of transactions in SQL. How are COMMIT, ROLLBACK, and SAVEPOINT used in managing transactions?	8 Marks	L4	CO3
	b)	Explain the concept of indexes in SQL. How do they improve query performance? Discuss different types of indexes (e.g., clustered vs. non-clustered) with examples.	8 Marks	L3	CO3

(OR)

7.	a)	Explain the different data types available in PL/SQL with examples. How do they differ from SQL data types?	8 Marks	L2	CO3
	b)	What is normalization in SQL? Explain the different normal forms (1NF, 2NF, 3NF, BCNF) with examples of how each form eliminates redundancy and ensures data integrity	8 Marks	L3	CO3

MODULE-IV

8.	a)	Discuss transaction durability and how it is maintained in modern databases?	8 Marks	L2	CO4
	b)	Explain Second Normal Form (2NF) with an example. How does 2NF address the issues of partial dependencies?	8 Marks	L3	CO4

(OR)

9.	a)	Discuss the testing methods for serializability in transaction?	8 Marks	L2	CO4
	b)	Explain the concept of a transaction in a database. Discuss the ACID properties (Atomicity, Consistency, Isolation, Durability) of transactions with examples.	8 Marks	L3	CO4

MODULE-V

10.	a)	Discuss different file organization techniques in databases. Provide examples for heap, sequential, and hash-based file organizations?	8 Marks	L2	CO5
	b)	Explain the different types of external storage used in databases. How do these storage mechanisms impact query performance?	8 Marks	L3	CO5

(OR)

11.	a)	What is a clustered index? How does it differ from a non-clustered index? Provide examples to explain your answer?	8 Marks	L2	CO5
	b)	Explain the concept of extendible hashing in databases. How does it handle dynamic data growth, and what are its advantages over static hashing techniques?	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MCA I Semester (MBU-25) Supplementary Examinations, May – 2026

COMPUTATIONAL STATISTICS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List out various measures of Central tendency.	2 Marks	L1	CO1
	b)	Define Statistics	2 Marks	L1	CO1
	c)	Write any 3 math functions in R.	2 Marks	L1	CO2
	d)	Explain the data types in R?	2 Marks	L2	CO2
	e)	Define binomial distribution.	2 Marks	L1	CO3
	f)	Define Poisson distribution.	2 Marks	L1	CO3
	g)	Define correlation	2 Marks	L1	CO4
	h)	Define regression	2 Marks	L1	CO4
	i)	Define null hypothesis	2 Marks	L1	CO5
	j)	Define alternative hypothesis	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2. a) Find mode to the following data: 8 Marks L3 CO1

Class Interval	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40
Frequency	5	7	10	18	20	12	8	2

b) Calculate standard deviation for the following grouped frequency distribution. 8 Marks L3 CO1

Class Interval	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	2	8	16	28	12	4

(OR)

3. a) Calculate Bowley's coefficient of skewness to the following data: 8 Marks L3 CO1

Class Interval	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90
Frequency	2	6	11	20	40	75	45	25	18

b) Calculate mean and median to the following data: 8 Marks L4 CO1

Class Interval	40-50	50-60	60-70	70-80	80-90
Frequency	2	8	16	28	12

MODULE-II

4. a) Explain about Variables and Data Types in R Programming. 8 Marks L2 CO2

b) Define a vector and create i) (2 X 2) matrix and ii) (3 X 3) matrix by using R and implement addition in R. 8 Marks L3 CO2

(OR)

5. a) What is R Studio? Explain its features. 8 Marks L2 CO2

b) Explain R functions with suitable examples? 8 Marks L3 CO2

MODULE-III

6. a) Obtain mean and variance of Poisson distribution. 8 Marks L4 CO3

b) The probability of a man hitting a target 1/4 8 Marks L3 CO3

i) If he fires 7 times, what is the probability of his hitting the target at least twice?

ii) How many times must he fire so that the probability of his hitting the target at least once is greater than 2/3?

(OR)

7. a) If X is a normal variate with mean 30 and standard deviation 5. Find the probabilities that i) $26 \leq X \leq 40$ ii) $X \geq 45$ 8 Marks L3 CO3

b) Show that Binomial distribution tends to Poisson distribution as a limiting case. 8 Marks L4 CO3

MODULE-IV

8. a) Find the rank correlation for the following data. 8 Marks L4 CO4

X	56	42	72	36	63	47	55	49	38	42	68	60
Y	147	12	160	118	19	128	150	145	115	40	152	155

b) Obtain the equations of two lines of regression for the following data. Also obtain the estimate of X for Y = 70. 8 Marks L3 CO4

X	65	66	67	67	68	69	70	72
Y	67	68	65	68	72	72	69	71

(OR)

9. a) Find the rank correlation for the following data 8 Marks L4 CO4

X	65	63	67	64	68	62	70	66	68	67	69	71
Y	68	66	68	65	69	66	68	65	71	67	68	70

b) Compute the coefficient of correlation and the two lines of regression for the following data. 8 Marks L3 CO4

Price X:	14	16	17	18	19	20	21	22	23
Demand Y:	84	78	70	75	66	67	62	58	60

MODULE-V

10. a) Before an increase in excise duty on tea, 800 persons out of a sample of 1000 persons were found to be tea drinkers. After an increase in excise duty, 800people were tea drinkers in a sample of 1200 people. Using standard error of proportion, state whether there is a significant decrease in the consumption of tea after the increase in excise duty? 8 Marks L3 CO5

b) The mean weekly sales of soap bars in departmental stores were 146.3 bars per store. After an advertising campaign the mean weekly sales in 22 stores for a typical week increased to 153.7 and showed a S.D. of 17.2. Was the advertising campaign successful? 8 Marks L3 CO5

(OR)

11. a) Below are given the gain in weights (in lbs) of pigs fed on two diets A and B: 8 Marks L3 CO5

Diet- A	25	32	30	34	24	14	32	24	30	31	35	25	-
Diet- B	44	34	22	10	47	31	40	30	32	35	18	21	35

Test, if the two diets differ significantly as regards their effect on increase in weight. (5% Level of significant)

b) 4 coins were tossed 130 times and the following results were obtained. 8 Marks L3 CO5

No. of heads	0	1	2	3	4
Observed frequencies	17	52	54	31	6

Use the assumption that coins are balanced, find the expected frequencies of 0, 1,s 2, 3 or 4 heads and test the goodness of fit (at 5% LOS).

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MCA I Semester (MBU-25) Supplementary Examinations, May – 2026

COMPUTER ORGANIZATION AND ARCHITECTURE

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List the basic functional units of a computer.	2 Marks	L1	CO1
	b)	What is the role of the control unit?	2 Marks	L2	CO1
	c)	State Booth's Algorithm.	2 Marks	L1	CO2
	d)	Define Addressing Mode.	2 Marks	L1	CO2
	e)	What are control signals?	2 Marks	L1	CO3
	f)	Define Direct Memory Access (DMA).	2 Marks	L1	CO3
	g)	Define cache memory.	2 Marks	L1	CO4
	h)	Differentiate between DRAM and SRAM.	2 Marks	L2	CO4
	i)	What is an Instruction Pipeline?	2 Marks	L1	CO5
	j)	Differentiate between SISD and SIMD architectures	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the basic functional units with block diagram.	8 Marks	L2	CO1
	b)	Describe operational concepts of instruction execution.	8 Marks	L2	CO1

(OR)

3.	a)	Write notes on carry-look ahead adders and their performance benefits.	8 Marks	L2	CO1
	b)	Describe error detection techniques	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the design and functions of Arithmetic Logic Unit.	8 Marks	L2	CO2
	b)	Discuss integer multiplication using Booth's algorithm with an example.	8 Marks	L2	CO2

(OR)

5.	a)	Describe floating-point representation with suitable example.	8 Marks	L2	CO2
	b)	Evaluate the advantages and disadvantages of floating-point arithmetic.	8 Marks	L4	CO2

MODULE-III

6.	a)	Explain different types of micro operations with examples.	8 Marks	L2	CO3
	b)	Discuss the functional requirements of a control unit.	8 Marks	L2	CO3

(OR)

7.	a)	Compare hardwired and micro programmed control units.	8 Marks	L4	CO3
	b)	With a neat diagram, explain internal processor organization.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain the organization of semiconductor main memory with neat diagram.	8 Marks	L2	CO4
	b)	Compare SRAM, DRAM, and ROM with examples.	8 Marks	L4	CO4
		(OR)			
9.	a)	What are the principles of cache memory? Explain in detail.	8 Marks	L2	CO4
	b)	Explain different cache mapping functions with diagrams.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain the different types of parallel processing with examples.	8 Marks	L2	CO5
	b)	Describe the pipeline architecture with neat diagram.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain Non-Uniform Memory Access (NUMA) and its advantages.	8 Marks	L2	CO5
	b)	Analyze the differences between UMA and NUMA.	8 Marks	L4	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MCA I Semester (MBU-25) Supplementary Examinations, May – 2026

SOFTWARE ENGINEERING

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define software engineering.	2 Marks	L1	CO1
	b)	List the major characteristics of good software.	2 Marks	L1	CO1
	c)	What is the purpose of feasibility study in software projects?	2 Marks	L1	CO2
	d)	Distinguish functional and non-functional requirements.	2 Marks	L2	CO2
	e)	What is modular design?	2 Marks	L1	CO3
	f)	Define coupling with an example.	2 Marks	L1	CO3
	g)	What is black-box testing?	2 Marks	L1	CO4
	h)	List any two software quality assurance activities.	2 Marks	L1	CO4
	i)	What is project risk management?	2 Marks	L1	CO5
	j)	Define Agile methodology.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain various software process models with suitable diagrams.	8 Marks	L2	CO1
	b)	Discuss software engineering principles with examples.	8 Marks	L2	CO1
		(OR)			
3.	a)	Explain the role of project feasibility analysis.	8 Marks	L2	CO1
	b)	Write short notes on software project planning activities.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain requirements elicitation techniques with examples.	8 Marks	L2	CO2
	b)	Prepare a sample SRS for an online banking system.	8 Marks	L4	CO2
		(OR)			
5.	a)	Explain requirements validation process in detail.	8 Marks	L2	CO2
	b)	Write about functional and non-functional requirements with examples.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain design concepts and principles with examples.	8 Marks	L2	CO3
	b)	Write short notes on UML diagrams used in system design.	8 Marks	L2	CO3
		(OR)			
7.	a)	What are the different types of architectural styles in software design?	8 Marks	L1	CO3
	b)	Explain modular design and its advantages.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain different software testing strategies.	8 Marks	L2	CO4
	b)	What are the software quality assurance activities?	8 Marks	L1	CO4
		(OR)			
9.	a)	Explain white-box testing techniques with examples.	8 Marks	L2	CO4
	b)	Discuss software reliability and metrics.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain project planning and scheduling activities.	8 Marks	L2	CO5
	b)	Discuss software maintenance process models.	8 Marks	L2	CO5
		(OR)			
11.	a)	Write about risk management in software projects.	8 Marks	L2	CO5
	b)	Explain the role of CASE tools in software project management.	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MCA I Semester (MBU-25) Supplementary Examinations, May – 2026

DATABASE MANAGEMENT SYSTEMS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is the purpose of SQL ?	2 Marks	L1	CO1
	b)	Define primary key ?	2 Marks	L1	CO1
	c)	What is a candidate key?	2 Marks	L1	CO2
	d)	What is the purpose of a CHECK constraint in SQL?	2 Marks	L1	CO2
	e)	What is a transaction in SQL?	2 Marks	L1	CO3
	f)	What does the DISTINCT keyword do in SQL?	2 Marks	L1	CO3
	g)	What is Transitive Dependency?	2 Marks	L1	CO4
	h)	What is a functional dependency?	2 Marks	L1	CO4
	i)	What is the difference between a shared lock and an exclusive lock?	2 Marks	L1	CO5
	j)	What is deadlock detection?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the role of a Database Management System in modern applications. Provide examples of its use in real-world industries.	8 Marks	L2	CO1
	b)	Discuss the purpose of database systems and explain how they differ from traditional file systems. What advantages do database systems provide over file systems?	8 Marks	L2	CO1

(OR)

3.	a)	Discuss the concept of data abstraction in database systems. How do different levels of abstraction enhance database management?	8 Marks	L2	CO1
	b)	Differentiate between instances and schemas in a database system. Illustrate your explanation with examples.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the process of creating and modifying relations in a relational database. Provide SQL examples of creating and modifying tables?	8 Marks	L2	CO2
	b)	Explain the process of querying relational data using SQL. Describe the syntax and structure of a basic SQL query, and provide examples of SELECT statements involving filtering, sorting, and joining tables.	8 Marks	L3	CO2

(OR)

5.	a)	What are integrity constraints in a relational database? Discuss the various types of integrity constraints with examples?	8 Marks	L2	CO2
	b)	How are integrity constraints enforced in a relational database system? Provide examples of how foreign key, primary key, and check constraints are maintained.	8 Marks	L3	CO2

MODULE-III

6.	a)	Discuss the advantages and limitations of nested queries. Provide examples of correlated and non-correlated subqueries?	8 Marks	L2	CO3
	b)	Discuss the concept of nested queries in SQL. How do subqueries work in the WHERE, FROM, and SELECT clauses? Provide examples to demonstrate each usage.	8 Marks	L3	CO3

(OR)

7.	a)	How do aggregate operators like SUM, COUNT, AVG, MAX, and MIN work? Illustrate their use with examples?	8 Marks	L2	CO3
	b)	Explain the structure of a basic SQL query and describe how the WHERE, ORDER BY, and GROUP BY clauses work together. Provide an example query using all three.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Define functional dependencies and explain their significance in schema refinement?	8 Marks	L2	CO4
	b)	What problems are caused by redundancy in database schemas? Explain how redundancy can lead to update, deletion, and insertion anomalies with suitable examples.	8 Marks	L3	CO4

(OR)

9.	a)	Explain First Normal Form with an example. What are its limitations?	8 Marks	L2	CO4
	b)	What are functional dependencies (FDs)? Discuss the role of FDs in schema design, and explain Armstrong's axioms with examples.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain the working of lock-based protocols in concurrency control. What are the benefits and limitations of this approach?	8 Marks	L2	CO5
	b)	What is the two-phase locking (2PL) protocol? Explain the phases involved and discuss how 2PL ensures serializability. Provide an example of its implementation.	8 Marks	L3	CO5

(OR)

11.	a)	Discuss the Two-Phase Locking protocol in detail. How does it ensure serializability?	8 Marks	L2	CO5
	b)	What is Strict Two-Phase Locking (Strict 2PL)? How does it differ from the basic two-phase locking protocol? What are its advantages and disadvantages?	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MCA I Semester (MBU-25) Supplementary Examinations, May – 2026

CLOUD COMPUTING

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define 'virtualization' in the context of cloud computing.	2 Marks	L1	CO1
	b)	What are the three main cloud delivery models?	2 Marks	L1	CO1
	c)	What is virtualization and why is it important for cloud environments?	2 Marks	L2	CO2
	d)	Name two technologies that enable cloud-based web services.	2 Marks	L1	CO2
	e)	What is non-disruptive service relocation, and why is it crucial for cloud operations?	2 Marks	L1	CO3
	f)	Explain the concept of zero downtime in cloud architectures.	2 Marks	L2	CO3
	g)	What role does compliance play in cloud security considerations?	2 Marks	L1	CO4
	h)	Give an example of a real-world cloud security incident.	2 Marks	L2	CO4
	i)	Provide an example of a SaaS application and briefly describe its primary function.	2 Marks	L2	CO5
	j)	What are the main benefits of using IaaS for businesses?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Analyze the benefits and challenges of adopting cloud computing for small and medium enterprises.	8 Marks	L3	CO1
	b)	Examine the role of virtualization in cloud computing. How does it enable resource pooling and scalability in cloud environments?	8 Marks	L3	CO1

(OR)

3.	a)	What are the main security risks associated with cloud computing, and how can organizations mitigate these risks?	8 Marks	L2	CO1
	b)	Discuss the concept of multi-tenancy in cloud computing. How does it affect security, resource allocation, and cost-efficiency?	8 Marks	L2	CO1

MODULE-II

4.	a)	What is multitenant technology, and how does it enable cost-efficiency and scalability in cloud environments?	8 Marks	L2	CO2
	b)	Describe service-oriented architecture and its role in the development of cloud services.	8 Marks	L2	CO2

(OR)

5.	a)	Discuss the advantages and challenges of using resource pooling in cloud computing.	8 Marks	L2	CO2
	b)	Explain the concept of workload distribution in cloud computing and how it improves system performance and availability.	8 Marks	L2	CO2

MODULE-III

6.	a)	Analyze the importance of cloud balancing in resource management. How does it help in optimizing resource utilization across multiple cloud environments?	8 Marks	L3	CO3
	b)	Explain resource reservation in cloud computing. Discuss its role in guaranteeing service levels and how it affects resource allocation.	8 Marks	L2	CO3

(OR)

7.	a)	What are the methods for dynamic failure detection and recovery in cloud architectures? Discuss how these methods contribute to system reliability.	8 Marks	L2	CO3
	b)	Describe bare-metal provisioning and its advantages over traditional virtualization in specific use cases, such as high-performance computing.	8 Marks	L2	CO3

MODULE-IV

8.	a)	How do human factors contribute to cloud security vulnerabilities? Discuss the importance of training and awareness programs in mitigating these risks.	8 Marks	L3	CO4
	b)	Evaluate the shared responsibility model in cloud computing. How does this model affect the security responsibilities of cloud providers and customers?	8 Marks	L3	CO4

(OR)

9.	a)	What are the challenges organizations face when implementing cloud security measures? Discuss strategies to overcome these challenges.	8 Marks	L2	CO4
	b)	Analyze the importance of incident response planning in cloud security. How can organizations prepare for potential security breaches?	8 Marks	L2	CO4

MODULE-V

10.	a)	How do integration and interoperability affect the adoption of SaaS in enterprises? Discuss the importance of APIs in this context.	8 Marks	L3	CO5
	b)	Define Platform as a Service and discuss its key components. How does PaaS facilitate the development and deployment of applications?	8 Marks	L3	CO5

(OR)

11.	a)	Examine the benefits of using PaaS solutions, such as Google App Engine and Microsoft Azure. How do they enhance developer productivity and innovation?	8 Marks	L3	CO5
	b)	Analyze the role of PaaS in the context of DevOps practices. How does PaaS support continuous integration and continuous deployment pipelines?	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA I Semester (MBU-25) Supplementary Examinations, May – 2026

MATRIX THEORY AND LINEAR ALGEBRA

[Computer Applications]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Find the Inverse of the matrix $\begin{bmatrix} 4 & 3 \\ 12 & 2 \end{bmatrix}$	2 Marks	L1	CO1
	b)	Define Singular and Non-Singular Matrix	2 Marks	L1	CO1
	c)	Write any two properties of Eigenvalues.	2 Marks	L1	CO2
	d)	If $A = \begin{bmatrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{bmatrix}$, Find sum and product of Eigen values of A.	2 Marks	L2	CO2
	e)	What are linearly independent vectors.	2 Marks	L1	CO3
	f)	Define Basis of Vector Space and Finite Dimensional Space.	2 Marks	L1	CO3
	g)	Write the properties oflinear transformations.	2 Marks	L1	CO4
	h)	Define Transformation.	2 Marks	L1	CO4
	i)	Write Triangle Inequality and Schwarz Inequality.	2 Marks	L1	CO5
	j)	Define Orthogonal and Orthonormal sets of inner product spaces.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.		Solve the equations by LU decomposition method $2x - 3y + 10z = 3; -x + 4y + 2z = 20; 5x + 2y + z = -12$.	16 Marks	L2	CO1

(OR)

3.	a)	Test for consistency and hence solve the system of equations $x + y + 2z = 4; 2x - y + 3z = 9; x - y - z = 2$	8 Marks	L2	CO1
	b)	Expressing a matrix $A = \begin{bmatrix} 1 & 2 & 0 \\ 0 & 1 & 3 \\ 3 & 8 & 7 \end{bmatrix}$ as a product of elementary matrices.	8 Marks	L3	CO1

MODULE-II

4. a) Determine the Eigen values and Eigen vectors of $B = 2A^2 - \frac{1}{2}A + 3I$, where $A = \begin{bmatrix} 8 & -4 \\ 2 & 2 \end{bmatrix}$. 8 Marks L1 CO2

b) Find the Eigen values of A^{-1} and A^3 of the matrix $A = \begin{bmatrix} 1 & 0 & -1 \\ 1 & 2 & 1 \\ 2 & 2 & 3 \end{bmatrix}$. 8 Marks L1 CO2

(OR)

5. a) Verify the caley-Hamilton theorem for the matrix, if the matrix $A = \begin{bmatrix} 1 & 2 & -3 \\ 0 & 3 & 2 \\ 0 & 0 & -2 \end{bmatrix}$. 8 Marks L2 CO2

b) Find a matrix P which transform the matrix $A = \begin{bmatrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{bmatrix}$ to diagonal form. 8 Marks L1 CO2

MODULE-III

6. a) Show that the set P_n of all polynomials of degree less than or equal to n is a vector space. 8 Marks L2 CO3

b) In vector space P_2, determine whether the set of vectors $B = \{1+x, 1+x^2, 1-x+x^2\}$ form a basis or not. 8 Marks L2 CO3

(OR)

7. a) In $V = M_{22}$, determine the set of matrices $\left\{\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}, \begin{bmatrix} 1 & 1 \\ 1 & 0 \end{bmatrix}, \begin{bmatrix} 1 & 1 \\ -1 & 1 \end{bmatrix}\right\}$ is a basis or not. 8 Marks L2 CO3

b) Write four fundamental subspaces of matrix and give an example. 8 Marks L1 CO3

MODULE-IV

8. a) Find the kernel and Range of the differential operator $D: P_3 \to P_2$ defined by $D(p(x)) = p'(x)$. 8 Marks L1 CO4

b) Let $T: R^2 \to R^3$ be a linear transformation for which $T\begin{bmatrix} 1 \\ 0 \end{bmatrix} = \begin{bmatrix} 1 \\ 2 \\ -1 \end{bmatrix}$ and $T\begin{bmatrix} 0 \\ 1 \end{bmatrix} = \begin{bmatrix} 3 \\ 0 \\ 4 \end{bmatrix}$, then find $T\begin{bmatrix} 5 \\ 2 \end{bmatrix}$ and $T\begin{bmatrix} a \\ b \end{bmatrix}$. 8 Marks L2 CO4

(OR)

9. a) Define the following terms (i) Linear Transformation (ii) Range of a linear transformation (iii) Kernel of a transformation. 8 Marks L1 CO4

b) Verify that the mapping $T: R^2 \to P_1$ and $T': P_1 \to R^2$ defined by $T\begin{bmatrix} a \\ b \end{bmatrix} = a + (a+b)x$ and $T'\begin{bmatrix} c \\ d \end{bmatrix} = \begin{bmatrix} c \\ d-c \end{bmatrix}$ are inverses. 8 Marks L2 CO4

MODULE-V

10.	a)	Find the singular value decomposition of the matrix $\begin{bmatrix} 1 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$.	10 Marks	L1	CO5
	b)	In the inner product space $R^3(R)$ with respect to the standard inner product, prove that the set $X = \{(1,1,0),(1,-1,1),(-1,1,2)\}$ is an orthogonal set.	6 Marks	L2	CO5

(OR)

11.	a)	Find the normalize $\alpha = \left(\frac{1}{2},\frac{1}{3},-\frac{1}{4}\right)$ in the inner product space of $R^3(R) = V_3(R)$.	8 Marks	L1	CO5
	b)	Prove that the set $S = \left\{\left(\frac{1}{3},-\frac{2}{3},-\frac{2}{3}\right),\left(\frac{2}{3},-\frac{1}{3},\frac{2}{3}\right),\left(\frac{2}{3},\frac{2}{3},-\frac{1}{3}\right)\right\}$ is an orthonormal set in R^3 with standard inner product.	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Supplementary Examinations, May– 2026

DISCRETE MATHEMATICAL STRUCTURES

[Computer Science and Engineering (Data Science),
Computer Science and Engineering (Artificial Intelligence and Machine Learning)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define Principle Disjunctive Normal Forms and give an example.	2 Marks	L1	CO1
	b)	Write the truth table for $(p \to q) \vee (q \to p)$	2 Marks	L2	CO1
	c)	What is a partition of a set and give an example?	2 Marks	L1	CO2
	d)	Define the inverse of a relation R with an example.	2 Marks	L3	CO2
	e)	What are Basic and Inductive steps in Mathematical Induction?	2 Marks	L1	CO3
	f)	Define: i) Semigroup ii) Monoid	2 Marks	L1	CO3
	g)	When is a recurrence relation said to be Homogeneous and Non-Homogeneous?.	2 Marks	L3	CO4
	h)	Define generating function oa a Sequence and give an example.	2 Marks	L2	CO4
	i)	Define a connected graph and a disconnected graph.	2 Marks	L3	CO5
	j)	Define a path and the length of a path..	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Show that $P \to (Q \vee R) \Leftrightarrow (P \to Q). \vee (P \to R)$ using truth table.	8 Marks	L3	CO1
	b)	Find principal disjunctive normal form using truth table for $P \to ((P \to Q) \wedge \neg(\neg Q \vee \neg P))$.	8 Marks	L2	CO1

(OR)

3.	a)	Show that $((P \vee Q) \wedge (\neg(P \wedge (\neg Q \vee \neg R)) \vee (\neg P \wedge \neg Q) \vee (\neg P \wedge \neg R)$ is a Tautology	8 Marks	L3	CO1
	b)	Without using truth table, Obtain the PCNF of $P \to ((P \to Q) \wedge \neg(\neg Q \vee P))$.	8 Marks	L5	CO1

MODULE-II

4.	a)	Define a relation on a set and discuss the properties of reflexivity, symmetry, and transitivity with an example for each property.	8 Marks	L3	CO2
	b)	For the poset [{(3,5,9,15,24,45)};divisor of], find. i) The Upper Bounds and LUB of {3,5} ii) The Lower Bounds and GLB of {15,45}	8 Marks	L2	CO2

(OR)

5.	a)	Define a binary relation with an example. Let R be the relation from the set A = { 3, 5,7} on itself and defined by R = { (3, 3), (7, 3), (5, 5), (7, 7)} then find the matrix of R and draw the digraph of R.	8 Marks	L3	CO2
	b)	Prove that the function f:R→R defined by $f(x)=\frac{(x-1)}{2}$ is invertible and find its inverse.	8 Marks	L2	CO2

MODULE-III

6.	a)	Show that the set Q^+ of all positive rational numbers forms a group under the operation * defined by $a * b = \frac{1}{2}ab$; $a, b \in Q^+$.	8 Marks	L2	CO3
	b)	Prove by mathematical induction, that $\frac{1}{1.2}+\frac{1}{2.3}+\ldots+\frac{1}{n.(n+1)}=\frac{n}{n+1}$	8 Marks	L4	CO3

(OR)

7.	a)	Show that set of all roots of the equation $x^4=1$ forma a Group under multiplication.	8 Marks	L4	CO3
	b)	Use mathematical induction to prove that n^3+2n is divisible by 3, for $n \geq 1$.	8 Marks	L2	CO3

MODULE-IV

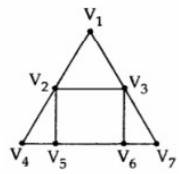
8.	a)	Solve the recurrence relation by the method of generating function $a_{n+1}-a_n=3n^2-n\ ;\ n\geq 0,\ a_0=3$.	8 Marks	L2	CO4
	b)	Find the Generating function for the following sequences i) $1^2, 2^2, 3^2, \ldots\ldots$ ii) $a_n=3^n, n\geq 0$	8 Marks	L3	CO4

(OR)

9.	a)	Solve the recurrence relation by the method of generating function $a_n=2a_{n-1}+2^n\ ;\ a_0=2$	8 Marks	L2	CO4
	b)	i) Find the coefficient of x^{27} in $(x^4+x^5+x^6---)^5$. ii) Find the sequence generated by the function $(2+x)^3$.	8 Marks	L2	CO4

MODULE-V

10.	a)	Find the degree of each vertex in the given graph.	8 Marks	L3	CO5



	b)	i) State four properties of Tree. ii) Define: a) Rooted Tree b) Binary Tree with an give one example each.	8 Marks	L4	CO5

(OR)

11.	a)	Define: i) Graph ii) Simple Graph iii) Null graph iv) Connected Graph by giving an example each.	8 Marks	L1	CO5
	b)	Write Algorithm for constructing minimum spanning trees using i) Prim's Algorithm ii) Kruskal's Algorithm	8 Marks	L5	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Supplementary Examinations, May– 2026

ENGINEERING CHEMISTRY

[Electronics and Communication Engineering, Electronics and Computer Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	List any four specifications of potable water as per WHO & BIS standards.	2 Marks	L1	CO1
	b)	What are the salts that are responsible for temporary and permanent hardness?	2 Marks	L1	CO1
	c)	Write the synthesis of Teflon.	2 Marks	L1	CO2
	d)	Define polymer. Give an example.	2 Marks	L1	CO2
	e)	Give the examples of primary and secondary cell.	2 Marks	L1	CO3
	f)	What are sensors? Give an example.	2 Marks	L1	CO3
	g)	State Beer-lambert's law.	2 Marks	L1	CO4
	h)	Recall the various types of energy present in a molecule.	2 Marks	L1	CO4
	i)	What are eco-friendly fuels? Give an example.	2 Marks	L1	CO5
	j)	Write any four characteristics of a good fuel.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.		Explain the ion exchange process with a neat diagram. Write its advantages over the zeolite process.	16 Marks	L2	CO1
		(OR)			
3.	a)	Describe the estimation hardness by the EDTA method.	10 Marks	L2	CO1
	b)	Calculate the total, temporary and permanent hardness of the water sample with 0.5 g of $CaCO_3$ dissolved in dil HCl, and the solution was made up to 500 ml with distilled water. 50 mL of the solution required 48 ml of the EDTA solution for the titration. 50 ml of hard water sample required 15 ml of EDTA and after boiling and filtering required 10 ml of the EDTA solution.	6 Marks	L3	CO1

MODULE-II

4.		Explain in detail the classification of conducting polymers.	16 Marks	L2	CO2
		(OR)			
5.	a)	Describe the various properties of nanomaterials.	8 Marks	L2	CO2
	b)	Illustrate the synthesis of nanomaterials by the CVD method.	8 Marks	L2	CO2

MODULE-III

6.		Discuss the construction, working, and applications of the H_2-O_2 fuel cell. Explain the advantages of fuel cells.	16 Marks	L2	CO3
		(OR)			
7.		Describe the construction and working of Lithium-ion batteries with a neat diagram and list their applications. List its advantages over a primary battery.	16 Marks	L2	CO3

MODULE-IV

8.		Discuss the instrumentation and working of the UV-spectrophotometer with a block diagram. Write its applications.	16 Marks	L2	CO4
		(OR)			
9.		Explain the working principle and applications of SEM and TEM.	16 Marks	L2	CO4

MODULE-V

10.	a)	Describe the manufacture of gasoline by the Bergius process with a neat diagram.	10 Marks	L2	CO5
	b)	Calculate the gross and net calorific values of a coal sample containing 84% carbon, 1.5% sulphur, 0.6% nitrogen, 5.5 % hydrogen, and 8.4% oxygen.	6 Marks	L3	CO5
		(OR)			
11.		What is lubrication? Illustrate the various types of the mechanism of lubrication.	16 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Supplementary Examinations, May– 2026

DIGITAL LOGIC DESIGN

[Computer Science and Engineering, Computer Science and Engineering (Cyber Security), Information Technology, Computer Science and Engineering (Cloud Computing), Computer Science and Engineering (Artificial Intelligence and Data Science), Computer Science and Engineering (DevOps)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Convert $(2BDC)_{16}$ to binary and Hexadecimal	2 Marks	L2	CO1
	b)	Convert $(267.54)_8$ to binary	2 Marks	L2	CO1
	c)	Simplify F(x, y, z) = x'yz'+xy'z+x'z'	2 Marks	L3	CO1
	d)	Simplify F(x, y, z) = Σ (3, 4, 6, 7) using K-map.	2 Marks	L3	CO1
	e)	Write the sum and carry expression for half adder	2 Marks	L2	CO2
	f)	Draw the block diagram of 2x4 decoder with enable input.	2 Marks	L1	CO2
	g)	Draw the logic diagram of SR NAND Latch.	2 Marks	L2	CO3
	h)	State Mealy and Moore state machines with its block diagrams.	2 Marks	L1	CO3
	i)	How many fuses were required for n inputs, k Product terms and m outputs of a typical PLA circuit?	2 Marks	L2	CO4
	j)	Define EPROM	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Perform BCD Addition of the two decimal numbers 679.6 and 536.8	8 Marks	L2	CO1
	b)	Find compliment of the function, F = xy'z' + xyz, using De-Morgan's theorem.	8 Marks	L2	CO1

(OR)

3.	a)	Let X = 74581 and Y = 43662. Perform X - Y using 9'S complement and 10'S complement.	10 Marks	L2	CO1
	b)	Minimize the following functions using Boolean algebra	6 Marks	L3	CO1

i) y'z' + w'x'z' + w'xyz' + wyz'
ii) ABC + A'B'C + A'BC +ABC' + A'B'C'

MODULE-II

4.		Simplify the Boolean function using K-map i) F (A.B, C, D) = A'B'C'+ B'CD'+ A'BCD'+AB'C' ii) F (W,X,Y,Z) = Σm (0,6,8,13,14) + Σd (2,4,10)	16 Marks	L3	CO2

(OR)

5.	a)	Simplify the following Boolean function using K-map method. $F(w,x,y,z) = \sum_m (0,2,4,5,6,7,8,10,13,15)$	8 Marks	L3	CO2
	b)	Minimize the function F(A, B, C, D)=∑m(0,4,6,8,9,10,12) +∑d (2,13). Implement the minimized function using only NOR gates.	8 Marks	L3	CO2

MODULE-III

6.	a)	Construct a 16×1 multiplexer with two 8×1 and one 2×1 multiplexers using block diagram representation.	10 Marks	L2	CO3
	b)	Design a circuit for 3×3 bit binary multiplier.	6 Marks	L3	CO3

(OR)

7.	a)	Construct a 4-to-16 line decoder with five 2-to-4 line decoders with enable.	8 Marks	L1	CO3
	b)	Demonstrate half adder and full adder using decoder and OR gates	8 Marks	L2	CO3

MODULE-IV

8.	a)	What is race-around problem in JK Flip-Flop? Explain how it is eliminated in Master Slave Flip-Flop with its neat logic diagram.	6 Marks	L2	CO3
	b)	Design Mod-10 Counter using T Flip-Flops.	10 Marks	L3	CO3

(OR)

9.	a)	Design of a synchronous BCD up counter using T Flip-Flop.	8 Marks	L3	CO3
	b)	Draw a 3 bit Johnson counter and explain.	8 Marks	L2	CO3

MODULE-V

10.	a)	Explain in detail about ROM	6 Marks	L1	CO4
	b)	Implement the following Boolean functions using PAL with AND-OR structure. F1 (A,B,C,D)=∑m(2,12,13) F2 (A,B,C,D)=∑m(7,8,9,10,11,12,13,14,15) F3 (A,B,C,D)=∑m(0,2,3,4,5,6,7,8,10,11,15) F4 (A,B,C,D)=∑m(1,2,8,12,13)	10 Marks	L2	CO4

(OR)

11.	a)	Explain in detail about FPGA	8 Marks	L1	CO4
	b)	Explain in detail about CPLD	8 Marks	L1	CO4

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Supplementary Examinations, May– 2026

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

[Computer Science and Engineering (Data Science),
Computer Science and Engineering (Artificial Intelligence and Machine Learning)]

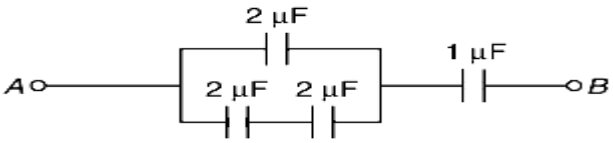
Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define lumped and distributed elements with examples.	2 Marks	L2	CO1
	b)	What is the equivalent capacitance between terminals A and B in the given network?	2 Marks	L1	CO1



	c)	Select the suitable motor which is used in elevator. Sketch its equivalent circuit.	2 Marks	L2	CO2
	d)	List some important characteristics should be noted in stepper motor.	2 Marks	L1	CO2
	e)	State some recommended Illumination levels for Street lighting.	2 Marks	L1	CO3
	f)	Mention the important factors to be considered while selecting the Filament Lamp.	2 Marks	L1	CO3
	g)	State Piezo electric effect.	2 Marks	L1	CO4
	h)	How transducers are classified based on working principle?	2 Marks	L1	CO4
	i)	Sketch the pin diagram of Op-amps.	2 Marks	L1	CO1
	j)	Enumerate the difference between Avalanche breakdown and zener breakdown.	2 Marks	L1	CO1

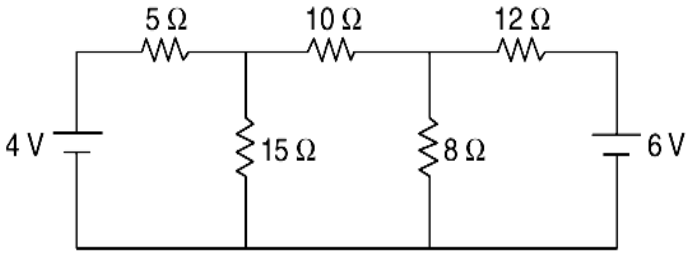
PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

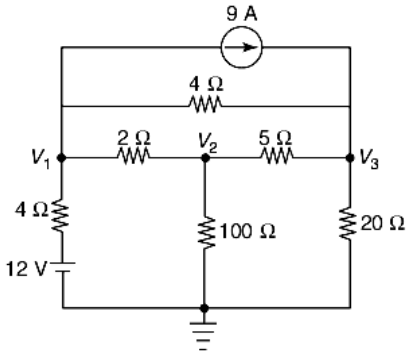
5 X 16 = 80 Marks

MODULE-I

2.	a)	Using mesh Analysis, find the current through the 10 Ω resistor.	8 Marks	L3	CO1



b) Using Nodal Analysis, Find the voltage across the 5 Ω resistor for the network shown in Fig. 8 Marks L3 CO1



(OR)

3. a) With neat sketch, Explain the working of single loop generator. 10 Marks L2 CO1

b) An Alternating Current of i(t)=275sin(628t+30°) is given to the system. Find the following parameters. 6 Marks L2 CO1

i) Supply frequency
ii) Maximum Current
iii) RMS Current
iv) Time Period
v) Instantaneous current at t=100ms

MODULE-II

4. a) Select the suitable AC motor for varying the speed by connecting the external resistance. Explain the construction and working with neat sketch. Mention its applications. 10 Marks L2 CO2

b) Derive the EMF equation of single-phase transformer. 6 Marks L3 CO2

(OR)

5. a) Classify different types of wiring schemes. Explain the various types of wiring in detail. Mention its advantages and disadvantages. 8 Marks L1 CO2

b) Define relay. Explain the working principle of relay with neat sketch. 8 Marks L1 CO2

MODULE-III

6. a) With neat sketch, Explain the working principle of fluorescent lamp. Mention its advantage and disadvantages. 8 Marks L1 CO3

b) A hall of 30m long and 12m wide is to be illuminated and the illumination required is 50 lumens per meter. Calculate the number of lamps, the wattage of each unit and the location and mounting height of the units, taking a depreciation factor of 1.3 and utilization coefficient of 0.5. Given the outputs of the different types of lamps are as below: 8 Marks L3 CO3

Watts	100	200	300	500	1000
Lumens	1615	3650	4700	9950	21500

(OR)

7. a) With neat sketch, Explain the operation of Ni-Cd battery with the help of chemical formulas. 8 Marks L3 CO3

b) A lamp having a candle power of 200 in all directions is provided with a reflector which directs 68% of total light uniformly on a circular area 20m in diameter. The lamp is 12m long above the area. Calculate the 8 Marks L3 CO3

i) Illumination
ii) Illumination at center and
iii) Illumination at the edge of the surface without reflector

MODULE-IV

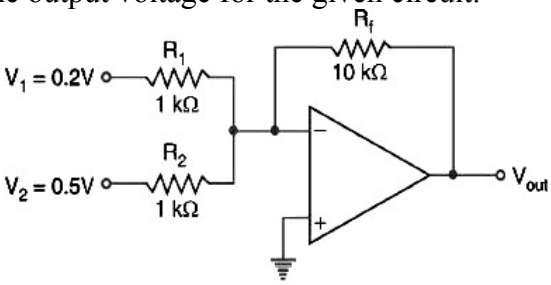
8.	a)	With neat sketch, Explain the working principle of Voltage Sensor with its types. Mention its advantage and disadvantages.	8 Marks	L2	CO4
	b)	Explain the construction and working of Wireless Bluetooth sensor with neat sketch.	8 Marks	L2	CO4

(OR)

9.	a)	Define Hall Effect. With neat sketch, explain the working of Hall Effect Transducer. Mention its advantage and disadvantages.	8 Marks	L2	CO4
	b)	Define Data Acquisition system. With neat Block diagram, Explain the digital Data Acquisition system.	8 Marks	L2	CO4

MODULE-V

10.	a)	Recommend the suitable device to convert AC supply to DC supply which is having efficiency of 80.6%. Explain the operation with neat circuit diagram and waveforms.	8 Marks	L2	CO5
	b)	Determine the output voltage for the given circuit.	8 Marks	L3	CO5



(OR)

11.	a)	With neat sketch, explain the operation of Successive approximation type ADC with an example.	8 Marks	L2	CO5
	b)	Design the 3-bit R-2R Digital to Analog conversion using inverting Op-Amp also derive an expression for the output voltage.	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Supplementary Examinations, May– 2026

FUNDAMENTALS OF ELECTRICAL ENGINEERING

[Civil Engineering, Mechanical Engineering, Electronics and Communication Engineering, Electronics and Computer Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List the steps involved in performing mesh analysis for a DC circuit.	2 Marks	L1	CO1
	b)	Define the term "nodal analysis" and its use in DC circuits.	2 Marks	L1	CO1
	c)	State the relationship between impedance and admittance.	2 Marks	L1	CO2
	d)	What is the quality factor in an AC circuit and how is it determined?	2 Marks	L1	CO2
	e)	Name the different starting methods used for single-phase induction motors.	2 Marks	L1	CO3
	f)	What is the role of a split-phase winding in an induction motor?	2 Marks	L1	CO3
	g)	Differentiate between PMBLDC and VR type stepper motors.	2 Marks	L1	CO4
	h)	Identify two practical applications of stepper motors in electrical systems.	2 Marks	L1	CO4
	i)	What is the significance of the equivalent circuit of a transformer?	2 Marks	L1	CO5
	j)	State the purpose of open-circuit and short-circuit tests on transformers.	2 Marks	L1	CO5

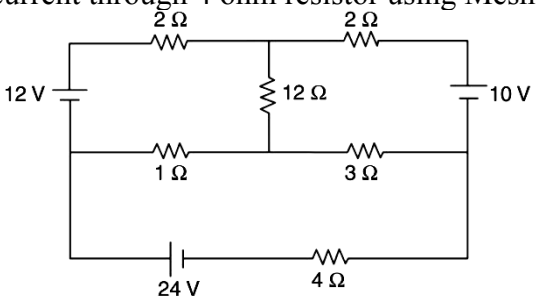
PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

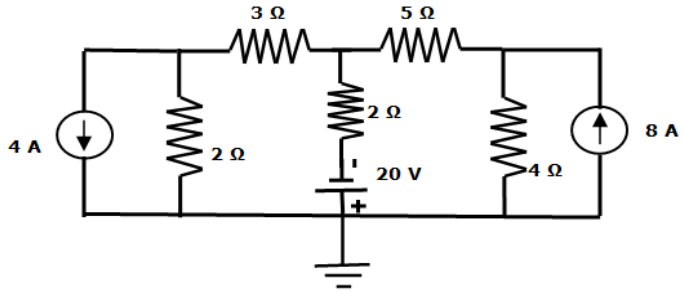
5 x 16 = 80 Marks

MODULE-I

2. a) Determine the current through 4 ohm resistor using Mesh Analysis. 8 Marks L2 CO1

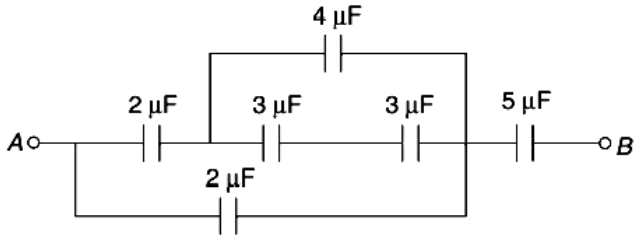


b) Determine the current through 5 ohm resistor using Nodal Analysis 8 Marks L2 CO1

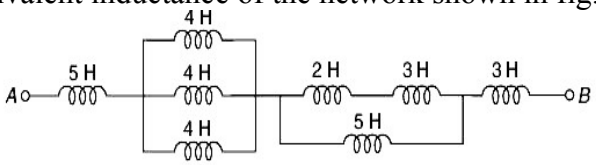


(OR)

3. a) Find the equivalent capacitance for the network shown below 8 Marks L2 CO1



b) Find an equivalent inductance of the network shown in fig. 8 Marks L2 CO1



MODULE-II

4. a) Define the following terms 8 Marks L2 CO2
   i) Real power
   ii) Reactive Power
   iii) Apparent Power
   iv) iv. Power Factor

b) An Alternating Current of i(t)=275sin(628 Markst+30°) is given to the system. Find the following parameters. 8 Marks L2 CO2
   i) Supply frequency
   ii) Maximum Current
   iii) RMS Current
   iv) Time Period

   Instantaneous current at t=100ms

(OR)

5. a) Determine the phasor relationship between voltage and current for the Inductor. 4 Marks L2 CO2

b) For the AC circuit is having a v(t) = 250 sin (ωt+100°) in volts and i(t) = 15 sin (ωt+30°) in Amperes. Determine the power factor, active, reactive and apparent power 12 Marks L2 CO2

MODULE-III

6. a) Draw the construction diagram of a single-phase induction motor and explain each component's function. 8 Marks L3 CO3

b) Analyze the operation of a capacitor start induction motor. 8 Marks L3 CO3

(OR)

7. a) Explain the working principle of a split-phase induction motor and its applications. 8 Marks L3 CO3

b) Compare the starting and running characteristics of capacitor start and split-phase induction motors. 8 Marks L3 CO3

MODULE-IV

8.	a)	With a neat sketch, explain the construction and operation of a PMBLDC motor.	8 Marks	L3	CO4
	b)	Describe the working principle of a VR stepper motor and its applications in precise control systems.	8 Marks	L3	CO4

(OR)

9.	a)	Differentiate between PMBLDC motors and stepper motors with respect to their construction and operation.	8 Marks	L3	CO4
	b)	Discuss the advantages of using PMBLDC motors in applications requiring high power density.	8 Marks	L3	CO4

MODULE-V

10.	a)	Derive the EMF equation for a single-phase transformer and explain each term in detail.	8 Marks	L3	CO5
	b)	For a given transformer, perform an open-circuit test and calculate its efficiency at full load.	8 Marks	L3	CO5

(OR)

11.	a)	Discuss the importance of equivalent circuits in analyzing transformer performance.	8 Marks	L3	CO5
	b)	Calculate the regulation of a transformer using the short-circuit test results.	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Supplementary Examinations, May– 2026

ENGLISH FOR PROFESSIONALS

[Electrical and Electronics Engineering, Computer Science and Engineering, Computer Science and Engineering (Cloud Computing), Information Technology, Computer Science and Engineering (DevOps),Computer Science and Engineering (Artificial Intelligence and Data Science)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	***Complete the statement using a suitable question tag.*** The boys didn't complete the project, _____?	2 Marks	L1	CO2
	b)	***Fill in the blanks using the correct articles.*** I saw _____ one-eyed beggar carrying ___ child.	2 Marks	L1	CO2
	c)	***Write the meaning of the following idiomatic expression.*** Once in a blue moon	2 Marks	L1	CO4
	d)	***Write the meaning of the following idiomatic expression.*** Just beating around the bush	2 Marks	L1	CO4
	e)	***Write the meaning of the following idiomatic expression.*** By hook or crook	2 Marks	L1	CO4
	f)	***Write a one-word substitute for the description.*** One who presents everywhere	2 Marks	L1	CO4
	g)	***Write a one-word substitute for the description.*** A person who does not believe in the existence of God	2 Marks	L1	CO4
	h)	***Fill in the blank using verbs in the correct tense.*** When we reached the class, the teacher _____ (already start) the lesson.	2 Marks	L1	CO2
	i)	***Read the sentence below and make the necessary changes.*** Though he is poor but he is happy.	2 Marks	L1	CO2
	j)	***Read the sentence below and make the necessary changes.*** Neither the students nor the teacher have reached the auditorium.	2 Marks	L1	CO2

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	***Write the meaning of the following idiomatic expressions.*** Blue-eyed boy At the eleventh hour A red-letter day Don't cry over a split milk Pay an arm and a leg Flog a dead horse vii) To be in hot water viii) In seventh heaven	8 Marks	L1	CO4
	b)	Write a review on the laptop that you purchased recently.	8 Marks	L1	CO5

(OR)

3.	a)	Interpret the importance of verbal and non-verbal communication.	8 Marks	L2	CO1
	b)	Illustrate the science behind superheroes with examples.	8 Marks	L3	CO1

MODULE-II

4.	a)	***Write one-word substitutes for these descriptions.***	8 Marks	L1	CO4
		That which can be easily broken			
		One who is capable of using both hands			
		One who studies human antiquities			
		One who loves mankind			
		Writing one's own life story			
		A lover of books			
	vii)	One who hates women			
	viii)	Speech delivered without preparation.			
	b)	Write a description of an exhibition that you have visited recently.(200-250 words)	8 Marks	L1	CO5

(OR)

5.	a)	Illustrate various channels of communication.	8 Marks	L3	CO1
	b)	Do you believe in the existence of aliens in other planets? Support your answer with scientific reasoning and personal reflections.	8 Marks	L5	CO1

MODULE-III

6.	a)	Define scanning and skimming, and explain their significance as effective reading strategies for extracting information from a text.	8 Marks	L2	CO4
	b)	***Fill in the blanks using verbs in the correct tense.***	8 Marks	L1	CO2
		i) My uncle _____ (visit) Ooty every summer season.			
		ii) Telugu ____ (speak) in both Andhra Pradesh and Telangana.			
		iii) My cousin____ (live) in Mumbai for the last five years.			
		iv) We_____ (learn) Bengali in Calcutta in 2020..			
		v) By next June, I_____ (complete) ten years of service in this company.			
		vi) The boys_____ (quarrel) when I reached the play ground.			
		vii) My sister _____ (complete) the painting just now.			
		viii) He usually _____ (get) up at 9 ^{o} clock in the morning.			

(OR)

7.	a)	Discuss the barriers of communication with examples.	8 Marks	L2	CO1
	b)	Raman's discovery had caught the attention of the world. According to Raman, why is the sea blue in color?	8 Marks	L1	CO1

MODULE-IV

8.	a)	***Complete the following sentences using an appropriate verb form. Choose your answers from the given options.***	8 Marks	L1	CO2

1) If we are there, we _____ in trouble.
   i) shall be ii) should be iii) would have been
2) If I practiced well, I _____ better performance.
   i) can deliver ii) could deliver iii) could have delivered
3) If he_____ good care of his health, he will not fall ill often.
   i) takes ii) took iii) had taken
4) If he _____ Hindi, he could find a better job.
   i) speaks ii) spoke iii) had spoken
5) If my father had been more careful, this _____.
   i) will not happen ii) would not happen
   iii) would not have happened
6) If she ___ a little earlier, she could meet her.
   i) arrive ii) arrived iii) had arrived

7) If we ____ hard, we could have cracked a job.
i) work ii) worked iii) had worked
8) If he reached earlier, he_____ the train.
i) will catch ii) would catch iii) would have caught

	b)	Compare voice-based modes of communication and video-based modes of communication.	8 Marks	L2	CO1

(OR)

9.	a)	Write a description explaining the steps involved in the unboxing and setting up of a new android Smartphone for use.	8 Marks	L1	CO5
	b)	Discuss in detail, what happens in the body when you consume soft drinks? List foods that contain high amounts of sodium.	8 Marks	L2	CO1

MODULE-V

10.	a)	***Fill in the blanks in the following sentences by using appropriate modals.***	8 Marks	L1	CO2

____ I take the day off?
I want to go to the airport. ____ I take this bus?
It____ rain this evening.
You ____ reach college before 9' O clock.
_____ we go for a walk?
The soldiers in the Army ____ wear a uniform.
____you help me with this form please?
viii) I am busy now. _____ I call you later?

	b)	Analyze the key factors that contributed to Ms. Zhou's success.	8 Marks	L4	CO1

(OR)

11.	a)	You want to organize an event in your college on the occasion of Women's Day. Prepare a proposal for this.	8 Marks	L1	CO5
	b)	You are planning to sell some used electronic gadgets like smart phone, laptop, smart watch, etc., Write a short description in about 250-300 words	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Supplementary Examinations, May– 2026

PROFESSIONAL ETHICS AND HUMAN VALUES

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Computer Science and Engineering (Artificial Intelligence and Machine Learning), Computer Science and Engineering (Data Science)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List and explain the different categories of ethical inquiries	2 Marks	LI	CO1
	b)	What do you understand by the term moral autonomy?	2 Marks	LI	CO1
	c)	Provide a definition of integrity in the context of professional ethics.	2 Marks	LI	CO2
	d)	How is professionalism defined within the engineering domain?.	2 Marks	LI	CO2
	e)	Mention a few key takeaways from historical experiments and their relevance today.	2 Marks	L2	CO3
	f)	Why is experimentation considered vital in engineering practice?	2 Marks	LI	CO3
	g)	Define collegiality and describe its significance in teamwork.	2 Marks	LI	CO4
	h)	Explain the concept of whistle-blowing and its ethical implications.	2 Marks	LI	CO4
	i)	Outline the journey from the current societal structure to the establishment of a Universal Human Order.	2 Marks	L1	CO5
	j)	In what way does awareness and comprehension influence ethical human behavior?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	How moral dilemmas arise across various domains in workplace?	8 Marks	L1	CO1
	b)	Consensus and shared agreement are needed among members of a team, Explain.	8 Marks	L2	CO1

(OR)

3.	a)	Compare the major ethical theories to bring out the similarities and differences among them.	8 Marks	L1	CO1
	b)	How do moral development theories help us to be ethical? Explain.	8 Marks	L2	CO1

MODULE-II

4.	a)	What is self-respect? How is it important for professionals?	8 Marks	L2	CO2
	b)	Engineering is an important and learned profession - Discuss the code of ethics for Engineers.	8 Marks	L2	CO2

(OR)

5.	a)	List out the elements and benefits of empathy.	8 Marks	L2	CO2
	b)	Illustrate the character and its importance in ethics.	8 Marks	L1	CO2

MODULE-III

6.	a)	What are the different roles and functions of codes of ethics.	8 Marks	L1	CO3
	b)	Discuss the parallels between engineering-based experimental procedures and conventional scientific experimentation.	8 Marks	L1	CO3

(OR)

7.	a)	Compare and contrast engineering experiments with standard experiments	8 Marks	L1	CO3
	b)	What are the moral and ethical lessons we can be learned from space shuttle challenger tragedy and how the principal actors behave as responsible experiments	8 Marks	L1	CO3

MODULE-IV

8.	a)	Analyze the significance of human and professional rights in the engineering profession.	8 Marks	L2	CO4
	b)	Outline the key human rights and professional entitlements engineers must uphold in their practice.	8 Marks	L2	CO4

(OR)

9.	a)	Explain in detail the Rights of Engineers.	8 Marks	L2	CO4
	b)	Discuss the ethical and legal foundations of human and professional rights in engineering.	8 Marks	L2	CO4

MODULE-V

10.	Describe the concept of an undivided society and the universal order and explain how both these can help to create a world family.	16 Marks	L2	CO5

(OR)

11.	Explain how production activities can be enriching to all the orders of nature.	16 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Supplementary Examinations, May– 2026

BASIC CIVIL AND MECHANICAL ENGINEERING

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Write two points about building construction	2 Marks	L2	CO1
	b)	List two uses of surveying	2 Marks	L4	CO1
	c)	Define Built-up area	2 Marks	L1	CO2
	d)	List different types of highways	2 Marks	L2	CO2
	e)	What is the basic idea behind the 2 stroke engine when compared with 4 stroke engine.	2 Marks	L2	CO3
	f)	Draw the sketch of a reciprocating pump	2 Marks	L2	CO3
	g)	Draw the sketch of a compound gear train.	2 Marks	L1	CO4
	h)	Write the formula for length of a crossed belt drive with one line description for each term in it.	2 Marks	L1	CO4
	i)	List the important steps in the working of a powder-based rapid prototyping.	2 Marks	L2	CO5
	j)	What are the disadvantages of Rapid Prototyping?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the role on civil engineering in society	8 Marks	L4	CO1
	b)	Discuss the different classifications of bricks based on parameters	8 Marks	L2	CO1

(OR)

3.	a)	Represent different types of surveys using a neat sketch	8 Marks	L2	CO1
	b)	Describe the principles of surveying	8 Marks	L2	CO1

MODULE-II

4.	a)	Differentiate Load bearing structures to framed structures	8 Marks	L2	CO2
	b)	Define lintel and describe different types of lintels.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the comfort ability factor in considering the rise and tread of a step in stair case	8 Marks	L2	CO2
	b)	Briefly explain various rain water harvesting systems in practice. And it's working principle	8 Marks	L4	CO2

MODULE-III

6.	a)	List the major components of a steam power plant showing them on a sketch and explain each in brief.	8 Marks	L2	CO3
	b)	A centrifugal pump is chosen over a reciprocating pump for a large-scale irrigation project. Justify this selection based on the operating principles and characteristics of both types of pumps.	8 Marks	L2	CO3

(OR)

7.		Compare SI and CI engines with respective to i) the induction of charge ii) formation of charge iii) combustion process and iv) compression ratio	16 Marks	L2	CO3

MODULE-IV

8.		List the applications, advantages, and limitations of belt, rope, and chain drives with respect to efficiency and power transmission. Also explain the working principle of each.	16 Marks	L2	CO4
		(OR)			
9.	a)	Discuss about: i) Chain Drives and ii) Compound gear train.	8 Marks	L2	CO4
	b)	A belt drive is used to transmit power between two shafts with a significant distance between them. Would you recommend an open or crossed belt drive? Justify your recommendation with suitable examples.	8 Marks	L2	CO4

MODULE-V

10.	a)	"Rapid prototyping can reduce development time and identify potential challenges during the prototyping phase". Discuss.	8 Marks	L2	CO5
	b)	Discuss the material selection, precision, and biocompatibility of 3DP in the manufacturing of a custom prosthetic limb.	8 Marks	L2	CO5
		(OR)			
11.		A company plans to use Powder-Based Rapid Prototyping (PBRP) systems, such as Selective Laser Sintering (SLS), to manufacture lightweight and complex aerospace components. The company's aim is to improve design flexibility and reduce material wastage while addressing challenges like powder selection and post-processing needs. **Discuss the following:** i) Explain how Powder-Based Rapid Prototyping systems are useful in manufacturing lightweight and complex aerospace components. Discuss two key challenges the company might face with PBRP systems and suggest solutions to overcome.	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) V Semester (SOA-22) Supplementary Examinations, June – 2026

ENTREPRENEURSHIP DEVELOPMENT AND BUSINESS COMMUNICATION [Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 X 1 = 20 Marks**

1	An _____ is a person who creates a new business, bearing risks and enjoying most of the rewards	1 Mark	L1	CO1
2	According to Richard Cantillon, "entrepreneurship is a function of taking _____	1 Mark	L1	CO1
3	The innovative factor includes change in the form of the product which already exists (True or false)	1 Mark	L1	CO1
4	Agri- entrepreneur is also called as _____	1 Mark	L1	CO1
5	Rejection by the market is____ among SWOT for an organization.	1 Mark	L1	CO1
6	Expand MSE_____	1 Mark	L2	CO2
7	_____ *is a Scheme of "Promotion and Handholding of Micro and Small Enterprises"*	1 Mark	L2	CO2
8	Which of the following is not a scheme created for women enterprises. i) Mahila Udyami Yojana ii) SBI Stree Sakthi Package iii) Mahila Sakthi yojana iv) Priya Darshini Yojana	1 Mark	L1	CO2
9	Expand MSMED.	1 Mark	L1	CO2
10	The primary objective of economics reforms is _____	1 Mark	L2	CO2
11	The 3 phases of entrepreneurial development cycle are_____	1 Mark	L2	CO3
12	The two types of departmentalization are _____ & _____	1 Mark	L1	CO3
13	To ___ means to oversee the actions or work of (a person).	1 Mark	L2	CO3
14	Authoritarian leaders are also called as _____	1 Mark	L1	CO3
15	_____refers to ability to solve problems in an effective, efficient and timely manner without any impediments.	1 Mark	L1	CO3
16	Expand LPG of Indian economy.	1 Mark	L1	CO4
17	The term, "Supply Chain Management" was first coined by _____in_____.	1 Mark	L1	CO4
18	The first stage of project formulation is.	1 Mark	L1	CO4
19	The money invested in current assets like raw material, finished goods etc. is known as _____ capital.	1 Mark	L1	CO4
20	_____entrepreneurship can be defined as entrepreneurship emerging at village level.	1 Mark	L2	CO4

PART - B

Answer any Ten Question
All Questions Carry Equal Marks

II **10 X 3 = 30 Marks**

1	Define entrepreneur and explain its meaning under different concepts.	3 Marks	L2	CO1
2	Write a short note on Agri-entrepreneurship and agriprenuer and their importance.	3 Marks	L3	CO1
3	Differentiate between an entrepreneur and a manager.	3 Marks	L4	CO1
4	Write a short note on Rajiv Gandhi Udyami Mitra Yojana.	3 Marks	L3	CO2
5	Define EDP and mention its objectives.	3 Marks	L2	CO2
6	Examine the impact of economic reforms on Agribusiness/Agri-enterprises.	3 Marks	L5	CO2
7	Illustrate the entrepreneurial development cycle with clear explanation.	3 Marks	L5	CO3
8	Write a short note on supervision, Monitoring and evaluation.	3 Marks	L3	CO3
9	Discuss about different types of problem-solving skills and strategies.	3 Marks	L2	CO3
10	Define leadership and explain its principles.	3 Marks	L2	CO3
11	What are various advantages of TQM to small scale enterprises.	3 Marks	L2	CO4
12	Define rural entrepreneurship and explain various problems faced by rural entrepreneurs.	3 Marks	L3	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) V Semester (SOA-22) Supplementary Examinations, June – 2026

ENVIRONMENTAL STUDIES AND DISASTER MANAGEMENT

[Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 x 1 = 20 Marks**

1.	Geographical area where biotic and abiotic components interact with each other is called_____	1 Mark	L1	CO1
2.	The World environment day is celebrated_____	1 Mark	L1	CO1
3.	The complex network of interconnected food chains is called _____	1 Mark	L1	CO1
4.	The organism living on or in the body of another organism is called _____	1 Mark	L2	CO1
5.	Pesticides like DDT accumulate in the food chain through a process called _____	1 Mark	L1	CO2
6.	The Indus River water conflict is mainly between _____ and _____	1 Mark	L1	CO2
7.	The nitrogen gas content in the atmosphere is _____	1 Mark	L2	CO2
8.	Compound responsible for reduction in O2 carrying capacity of blood is_____	1 Mark	L1	CO3
9.	Lichen is a bioindicator of_____	1 Mark	L1	CO3
10.	Due to addition of phosphates and nitrates in water body they become more productive because of _____	1 Mark	L1	CO3
11.	The global warming gas that is produced from rice field is _____	1 Mark	L1	CO3
12.	IPCC was initiated in which year _____	1 Mark	L1	CO3
13.	Kingston Protocol was initiated for _____	1 Mark	L1	CO4
14.	UNICED is expanded as _____	1 Mark	L2	CO4
15.	Efficient irrigation techniques like drip and sprinkler help in _____	1 Mark	L1	CO4
16.	In Pyramids of Energy, the pyramid always _____	1 Mark	L1	CO4
17.	The _____ gas tragedy in India was caused by a leak of methyl isocyanate gas.	1 Mark	L2	CO5
18.	The number of live births per 1,000 people in a year is called the _____ rate.	1 Mark	L1	CO5
19.	Developed nations usually have _____ birth rates and _____ death rates.	1 Mark	L1	CO5
20.	India launched its Family Welfare Programme in the year _____.	1 Mark	L1	CO5

PART - B

Answer any Ten Question
All Questions Carry Equal Marks

II **10 x 3 = 30 Marks**

1.	Explain the scope and significance of environmental studies.	3 Marks	L4	CO1
2.	Briefly discuss the Major environmental issues exist in present condition	3 Marks	L4	CO1
3.	What is biodiversity? Explain its different levels (genetic, species, and ecosystem diversity), its measurement, and its importance for human survival and ecosystem stability	3 Marks	L2	CO2
4.	Describe the types, characteristic features, structures and function of Forest ecosystem, grassland and aquatic ecosystem.	3 Marks	L4	CO2
5.	Discuss the concept of i) Commensalism, ii) Proto co-operation and iii) mutualism, iv) Competition, v) Predation vi) Parasitism and vii) antibiosis.	3 Marks	L4	CO2
6.	Provide a short explanation of what causes air and soil pollution, the consequences they lead to, and how they can be controlled.	3 Marks	L3	CO3
7.	Explain the importance of rainwater harvesting in urban areas with reference to water demand, storm water management, and sustainability.	3 Marks	L4	CO3
8.	Briefly describe the sources, harmful effects, and prevention methods of noise and water pollution	3 Marks	L4	CO4
9.	Briefly explain the Environment Protection Act and its main objectives.	3 Marks	L4	CO4
10.	Give a brief overview of the Air Act along with the goals it aims to achieve and the roles and responsibilities of the air pollution control boards.	3 Marks	L4	CO5
11.	What is meant by population explosion? Describe its main causes.	3 Marks	L2	CO5
12.	Define the following terms Cyclone, earthquakes, Landslides, , Volcanic Eruptions, Heat and cold waves	3 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) V Semester (SOA-22) Supplementary Examinations, June – 2026

GEOINFORMATICS NANO-TECHNOLOGY AND PRECISION FARMING

[Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 X 1 = 20 Marks**

1	_____ aims at maximum production efficeniency with minimum environmental impact.	1 Mark	L1	CO1
2	When measuring soil and crop characteristics, _____can be used to identify the location where the data are taken.	1 Mark	L2	CO1
3	_____ utilizes real time sensors and feed back control to major soil properties or crop characteristics and immediately use this signal to control the variable rate applicators.	1 Mark	L1	CO1
4	GPS is a navigation system based on a network of satellites that helps users to record positional information (latitude, longitude and elevation) with an accuracy of between_____ m.	1 Mark	L2	CO1
5	_____ involves the use of remote sensing data, such as satellite imagery or aerial photography, to distinguish between different types of crops or vegetation cover within a field.	1 Mark	L1	CO2
6	_____ is used to identify areas of a field where yields are high or low, and to determine what factors might be contributing to these variations.	1 Mark	L1	CO2
7	geospatial technologies for fertilizer recommendation helps in reducing _____wastage, minimizing the risk of _____ runoff, and increasing crop yield.	1 Mark	L1	CO2
8	_____ model represents a surface as a set of contiguous, non-overlapping triangles.	1 Mark	L2	CO2
9	_____ is a carrier of electromagnetic energy by transmitting the oscillation of the electromagnetic field through space or matter.	1 Mark	L2	CO3
10	The retention of EMR by molecules in the atmosphere is called _____.	1 Mark	L3	CO3
11	UV light from the sun that is damaging to most living things is absorbed by _____ layer.	1 Mark	L1	CO3
12	The wavelengths at which EMR are partially or wholly transmitted through the atmosphere are known as _____.	1 Mark	L1	CO3
13	_____ is defined as the application of methods to analyse complex, real-world problems in order to make predictions.	1 Mark	L1	CO4
14	The crop model used for Sugarcane is _____.	1 Mark	L1	CO4
15	_____ is related to the quality of scientific data used in model development, calibration and validation.	1 Mark	L2	CO4
16	The goal of a grid soil sampling is to generate a map of nutrient requirement is called as _____ map.	1 Mark	L1	CO4
17	The term Nano technology was first used in 1974 by _____ scientist.	1 Mark	L2	CO5
18	_____ methodology was suggested by rostislav lapshin appears	1 Mark	L2	CO5

	to be a promising way to implement these nanomanipulations in automatic mode.			
19	fascinating and powerful result of the _____ effects of the nanoscale is the concept of tunability of properties.	1 Mark	L3	CO5
20	Nanofertilisers are nutrient carriers of nanodimension ranging from _____ nm will have capable of holding bountiful of nutrient ions due to their higher surface area.	1 Mark	L1	CO5

PART - B

Answer any Ten Question
All Questions Carry Equal Marks

II **10 X 3 = 30 Marks**

1	Write about the methods of Precision Agriculture.	3 Marks	L1	CO1
2	List out the tools and equipment for precision farming. Explain briefly any two tools.	3 Marks	L1	CO1
3	What do you know about the Local Binary Pattern?	3 Marks	L1	CO2
4	Write a short note on soil mapping.	3 Marks	L1	CO2
5	How would you explain about Image Enhancement?	3 Marks	L2	CO3
6	Write about your opinion on GPS Receivers.	3 Marks	L1	CO3
7	List out and explain about the input data for crop modeling.	3 Marks	L1	CO4
8	How would you explain about the agricultural model limitations?	3 Marks	L3	CO4
9	Write a brief note on nanosensors.	3 Marks	L2	CO5
10	Write about the scope of Weed management.	3 Marks	L2	CO5
11	Write about the spectral feature for crop discrimination.	3 Marks	L2	CO2
12	How would you define Crop identification and mapping, Multisensor data?	3 Marks	L1	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) IV Semester (SOA-22) Supplementary Examinations, June – 2026

FUNDAMENTAL OF STRESS PHYSIOLOGY

[Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 x 1 = 20 Marks**

1.	The ability of the plant to live, grow, and yield satisfactorily with limited water supply or under periodic water deficits is called as_____	1 Mark	L1	CO1
2.	The osmolyte which serves as metabolic index of drought resistance is_____	1 Mark	L1	CO1
3.	Even under abundant supply of water in the soil, if plants could not uptake them, then it is called as_____	1 Mark	L1	CO1
4.	The ion responsible for stomatal closure is_____	1 Mark	L2	CO1
5.	Brassinolide at _____ ppm enhances photosynthetic activity in plants during low-temperature stress.	1 Mark	L1	CO2
6.	The foliar spray of _____ at critical stages helps improve plant resilience to low-temperature stress by enhancing root penetration.	1 Mark	L1	CO2
7.	The temperature at which growth and development of a plant cease is known as the _____.	1 Mark	L2	CO2
8.	An example of flood tolerant crop_____	1 Mark	L1	CO3
9	The enzyme which removes oxidative stress in plants is _____	1 Mark	L1	CO3
10	Abscisic acid (ABA) regulates _____ closure in response to waterlogged conditions.	1 Mark	L1	CO3
11	Flood stress can lead to the formation of _____ roots as an adaptive response to oxygen deprivation.	1 Mark	L1	CO3
12	_____ is a toxic compound that accumulates in waterlogged soils, worsening stress effects.	1 Mark	L1	CO3
13	Example for salt tolerant crops_____	1 Mark	L1	CO4
14	Salinity stress in agriculture occurs when soil contains high levels of _____.	1 Mark	L2	CO4
15	The application of organic matter can help improve soil structure and reduce the impact of _____ stress on crops.	1 Mark	L1	CO4
16	Halophytic crops are plants specifically adapted to grow in _____ environments and are highly salt-tolerant.	1 Mark	L1	CO4
17	Heavy metal stress in agriculture occurs when plants absorb excessive amounts of _____ from the soil.	1 Mark	L2	CO5
18	One common symptom of heavy metal stress in plants is the inhibition of _____ growth.	1 Mark	L1	CO5
19	Increased heavy-metal concentration in the environment is mainly_____	1 Mark	L1	CO5
20	Plants can absorb and accumulate heavy metals like cadmium, chromium, and mercury from contaminated soil. True or False	1 Mark	L1	CO5

PART - B

Answer any Ten Question
All Questions Carry Equal Marks

II **10 x 3 = 30 Marks**

1	Define the following terms a) Drought b) Dehydration c) Desiccation d) Homoiohydry e) Poikilohydry f) Drought Avoidance g) Drought Tolerance	3 Mark	L1	CO1
2	What are the physiological response of plants to drought stress	3 Mark	L2	CO1
3	discuss the concept of osmotic adjustment, osmoprotectants and stress proteins with examples	3 Mark	L4	CO1
4	Discuss in detail on heat shock protein (HSP) in plants.	3 Mark	L4	CO2
5	What are the Mitigation methods of high Temperature Stress on crops	3 Mark	L2	CO2
6	What are the Effects of Flood Stress on Crop Plants	3 Mark	L2	CO3
7	What are Enzymatic antioxidants and Non-enzymatic antioxidants generated on crop plants	3 Mark	L2	CO3
8	Discuss the physiological Constraints Imposed by Salinity	3 Mark	L4	CO4
9	Explain Physiological Mechanisms Conferring Salinity Tolerance in Plants	3 Mark	L4	CO4
10	Briefly explain the Defense Mechanisms Employed by Plants against heavy metal Stress	3 Mark	L3	CO5
11	Explain Mechanisms adopted by Plants against heavy metal Stress	3 Mark	L4	CO5
12	Briefly explain the causes of environmental pollution	3 Mark	L4	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) V Semester (SOA-22) Supplementary Examinations, June – 2026

PROTECTED CULTIVATION

[Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 x 1 = 20 Marks**

1.	Protected cultivation is defined as cultivation of crops under _____ conditions.	1 Mark	L1	CO1
2.	Certain gases in the atmosphere, known as _____ trap heat, preventing it from escaping into space.	1 Mark	L1	CO1
3.	_____Offers subsidies for setting up protected cultivation structures and for purchasing planting materials.	1 Mark	L1	CO1
4.	The country with the largest area under greenhouses is _____.	1 Mark	L1	CO1
5.	The cost involved per m^2 for a medium cost greenhouse with pad and fan system without automation is _____	1 Mark	L2	CO2
6.	Structures covered with green or black nets are called _____ houses.	1 Mark	L1	CO2
7.	Walk in tunnels height range between _____	1 Mark	L2	CO2
8.	The most widely used thickness of hammered and tampered glass is ____	1 Mark	L1	CO2
9.	The microclimate parameter that regulates photosynthesis is _____.	1 Mark	L1	CO3
10.	The gas essential for crop growth and controlled in greenhouses is _____.	1 Mark	L1	CO3
11.	The process of removing hot air and introducing fresh air inside a greenhouse is called _____.	1 Mark	L1	CO3
12.	_____ systems are used for automatic control of temperature, humidity, and CO_2.	1 Mark	L2	CO3
13.	The vegetable crop commonly grown in polyhouses is _____.	1 Mark	L1	CO4
14.	The flower crop suitable for greenhouse cultivation is _____.	1 Mark	L1	CO4
15.	The technique of growing plants without soil using nutrient solution is called _____.	1 Mark	L2	CO4
16.	The method of supplying fertilizers along with irrigation water is called _____.	1 Mark	L1	CO4
17.	IPM stands for _____.	1 Mark	L1	CO5
18.	Off-season production of vegetables helps farmers in getting _____ prices.	1 Mark	L1	CO5
19.	The study of income and expenditure in crop production is called _____.	1 Mark	L1	CO5
20.	The process of linking farmers to consumers through intermediaries is called _____.	1 Mark	L1	CO5

PART - B

Answer any Ten Question
All Questions Carry Equal Marks

II **10 x 3 = 30 Marks**

1.	Explain the scope and importance of protected cultivation in India.	3 Marks	L2	CO1
2.	Write a short note on the global and national scenario of protected cultivation.	3 Marks	L1	CO1
3.	Describe the different types of polyhouses.	3 Marks	L2	CO2
4.	Write about shade net houses and insect-proof net houses.	3 Marks	L1	CO2
5.	Explain the design and construction materials used in greenhouses.	3 Marks	L2	CO2
6.	Describe heating and cooling systems used in greenhouses.	3 Marks	L3	CO3
7.	Write short notes on sensors and automation systems.	3 Marks	L1	CO3
8.	Explain the importance of substrate management and soil preparation in protected cultivation.	3 Marks	L2	CO3
9.	Describe the nursery raising techniques for vegetables and flowers under protected conditions.	3 Marks	L3	CO4
10.	Write about the cultivation practices of tomato and cucumber in greenhouses.	3 Marks	L1	CO4
11.	Explain the cost economics of cultivating high-value crops under protected conditions.	3 Marks	L2	CO5
12.	Discuss the role of marketing and value chain in protected cultivation.	3 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) V Semester (SOA-22) Supplementary Examinations, June – 2026

MANAGEMENT OF BENEFICIAL INSECTS

[Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 x 1 = 20 Marks**

1	---------- and ---------- species of honey bees are wild in nature	1 Mark	L3	CO1
2	In honey bees, wax glands are situated in ---------- to ----------abdominal segments	1 Mark	L2	CO1
3	The plants which are visited by honey bees only for pollen ---------- i) Bajra ii) Pomegranate iii) Castor iv) All the above	1 Mark	L1	CO1
4	---------- queen is replaced by old queen, when the old queen is unable to lay sufficient eggs.	1 Mark	L2	CO1
5	Round dance is used to indicate a short distance of ----------	1 Mark	L2	CO1
6	---------- and ---------- are the lepidopteran pests of honey bees (scientific names).	1 Mark	L3	CO2
7	---------- mite feed on the blood (haemolymph) by piercing with their mouthparts through the tracheal walls.	1 Mark	L2	CO2
8	Due to ---------- disease, the honeybee larvae turn watery, yellow then brown and dark coloured and also tracheal system becomes visible and larva dies in a coiled stage causing foul smell.	1 Mark	L2	CO2
9	Commercially important silks under non mulberry silk are _____ i) Eri silk ii) Tasar silk iii) Muga silk iv) All the above	1 Mark	L1	CO2
10	Branches with pencil thickness ---------- from ---------- old plants of desired variety are used for cuttings.	1 Mark	L3	CO2
11	Vector of mulberry tukra disease ----------	1 Mark	L1	CO3
12	The process of keeping eggs at pinhead stage under total darkness either by wrapping them in black paper or keeping them in a black box or dark room is known as ----------	1 Mark	L3	CO3
13	An ideal mountage should ---------- i) Provide convenient space of suitable dimension, be cheap and durable ii) not promote formation of double cocoons, malformed cocoons and flimsy cocoons iii) Have provision for drying of liquid excreta passed by the worms iv) All the above	1 Mark	L1	CO3
14	Reelability% = ----------	1 Mark	L3	CO3
15	Flacherie diseases of silkworm is caused by----------	1 Mark	L2	CO3
16	Scientific name of lac insect ----------	1 Mark	L1	CO4
17	Expand IINRG ----------	1 Mark	L2	CO4
18	Hemerobiidae is easily differentiated from Chrysopidae by the presence of ---------- on forewings.	1 Mark	L2	CO4

19	Ichneumonids are characterized by ---------- number of m-cu veins on forewings.	1 Mark	L1	CO4
20	Pollination through beetles is known as ---------- i) Myrmecophily ii) Myophily iii) Cantharophily iv) Melittophily	1 Mark	L1	CO4

PART - B

Answer any Ten Question
All Questions Carry Equal Marks

II **10 x 3 = 30 Marks**

1	What do you mean by beneficial insects and its classification.	3 Marks	L1	CO1
2	Write in detail about caste and sex determination in honeybees.	3 Marks	L3	CO1
3	Describe about management of beehive colonies in different seasons.	3 Marks	L2	CO1
4	Explain briefly about nature of damage and management of greater wax moth and lesser wax moth.	3 Marks	L3	CO2
5	Explain briefly about nature of damage and management of bacterial diseases of honey bees.	3 Marks	L2	CO2
6	What is voltinism and describe races of silkworms based on voltinism.	3 Marks	L1	CO2
7	Write a short note on root knot disease of mulberry.	3 Marks	L2	CO3
8	Explain briefly about young age and late age silkworm rearing.	3 Marks	L3	CO3
9	Write a short notes on Renditta and Stiffling.	3 Marks	L1	CO3
10	Explain in brief about different forms of lac.	3 Marks	L1	CO3
11	Write important identification characters of Cicindellidae and Coccinellidae.	3 Marks	L3	CO4
12	List out important species of pollinators and weed killers (scientific name).	3 Marks	L1	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) IV Semester (SOA-22) Supplementary Examinations, June – 2026

PESTS OF CROPS, STORED GRAIN AND THEIR MANAGEMENT

[Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 x 1 = 20 Marks**

1. Dead hearts in rice is caused by _____(Scientific Name) 1 Mark L2 CO1
2. Match and tick the correct option 1 Mark L2 CO1
   a. *Nephotettix virescens* ( ) 1. Rice Grassy stunt
   b. *Nilaparvata lugens* ( ) 2. Rice Tungro
   c. *Scirpophaga excerptalis* ( ) 3. Sorghum mosaic
   d. *Peregrinus maidis* ( ) 4. Bunchy top

   a. 2, 1, 4, 3
   b. 1, 2, 4, 3
   c. 4, 3, 2, 1
   d. 3, 2, 1, 4
3. In sugarcane, _____ and _____ are the damage symptoms of early shoot borer 1 Mark L1 CO1
4. In cotton, pink boll worm damage results in _____ flowers 1 Mark L2 CO1
5. In ragi, _____ (Scientific name) attack underground parts of plants, suck sap from roots causing gradual wilting and drying of plants in patches 1 Mark L3 CO1
6. _____ are the damage symptoms due to Red gram Eriophyid mite 1 Mark L1 CO2
   Leaves become soft and loose
   Mosaic appearance on leaves
   Bushy appearance of the plant
   All the above
7. Under severe infestation, ground nut leaf miner larvae causes _____ on leaves, due to which the whole field looks like _____ appearance 1 Mark L2 CO2
8. _____ is the resistant variety in Coastal Andhra against brinjal shoot and fruit borer. 1 Mark L1 CO2
9. In tomato, *Helicoverpa armigera* causes _____ holes on fruits 1 Mark L2 CO2
   Round/circular/regular
   Irregular
   Both A & B
   None of the above
10. _____ is the scientific name of recently invaded chilli thrips 1 Mark L1 CO2
11. In mango, hot water treatment is done to reduce the infestation of _____ pest (scientific name). 1 Mark L2 CO3
12. Citrus fruit sucking moth larvae feeds on _____ host plant while, adults suck juicy content from _____ 1 Mark L2 CO3

13	Match and tick the correct option a. Citrus greening ( ) 1. *Pentalonia nigronervosa* b. Citrus tristeza virus ( ) 2. *Aceria jasmini* c. Banana bunchy top ( ) 3. *Toxoptera citricida* d. Jasmine erineum ( ) 4. *Diaphorina citri* a. 4, 3, 1, 2 b. 1, 2, 4, 3 c. 4, 3, 2, 1 d. 3, 2, 1, 4	1 Mark	L1	CO3
14	In turmeric and ginger, _____ insect pest causes rotting of rhizomes, wilting and drying of plants (scientific name)	1 Mark	L2	CO3
15	In guava, tea mosquito bug causes _____ damage symptoms on various parts of plant Corky scab formation Black linear scars on twigs Reddish streaks on leaves All the above	1 Mark	L2	CO3
16	_____ and _____ are the scientific names of rose scale	1 Mark	L1	CO4
17	_____ are the primary stored grain internal feeders a) Rice weevil b) Drug store beetle c) Pulse beetle d) All the above	1 Mark	L2	CO4
18	In rice _____ nematodes causes leaf tips (2-5 cm) turning yellow, brown and finally turn white, dry up and hang down.	1 Mark	L2	CO4
19	_____ is an example for single dose anticoagulant.	1 Mark	L1	CO4
20	_____ and _____ are the examples for acaricides.	1 Mark	L2	CO4

PART - B

Answer any Ten Question
All Questions Carry Equal Marks

II **10 x 3 = 30 Marks**

1	Write down the nature and symptoms of damage and management aspects of rice yellow stem borer?	3 Marks	L2	CO1
2	Write in brief about the nature and damage symptoms and management practices of recently invaded pest of Maize?	3 Marks	L2	CO1
3	Write down the adult identification characters of a) Chilo infuscatellus vs. Chilo partellus? b) Scirpophaga incertulas vs. Scirpophaga excerptalis?	3 Marks	L3	CO1
4	List out and enlist the Integrated Pest Management aspects of cotton boll worms?	3 Marks	L2	CO1
5	Write the nature and symptoms of damage and management aspects of ground nut leaf miner?	3 Marks	L2	CO2
6	Write down the adult identification characters of a) *Earias vitella* vs. *Earias insulana*? b) Tobacco cut worm vs. Sunflower head borer?	3 Marks	L3	CO2
7	Differentiate the damage symptoms of a) Castor semilooper vs. Snake gourd semilooper? b) Tobacco cut worm vs. Sunflower head borer?	3 Marks	L3	CO2
8	List out the leaf hopper sucking pest complex of mango and write down the damage symptoms and management practices?	3 Marks	L3	CO3

9	Describe the nature and symptoms of damage and management aspects of guava tea mosquito bug?	3 Marks	L2	CO3
10	Write down the damage symptoms of a) Banana rhizome weevil vs. Banana pseudostem weevil? b) Apple woolly aphid vs. sugarcane woolly aphid?	3 Marks	L3	CO3
11	List out any two lepidopteran stored grain pest along with damage symptoms and management practices?	3 Marks	L2	CO4
12	Enlist any six different types of mites? Write down the management aspects of mites?	3 Marks	L3	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) V Semester (SOA-22) Supplementary Examinations, June – 2026

CROP IMPROVEMENT-I (KHARIF CROPS)

[Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 x 1 = 20 Marks**

1.	Who proposed the concept of crop ideotype?	1 Mark	L2	CO1
2.	Name a rice variety developed for salinity tolerance in India.	1 Mark	L1	CO1
3.	What is the role of R-lines in hybrid pigeonpea breeding?	1 Mark	L2	CO1
4.	Which gene confers stem rust resistance in wheat but is also studied in sorghum and maize for pyramiding?	1 Mark	L1	CO1
5.	Write one advantage of wide hybridization in crop improvement.	1 Mark	L2	CO1
6.	Which transgenic cotton variety widely used in India?	1 Mark	L2	CO2
7.	Give one example of a biofortified rice variety.	1 Mark	L1	CO2
8.	Mention any one limitation of mutation breeding.	1 Mark	L3	CO2
9.	Which institute is pioneering research on biofortified maize in India?	1 Mark	L3	CO2
10.	Which breeding method is most suitable for improving cross-pollinated sorghum populations?	1 Mark	L1	CO2
11.	What is the main objective of ideotype breeding in cotton?	1 Mark	L2	CO3
12.	_____ growth habit a challenge in pulse improvement	1 Mark	L3	CO3
13.	Name the global institute maintaining vegetable germplasm collections.	1 Mark	L2	CO3
14.	Which type of pollination is most common in cotton?	1 Mark	L2	CO3
15.	What is the key morphological trait selected in ideotype breeding of rainfed sorghum?	1 Mark	L1	CO3
16.	Define the main goal of recurrent backcross method in maize breeding.	1 Mark	L3	CO4
17.	Write one kharif pulse crop where mutation breeding produced early maturing varieties.	1 Mark	L3	CO4
18.	Which disease in rice is targeted through gene pyramiding strategies?	1 Mark	L1	CO4
19.	State the anti nutritional factor present in Brassicaceae family .	1 Mark	L4	CO5
20.	DNA fingerprinting used to study genetic_____	1 Mark	L1	CO5

PART - B

Answer any Ten Questions
All Questions Carry Equal Marks

II **10 x 3 = 30 Marks**

1.	Define crop ideotype. Write ideotype features for rice and maize.	3 Marks	L1	CO1
2.	Explain the role of Hybrid Pigeonpea (HM) in breaking the yield barrier of pulses.	3 Marks	L1	CO2
3.	Differentiate between wide hybridization and interspecific hybridization with examples.	3 Marks	L1	CO1
4.	Describe how Bt cotton was developed and its impact on pest management.	3 Marks	L3	CO2
5.	Achievements in okra (YVMV resistance, hybrids); procedures (pedigree/backcross); outcome	3 Marks	L3	CO2

6.	Write notes on gene pyramiding and its application in rice and maize.	3 Marks	L4	CO2
7.	Differentiate between half-sib and full-sib mating designs in maize breeding.	3 Marks	L3	CO3
8.	Objectives in brinjal (yield, pest resistance, fruit quality); procedure (selection, pedigree, backcross); example	3 Marks	L1	CO3
9.	Outline the breeding objectives and methods in jute and mesta improvement**.**	3 Marks	L2	CO4
10.	Types of male sterility (cytoplasmic, genetic, CMS); role in avoiding emasculation; use in hybrids.	3 Marks	L3	CO3
11.	Differentiate between A-line, B-line, and R-line in pigeonpea hybrid breeding.	3 Marks	L3	CO5
12.	Describe the concept of ideotype breeding with suitable examples in maize, and groundnut.	3 Marks	L1	CO6

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) IV Semester (SOA-22) Supplementary Examinations, June – 2026

CROP IMPROVEMENT-II (RABI CROPS)

[Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 x 1 = 20 Marks**

1.	The Centre of origin of wheat is_____	1 Mark	L1	CO1
2.	The reason for dwarfism in wheat is_____	1 Mark	L1	CO1
3.	The gene pool in which intermating (crossing) is easy and leads to production of fertile hybrids is known as ---------	1 Mark	L2	CO1
4.	_____ are the primitive cultivar which were selected and cultivated by the farmers for many generations.	1 Mark	L1	CO1
5.	IRRI situated in_____	1 Mark	L2	CO1
6.	_____ is a major trait in pulse crop.	1 Mark	L2	CO2
7.	Improvement of Sulphur containing amino acids are important in _____ crops.	1 Mark	L1	CO2
8.	What is the chromosome number of red gram ,22 or twenty two.	1 Mark	L3	CO2
9	Give an example of perennial barley	1 Mark	L3	CO2
10	State a wild relative of field pea.	1 Mark	L1	CO2
11	State a high yielding and wilt resistant cultivar of chick pea	1 Mark	L2	CO3
12	_____ is an asexual phenomenon is useful for fixing Heterosis.	1 Mark	L3	CO3
13	_____defined as the hybrid production which exceeds the parental phenotypes.	1 Mark	L2	CO3
14	State the botanical family of safflower.	1 Mark	L2	CO3
15	State the chromosome number of Berseem.	1 Mark	L1	CO3
16	The closely related species of Napier grass is_____	1 Mark	L3	CO4
17	_____is cultivated species of mango crop.	1 Mark	L3	CO4
18	The useful fodder sorghum spp is_____	1 Mark	L1	CO4
19	Sugarcane leads to cross pollination due to _____ phenomenon.	1 Mark	L4	CO4
20	The seeds whose viability drops drastically if their moisture content is reduced below 12% are called as_____.	1 Mark	L1	CO4

PART - B

Answer any Ten Questions
All Questions Carry Equal Marks

II **10 x 3 = 30 Marks**

1	Why plant breeding is important and describe their role in Wheat, Barley and oat?	3 Marks	L1	CO1
2	Define domestication and characteristics of domestication in Rabi oil seed crops.	3 Marks	L1	CO1
3	Discuss the importance of barley as a food and feed crop in India and the breeding objectives related to improving yield and forage quality.	3 Marks	L2	CO1
4	Explain the concept of U triangle in Brassica species.	3 Marks	L3	CO2

5	Discuss the importance of cowpea in food and nutritional security. Explain the nutritional components of cowpea and their health benefits.	3 Marks	L4	CO2
6	Write in detail about reproductive biology of chickpea.	3 Marks	L5	CO2
7	Why breeding attempts are necessary for fodder crops? List some key achievements in Berseem breeding.	3 Marks	L2	CO3
8	Explain breeding procedures for the improvement of potato.	3 Marks	L1	CO3
9	Explain the breeding achievements in safflower.	3 Marks	L2	CO3
10	How is a conceptual model developed for ideotype breeding, and what factors are considered in its design?	3 Marks	L3	CO3
11	State the novel breeding techniques to bring homozygosity in a segregating population. Explain with suitable example.	3 Marks	L3	CO4
12	Compare and contrast the methods of traditional breeding and modern biotechnological approaches (e.g., genetic modification and gene editing) for disease resistance.	3 Marks	L1	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) V Semester (SOA-22) Supplementary Examinations, June – 2026

PRODUCTION TECHNOLOGY FOR ORNAMENTAL CROPS, MAP AND LANDSCAPING

[Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 x 1 = 20 Marks**

1.	_____ in every garden is a centre of attraction	1 Mark	L1	CO1
2.	Japanese & English gardens are _____type of garden examples	1 Mark	L2	CO1
3.	Repetition of the same object at equal distance is called_____	1 Mark	L1	CO1
4.	Expand-CIMAP _____	1 Mark	L1	CO1
5.	Directorate of floriculture research is located at _____	1 Mark	L2	CO1
6.	Botanically chrysanthemum is known as_____.	1 Mark	L2	CO2
7.	Cross of Hybrid tea is _____. a) Hybrid perpetual x Tea roses b) Hybrid tea x Floribunda c) Hybrid tea x Poliantha d) None of the above	1 Mark	L1	CO2
8.	Chrysanthemum is propagated by _____ method. a) Suckers b) Micro propagation c) Cuttings d) All of the above	1 Mark	L2	CO2
9.	Name of the family of carnation_____	1 Mark	L2	CO2
10.	Commercial propagation method of gladiolus is _____	1 Mark	L1	CO2
11.	Botanical name of African Marigold is _____. a) Tagetes erecta b) Tagetes minuta c) Tagetes patula d) Tagetes tenuifolia	1 Mark	L2	CO3
12.	Botanically Isabgol is known as_____ a) Withenia somnifera b) Plantago ovate c) Cymbopgon flexuosus d) None of the above	1 Mark	L3	CO3
13.	Name of the family of Aloe _____	1 Mark	L2	CO3
14.	Nirmal' and 'Dhawal' are the released cultivars of_____	1 Mark	L2	CO3
15.	Name of the family of Periwinkle _____	1 Mark	L1	CO3
16.	Give family of Geranium _____	1 Mark	L2	CO4
17.	Scientific name of Vetiver _____ _____	1 Mark	L2	CO4
18.	_____ oil 70-80 % is present in mint	1 Mark	L1	CO4
19.	Citral is present in _____aromatic plant	1 Mark	L2	CO4
20.	Scientific name of Palmarosa _____ _____	1 Mark	L1	CO4

PART - B

Answer any Ten Question
All Questions Carry Equal Marks

II **10 x 3 = 30 Marks**

1.	Write down the importance and scope of Ornamental plants, Medicinal and Aromatic plants	3 Marks	L2	CO1
2.	Write 6 any botanical names and families of Medicinal and Aromatic crops	3 Marks	L3	CO1
3.	Define following terms: Ornamental plants, Medicinal plants, Aromatic plants and Landscaping	3 Marks	L3	CO1
4.	Write down about different classification of roses along with examples	3 Marks	L2	CO2
5.	Define following terms: i) Deshooting ii) Tinting iii) Landscaping iv) Pinching v) Bud capping vi) Bending	3 Marks	L3	CO2
6.	Write soil and climatic conditions for tuberose cultivation	3 Marks	L4	CO2
7.	Enlist various health benefits of Ashwagandha	3 Marks	L2	CO3
8.	Write medicinal uses of Asparagus	3 Marks	L1	CO3
9.	Describe uses, soil and climatic condition of aloe	3 Marks	L2	CO3
10.	Write down steam distillation practices for extracting essential oils	3 Marks	L3	CO4
11.	Enlist and describe various uses of Vetiver	3 Marks	L3	CO4
12.	Describe and enlist different methods followed in dry flower technology	3 Marks	L1	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) IV Semester (SOA-22) Supplementary Examinations, June – 2026

AGRI- INFORMATICS
(FUNDAMENTALS OF COMPUTER APPLICATIONS IN AGRICULTURE)
[Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 x 1 = 20 Marks**

1.	_____ is the smallest unit of memory.	1 Mark	L1	CO1
2.	Computer hardware is the collection of _____ that constitutes a computer system.	1 Mark	L1	CO1
3.	_____is an extremely fast computer that can perform hundreds of millions of instructions per second.	1 Mark	L1	CO1
4.	Microsoft Word is a word processor developed by _____.	1 Mark	L1	CO1
5.	The computer is an _____	1 Mark	L1	CO1
6.	_____is a global Community of Practice, where people worldwide exchange information, ideas, and resources.	1 Mark	L1	CO2
7.	_____ models are used to forecast localized weather conditions such as single-cell thunderstorms and tornadoes.	1 Mark	L1	CO2
8.	A _____ is a simulation model that describes processes of crop growth and development as a function of weather conditions, soil conditions, and crop management.	1 Mark	L1	CO2
9	In Java, the compiler converts source code into _____, which can run on any platform	1 Mark	L1	CO2
10	The programming language C was developed by _____ at Bell Labs	1 Mark	L1	CO2
11	In agriculture, the use of the _____provides benefits in geo-fencing, map-making, and surveying	1 Mark	L1	CO3
12	_____ = Nroots + Ncropresidue + Nbyproduct + Ngrain is the basic equilibrium equation of the annual crop.	1 Mark	L1	CO3
13	_____is imagery and data collected from space- or airborne camera and sensor platforms.	1 Mark	L1	CO3
14	Crop yield gaps quantify the potential for _____ increases	1 Mark	L1	CO3
15	The Kisan Call Centre agents are known as _____.	1 Mark	L1	CO3
16	_____ Farming helps reduce labor and fertilizer inputs	1 Mark	L1	CO4
17	The _____ system includes an Information System, Decision Support System, and Diagnosing System.	1 Mark	L1	CO4
18	The Early Warning Crop Monitor is focused on _____ risks.	1 Mark	L1	CO4
19	The Crop Doctor helps diagnose _____in crops.	1 Mark	L1	CO4
20	Nutrient management is crucial for _____ production.	1 Mark	L1	CO4

PART - B

Answer any Ten Question
All Questions Carry Equal Marks

II **10 x 3 = 30 Marks**

1	What are the key characteristics of a computer? Explain with examples.	3 Marks	L2	CO1
2	Explain the different types of operating systems with examples.	3 Marks	L2	CO1
3	What are computer viruses? Explain their types, effects, and methods to prevent them.	3 Marks	L3	CO1
4	Explain the different types of computer memory (Primary and Secondary) with suitable examples	3 Marks	L2	CO1
5	Describe the role of ICT in e-Agriculture and its advantages for agricultural development.	3 Marks	L2	CO2
6	What is e-Agriculture? Explain its purpose and applications	3 Marks	L2	CO2
7	Write a short note on the architecture of ICT-based systems in agriculture.	3 Marks	L2	CO2
8	Explain the role of smartphone apps and ICT-based solutions in improving agricultural productivity.	3 Marks	L2	CO3
9	Describe the concept and applications of precision agriculture with examples	3 Marks	L3	CO3
10	Discuss the impact of IT in improving decision-making and productivity in agriculture.	3 Marks	L3	CO3
11	Describe the Soil Information System (SIS) and its applications in farm management and crop productivity	3 Marks	L2	CO4
12	Describe the benefits of using Soil Information System (SIS) for field preparation and field design.	3 Marks	L2	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) IV Semester (SOA-22) Supplementary Examinations, June – 2026

DISEASES OF FIELD AND HORTICULTURAL CROPS AND THEIR MANAGEMENT-I

[Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 x 1 = 20 Marks**

1	The symptom which characterizes the proliferation of axillary buds on the stalk of tassel as well as the cobs is _____	1 Marks	L1	CO1
2	The disease caused by *Sphacelotheca sorghi* pathogen in sorghum is _____	1 Marks	L1	CO1
3	Bacterial leaf blight disease in case of rice is caused by the bacterium _____	1 Marks	L1	CO1
4	The causal organism involved in the ergot or sugary disease of sorghum crop is _____	1 Marks	L1	CO1
5	The chemical compound which is used for the management of leaf spot pathogen in groundnut is_____	1 Marks	L4	CO2
6	Late leaf spot in groundnut is usually occurs how many days after sowing _____	1 Marks	L3	CO2
7	In groundnut, leaf spot is also known as _____	1 Marks	L2	CO2
8	The chemical compound which is used for the management of mosaic disease of soybean is_____	1 Marks	L1	CO2
9	Sterility mosaic disease in pigeonpea is transmitted by _____	1 Marks	L1	CO3
10	A purple band extending upwards from the base of the main stem is the most characteristic symptom in pigeonpea is due to _____	1 Marks	L1	CO3
11	Anthracnose disease in blackgram is caused by _____	1 Marks	L1	CO3
12	Name the soil borne disease in castor _____	1 Marks	L1	CO3
13	Longitudinal splitting and the discoloration appears first in the outer or oldest leaf sheath and extends in to the inner sheaths in banana is due to _____	1 Marks	L2	CO4
14	Prominent dark green streaks on the petioles and along midrib and leaf veins that range from a series of dark green dots to a continuous dark green line in banana is due to _____	1 Marks	L1	CO4
15	Insect vector which is involved in the transmission of papaya ringspot mosaic virus is _____	1 Marks	L1	CO4
16	In crucifers, spots are small, dark coloured later they enlarged and produces concentric rings on leaves is due _____	1 Marks	L1	CO4
17	Insect vector which is involved in the transmission of Tomato spotted wilt virus (TSWV) is _____	1 Marks	L2	CO5
18	Black, sunken, circular spots of varying sizes appear on pods with bright red, yellow or orange margins in beans is due to _____ disease	1 Marks	L1	CO5
19	The bacterial species involved in the blight disease in beans is _____	1 Marks	L1	CO5
20	_____ spores are involved in the primary and secondary spread of blister blight of tea	1 Marks	L1	CO5

PART - B

Answer any Ten Question
All Questions Carry Equal Marks

II **10 x 3 = 30 Marks**

1	Write about symptoms and management of false smut of rice?	3 Marks	L2	CO1
2	Describe in detail about symptomology of maize stalk rot disease?	3 Marks	L1	CO1
3	Write about disease cycle and management of rhizoctonia blight in soybean?	3 Marks	L1	CO2
4	Write about disease cycle and management of seed and seedling rot in soybean?	3 Marks	L1	CO2
5	Write about disease cycle and management of wilt in pigeonpea?	3 Marks	L3	CO3
6	Explain in detail about symptomology and etiology of cercospora leaf spot in blackgram?	3 Marks	L2	CO3
7	Write about symptomology and disease cycle of sigatoka disease in banana	3 Marks	L4	CO4
8	Write about management of bacterial blight in pomegranate?	3 Marks	L2	CO4
9	Write about symptomology and management of Phomopsis blight and fruit rot in brinjal?	3 Marks	L2	CO5
10	Write about symptomology and management of black rot disease in crucifers?	3 Marks	L1	CO5
11	Write about symptomology and management of anthracnose in beans?	3 Marks	L1	CO5
12	Write about symptomology and management of bud rot disease in coconut?	3 Marks	L1	CO1

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) V Semester (SOA-22) Supplementary Examinations, June – 2026

PRINCIPLES OF INTEGRATED PEST AND DISEASE MANAGEMENT

[Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 X 1 = 20 Marks**

1	The pests which occur on a few isolated localities is known as_____	1 Mark	L1	CO1
2	Lowest population at which the pest will cause economic damage_____	1 Mark	L1	CO1
3	Relative amount of heritable qualities possessed by the plant which influence the ultimate degree of damage done by the insect is called_____	1 Mark	L1	CO1
4	_____is a form of risk analysis conducted by regulatory plant health authorities to identify the appropriate phytosanitary measures required to protect plant resources against new or emerging pests and regulated pests of plants or plant products	1 Mark	L1	CO1
5	The prevention of the pathogen from entering the host or checking the further development in already infected plants by the application of chemicals is called_____	1 Mark	L1	CO1
6	Ooze test is used for the detection and diagnosis _____	1 Mark	L2	CO2
7	Downy mildew is the diagnostic sign produced by _____	1 Mark	L2	CO2
8	ETL value for BPH in rice is_____	1 Mark	L3	CO2
9	Pests that cause less than 5% loss in yield is _____	1 Mark	L3	CO2
10	Preventing the inoculum from entering or establishing in the field or area where it does not exist_____	1 Mark	L3	CO2
11	Early maturing varieties of wheat escape the damage due to_____	1 Mark	L2	CO3
12	Expand DIPA_____	1 Mark	L3	CO3
13	The systemic fungicides were first introduced by_____	1 Mark	L2	CO3
14	The primary mechanism of action for many insecticides is to disrupt the insect's _____system	1 Mark	L2	CO3
15	_____ is the predicting for the occurrence of plant disease in a specified area ahead of time, so that suitable control measures can be undertaken in advance to avoid losses	1 Mark	L1	CO3
16	Predicting disease outbreaks over a longer period, usually spanning weeks to months or even an entire growing season is known as _____	1 Mark	L1	CO4
17	_____is the one time process or official process to collect and record the data in a particular area at particular point of time.	1 Mark	L3	CO4
18	_____is recommended as an antidote for some organochlorine insecticides	1 Mark	L1	CO4
19	Convulsions, respiratory failure, loss of consciousness and loss of pulse are the major symptoms of _____poisoning	1 Mark	L3	CO4
20	Passing a rope over the crop in vegetative phase against_____	1 Mark	L2	CO4

PART - B

Answer any Ten Question
All Questions Carry Equal Marks

II **10 X 3 = 30 Marks**

1	Describe in detail about history and evolution of IPM	3 Marks	L1	CO1
2	Define EIL, ETL, GEP and DB?	3 Marks	L1	CO1
3	Write a short note on economic importance of insect pests and diseases?	3 Marks	L2	CO1
4	Write a short note on different biotechnological methods used for detection and diagnosis of fungi?	3 Marks	L3	CO2
5	Define symptom? Write a short note diagnosis of fungi using symptoms?	3 Marks	L1	CO2
6	Write a short note on importance of ETL?	3 Marks	L3	CO2
7	Explain in detail about legislative practices of insect pest management?	3 Marks	L2	CO3
8	Explain in detail about different methods of survey?	3 Marks	L2	CO3
9	Write a short note on requirements or conditions for disease forecasting?	3 Marks	L1	CO3
10	Write a short note on IPM module in pulse crop against different diseases?	3 Marks	L3	CO3
11	Write a short note on specific antidotes against insecticide poisoning?	3 Marks	L2	CO4
12	Explain in detail about legal implications of IPM?	3 Marks	L3	CO4

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) IV Semester (SOA-22) Supplementary Examinations, June – 2026

MANURES FERTILIZERS AND SOIL FERTILITY MANAGEMENT

[Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 X 1 = 20 Marks**

1	Criteria of essentiality were given by _____ in the year _____	1 Marks	L1	CO1
2	Nutrients involved in cell wall formation_____ and _____	1 Marks	L2	CO1
3	Yellowing in between leaf veins, yet veins remain green is termed as _____	1 Marks	L2	CO1
4	The ability of soil to produce crops under a specified management system is called _____	1 Marks	L1	CO1
5	Purplish-red discolorations in plant stems and leaves are due to _____ nutrient deficiency and _____ pigment	1 Marks	L2	CO1
6	One which would supply all the three major plant nutrient element in required. Proportions is termed as _____	1 Marks	L2	CO1
7	Name two fungal biofertilizers, which enhances the growth and soil fertility _____ and _____	1 Marks	L2	CO2
8	Associative symbiotic nitrogen fixer are _____	1 Marks	L1	CO2
9	Rhizobium strains are best suited for _____ and _____ crops	1 Marks	L3	CO2
10	12:6:6:2 refers to _____, _____,_____ and _____	1 Marks	L2	CO2
11	FYM contains _____% N, _____% P and _____% K	1 Marks	L2	CO3
12	The wide C/N ratio (>30:1) enhances immobilization of N (T/F)	1 Marks	L1	CO3
13	*Sesbania rostrata* can fix _____ kg of N/ha in 45-55 days	1 Marks	L2	CO3
14	Phosphate-solubilizing bacteria such as _____ and _____ were used for enhancing P availability to the soils	1 Marks	L2	CO3
15	Edible concentrated organic manure is _____ and _____	1 Marks	L2	CO3
16	DRIS?	1 Marks	L2	CO4
17	Application of fertilizer dissolved in irrigation water is _____	1 Marks	L1	CO4
18	Fertilizer ratio 1:2:1 refers to _____	1 Marks	L3	CO4
19	'A value', a biological test was given by _____	1 Marks	L2	CO4
20	Indicator crop for Molybdenum deficiency?	1 Marks	L2	CO4

PART - B

Answer any Ten Question
All Questions Carry Equal Marks

II **10 X 3 = 30 Marks**

1	Explain Root interpretation and factors affecting it?	3 Marks	L3	CO1
2	What is Mass flow in nutrient transport and its factors .	3 Marks	L1	CO1
3	Explain importance of secondary nutrients in plants.	3 Marks	L3	CO1
4	Write down the types of biofertilizers and its advantages.	3 Marks	L1	CO2
5	Define Fertilizer storage – Interpret Ideal conditions for indoor and outdoor storage.	3 Marks	L1	CO2
6	Define mixed fertilizer, complete fertilizer and complex fertilizers with examples.	3 Marks	L1	CO2
7	What is organic manures and classification of organic manures.	3 Marks	L1	CO3
8	What is INM and goals of INM.	3 Marks	L1	CO3
9	Explain Enriched compost and advantages of enriched compost.	3 Marks	L1	CO5
10	What are indicator crops and write down the indicator crops for macro and micronutrients.	3 Marks	L1	CO4
11	Explain Solid Form of fertilizer application and its disadvantages .	3 Marks	L3	CO4
12	Discuss about spot application of fertilizers and brief different types of spot placements.	3 Marks	L3	CO4

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) V Semester (SOA-22) Supplementary Examinations, June – 2026

PROBLEMATIC SOILS AND THEIR MANAGEMENT

[Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 x 1 = 20 Marks**

1.	The measurable properties of soil or plants that provides clues about how well the soil can function is called as an _____	1 Mark	L1	CO1
2.	The downward entry of water into the soil is called as _____	1 Mark	L1	CO1
3.	The units for electrical conductivity is _____	1 Mark	L1	CO1
4.	In Soil quality Index (SQI) = f (SP, P, E, H, ER, BD, FQ, MI), H means _____	1 Mark	L1	CO1
5.	The value to convert OC to SOM is _____	1 Mark	L1	CO1
6.	The full form of SAR is _____	1 Mark	L1	CO2
7.	In Universal Soil Loss Equation, the factor K stands for _____	1 Mark	L1	CO2
8.	Sheet erosion removes a fairly _____ layer of soil.	1 Mark	L1	CO2
9.	The determination of lime requirement of an acid soil was given by _____	1 Mark	L1	CO2
10.	The use of specific plants (metal accumulator plants) to extract contaminants from the top soil layer is called as _____	1 Mark	L1	CO2
11.	The formula for calculating RSC is _____	1 Mark	L1	CO3
12.	The Full form of COD is _____	1 Mark	L1	CO3
13.	Good quality irrigation water has SAR value less than _____.	1 Mark	L1	CO3
14.	Eroded soils reflects more in the visible and _____ region.	1 Mark	L1	CO3
15.	Magnesium hazard on irrigation water is expected having Mg:Ca ratio more than _____	1 Mark	L1	CO3
16.	Soils under MPT's increased (MWD) of aggregates upto _____ %	1 Mark	L1	CO4
17.	An example of tree species selected for agroforestry for laterite soils is _____	1 Mark	L1	CO4
18.	A non-leguminous species belong to a genus of actinomycetes is _____	1 Mark	L1	CO4
19.	In LCC, the degree and kind of limitations is indicated as _____	1 Mark	L1	CO4
20.	A pyrolysed product of biomass which is produced in absence or presence of little amount of oxygen by thermal decomposition is called as _____	1 Mark	L1	CO4

PART - B

Answer any Ten Questions
All Questions Carry Equal Marks

II **10 x 3 = 30 Marks**

1.	Difference between saline and alkali soils.	3 Marks	L4	CO1
2.	Explain the kinds of acidity.	3 Marks	L2	CO1
3.	Difference between Geological erosion and Accelerated erosion.	3 Marks	L4	CO1
4.	Explain reclamation of sodic soils using Gypsum with equations.	3 Marks	L2	CO2
5.	Write a note on Phytoremediation.	3 Marks	L2	CO2

6.	Write in detail the advantages of wind breaks or shelter belts.	3 Marks	L2	CO2
7.	List out factors affecting the suitability of irrigation water.	3 Marks	L1	CO3
8.	Write about the management practices for efficient use of water with sodicity hazard.	3 Marks	L2	CO3
9.	Explain how to use of saline water in agriculture.	3 Marks	L2	CO3
10.	Discuss about multipurpose tree species recommended for physical constraints.	3 Marks	L2	CO4
11.	Explain Land capability classification.	3 Marks	L2	CO4
12.	Write about the role of agroforestry in Biological Nitrogen Fixation.	3 Marks	L2	CO4

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Honrs) III Semester (SOA-24) Supplementary Examinations, June – 2026

ENTREPRENEURSHIP DEVELOPMENT AND BUSINESS COMMUNICATION

[Agriculture]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 X 1 = 20 Marks**

1	The concept of motivation is derived from the Latin word '_____', which means _____.	1 Mark	L2	CO1
2	_____ is the most important function of an entrepreneur.	1 Mark	L1	CO1
3	SWOT stands for Strengths, Weaknesses, _____, and Threats.	1 Mark	L1	CO1
4	The main motive of an entrepreneur is _____, whereas the main motive of a manager is to manage the enterprise.	1 Mark	L2	CO1
5	The process of entrepreneurship development begins with _____ identification.	1 Mark	L1	CO1
6	SIDBI provides _____ assistance to entrepreneurs	1 Mark	L2	CO2
7	The analysis of the internal environment helps to identify the _____ of the firm	1 Mark	L1	CO2
8	_____ Image refers to creating a mental picture of the firm in the minds of customers.	1 Mark	L1	CO2
9	_____ Registration provides legal recognition to a business.	1 Mark	L1	CO3
10	_____ Society is most suitable for collective farming.	1 Mark	L2	CO3
11	The first step in functioning of an enterprise is _____.	1 Mark	L1	CO3
12	Udyam registration is done online at _____ website.	1 Mark	L1	CO3
13	Private Limited Company is governed by _____ and shareholders.	1 Mark	L2	CO3
14	Market research is conducted to understand _____ needs.	1 Mark	L2	CO3
15	The first step in functioning of an enterprise is _____.	1 Mark	L1	CO4
16	Break-even analysis shows the level of sales at which _____ = total cost.	1 Mark	L1	CO4
17	In the three levels of product, the additional services or benefits offered are part of the _____ product.	1 Mark	L2	CO4
18	Journal is the _____ book of entry.	1 Mark	L1	CO5
19	The principal book of accounts is called _____.	1 Mark	L1	CO5
20	The first step in functioning of an enterprise is _____.	1 Mark	L2	CO5

Multiple Choice Questions

II **20 X 0.5 = 10 Marks**

1	Which function involves systematic collection of market data? a) Idea generation b) Procurement of raw materials c) Market research d) Recruitment	0.5 Mark	L2	CO1
2	Which of the following is not a characteristic of an entrepreneur? a) Hard work b) Independence c) High dependency d) Self-confidence	0.5 Mark	L2	CO1
3	Who defined entrepreneurship as "purposeful activity to initiate, maintain or aggrandize profit"? a) Knight b) Schumpeter c) A.H. Cole d) Cantillon	0.5 Mark	L1	CO1

4	Which of the following is a threat? a) Availability of money b) Shortage of power c) Growing population d) Favourable cultural environment	0.5 Mark	L2	CO2
5	Growing union pressure is considered as: a) Strength b) Weakness c) Opportunity d) Threat	0.5 Mark	L2	CO2
6	National Award Scheme is meant for: a) Large industries b) Only foreign investors c) MSMEs d) Banks	0.5 Mark	L2	CO2
7	Which organization provides loans for export-import activities? a) NABARD b) RBI c) EXIM Bank d) MCA	0.5 Mark	L2	CO3
8	Which factor is NOT part of the 4Ps of project conception? a) Product b) Price c) Place d) Partner	0.5 Mark	L1	CO3
9	Which type of ownership provides unlimited liability? a) Sole Proprietorship b) Private Limited Company c) LLP d) Co-operative Society	0.5 Mark	L1	CO3
10	Which factor ensures sustainability of product choice? a) Government Support b) Market Saturation c) High Cost d) Legal Barriers	0.5 Mark	L1	CO3
11	Which business entity is most suitable for scalable agribusiness start-ups? a) Sole Proprietorship b) Partnership c) Private Limited Company d) Co-operative	0.5 Mark	L2	CO3
12	Which document defines the structure and rules of a company? a) Memorandum of Association b) Trade License c) GSTIN d) PAN	0.5 Mark	L1	CO3
13	Backward scheduling means: a) Planning from present time b) Planning from delivery date c) Ignoring deadlines d) Extending production indefinitely	0.5 Mark	L2	CO4
14	Routing in production management refers to: a) Hiring labour b) Determining path of operations c) Ensuring product quality d) Delivering goods	0.5 Mark	L2	CO4
15	The preparation of a project report is important because: a) It ensures government approval b) It guides enterprise direction and attracts investors c) It guarantees subsidies d) It replaces project planning	0.5 Mark	L2	CO4
16	Which factor is NOT included in making a product choice? a) Packaging b) Branding c) Climate change d) After-sales service	0.5 Mark	L2	CO4
17	Who defined manpower planning as the planning, organizing, directing and controlling of procurement, development, compensation, integration and maintenance of people? a) Koontz b) Edwin B. Flippo c) Taylor d) Fayol	0.5 Mark	L1	CO5
18	Which of the following is NOT a factor affecting manpower planning? a) Existing stock of manpower b) Labour wastage c) Future withdrawal d) Shareholders' dividends	0.5 Mark	L2	CO5
19	Which of the following is NOT a subsidiary book? a) Sales Book b) Purchases Return Book c) Balance Sheet d) Cash Book	0.5 Mark	L1	CO5
20	Which of these is NOT a component of wages? a) Dearness Allowance b) House Rent Allowance c) Bonus d) Depreciation	0.5 Mark	L2	CO5

Match the Following

III **0.5 X 10 = 5 Marks**

1	Richard Cantillon	a)	Rate of employee exits and replacements	0.5 Mark	L1	CO1
2	Joseph Schumpeter	b)	Forecasting future human resource needs	0.5 Mark	L1	CO1
3	SWOT	c)	Determining exact path for operations	0.5 Mark	L2	CO2
4	PEST	d)	Deciding what, how and when to produce	0.5 Mark	L1	CO3
5	Project Selection	e)	Selecting appropriate process and equipment	0.5 Mark	L1	CO4
6	Technology and Machinery	f)	Choosing a viable product or service idea	0.5 Mark	L1	CO4
7	Planning	g)	Political, Economic, Social, Technological	0.5 Mark	L2	CO4
8	Routing	h)	Strengths, Weaknesses, Opportunities, Threats	0.5 Mark	L2	CO4
9	Manpower Planning	i)	Propounded the risk-bearing concept	0.5 Mark	L1	CO5
10	Labour Turnover	j)	Introduced the innovator theory of entrepreneurship	0.5 Mark	L1	CO5

Answer the Following

IV **1 X 5 = 5 Marks**

1	Give one example of a co-operative society in India.	1 Mark	L1	CO3
2	Mention one advantage of a Private Limited Company.	1 Mark	L2	CO3
3	State two functions of project report.	1 Mark	L2	CO4
4	Define augmented product.	1 Mark	L1	CO4
5	Name any two subsidiary books.	1 Mark	L1	CO5

PART - B

Answer any Five Questions

V **12 X 5 = 60 Marks**

1	a)	"Entrepreneurs play a vital role in economic development." Justify with suitable points.	6 Marks	L4	CO1
	b)	Write in brief about PMEGP.	6 Marks	L1	CO2
2	a)	Critically analyse the role of financial institutions in entrepreneurship development.	6 Marks	L4	CO2
	b)	Apply PEST analysis to evaluate the external factors affecting MSMEs in India.	6 Marks	L3	CO2
3	a)	Compare and contrast the usefulness of SWOT and PEST analysis for entrepreneurs.	6 Marks	L4	CO2
	b)	Analyze the role of government support and policies in entrepreneurial development.	6 Marks	L4	CO3
4		Write in brief about different government entrepreneurial development schemes.	12 Marks	L4	CO3
5		Discuss the different types of business entities with their suitability for agri-business.	12 Marks	L2	CO3
6		Critically analyze the role of co-operative societies in Indian agriculture.	12 Marks	L4	CO3
7		Discuss the importance of project report and its components.	12 Marks	L2	CO4
8	a)	Discuss objectives and advantages of manpower planning.	6 Marks	L2	CO5
	b)	Differentiate between wages and salaries.	6 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Honrs) III Semester (SOA-24) Supplementary Examinations, June – 2026

CROP PRODUCTION TECHNOLOGY-I (KHARIF CROPS)

[Agriculture]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 X 1 = 20 Marks**

1	Cereals are deficient in _____ and _____.	1 Mark	L1	CO1
2	The rice bowl of India is _____.	1 Mark	L1	CO1
3	CIMMYT is located at _____	1 Mark	L1	CO1
4	I^{rst} high yielding dwarf variety of rice is_____.	1 Mark	L2	CO1
5	Miracle crop of 21st century_____.	1 Mark	L1	CO1
6	Cereal crop that doesn't produce tillers is _____	1 Mark	L1	CO2
7	Sorghum cultivar most suitable for rationing is _____.	1 Mark	L2	CO2
8	The highest WUE is present in _____crop.	1 Mark	L1	CO2
9	The millet crop that tolerates salinity to greater extent is _____.	1 Mark	L1	CO2
10	Spiked millet is the other name of _____.	1 Mark	L1	CO2
11	The pulse crop that act as biological plough, soil renovator is _____	1 Mark	L1	CO3
12	Critical stage for moisture for pulses _____	1 Mark	L1	CO3
13	_____ used as a pulse, fodder and green manure	1 Mark	L1	CO3
14	Hormone used to check flower and fruit shedding in cotton _____.	1 Mark	L2	CO3
15	Unpredictable legume crop (legume + Oilseeed) _____	1 Mark	L1	CO3
16	1st sweet sorghum variety _____.	1 Mark	L1	CO4
17	Herbicide resistant cotton _____.	1 Mark	L2	CO4
18	Wonder crop is _____.	1 Mark	L1	CO4
19	Weed smothering crop is _____.	1 Mark	L1	CO4
20	1st high oleic acid groundnut varieties developed by ICAR-DGR, Junagadh is _____ and _____.	1 Mark	L1	CO4

Multiple Choice Questions

II **20 X 0.5 = 10 Marks**

1	The term cereal is derived from _____. a) Latin b) Roman c) Germany d) Sanskrit	0.5 Mark	L1	CO1
2	Staple food of India a) Rice b) Wheat c) Groundnut d) All of the above	0.5 Mark	L1	CO1
3	Golden rice is rich in Vitamin _____. a) A b) B c) C d) D	0.5 Mark	L1	CO1
4	Plant population of rice with spacing of 20 cm x 10 cm ____hills/ha. a) 5 x10^5 b) 6 x 10^5 c) 5 x 10^4 d) 6x 10^4	0.5 Mark	L1	CO1
5	LCC consists of ____strips a) 3 b) 6 c) 9 d) 12	0.5 Mark	L1	CO1
6	_____ deficiency in maize leads to white bud disease a) Zn b) Ca c) Fe d) None of the above	0.5 Mark	L1	CO2
7	Crop that is called as camel crop is _____. a) Maize b) Sorghum c) Pearlmillet d) Ragi	0.5 Mark	L1	CO2

8	Fall army worm is a major problem in _____. a) Rice b) Maize c) Sorghum d) Ragi	0.5 Mark	L1	CO2
9	The nutrient deficiency most commonly noticed in upland rice is _____. a) Ca b) Fe c) Zn d) All the above	0.5 Mark	L1	CO2
10	The millet crop that tolerates salinity to greater extent is _____. a) Rice b) Maize c) Sorghum d) Ragi	0.5 Mark	L1	CO2
11	Among *kharif* pulses _____have more tolerant to moisture stress a)Redgram b) Groundnut c) blackgram d) All the above	0.5 Mark	L1	CO3
12	Wonder variety of Tossa jute is a) JRO-524 b) JRO- 520 c) JRO- 424 d) JRO 425	0.5 Mark	L1	CO3
13	First Hybrid pigeon pea – ICPL-87 (released from ICRISAT) (True/False)	0.5 Mark	L2	CO4
14	Fertilizer recommended for foliar application in pulses 2% DAP, 1% Urea and 1% MOP (True/False)	0.5 Mark	L1	CO4
15	Queen of oil seeds is _____. a) Groundnut b) castor c) Sesame d) Mustard	0.5 Mark	L2	CO4
16	Power house of nutrients are a) Cereals b) Millets c) Pulses d) Oil seeds	0.5 Mark	L1	CO4
17	Soybean ___%, Protein ____% a) 20% and 40% b) 40% and 20% c) 20%and 20% d) 40%and 40%	0.5 Mark	L1	CO5
18	Multicut popular varirty of fodder sorghum is a) COFS 20 b) COFS 25 c) COFS 29 d) COFS 39	0.5 Mark	L1	CO5
19	Black eyed pea also known as a) Green gram b) Black gram c) cowpea d) Sesame	0.5 Mark	L1	CO5
20	Hybrid cotton spacing _____m a) 1 x 1 m b) 5 x 5 m c) 2 x 2 m d) 4 x 4 m	0.5 Mark	L1	CO5

Match the Following

III **0.5 X 10 = 5 Marks**

1	White jute/ Tita jute	a)	180 kg	0.5 Mark	L2	CO1
2	Black/brown/Tossa jute	b)	170 kg	0.5 Mark	L2	CO1
3	Jute fibre	c)	G. barbadense and G. hirsutum	0.5 Mark	L2	CO1
4	Cotton fibre	d)	G. herbacium and G. arboretum	0.5 Mark	L1	CO2
5	One bale of jute	e)	Feeding harvested fodder directly to cattle	0.5 Mark	L1	CO2
6	One bale of cotton	f)	Preservation of fodder in wet condition	0.5 Mark	L1	CO2
7	New World Cotton	g)	seed	0.5 Mark	L2	CO3
8	Old World Cotton/ Desi cotton/Diploid cotton	h)	Parenchymatus/Stem fibre	0.5 Mark	L2	CO3
9	Soilage	i)	Corchorus olitorius	0.5 Mark	L1	CO3
10	Silage	j)	Corchorus Capsularis	0.5 Mark	L1	CO3

Answer the Following

IV **1 X 5 = 5 Marks**

1	Expand- **IIPR** _____	1 Mark	L1	CO1
2	Scientific name of Sweet corn _____	1 Mark	L1	CO2
3	Define Silage_____	1 Mark	L1	CO3
4	Define Beaushening	1 Mark	L1	CO3
5	Expand- IGFRI _____	1 Mark	L1	CO4

PART - B

Answer any Five Questions

V **12 X 5 = 60 Marks**

1	a)	Explain the reasons of low productivity of pulses in India.	6 Marks	L2	CO1
	b)	What are the economic importance of millets?	6 Marks	L2	CO1
2	a)	Define Puddling. Write the objectives of Puddling.	6 Marks	L1	CO1
	b)	Write a note on Midseason Correction, Ratooning and sorghum effect in sorghum crop.	6 Marks	L2	CO1
3	a)	Write a note on slow release Nitrogenous fertilizers and Nitrification inhibitors.	6 Marks	L2	CO2
	b)	Precautions to be observed with regarding to irrigation and drainage during the life cycle of maize crop.	6 Marks	L2	CO2
4	a)	Explain the growth stages of Rice.	6 Marks	L2	CO2
	b)	List out the cultivation methods of Planting of Rice and Explain Dapog and SRI cultivation.	6 Marks	L2	CO2
5	a)	Explain the factors influencing quality of fibre in Jute.	6 Marks	L1	CO3
	b)	Write a note on Bud and Boll shedding in cotton and Write a note on Zing Terracing in Maize.	6 Marks	L2	CO3
6	a)	Write the economic importance of castor and uses of sesame.	6 Marks	L1	CO3
	b)	Branching in cotton and list out quality parameters of cotton and explain any three.	6 Marks	L2	CO3
7	a)	Describe the Ideal characters of forage /fodder crops.	6 Marks	L1	CO4
	b)	Explain the types of poisoning is noticed in fodder sorghum and write about Striga and its management.	6 Marks	L1	CO4
8	a)	Explain the Hay and Silage preparation and preservation.	6 Marks	L3	CO4
	b)	Differences between the two cultitvable species of Jute.	6 Marks	L2	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Honrs) III Semester (SOA-24) Supplementary Examinations, June – 2026

PRINCIPLES AND PRACTICES OF NATURAL FARMING

[Agriculture]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 X 1 = 20 Marks**

1	Natural farming emphasizes working in harmony with _____ instead of relying on synthetic inputs.	1 Mark	L1	CO1
2	Excavations at _____ and _____ reveal advanced agricultural practices in the Indus Valley.	1 Mark	L1	CO1
3	The Rigveda was composed around _____ BCE to _____ BCE.	1 Mark	L1	CO1
4	Runoff from chemical-laden fields in conventional farming can contaminate _____ sources.	1 Mark	L2	CO1
5	Practices like cover cropping and crop rotation help maintain _____ health and fertility.	1 Mark	L1	CO1
6	Natural farming is a _____ and sustainable agricultural approach that centers on ecological harmony.	1 Mark	L1	CO2
7	Natural farming rejects _____ inputs and emphasizes organic practices like cover cropping and crop rotation.	1 Mark	L2	CO2
8	The main goal of natural farming is to produce _____-dense and chemical-free food.	1 Mark	L1	CO2
9	Natural farming improves soil structure, water retention, and nutrient availability through _____ techniques.	1 Mark	L1	CO2
10	Natural Farming actively mitigates _____ change by sequestering carbon in the soil.	1 Mark	L1	CO2
11	The Kyoto Protocol aims to reduce global GHG emissions by _____% compared to 1990 levels.	1 Mark	L1	CO3
12	The Clean Development Mechanism (CDM) allows industrialized countries to earn saleable _____ by implementing emission-reduction projects in developing countries.	1 Mark	L1	CO3
13	The concept of _____ footprint measures the emission of gases contributing to global warming in CO2-equivalents.	1 Mark	L1	CO3
14	_____ footprint measures the consumption and contamination of freshwater resources.	1 Mark	L2	CO3
15	_____ footprint measures the amount of nitrogen released into the environment in relation to consumption.	1 Mark	L1	CO3
16	Natural farming is considered a _____ farming practice with scope for increasing employment and rural development.	1 Mark	L1	CO4
17	The preparation procedure for Beejamrutha involves adding fresh desi cow dung, cow urine, and _____ (50g) to 20 liters of water.	1 Mark	L2	CO4
18	The focus should be "_____ rather than crop."	1 Mark	L1	CO4
19	Natural farming envisages nutrient management through emphasis on enhanced _____ recycling.	1 Mark	L1	CO4
20	Beejamrutha acts as a _____ for the control of soil-borne diseases.	1 Mark	L1	CO4

Multiple Choice Questions

II **20 X 0.5 = 10 Marks**

1	Natural farming contributes to community development by: a) Reducing local employment b) Promoting family-owned farms and local food production c) Increasing dependency on imported foods d) Encouraging deforestation	0.5 Mark	L1	CO1
2	Healthy soils in natural farming also help in a) Increasing pesticide efficiency b) Acting as a carbon sink c) Raising water pollution d) Supporting monoculture farming	0.5 Mark	L1	CO1
3	Water conservation in natural farming can be achieved through a) Heavy irrigation b) Rainwater harvesting and efficient irrigation c) Overuse of groundwater d) Long-distance food transport	0.5 Mark	L1	CO1
4	Which of the following is a benefit of natural farming on human health? a) High chemical residues in food b) Food free from synthetic residues c) Reduced nutritional content d) Increased pesticide dependency	0.5 Mark	L1	CO1
5	"Waaphasa" in natural farming refers to _____. a) Soil aeration and moisture balance b) Waterlogging condition c) Dry soil condition d) Soil fertility testing	0.5 Mark	L1	CO2
6	Natural farming is also called _____. a) Do-nothing farming b) Chemical farming c) Precision farming d) Modern farming	0.5 Mark	L1	CO2
7	The concept of seed balls was introduced by _____. a) Subhash Palekar b) Masanobu Fukuoka c) Norman Borlaug d) Jagdish Chandra Bose	0.5 Mark	L1	CO2
8	The main goal of natural farming is to _____. a) Increase fertilizer use b) Work in harmony with nature c) Increase pesticide application d) Promote mechanization	0.5 Mark	L1	CO2
9	Natural farming discourages _____. a) Soil disturbance b) Mulching c) Use of compost d) Crop rotation	0.5 Mark	L1	CO2
10	Which of the following is not a principle of natural farming? a) No tillage b) No chemicals c) Use of synthetic fertilizers d) No weeding	0.5 Mark	L1	CO3
11	Carbon footprint measures: a) Water consumption in cubic meters b) Emission of gases contributing to global warming c) Use of bio-productive space d) Nitrogen released into the environment	0.5 Mark	L1	CO3
12	Polyculture involves: a) Growing a single crop over a large area b) Growing multiple crops together in the same field c) Planting only trees d) Using chemical fertilizers	0.5 Mark	L1	CO3
13	The ideal ratio of nitrogen, phosphorous, and potassium in soil is _____. a) 1:1:1 b) 4:2:1 c) 2:1:3 d) 3:2:1	0.5 Mark	L2	CO3
14	India is considered the mother of _____ farming systems. a) Chemical b) Organic c) Non-chemical d) Monoculture	0.5 Mark	L1	CO3
15	Nitrogen footprint measures: a) Emission of greenhouse gases b) Water consumption c) Nitrogen released into the environment d) Soil organic matter content	0.5 Mark	L2	CO3
16	Natural Farming aims to restore which of the following? a) Soil health and biodiversity b) Chemical dependency c) Barren lands through fertilizers d) High-input farming systems	0.5 Mark	L1	CO4

17	What are the four wheels of Zero Budget Natural Farming (ZBNF)? a) Pesticides, Herbicides, Fungicides, Insecticides b) Beejamruta, Jeevamruta, Mulching, Whapasa c) Irrigation, Tillage, Harvesting, Storage d) Crop Rotation, Monocropping, Intercropping, Fallowing	0.5 Mark	L1	CO4
18	Beejamruta is primarily used for what purpose in Natural Farming? a) Soil aeration b) Seed treatment using cow dung and urine c) Mulching crops d) Pest management with neem	0.5 Mark	L1	CO4
19	What is a key benefit of Natural Farming over chemical farming in terms of soil health? a) Reduces organic carbon content b) Rejuvenates soil health and increases organic matter c) Increases soil compaction d) Promotes soil erosion	0.5 Mark	L1	CO4
20	What is the pH value of Jeevamruta? a) 7.64 b) 4.68 c) 2.12 d) 1.05	0.5 Mark	L1	CO4

Match the Following

III **0.5 X 10 = 5 Marks**

1	SDG 2	a)	Andhra Pradesh's community-managed natural farming program	0.5 Mark	L2	CO1
2	SDG 13	b)	Promotes scientific validation of natural farming practices	0.5 Mark	L2	CO1
3	Seed Balls	c)	A method to ensure aeration and moisture balance in the soil	0.5 Mark	L2	CO2
4	No Cultivation	d)	A microbial formulation made from cow dung, urine, jaggery, and soil	0.5 Mark	L1	CO2
5	Renewable energy	e)	Climate Action via emission reduction and resilience	0.5 Mark	L1	CO3
6	Animal integration	f)	Zero Hunger through sustainable food systems	0.5 Mark	L1	CO3
7	Jeevamruta	g)	Provides manure, draft power, and income	0.5 Mark	L2	CO4
8	Beejamruta	h)	Solar, wind, and biogas sources on farms	0.5 Mark	L2	CO4
9	NITI Aayog	i)	Minimal soil disturbance to preserve structure and microbes	0.5 Mark	L1	CO4
10	APCNF	j)	Seeds coated with clay and compost for better germination	0.5 Mark	L1	CO4

Answer the Following

IV **1 X 5 = 5 Marks**

1	NITI Aayog	1 Mark	L1	CO1
2	SDG 12	1 Mark	L1	CO1
3	IFOAM	1 Mark	L1	CO3
4	IPCC	1 Mark	L1	CO2
5	OFAI	1 Mark	L1	CO4

PART - B

Answer any Five Questions

V **12 X 5 = 60 Marks**

1	a)	What are stepwells? Give an example and explain their importance in ancient agriculture.	4 Marks	L3	CO1
	b)	Who is known as the "Gandhi of Natural Farming"? Mention his main contributions.	4 Marks	L3	CO1
	c)	Write short notes on Krisi Shastras and their significance.	4 Marks	L2	CO1
2		Critically analyze the importance of natural farming in addressing modern challenges such as climate change, soil degradation, and biodiversity loss.	12 Marks	L3	CO1
3	a)	Explain the concept and definition of natural farming.	6 Marks	L2	CO2
	b)	Discuss the principles of Masanobu Fukuoka's natural farming.	6 Marks	L2	CO2
4		Describe the main pillars and philosophical foundation of natural farming as developed by Masanobu Fukuoka.	12 Marks	L2	CO2
5		Discuss how natural farming contributes to reducing environmental footprints and achieving sustainable development goals (SDGs).	12 Marks	L3	CO3
6	a)	Discuss biodiversity approaches followed in natural farming.	6 Marks	L3	CO3
	b)	Explain water conservation techniques adopted under natural farming systems.	6 Marks	L2	CO3
7		Describe the certification standards, labelling requirements, and regulatory mechanisms for Natural Farming in India under NPOP. Discuss economic considerations, viability, and global comparisons (e.g., EU, US, Japan).	12 Marks	L3	CO4
8	a)	Discuss the role of livestock integration in Natural Farming for nutrient management.	6 Marks	L2	CO4
	b)	How does Natural Farming contribute to water conservation in nutrient management?	3 Marks	L2	CO4
	c)	Explain the differences between Natural Farming and Organic Farming in nutrient management practices.	3 Marks	L2	CO4

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) II Semester (SOA-24) Supplementary Examinations, June – 2026

ENVIRONMENTAL STUDIES AND DISASTER MANAGEMENT

[Agriculture]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 X 1 = 20 Marks**

1	Geographical area where biotic and abiotic components interact with each other is called_____	1 Mark	L1	CO1
2	The World environment day is celebrated_____	1 Mark	L1	CO1
3	The complex network of interconnected food chains is called _____	1 Mark	L1	CO1
4	All members of single species occupying a common geographical area at the same time is _____	1 Mark	L2	CO1
5	The animal which consumes decaying organic matter is _____	1 Mark	L1	CO2
6	The Indus River water conflict is mainly between _____ and _____.	1 Mark	L1	CO2
7	The nitrogen gas content in the atmosphere is _____	1 Mark	L2	CO2
8	Compound responsible for reduction in O2 carrying capacity of blood is_____	1 Mark	L1	CO3
9	Lichen is a bioindicator of_____	1 Mark	L1	CO3
10	Due to addition of phosphates and nitrates in water body they become more productive because of _____	1 Mark	L1	CO3
11	National biodiversity authority situated at _____	1 Mark	L1	CO3
12	The color of NO2 gas is _____	1 Mark	L1	CO3
13	The global warming gas that is produced from rice field is _____	1 Mark	L1	CO4
14	_____treaty is implemented with the objective of the UNFCCC to fight global warming by reducing greenhouse gas concentrations in the atmosphere.	1 Mark	L2	CO4
15	IPCC was initiated in which year _____	1 Mark	L1	CO4
16	Kingston Protocol was initiated for _____	1 Mark	L1	CO4
17	Mental _____ at the workplace can cause accidents by reducing focus.	1 Mark	L2	CO5
18	The _____ monitors and provides weather-related information including cyclone alerts.	1 Mark	L1	CO5
19	Indian Meteorological Department located in _____	1 Mark	L1	CO5
20	The Central Water Commission is primarily responsible for _____ monitoring.	1 Mark	L1	CO5

Multiple Choice Questions

II **20 X 0.5 = 10 Marks**

1	The word environment is derived from the _____ verb environner a) Greek b) English c) French d) German	0.5 Mark	L1	CO1
2	The term ecology was coined by_____. a) Odum b) Tansley c) Haeckel d)Bell	0.5 Mark	L1	CO1
3	Energy flow in an ecosystem is a) Uni directional b) Bidirectional c) Multidirectional d) All the above	0.5 Mark	L1	CO1
4	The world freshwater availability for human use is approximately around a) 0.03% b) 0.003% c) 0.0003% d) 0.3%.	0.5 Mark	L1	CO2

5	According to IUCN classification, white bellied sea eagle comes under a) Rare species b) Vulnerable species c) Extinct species d) Endangered species	0.5 Mark	L1	CO2
6	The main abiotic component in Tundra ecosystem a) Permafrost b) Lichens c) Penguin d) Polar beer	0.5 Mark	L1	CO2
7	In a forest ecosystem Lion is an example for_____ a) Primary consumer b) Seconday consumer c) Tertiary Consumer d) Top consumer	0.5 Mark	L1	CO2
8	Group of individual organisms of the same species in a given area are called ---- a) Population b) Community c) Habitat d) Groupies	0.5 Mark	L1	CO3
9	The death of lichens in an area is an indicator of a) Air pollution b) Sound pollution c) Water pollution d) Soil pollution	0.5 Mark	L1	CO3
10	Which of the following is not a gaseous air pollutant? a) Chlorofluoro carbons b) Carbon monoxide c) Carbon di oxide d) Sonar	0.5 Mark	L1	CO3
11	Carbon monoxide , carbon di oxide sulphur di oxide comes under a) Secondary pollutants b) primary pollutants c) aromatic hydrocarbons d) oxides of sulphur.	0.5 Mark	L2	CO3
12	The intensity of noise is measured by a) dB b) cg c) mm d) watt	0.5 Mark	L1	CO4
13	The Environment (Protection) Act, was passed in the year a)1956 b)1 966 c) 1976 d)1986	0.5 Mark	L2	CO4
14	When is the world earth day? a) April 22 b) September 22 c) June 22 d) September 16	0.5 Mark	L1	CO4
15	When is the world ozone day? a) June 5 b) September 5 c) June 16 d) September 16	0.5 Mark	L1	CO4
16	Which among the following colour is a sign of conservation of environment? a) Green b) Yellow c) Blue d) White	0.5 Mark	L1	CO5
17	Chernobyl nuclear disaster a) 1966 b) 1976 c) 1986 d) 1996	0.5 Mark	L1	CO5
18	Which of the following is a preventive measure for road accidents? a) Ignoring traffic signs b) Pulling into traffic without looking c) Scanning 12 seconds ahead d) Using mobile phones while driving	0.5 Mark	L1	CO5
19	What is a major cause of air accidents? a) Proper weather forecasting b) Excellent air traffic control c) Poor maintenance of aircraft d) Well-designed runways	0.5 Mark	L1	CO5
20	Which of the following is a common workplace accident cause? a) Following safety rules b) Neglecting safety procedures c) Using protective gear d) Asking for help	0.5 Mark	L1	CO5

Match the Following

III **0.5 X 10 = 5 Marks**

1	RAMSAR Convention	a)	Wetlands	0.5 Mark	L2	CO1
2	Vienna Convention	b)	Ozone Layer	0.5 Mark	L2	CO1
3	Environmental Protection Act	c)	1986	0.5 Mark	L2	CO2
4	Montreal Protocol	d)	1987	0.5 Mark	L1	CO2
5	IUCN	e)	Red data Book	0.5 Mark	L1	CO3
6	Rio de janeiro Submit	f)	2002	0.5 Mark	L1	CO3
7	Pencillin	g)	Antibiotics	0.5 Mark	L2	CO4
8	Digitalin	h)	Heart aliments	0.5 Mark	L2	CO4
9	Hot spots	i)	Myers	0.5 Mark	L1	CO5
10	Eastern Himalayas	j)	Sikkim	0.5 Mark	L1	CO5

Answer the Following

IV					1 X 5 = 5 Marks
	1	Expand IPCC _____	1 Mark	L1	CO1
	2	What are the major functional attributes of an ecosystem	1 Mark	L1	CO2
	3	PAN stands for_____	1 Mark	L1	CO3
	4	What is ozone layer depletion?	1 Mark	L1	CO4
	5	Expand WHO _____	1 Mark	L1	CO5

PART - B

Answer any Five Questions

V					12 X 5 = 60 Marks
1	a)	Write in detail on importance of environmental studies	4 Marks	L1	CO1
	b)	Briefly discuss the Major environmental issues exist in present condition	4 Marks	L4	CO1
	c)	Explain the different layers of atmosphere	4 Marks	L4	CO1
2	a)	What are the causes for loss of biodiversity?	6 Marks	L1	CO1
	b)	Explain the biodiversity conservation concept in detail.	6 Marks	L4	CO1
3	a)	Describe the term hot spot in biodiversity	4 Marks	L4	CO2
	b)	Briefly explain the energy flow through ecosystem.	4 Marks	L4	CO2
	c)	Describe the types, characteristic features, structures and function of Forest ecosystem.	4 Marks	L3	CO2
4	a)	Provide a short explanation of what causes air pollution, the consequences they lead to, and how they can be controlled.	6 Marks	L2	CO3
	b)	Briefly describe the sources, harmful effects, and prevention methods of soil pollution	6 Marks	L3	CO3
5	a)	Give a brief overview of the Air Act along with the goals it aims to achieve and the roles and responsibilities of the air pollution control boards.	6 Marks	L2	CO4
	b)	Summarize the key provisions of the water Act, its main objectives, and the powers and functions assigned to the pollution control authorities.	6 Marks	L4	CO4
6	a)	Provide a brief explanation of the Forest Act, its main objectives, and the powers and functions it grants to authorities.	4 Marks	L2	CO4
	b)	What are the Effects of Poor Solid Waste Management	4 Marks	L1	CO4
	c)	Steps involved in Solid Waste Management	4 Marks	L2	CO4
7	a)	Describe the objectives and important provisions of the Water (Prevention and Control of Pollution) Act, 1974. In what ways has this law helped in controlling water pollution in India?	6 Marks	L4	CO4
	b)	Discuss the main features of the Air (Prevention and Control of Pollution) Act, 1981. How has this act contributed to improving air quality in Indian cities?	6 Marks	L4	CO4
8	a)	What is an earthquake? Enumerate its effects. Mention the methods to mitigate the disaster.	4 Marks	L1	CO5
	b)	Explain various emergency management tips to be under taken in case of any disaster.	4 Marks	L4	CO5
	c)	State different natural calamities and explain one in detail.	4 Marks	L1	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) II Semester (SOA-24) Supplementary Examinations, June – 2026

FUNDAMENTALS OF ENTOMOLOGY

[Agriculture]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 X 1 = 20 Marks**

1	_____ succeeded as the second entomologist to Government of India	1 Mark	L1	CO1
2	The class Chilopoda and Diplopoda possess _____ and _____ pairs of legs per segment, respectively	1 Mark	L2	CO1
3	Insect head possesses _____ number of segments and there are _____ types of insect head based on orientation	1 Mark	L3	CO1
4	In thrips and plume moths, all the wings are modified into _____ and _____, respectively	1 Mark	L3	CO1
5	In sphingid caterpillar, anal hook or born is present on ____ abdominal segment	1 Mark	L1	CO1
6	Foregut, Hindgut are _____ in origin, while midgut is _____ in origin	1 Mark	L1	CO2
7	Most terrestrial insects excrete waste product as _____ while, aquatic insects excrete _____	1 Mark	L2	CO2
8	The blood sugar of insect is _____ and it lacks _____ vitamin	1 Mark	L2	CO2
9	_____ is a phenomenon where the immature insects or stages give birth to young ones	1 Mark	L1	CO2
10	The cuticular lining as a spiral thickening throughout the length of the tracheal tube is known as _____	1 Mark	L2	CO2
11	In short horned grasshoppers, tympanal organs are present on _____ while, in long horned grasshoppers, tympanal organs are present on _____	1 Mark	L3	CO3
12	In Hemiptera, _____ family possess hind tibiae/femur expanded into thin, leaf like plate	1 Mark	L2	CO3
13	In thrips _____ mandibles are absent	1 Mark	L1	CO3
14	In _____ family, tympanal case closed medially and praecinctorium absent	1 Mark	L1	CO3
15	Osmeterium is present in _____	1 Mark	L3	CO3
16	Water scavenger beetles are characterized by _____, often prolonged posteriorly into a long spine	1 Mark	L2	CO4
17	_____ and _____ is the tarsal phenomenon in Coccinellidae and Cerambycidae	1 Mark	L2	CO4
18	_____ Hymenopteran family has two recurrent veins on forewing costal wings	1 Mark	L2	CO4
19	In _____ and _____ families, costa broken once at the end of subcostal while, costa with both humeral and subcostal beaks, respectivley	1 Mark	L2	CO4
20	_____ is the total heat energy required to complete a certain stage of development in the life cycle or in the completion of a physiological process of a species is constant.	1 Mark	L2	CO4

Multiple Choice Questions

II **20 X 0.5 = 10 Marks**

1	Factors responsible for abundance of insects. a) Structural perforations b) Developmental characters c) Protective adaptations d) All the above	0.5 Mark	L2	CO1
2	Arrangement of layers in the insect cuticle from outer to inner a) Cement layer, Wax layer, Polyphenol layer, Cuticulin layer, Exocuticle, Endocuticle, Hypodermis, Inner basement membrane b) Inner basement membrane, Hypodermis, Endocuticle, Exocuticle, Cuticulin layer, Polyphenol layer, Wax layer, Cement layer c) Endocuticle, Exocuticle, Cement layer, Wax layer, Polyphenol layer, Cuticulin layer, Hypodermis, Inner basement membrane d) Cement layer, Wax layer, Polyphenol layer, Cuticulin layer, Endocuticle, Exocuticle, Hypodermis, Inner basement membrane	0.5 Mark	L3	CO1
3	Geniculate antenna is present in _____ a) Ants b) Wasps c) Weevils d) All the above	0.5 Mark	L1	CO1
4	In honey bees, fore legs, mid legs and hind legs are modified into _____, respectively. a) Antennal cleaning legs, wax picking legs and pollen basket b) Wax picking legs, antennal cleaning legs and pollen basket c) Pollen basket, Antennal cleaning legs and wax picking legs d) None of the above	0.5 Mark	L3	CO1
5	_____ and _____ are two arms of epicranial suture a) Frontal suture and coronal suture b) Occipital suture and Post-occipital suture c) Both A and B d) Genal suture and occular suture	0.5 Mark	L1	CO1
6	Alimentary canal and male reproductive gonads are situated in a) Perivisceral sinus b) Perineural sinus c) Pericardial sinus d) All the above	0.5 Mark	L1	CO2
7	Functions of blood are _____ a) Transport of minerals b) Phagocytosis c) Coagulation d) All the above	0.5 Mark	L1	CO2
8	Hermaphroditism is seen in _____ a) Icerya purchasi b)Perla marginata c) Both A and B d) Only A	0.5 Mark	L3	CO2
9	_____ and _____ number of malpighian tubules are present in coccids and locust, respectivley a) 2 and 250 b) 250 and 2 c) 2 and 200 d) 6 and 60	0.5 Mark	L3	CO2
10	Taenidia and resilin is present in _____ a) Trachea b) Tracheole c) Spiracle d) All the above	0.5 Mark	L2	CO2
11	According to ICZN rules and procedure, scientific name must be. a) Latinized b) Underlined if typed c) Italics if handwritten d) All the above	0.5 Mark	L1	CO3
12	In dragonflies and damselflies, eyes are _____ and _____, respectively a) Holoptic and dioptic b) Dioptic and Holoptic c) Both a and b d) None of the above	0.5 Mark	L2	CO3
13	Leaf insects and stick insects belongs to order _____ a) Phasmatodea b) Odonata c) Ephemeroptera d) Embiopetra	0.5 Mark	L2	CO3
14	Paddy leaf hopper belong to family _____ a) Cicadellidae b) Delphacidae c) Pseudococcidae d) Tingidae	0.5 Mark	L3	CO3

15	In _____ family of Lepidoptera, Sc and Rs in hindwing are connected by a cross vein and in _____ family of Lepidoptera, Sc and Rs is not connected by a cross vein a) Bombycidae and Saturniidae b) Saturniidae and Bombycidae c) Pyralidae and Crambidae d) Noctuidae and Sphingidae	0.5 Mark	L3	CO3
16	Bioluminescence is seen in _____ a) Fire flies/glow worms b) Rice yellow stem borer c) Pink boll worm d) All the above	0.5 Mark	L1	CO4
17	In _____ family of Hymenoptera, dorsal view posterior margin of pronotum is straight and with a constriction between it. a) Sphecidae b) Evanidae c) Bethylidae d) Both b and c	0.5 Mark	L3	CO4
18	_____ is the parasitoid family/members of Diptera, where post-scutellum was very well developed. a) Tachinidae b) Tachinid flies c) Both a and b d) Only a	0.5 Mark	L3	CO4
19	The word ecology is derived from the Greek word 'Oikos' meaning _____ and 'Logos' meaning _____ a) Home and Discourse b) Habitat and study c) Both a and b d) None of the above	0.5 Mark	L2	CO4
20	Monophagous insect is _____ a) Scirpophaga incertulas b) Helicoverpa armigera c) Spodoptera litura d) Conogethes punctiferalis	0.5 Mark	L1	CO4

Match the Following

III **0.5 X 10 = 5 Marks**

1	ZSI	a)	Kolkata	0.5 Mark	L1	CO1
2	Hamuli	b)	Honey bees	0.5 Mark	L1	CO1
3	Corbicula	c)	Hindlegs of honeybees	0.5 Mark	L2	CO1
4	Culicidae	d)	Mosquitoes	0.5 Mark	L1	CO4
5	Tiger moths	e)	Erebidae	0.5 Mark	L1	CO3
6	Adephaga	f)	Carabidae	0.5 Mark	L2	CO4
7	Pentatomidae	g)	Stink bugs	0.5 Mark	L1	CO3
8	Super-family	h)	oidea	0.5 Mark	L3	CO3
9	Foregut	i)	Ectodermal origin	0.5 Mark	L1	CO2
10	Systole	j)	Heart contracts	0.5 Mark	L2	CO2

Answer the Following

IV **1 X 5 = 5 Marks**

1	Why post-occipital suture is known as real suture?	1 Mark	L3	CO1
2	What is cryptonephridial condition?	1 Mark	L2	CO2
3	What is homonym and synonym?	1 Mark	L3	CO3
4	What is physogastry?	1 Mark	L1	CO3
5	What is a predator and parasitoid?	1 Mark	L1	CO4

PART - B

Answer any Five Questions

V **12 X 5 = 60 Marks**

1	a)	Write about the contributory factors for the abundance of insects?	8 Marks	L2	CO1
	b)	Briefly explain insect wing coupling mechanisms along with neat diagrams?	4 Marks	L2	CO1
2	a)	Describe the process of Insect moulting?	6 Marks	L3	CO1
	b)	Describe different types of insect head along with neat diagrams?	6 Marks	L2	CO1
3	a)	Enlist the differences between semilooper and looper?	4 Marks	L2	CO2
	b)	What is filter chamber and explain it with a neat diagram?	4 Marks	L2	CO2
	c)	Write down the differences between trachea and tracheoles?	4 Marks	L2	CO2

4	a)	Describe different types of insect metamorphosis?	6 Marks	L2	CO2
	b)	Explain any six types of insect tracheal system based on number and arrangement of functional spiracles?	6 Marks	L3	CO2
5	a)	List out the differences between Acrididae and Tettigonidae	6 Marks	L2	CO3
	b)	Briefly explain any six rules and procedure to be followed while naming organisms?	6 Marks	L2	CO3
6	a)	Briefly explain characteristic features of any six economically important families of the group moths of Lepidoptera?	6 Marks	L2	CO3
	b)	Write the characteristic features of Order Thysanopetra and agriculturally economically important family of it?	6 Marks	L2	CO3
7	a)	Explain characteristic features of any six economically important families of order Coleoptera?	6 Marks	L2	CO4
	b)	Explain in detail about the differences between two suborders Symphyta and Apocrita of Hymenoptera?	6 Marks	L3	CO4
8	a)	Explain characteristic features of any six economically important families of order Diptera	6 Marks	L2	CO4
	b)	Write down the importance of ecology in pest management?	6 Marks	L3	CO4

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) II Semester (SOA-24) Supplementary Examinations, June – 2026

PERSONALITY DEVELOPMENT

[Agriculture]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 X 1 = 20 Marks**

1	The term "personality" is derived from the Latin word _____, which originally referred to the mask worn by actors.	1 Mark	L1	CO1
2	According to Freud, the id operates on the _____ principle and seeks immediate gratification.	1 Mark	L1	CO1
3	According to Maslow, _____ is the highest level in the hierarchy of needs	1 Mark	L1	CO1
4	According to Hippocrates, the _____ personality is associated with yellow bile and is irritable and passionate.	1 Mark	L2	CO1
5	The interaction between genetic predispositions and environmental factors is known as _____	1 Mark	L1	CO2
6	_____ factors refer to the immediate circumstances or contexts that can temporarily influence behavior.	1 Mark	L1	CO2
7	_____ is the tendency to be organized, responsible, and hardworking, reflecting a strong sense of duty	1 Mark	L2	CO2
8	The Big Five dimensions of personality are also referred to by the acronym_____	1 Mark	L1	CO2
9	_____ refers to the degree of emotional stability and the tendency to experience negative emotions	1 Mark	L1	CO2
10	_____persons energized by interacting with others, thrive in social situations and tend to focus on the external world	1 Mark	L1	CO2
11	According to Lewin's Field Theory, behaviour is a function of both the _____ and the _____	1 Mark	L1	CO3
12	Bandura's Social Learning Theory emphasizes learning through _____ rather than direct reinforcement	1 Mark	L1	CO3
13	The three components of the ABC Model of behaviour are _____, _____, and _____	1 Mark	L1	CO3
14	_____is a structured, systematic process designed to impart specific skills or knowledge, often for a particular job or task .	1 Mark	L2	CO4
15	Classical conditioning was explained by _____	1 Mark	L1	CO4
16	A noticeable change in behaviour due to learning is considered _____ learning.	1 Mark	L1	CO4
17	Attitudes are also known as_____	1 Mark	L2	CO5
18	_____are the cognitive components of consumer attitude	1 Mark	L1	CO5
19	_____is the ability of an individual to make profitable use of past experience.	1 Mark	L1	CO5
20	_____ intelligence are physically not existing	1 Mark	L1	CO5

Multiple Choice Questions

II **20 X 0.5 = 10 Marks**

1	Who stated, "Personality is the total configuration of individual characteristics and modes of behaviours…"? a) J.B. Watson b) Dennell c) Trainer d) Hilgard	0.5 Mark	L1	CO1
2	According to Allport, which of the following traits dominates a person's entire behaviour? a) Central Trait b) Secondary Trait c) Cardinal Trait d) Peripheral Trait	0.5 Mark	L1	CO1
3	Which level in Maslow's hierarchy focuses on appreciation, creativity, and fulfillment? a) Social needs b) Safety needs c) Esteem needs d) Self-actualization	0.5 Mark	L1	CO1
4	The psychoanalyst who introduced the concept of 'collective unconscious' is? a) Freud b) Rogers c) Jung d) Adler	0.5 Mark	L1	CO1
5	The concept of 'Looking-Glass Self' refers to? a) One's true personality b) A mirror used in self-assessment c) Perception of others' perception of oneself d) Real self-image	0.5 Mark	L1	CO1
6	According to Maslow, self-actualization is: a) Deficiency-focused b) Problem-oriented d) Growth-oriented d) Survival-based	0.5 Mark	L1	CO2
7	Which of the following is not considered a determinant of personality? a) Heredity b) Environmental factors c) Astrological signs d) Situational factors	0.5 Mark	L1	CO2
8	People with an internal locus of control believe that: a) Their fate is determined by external factors b) Their actions directly affect outcomes c) Luck controls their lives d) Others are responsible for their success	0.5 Mark	L1	CO2
9	Which personality type is more prone to cardiovascular disease due to high stress? a) Type A b) Type B c) Judging d) Feeling	0.5 Mark	L1	CO2
10	What does the "C" stand for in the ABC model of behaviour? a) Confidence b) Conditioning c) Cognition d) Control	0.5 Mark	L1	CO3
11	In Herzberg's theory, which of the following is a hygiene factor? a) Achievement b) Recognition c) Salary d) Growth .	0.5 Mark	L1	CO3
12	Which type of culture emphasizes independence and personal goals? a) Collectivist b) Individualistic c) Patriarchal d) Egalitaria	0.5 Mark	L1	CO3
13	Which ability is related to tasks requiring stamina and agility? a) Intellectual ability b) Physical ability c) Emotional intelligence d) Social skill	0.5 Mark	L2	CO3
14	Which of the following is *not* a component of learning? a) Learning involves change b) Learning is temporary c) Learning is reflected in behaviour d) Learning is reinforced through experience	0.5 Mark	L1	CO4
15	Classical Conditioning was proposed by: a) B.F. Skinner b) Jean Piaget c) Albert Bandura d) Ivan Pavlov	0.5 Mark	L2	CO4
16	In Operant Conditioning, behaviour is influenced primarily by: a) Internal thoughts b) Environmental noise c) Consequences (rewards/punishments d) Physical reflexes	0.5 Mark	L1	CO4
17	According to Thorndike, which of the following is NOT a type of intelligence? a) Abstract intelligence b) Mechanical intelligence c) Social Intelligence d) Emotional intelligence	0.5 Mark	L1	CO5

18	Which component of attitude involves the actual actions or behaviors toward an object? a) Emotional component b) Cognitive component c) Behavioural component d) Evaluative component	0.5 Mark	L1	CO5
19	What does a positive attitude typically include? a) Blaming others b) Gratitude and problem-solving mindset c) Complaining frequently d) Resistance to feedback	0.5 Mark	L1	CO5
20	What is the relationship between values and norms? a) Norms are more abstract than values b) Norms are the accepted behaviors that support values c) Norms have no connection with values d) Values are temporary; norms are permanent	0.5 Mark	L1	CO5

Match the Following

III **0.5 X 10 = 5 Marks**

1	Jung's Classification	a)	Skinner	0.5 Mark	L2	CO1
2	Sheldon's Classification	b)	Bandura's	0.5 Mark	L2	CO1
3	Social needs	c)	Group goals	0.5 Mark	L2	CO2
4	Self-actualization	d)	Thorndike	0.5 Mark	L1	CO2
5	Operant conditioning	e)	Vroom's	0.5 Mark	L1	CO3
6	Social Learning	f)	Ultimate purpose of human being	0.5 Mark	L1	CO3
7	Collectivist Cultures	g)	Extroverts Personality	0.5 Mark	L2	CO3
8	Types of intelligence	h)	Endomorphic Personality	0.5 Mark	L2	CO3
9	Equity Theory	i)	Friendship, company	0.5 Mark	L1	CO3
10	Expectancy Theory	j)	John Stacey Adams'	0.5 Mark	L1	CO3

Answer the Following

IV **1 X 5 = 5 Marks**

1	Expand MMPI	1 Mark	L1	CO1
2	Expand TAT	1 Mark	L1	CO1
3	Which dimension of personality refers to inventive and curious	1 Mark	L1	CO2
4	B = f(P, E)	1 Mark	L2	CO3
5	What type of perception refers to feeling textures, pressure, or temperature?	1 Mark	L1	CO4

PART - B

Answer any Five Questions

V **12 X 5 = 60 Marks**

1	a)	List out the fundamental characteristics of personality and write any six?	6 Marks	L1	CO1
	b)	Write importance of personality development	6 Marks	L1	CO1
2		Explain briefly the assessment of Personality?	12 Marks	L2	CO1
3	a)	What is the Myers-Briggs Type Indicator (MBTI)?	6 Marks	L2	CO2
	b)	Differentiate between Type A and Type B personalities?	6 Marks	L2	CO2
4	a)	Explain the stages of perception?	4 Marks	L3	CO3
	b)	What are the different types of perception?	4 Marks	L1	CO3
	c)	What are the different models of individual behaviour?	4 Marks	L2	CO3
5		Explain the factors influence the perceptual process?	12 Marks	L5	CO3
6		Explain about the Principles of learning?	6 Marks	L2	CO4
7	a)	Write the difference between explicit and tacit knowledge?	6 Marks	L3	CO4
	b)	Write the differences between learning and training?	6 Marks	L3	CO4
8	a)	Explain the role of team work in organization?	6 Marks	L3	CO5
	b)	What are the different types of motives?	6 Marks	L1	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Honrs) III Semester (SOA-24) Supplementary Examinations, June – 2026

FUNDAMENTALS OF EXTENSION EDUCATION

[Agriculture]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 X 1 = 20 Marks**

1	The three main components of education are _____, ____, and _____.	1 Mark	L1	CO1
2	Skill refers to the _____ to do things.	1 Mark	L1	CO1
3	_____ is a predetermined course of action	1 Mark	L1	CO1
4	Extension education is also calle d as _____	1 Mark	L2	CO1
5	The four main transfer of technology projects of ICAR are AICPND, ORP, LLP, and _____.	1 Mark	L1	CO2
6	The first Krishi Vigyan Kendra (KVK) was established at _____ place	1 Mark	L1	CO2
7	The Small Farmers Development Agency (SFDA) provided subsidy ranging from 25% for non-tribal farmers to _____ for tribal farmers.	1 Mark	L2	CO2
8	IADP is popularly called a _____	1 Mark	L1	CO2
9	In Market-led Extension, farmers are considered as _____	1 Mark	L1	CO3
10	Cyber Extension refers to "Extension over _____."	1 Mark	L1	CO3
11	The process by which an individual passes from hearing about an innovation to its final adoption is called _____.	1 Mark	L1	CO3
12	Expert System is a software application designed to reproduce the performance of a _____ expert.	1 Mark	L1	CO3
13	According to Mahatma Gandhi, "India lives in its _____."	1 Mark	L1	CO4
14	Democratic Decentralization in India is popularly known as the _____ system.	1 Mark	L2	CO4
15	The _____Committee recommended the three-tier Panchayat Raj system.	1 Mark	L1	CO4
16	Buzz Groups, also called _____	1 Mark	L1	CO4
17	The functions of administration are represented by the acronym _____	1 Mark	L2	CO5
18	_____ involves the recruitment, selection, development, utilization and accommodation of human resources in an organization.	1 Mark	L1	CO5
19	The word communication is derived from the Latin word _____	1 Mark	L1	CO5
20	According to Aristotle's model, communication involves _____, _____, and _____.	1 Mark	L1	CO5

Multiple Choice Questions

II **20 X 0.5 = 10 Marks**

1	The basic concept of extension is: a) Helping people to help themselves b) Forcing people to act c) Providing charity d) Educating only students	0.5 Mark	L1	CO1
2	Which type of education follows a fixed curriculum and syllabus?	0.5 Mark	L1	CO1

a) Informal b) Non-formal c) Formal d) Social

3	Which principle stresses on starting from people's felt needs? a) Principle of interest and need b) Principle of self-motivation c) Principle of participation d) Principle of follow-up	0.5 Mark	L1	CO1
4	Programme planning in extension means: a) Designing systematic activities for rural development b) Random teaching c) Political campaigning d) Religious programmes	0.5 Mark	L1	CO1
5	The major mandates of KVKs are: a) Research, Teaching, Extension b) Training programmes, Frontline demonstrations, On-farm testing c) Planning, Evaluation, Monitoring d) Production, Distribution, Marketing	0.5 Mark	L1	CO2
6	The Firka Development Programme was launched in the year: a) 1921 b) 1946 c) 1948 d) 1950	0.5 Mark	L1	CO2
7	The Small Farmers Development Agency (SFDA) was established based on the recommendations of: a) Dr. Spencer Hatch Committee b) Rabindranath Tagore Committee c) B. Venkatappiah Committee d) Mahatma Gandhi Committee	0.5 Mark	L1	CO2
8	The full form of ATMA is: a) Agricultural Training and Management Agency b) Agricultural Technology Management Agency c) Agro-Technical Monitoring Association d) Agricultural Transfer Management Agency	0.5 Mark	L1	CO2
9	Privatization of agricultural extension means: a) Extension managed by government departments b) Extension managed by farmers' cooperatives c) Extension funded and delivered by private individuals or firms d) Extension free of cost to farmers	0.5 Mark	L1	CO3
10	The Warna Wired Village Project was launched in: a) Karnataka b) Maharashtra c) Tamil Nadu d) Uttar Pradesh	0.5 Mark	L1	CO3
11	The main objective of Farmer-Led Extension is: a) To replace government extension officers b) To train farmers by experienced farmers c) To privatize agriculture fully d) To collect market data	0.5 Mark	L1	CO3
12	In the five-stage model, the stage where an individual seeks more information about an innovation is called: a) Awareness b) Interest c) Evaluation d) Trial	0.5 Mark	L1	CO3
13	The term *Panchayat* literally means: a) Group of ten persons b) Assembly of five persons c) Village organization d) Local government	0.5 Mark	L2	CO4
14	A democratic leader encourages: a) Strict discipline b) Independent decision-making by leader only c) Group participation in decision-making d) No consultation with members	0.5 Mark	L1	CO4
15	The role of Group Harmonizer is to: a) Enforce strict rules in the group b) Promote harmony and resolve conflicts peacefully c) Plan the activities of the group d) Supervise field activities	0.5 Mark	L2	CO4
16	The Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) ensures: a) 50 days of employment b) 75 days of employment c) 100 days of employment d) 150 days of employment	0.5 Mark	L1	CO4

17	Management in relation to administration is: a) Superior to administration b) A separate system from administration c) A part of administration d) Not related to administration	0.5 Mark	L1	CO5
18	The full form of DAATTC is: a) District Agricultural Action and Technology Centre b) District Agricultural Advisory and Transfer of Technology Centre c) Development and Agricultural Technology Training Centre d) District Agricultural Assessment and Training Centre	0.5 Mark	L1	CO5
19	The term "communication" is derived from the Latin word: a) Communicare b) Communis c) Communicate d) Communa	0.5 Mark	L1	CO5
20	The success of an extension worker depends on: a) Intelligence b) Experience c) Effective communication d) Subject knowledge	0.5 Mark	L1	CO5

Match the Following

III **0.5 X 10 = 5 Marks**

1	Extension Education	a)	Venturesome	0.5 Mark	L2	CO1
2	Lifelong education	b)	1999	0.5 Mark	L1	CO1
3	Sri Niketan	c)	1960	0.5 Mark	L2	CO2
4	Seva gram	d)	Ravindranath Tagore	0.5 Mark	L1	CO2
5	Innovators	e)	Informal	0.5 Mark	L1	CO3
6	Early adopters	f)	Village	0.5 Mark	L1	CO3
7	Gram panchayat	g)	Mahatma Gandhi	0.5 Mark	L2	CO4
8	SGSY	h)	Non-formal	0.5 Mark	L2	CO4
9	Individual contact	i)	Respectful	0.5 Mark	L1	CO5
10	Berlo	j)	Farm and home visits	0.5 Mark	L1	CO5

Answer the Following

IV **1 X 5 = 5 Marks**

1	Write steps of extension education process?	1 Mark	L2	CO1
2	Expand ORP	1 Mark	L1	CO2
3	Expand CIG	1 Mark	L1	CO3
4	Expand MGNREGP	1 Mark	L1	CO4
5	Expand POSDCoRB	1 Mark	L1	CO5

PART - B

Answer any Five Questions

V **12 X 5 = 60 Marks**

1	a)	What is education? Explain different types of education.	6 Marks	L1	CO1
	b)	Explain the concept of Education and salesmanship	6 Marks	L2	CO1
2		List out all the principles of extension education and explain any six with examples?	12 Marks	L2	CO1
3		Explain about the four main transfer of technology projects of ICAR?	12 Marks	L3	CO2
4		List out all the pre-independence and post-independence rural development programmes and explain them?	12 Marks	L3	CO3
5		What is privatization in Extension? Explain the characteristics merits and problems encountered in private extension system?	12 Marks	L1	CO3
6		Illustrate the five-stage model of adoption process?	12 Marks	L4	CO4
7		Discuss about three tiers of panchayat raj system and organization set up – mandal system in Andhra Pradesh?	12 Marks	L3	CO4
8	a)	Briefly explain about the types of evaluation?	6 Marks	L2	CO5
	b)	Differentiate between education and training?	6 Marks	L1	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Honrs) III Semester (SOA-24) Supplementary Examinations, June – 2026

PRINCIPLES OF GENETICS

[Agriculture]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 X 1 = 20 Marks**

1	Mendel worked on _____ crop	1 Mark	L1	CO1
2	Gene term was given by _____	1 Mark	L1	CO1
3	Kary Mullis invented _____	1 Mark	L1	CO1
4	Mendel worked on _____ crop	1 Mark	L1	CO1
5	Co-dominance is seen in _____ blood group in humans.	1 Mark	L1	CO3
6	The rabbit fur colour is an example of_____.	1 Mark	L1	CO3
7	_____ is the tendency of genes located on the same chromosome to be inherited together.	1 Mark	L1	CO4
8	The two phases of linkage are coupling and _____	1 Mark	L1	CO4
9	Chromosomes that determine sex are called _____	1 Mark	L1	CO2
10	Plant cells have a rigid _____ wall, absent in animal cells	1 Mark	L1	CO2
11	The organelle responsible for photosynthesis in plants is _____	1 Mark	L1	CO2
12	The number of daughter cells formed after mitosis is _____	1 Mark	L1	CO2
13	The sugar present in RNA is _____.	1 Mark	L1	CO3
14	DNA replication in most organisms follows the _____ method	1 Mark	L1	CO3
15	UAA, UAG, UGA are _____.	1 Mark	L1	CO5
16	_____ is a functional unit of inheritance.	1 Mark	L1	CO5
17	_____ is the smallest unit of recombination.	1 Mark	L1	CO5
18	A mutagen is an agent that causes _____.	1 Mark	L1	CO4
19	Mapping distance is measured in_____	1 Mark	L1	CO4
20	_____ is the start codon.	1 Mark	L1	CO5

Multiple Choice Questions

II **20 X 0.5 = 10 Marks**

1	Chargaff's rule states that _____ a) A=C b) A=T c) C=A d) G=T	0.5 Mark	L1	CO1
2	T. H. Morgan worked with _____ a) Housefly b) Fruitfly c) Mosquito d) Ants	0.5 Mark	L1	CO1
3	The sugar in DNA is: a) Glucose b) Ribose c) Deoxyribose d) Fructose	0.5 Mark	L1	CO3
4	Example of Incomplete dominance is _____ a) Two o'clock plant b) Three o'clock plant c) Five o'clock plant d) Four o'clock plant	0.5 Mark	L1	CO1
5	Transmission of characters from one generation to other takes place only through _____ a) Germplasm b) Somatoplasm c) Both d) None	0.5 Mark	L1	CO1
6	Which organelle carries plastid inheritance? a) Mitochondria b) Chloroplast c) Nucleus d) Ribosome	0.5 Mark	L1	CO5

7	The centromere holds together a) Chromatin b) Sister chromatids c) Nucleolus d) Ribosomes	0.5 Mark	L1	CO2
8	Transcription is: a) DNA → RNA b) RNA → DNA c) RNA → Protein d) Protein → DNA	0.5 Mark	L1	CO5
9	Animal cells contain _____ that plant cells lack a) Ribosomes b) Centrioles c) Chloroplasts d) Nucleus	0.5 Mark	L1	CO2
10	The phase of cell cycle where DNA replication ocurs is a) G1 b) S c) G2 d) M	0.5 Mark	L1	CO2
11	A special type of chromosome is a) Lampbrush chromosome b) Polytene chromosome c) Both of the above d) None of the above	0.5 Mark	L1	CO2
12	Which is a chemical mutagen? a) Colchicine b) X-rays c) Gamma rays d) UV light	0.5 Mark	L1	CO4
13	Epistasis refers to: a) One gene masking another b) Alleles blending c) Gene influencing multiple traits d) None	0.5 Mark	L1	CO3
14	Incomplete dominance is shown by: a) Pink flowers in Mirabilis b) ABO blood group c) Rabbit fur colour d) Colour blindness	0.5 Mark	L1	CO3
15	Full form of EMS is a) ethyl methane sulphur b) ethyl ethane sulphonate c) methyl methane sulphonate d) ethyl methane sulphonate	0.5 Mark	L1	CO4
16	Coupling and repulsion are phases of: a) Crossing over b) Linkage c) Mutation d) Mapping	0.5 Mark	L1	CO4
17	Down's syndrome is caused by: a) Monosomy b) Trisomy c) Both of the above d) None of the above	0.5 Mark	L1	CO4
18	Mitochondrial inheritance is usually: a) Paternal b) Maternal c) Both d) None	0.5 Mark	L1	CO5
19	Genetic code is: a) Single b) Triplet c) Double d) Quadruple	0.5 Mark	L1	CO5
20	Which base is found only in RNA? a)Thymine b) Uracil c) Adenine d) Guanine	0.5 Mark	L1	CO3

Match the Following

III **0.5 X 10 = 5 Marks**

1	Watson & Crick	a)	Miescher	0.5 Mark	L1	CO2
2	Chi square test	b)	X-linked disorder	0.5 Mark	L1	CO2
3	Phenotype	c)	DNA double helix	0.5 Mark	L1	CO1
4	Nuclein	d)	Karl Pearson	0.5 Mark	L1	CO1
5	Colour blindness	e)	Johannsen	0.5 Mark	L1	CO3
6	Monosomic	f)	*Mirabilis jalapa*	0.5 Mark	L1	CO4
7	Nullisomic	g)	Polygenic inheritance	0.5 Mark	L1	CO4
8	Incomplete dominance	h)	Oligogenic inheritance	0.5 Mark	L1	CO3
9	Quantitative traits	i)	2n-1	0.5 Mark	L1	CO5
10	Qualitative traits	j)	2n-2	0.5 Mark	L1	CO5

Answer the Following

IV **1 X 5 = 5 Marks**

1	Genetics	1 Mark	L1	CO1
2	Autosomes	1 Mark	L1	CO2
3	Pleiotropy	1 Mark	L1	CO3
4	Mutation	1 Mark	L1	CO4
5	Translation	1 Mark	L1	CO5

PART - B

Answer any Five Questions

V **12 X 5 = 60 Marks**

1	a)	State the different theories in Pre-mendelian concepts of Heredity along with the scientists.	5 Marks	L2	CO1
	b)	Explain the Germplasm theory.	7 Marks	L2	CO1
2	a)	Define mutation and classify its types.	7 Marks	L2	CO4
	b)	What is a mutagen and give examples of two physical and chemical mutagens?	5 Marks	L2	CO4
3	a)	Define chromosome.	1 Mark	L1	CO2
	b)	Draw a neat diagram of a chromosome and label the parts.	8 Marks	L3	CO2
	c)	List out the special types of chromosome.	3 Marks	L2	CO2
4	a)	Explain why Mendel chose pea plants for his experiment.	6 Marks	L5	CO1
	b)	Reasons for the success of Mendel's Experiments.	6 Marks	L5	CO1
5	a)	Explain dominance and incomplete dominance.	4 Marks	L2	CO3
	b)	Explain co-dominance with an example.	8 Marks	L2	CO3
6	a)	Explain transcription.	8 Marks	L2	CO5
	b)	Draw a neat diagram for transcription.	4 Marks	L3	CO5
7	a)	Define cell and draw a diagram of plant cell.	6 Marks	L3	CO2
	b)	Difference between plant and animal cells.	6 Marks	L4	CO2
8	a)	What is a genetic code?	2 Marks	L2	CO5
	b)	Write the properties of genetic code.	10 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Honrs) III Semester (SOA-24) Supplementary Examinations, June – 2026

PRODUCTION TECHNOLOGY OF FRUIT AND PLANTATION CROPS

[Agriculture]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 X 1 = 20 Marks**

1	Plantation crops are cultivated on an extensive scale (true/false)	1 Mark	L1	CO1
2	CPCRI is located at _____	1 Mark	L1	CO1
3	Family of pine apple _____	1 Mark	L1	CO1
4	Botanical name of grape _____	1 Mark	L1	CO1
5	Plantation crops are cultivated on an extensive scale (true/false)	1 Mark	L1	CO1
6	Papaya variety most suitable for high density planting _____	1 Mark	L1	CO2
7	Major pollinator in mango _____	1 Mark	L1	CO2
8	Ganesh is a variety of _____	1 Mark	L1	CO2
9	Cultivated strawberry is _____	1 Mark	L1	CO2
10	Lucknow-49 is a popular variety of _____	1 Mark	L1	CO2
11	An example for Non-climacteric fruit is _____	1 Mark	L1	CO3
12	Commercial method of propagation in Strawberry_____	1 Mark	L1	CO3
13	National research center for litchi is located at_____	1 Mark	L1	CO3
14	An example for Non-climacteric fruit is _____	1 Mark	L1	CO3
15	In fruit of pine apple fruit contain _____ type of enzyme	1 Mark	L1	CO3
16	Family of rubber _____	1 Mark	L1	CO4
17	Inflorescence of coconut is known as _____	1 Mark	L1	CO4
18	The alcoholic beverage prepared from cashew apple is called _____	1 Mark	L1	CO4
19	Assam is leading state area and production of _____beverage crop	1 Mark	L1	CO4
20	Plantation crops are generally consumed after _____	1 Mark	L1	CO4

Multiple Choice Questions

II **20 X 0.5 = 10 Marks**

1	Which of the following crops is NOT a plantation crop? a) Tea b) Cocoa c) Rubber d) Papaya	0.5 Mark	L1	CO1
2	Which plantation crop is latex-producing? a) Arecanut b) Rubber c) Cocoa d) Cashew	0.5 Mark	L1	CO1
3	Scope of fruit cultivation in India is high due to: a) Diverse agro-climatic conditions b) Only tropical weather c) High rainfall in all regions d) Uniform soil type	0.5 Mark	L1	CO1
4	Fruit crops contribute to economic development mainly through: a) Export earnings and employment b) Increasing forest cover c) Weed control d) Water conservation	0.5 Mark	L1	CO1
5	Scope of fruit cultivation in India is high due to: a) Diverse agro-climatic conditions b) Only tropical weather c) High rainfall in all regions d) Uniform soil type	0.5 Mark	L1	CO1
6	The ideal method of propagation in mango is _____ a) Inarching b) Veneer grafting c) Side grafting d) All	0.5 Mark	L1	CO2

7	The fruit of banana is botanically a/an _____ a) Pepo b) Berry c) Pome d) Drupe	0.5 Mark	L1	CO2
8	Bending is practice in guava to encourage_____ a) Better sprouting b) Better ripening c) Better fruiting d) Better quality	0.5 Mark	L1	CO2
9	Which of the following system of training of grapes has high cost benefit ratio_____ a) Bower b) Head c) Kniffin d) Trellis	0.5 Mark	L1	CO2
10	Which state is known as "Apple Bowl of India" _____ a) Himachal Pradesh b) Uttrakhand c) J & K d) Punjab	0.5 Mark	L1	CO2
11	Which of the following is nut crop _____ a) Litchi b) Ber c) Almond d) Date palm	0.5 Mark	L1	CO3
12	Which state is the leading producer of Litchi? a) Jharkhand b) Uttar Pradesh c) Uttaranchal d) Bihar	0.5 Mark	L1	CO3
13	Bahar treatment is followed in_____ a) Guava b) Citrus c) Pomegranate d) All of these	0.5 Mark	L1	CO3
14	Which one of the following is a climacteric fruit_____ a) Fig b) Citrus c) Grape d) Ber	0.5 Mark	L1	CO3
15	Cultivated strawberry is _____ a) Diploid b) Octaploid c) Hexaploid d) Triploid	0.5 Mark	L1	CO3
16	The largest Coconut producing state in India is_____. a) Tamil Nadu b) Kerala c) Karnataka d) Andhra Pradesh	0.5 Mark	L1	CO4
17	Which country is the largest producer of Arecanut? a) India. b) Pakistan. c) Bangladesh. D) Sri Lanka	0.5 Mark	L1	CO4
18	Where is the Central Coffee Research Institute located? _____ a) Chikmagalur, Karnataka. b) Hapur, Uttar Pradesh. c) Balaghat, Madhya Pradesh. d) Siliguri, West Bengal.	0.5 Mark	L1	CO4
19	Where is Coconut Development Board located_____ a) Cochin, Kerala. b) Coimbatore, Tamil Nadu. c) Goa. d) Vishakhapatnam (Vizag), Andhra Pradesh	0.5 Mark	L1	CO4
20	_____ crop is considered as the 'gold mine' of the wasteland a) Coffee b) Cashew nut c) Date Palm d) Fig	0.5 Mark	L1	CO4

Match the Following

III **0.5 X 10 = 5 Marks**

1	Mango	a)	Pine apple	0.5 Mark	L1	CO2
2	Citrus	b)	Pajaro	0.5 Mark	L1	CO2
3	Guava	c)	Amrapali	0.5 Mark	L1	CO2
4	Apple	d)	Royal Gala	0.5 Mark	L1	CO2
5	Strawberry	e)	Lalit	0.5 Mark	L1	CO3
6	Coconut	f)	Tapping	0.5 Mark	L1	CO4
7	Rubber	g)	Roasting	0.5 Mark	L1	CO4
8	Cashew nut	h)	East coast Tall	0.5 Mark	L1	CO4
9	Tea	i)	CTC	0.5 Mark	L1	CO4
10	Coffee	j)	E) Robusta	0.5 Mark	L1	CO4

Answer the Following

IV **1 X 5 = 5 Marks**

1	CITH_____	1 Mark	L1	CO1
2	NRCG_____	1 Mark	L1	CO2
3	IIHR _____	1 Mark	L1	CO3
4	CPCRI _____	1 Mark	L1	CO4
5	NRCP _____	1 Mark	L1	CO5

PART - B

Answer any Five Questions

V **12 X 5 = 60 Marks**

1	a)	Give Name 6 ICAR research institutes along with location working on fruit and plantation crops in India	6 Marks	L2	CO1
	b)	Explain nutritional importance of fruit and plantation crops	6 Marks	L2	CO1
2	a)	Write any 6 family along with their botanical names of fruit crops	6 Marks	L2	CO1
	b)	Write in detail about importance and scope of fruits and plantation crops	6 Marks	L2	CO1
3	a)	Explain Special horticultural practices followed in Banana cultivation	6 Marks	L1	CO2
	b)	Classify citrus according to Swingle and Hodgson basis	6 Marks	L2	CO2
4	a)	Explain in detail about papain extraction in papaya	6 Marks	L2	CO2
	b)	Write in detail about alternate bearing in Mango along with remedial measures	6 Marks	L3	CO2
5	a)	Explain different stages of fruit development in date palm?	6 Marks	L2	CO3
	b)	Describe planting systems followed in Strawberry	6 Marks	L2	CO3
6	a)	Explain different types of propagation methods followed in pineapple	6 Marks	L2	CO3
	b)	Write in detail about training systems followed in pomegranate	6 Marks	L3	CO3
7	a)	Explain various steps followed in processing in Cashewnut	6 Marks	L3	CO4
	b)	Describe different tapping methods in Rubber	6 Marks	L3	CO4
8	a)	Write selection of mother plants in Coconut	2 Marks	L2	CO4
	b)	Discuss different types of pruning in Tea	10 Marks	L2	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Honrs) III Semester (SOA-24) Supplementary Examinations, June – 2026

FUNDAMENTALS OF NEMATOLOGY

[B.Sc. Agriculture]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 X 1 = 20 Marks**

1	Nematode was derived from greek words _____ and _____	1 Mark	L2	CO1
2	_____ was regarded as the 'Father of Modern Nematology'	1 Mark	L2	CO1
3	Radopholus similis was responsible for causing _____ disease of citrus in Florida, U.S.A and _____disease of pepper in Bangka Islands of Indonesia	1 Mark	L1	CO1
4	Molya diseases of wheat and barley is caused by _____ nematode (scientific name)	1 Mark	L2	CO1
5	In nematode cuticle, _____ are minute, round dots arranged in a pattern	1 Mark	L1	CO2
6	_____ and _____ nematodes feeds on tree trunk	1 Mark	L1	CO2
7	Phasmids are present in _____class, while absent in _____	1 Mark	L3	CO2
8	In Tylenchina, annules are _____, while in Aphelenchina, annules are _____	1 Mark	L3	CO2
9	Nematodes that transmit plant viruses are collectively known as _____ nematodes	1 Mark	L1	CO2
10	The formation of giant cells in host tissue is a characteristic symptom caused by _____ nematodes	1 Mark	L1	CO2
11	In rice, _____ nematode causes characteristic hook-shaped galls (root swellings), mainly formed at the root tips of infected plants	1 Mark	L2	CO3
12	_____ nematode causes yellowish to rusty brown discolouration of cortical tissue, degradation of cortex and disruption of vascular element	1 Mark	L3	CO3
13	In _____ nematode, females are encysted with tough resistant leathery wall called a cyst	1 Mark	L2	CO3
14	In pigeon pea, Heterodera cajani is responsible for causing _____ roots due to presence of white female cysts	1 Mark	L1	CO3
15	_____ is the resistant variety of wheat against Anguina tritici	1 Mark	L3	CO3
16	Radopholus similis causes _____ decline disease in banana	1 Mark	L2	CO4
17	_____ and _____ are the mechanical methods to remove seed galls of Anguina tritici	1 Mark	L2	CO4
18	Intercropping with antagonistic plant like _____ reduces soil population of many soil nematodes	1 Mark	L1	CO4
19	In tomato, _____ nematode is responsible for causing stunted growth, patch appearance, dwarfing, chlorosis, yellowing, gall formation on roots and day wilting symptoms of plants	1 Mark	L1	CO4
20	_____and _____ are the scientific name of a vector for raspberry ringspot virus and pepper ringspot virus	1 Mark	L3	CO4

Multiple Choice Questions

II **20 X 0.5 = 10 Marks**

1	Nematodes are defined as _____ a) Triploblastic b) Bilaterally symmetrical c) Pseudocoelomic cavity d) All the above	0.5 Mark	L2	CO1
2	Jones reported _____ nematode from Nilgiri hills of Tamil Nadu a) Arid climate b) Tropical climate c) Oceans d) All the above	0.5 Mark	L1	CO1
3	_____ nematode causes molya disease of wheat a) Heterodera avenae b) Pratylenchus coffeae c) Rotylenchus reniformis d) Trichodorus minor	0.5 Mark	L3	CO1
4	Nematodes body cavity is _____ a) Complete coelomate b) Pseudo coelom c) Both a and b d) None of the above	0.5 Mark	L2	CO1
5	In _____ and _____ nematodes, perineal pattern and rugse wall pattern are considered to be the modifications of transverse markings respectively a) Meloidogyne and Heterodera b) Heterodera and Meloidogyne c) Tylenchulus and Rhadopholus d) Paratylenchus and Pratylenchus	0.5 Mark	L1	CO1
6	The interaction between Meloidogyne incognita and Fusarium oxysporum is an example of _____ a) Antagonism b) Synergism c) Commensalism d) Competition	0.5 Mark	L2	CO2
7	Heterodera spp. and Meloidogyne spp. are _____ nematodes a) Sedentary endo-parasitic b) Sedentary ecto-parasitic c) Migratory endo-parasitic d) Migratory ecto-parasitic	0.5 Mark	L3	CO2
8	_____ are the characters of Order Dorylaimida a) Cuticular annulation absent b) Two parted oesophagus c) Odontostylet d) All the above	0.5 Mark	L2	CO2
9	_____ nematodes feeds on flower buds, leaves and bulbs a) Anguina tritici b) Aphelenchoides besseyi c) Ditylenchus dipsaci d) All the above	0.5 Mark	L1	CO2
10	Rotylenchulus reniformis and Tylenchulus semipenetrans are a) Semi endo-parasitic b) Sedentary ecto-parasitic c) Sedentary endo-parasitic d) Migratory endo-parasitic	0.5 Mark	L2	CO2
11	Among the Meloidogyne spp., _____ is a dominant species infesting rice ecosystem a) Meloidogyne graminicola b) Meloidogyne java c) Meloidogyne incognita d) Meloidogyne arenaria	0.5 Mark	L2	CO3
12	_____ and _____ are the resistant cultivars against root knot nematode of rice a) Oryza sativa and Oryza glaberrima b) Oryza longistaminata and Oryza glaberrima c) Oryza sativa and Oryza longistaminata d) All the above	0.5 Mark	L1	CO3
13	In pulses, _____ and _____ nematodes causes galls on roots a) Meloidogyne incognita b) Meloidogyne javanica c) Both a and b d) Only A	0.5 Mark	L1	CO3
14	Rotylenchulus reniformis causes _____ disease in pulses a) Dirty root b) White tip c) Slow decline d) Ufra	0.5 Mark	L2	CO3
15	Tylenchorhynchus brevilineatus causes _____ disease in groundnut pods a) Kalahasti malady b) Stubby root c) Pepper yellows d) All the above	0.5 Mark	L2	CO3

16	On the basis of rate of emergence of panicle the symptoms of ufra disease are classified as a) Ufra-I b) Ufra-II c) Ufra-II d) Ufra-I, Ufra-II and Ufra-III	0.5 Mark	L2	CO4
17	Tylenchulus semipenetrans causes _____ a) Early wilting during water stress b) Dirty appearance of infected roots c) Root death due to heavy infestation d) All the above	0.5 Mark	L2	CO4
18	_____ and _____ biocontrol agents are used to reduce nematode populations a) Trichoderma harzianum and Pseudomonas fluorescens b) Trichogramma chilonis and Bacillus subtilis c) Carbofuran and Oxamyl d) Fensulfothion and Carbaryl	0.5 Mark	L1	CO4
19	Hot water treatment and floatation methods is _____ kind of control a) Cultural b) Mechanical c) Physical d) Biological	0.5 Mark	L2	CO4
20	_____ are the damage symptoms of coconut red ring nematode a) Stunting, yellowing, a decrease in the quantity and size of leaves and leaflets b) Delayed flowering c) Button shedding d) All the above	0.5 Mark	L3	CO4

Match the Following

III **0.5 X 10 = 5 Marks**

1	William Shakespeare	a)	11%	0.5 Mark	L1	CO1
2	Virus transmitting nematode	b)	Heterodera avenae	0.5 Mark	L1	CO1
3	Vasudeva	c)	Ufra disease in rice	0.5 Mark	L2	CO2
4	N.A. Cobb	d)	Citrus nematode	0.5 Mark	L2	CO2
5	Siddiqi	e)	Nematodes that are of Importance in Agriculture	0.5 Mark	L2	CO3
6	Nematodes crop loss	f)	Indian Journal of Nematology	0.5 Mark	L2	CO3
7	Ditylenchus angustus	g)	Xiphinema index	0.5 Mark	L3	CO4
8	Soil fumigant	h)	Sowed cockle, reaped no corn	0.5 Mark	L2	CO4
9	Nematological Society of India	i)	Dichloropropane	0.5 Mark	L2	CO2
10	I.N. Filipjev	j)	Camera Lucida device	0.5 Mark	L3	CO1

Answer the Following

IV **1 X 5 = 5 Marks**

1	Explain, why the name 'Yellow slime or Tundu disease' of wheat?	1 Mark	L2	CO1
2	Write short notes on the slow decline of citrus?	1 Mark	L3	CO2
3	On what basis, ufra disease is categorized into Ufra-I, II and III?	1 Mark	L1	CO3
4	Write down the scientific name of pine wilt nematode?	1 Mark	L3	CO4
5	List out any two virus transmission nematodes?	1 Mark	L1	CO4

PART - B

Answer any Five Questions

V **12 X 5 = 60 Marks**

1	a)	Mention any six diseases caused by nematodes, their causal organism (nematode scientific name) and the author who reported it?	6 Marks	L1	CO1
	b)	What are chemoreceptors and tactoreceptors?	6 Marks	L1	CO1
2	a)	Explain in detail about cuticular markings on nematode cuticle?	6 Marks	L2	CO1
	b)	Define amphids, phasmids and dierids?	6 Marks	L2	CO1
3	a)	Write the classification of nematodes based on ecological habitat?	6 Marks	L2	CO2
	b)	Write down differentiating characters between Order Tylenchida and Dorylaimida?	6 Marks	L3	CO2

4	a)	Write about nematode and fungal complex diseases with examples?	6 Marks	L3	CO2
	b)	Write in detail about above ground part symptoms produced by nematode damage?	6 Marks	L2	CO2
5	a)	Write in detail about identification characters, nature of damage and symptoms and management of wheat seed gall nematode and cereal cyst nematode?	6 Marks	L2	CO3
	b)	Write in detail about Meloidogyne incognita and Rotylenchulus reniformis infesting cotton?	6 Marks	L2	CO3
6	a)	Write down the classification of Ufra disease of rice based on emergence of panicle by Rahman (1980)?	6 Marks	L2	CO3
	b)	Write down the identification character differences between Ditylenchus angustus, Ditylenchus dipsaci and Ditylenchus destructor?	6 Marks	L3	CO3
7	a)	Explain briefly about identification characters, nature of damage and symptoms and management of Meloidogyne spp. and Tylenchulus semipenetrans infesting fruit crops?	6 Marks	L2	CO4
	b)	Write the different types of nematode transmitting viruses? List out the virus name and vector under its respective category?	6 Marks	L2	CO4
8	a)	Write down the differences between the galls formed by Meloidogyne spp. and Naccobus spp.?	6 Marks	L2	CO4
	b)	Write in detail about Integrated Nematode Management?	6 Marks	L3	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) II Semester (SOA-24) Supplementary Examinations, June – 2026

FUNDAMENTALS OF PLANT PATHOLOGY

[Agriculture]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 X 1 = 20 Marks**

1	Any malfunctioning of host cells and tissues that result from continuous irritation by a pathogenic agent or environmental factor and leads to development of symptoms_____	1 Mark	L1	CO1
2	The book Fungi and Plant diseases was written by_____	1 Mark	L1	CO1
3	Irish famine during 1845 is due to _____ disease	1 Mark	L1	CO1
4	The set of varying symptoms characterizing a disease are collectively called a _____	1 Mark	L2	CO1
5	Necrotic, black, sunken, irregular lesions on stem, fruit, leaf and flowers is known as _____	1 Mark	L1	CO2
6	The microorganisms which are carried along with the seeds is known as _____ diseases	1 Mark	L1	CO2
7	***Excessive necrosis of twigs beginning at the tips and advancing towards their base is known as*** _____	1 Mark	L2	CO2
8	The development of a plant disease follows a typical sequence of events known as _____	1 Mark	L1	CO2
9	The thallus is differentiated into a vegetative part which absorbs nutrients and a reproductive part which forms reproductive structures, such thallus is called_____	1 Mark	L1	CO3
10	A flat or saucer shaped fruiting body with a stromatic mat of hyphae producing conidia on short conidiophores is known as _____	1 Mark	L1	CO3
11	Heterothallism in Rhizopus is favoured by sexual harmones called_____	1 Mark	L1	CO3
12	Spore group system for deuteromycotina fungus was given by _____	1 Mark	L1	CO3
13	Phytoplasma's were resistant to penicillin but sensitive to_____	1 Mark	L1	CO4
14	Genetic nature of the most of the plant virus is _____	1 Mark	L2	CO4
15	Example for double stranded DNA virus_____	1 Mark	L1	CO4
16	Cuscuta is the obligate stem parasite belongs to the family_____	1 Mark	L1	CO4
17	The ability of a plant to overcome completely or in some degree the effect of a pathogen or damaging factor is known as _____	1 Mark	L2	CO5
18	In 1931, _____ were the first to describe the fungicidal nature of Dithiocarbamates	1 Mark	L1	CO5
19	In India, domestic quarantine for wart of potato is present in _____region	1 Mark	L1	CO5
20	Antagonism mediated by specific or non-specific metabolites of microbial origin, by lytic agents, enzymes, volatile compounds or other toxic substances is known as _____	1 Mark	L1	CO5

Multiple Choice Questions

II **20 X 0.5 = 10 Marks**

1	The crystalline nature of the virus contains nucleic acid and protein is discovered by? a) Bawden & Pirie b) W.H. Stanley c) Beijerinck d) All	0.5 Mark	L1	CO1
2	Who is named as father of Indian Mycology? a) P.A. Michelli b) Anton De Bary c) E. J. Butler d) E.F. Smith	0.5 Mark	L1	CO1
3	Example for polycyclic disease? a) Wheat rust b) Rice blast c) Late blight of potato d) All	0.5 Mark	L1	CO1
4	Organisms which can never grow on living organisms and gets their food only from dead organic matter? a) Facultative parasite b) Obligative saprophytes c) Obligate parasites d) Facultative saprophytes	0.5 Mark	L1	CO2
5	Citrus witches broom disease is caused by? a) Virus b) Viroid c) Phytoplasma d) Spiroplasma	0.5 Mark	L1	CO2
6	Banana bunchy top disease is caused by? a) Fungi b) Bacteria c) Virus d) Phytoplasma	0.5 Mark	L1	CO2
7	The no. of spores produced by Puccinia graminis tritici during its life cycle is a) 5 b) 3 c) 2 d) 4	0.5 Mark	L1	CO3
8	Peach leaf curl is caused by a) Virus b) Bacteria c) Fungus d) Viroid	0.5 Mark	L1	CO3
9	A bacterium is devoid of a) Chlorophyll b) Well defined nucleus c) Cell wall d) Both a and b	0.5 Mark	L1	CO3
10	Gemini viruses contain a) ds RNA b) ss DNA c) ds DNA d) ss RNA	0.5 Mark	L1	CO4
11	Which of the following is a common example of a total stem parasite among phanerogamic plant parasites? a) Cuscuta b) Orobanche c) Viscum d) Striga	0.5 Mark	L1	CO4
12	Which of the following plant diseases is caused by a viroid? a) Citrus canker b) Potato spindle tuber c) Tobacco mosaic d) Tomato yellow leaf curl	0.5 Mark	L1	CO4
13	The trade name for Oxycarboxin is a) Vitavax b) Plantvax c) Topsin d) Ridomil	0.5 Mark	L1	CO5
14	Which of the following compound belongs to heterocyclic nitrogenous group? a) Mancozeb b) Captan c) Bordeaux mixture d) All	0.5 Mark	L1	CO5
15	Which among the following biocontrol formulation is used for the management of crown gall of stone fruits? a) Gallex b) Dagger-G c) Kodiak d) GlioGard	0.5 Mark	L1	CO5
16	Tillet and Prevost gave the nomenclature system for the fungi. (True/False)	0.5 Mark	L1	CO1
17	Non infectious disease will spread from infected plants to healthy plants by the help of insects. (True/False)	0.5 Mark	L2	CO2
18	Peach leaf curl is caused by virus pathogen. (True/False)	0.5 Mark	L1	CO3
19	Phytoplasma are wall less helical microorganisms. (True/False)	0.5 Mark	L3	CO4
20	Mancozeb is the specific chemical useful for the management of downy mildew diseases. (True/False)	0.5 Mark	L1	CO5

Match the Following

III **0.5 X 10 = 5 Marks**

1	Mycology	a)	Top sickness in tobocco	0.5 Mark	L2	CO1
2	Fungus	b)	Basidiomycotina	0.5 Mark	L2	CO1
3	Zinc deficiency	c)	Greek language	0.5 Mark	L2	CO2
4	Boron deficiency	d)	Ecofit	0.5 Mark	L1	CO2
5	Asci in an apothecium	e)	Double-stranded DNA	0.5 Mark	L1	CO3
6	Presence of clamp connection	f)	Latin word	0.5 Mark	L1	CO3
7	TMV	g)	Khaira disease in rice	0.5 Mark	L2	CO4
8	CaMV	h)	Copper fungicide	0.5 Mark	L2	CO4
9	Trichoderma viride	i)	Discomycetes	0.5 Mark	L1	CO5
10	Bordeaux mixture	j)	Single-stranded RNA	0.5 Mark	L1	CO5

Answer the Following

IV **1 X 5 = 5 Marks**

1	Red rust of Guava: _____ _____	1 Mark	L1	CO1
2	Weed of the laboratory: _____ _____	1 Mark	L1	CO2
3	Citrus Stubborn: _____ _____	1 Mark	L1	CO3
4	Pierce's disease of grapevine: _____ _____	1 Mark	L1	CO4
5	Root rot of cotton: _____ _____	1 Mark	L1	CO5

PART - B

Answer any Five Questions

V **12 X 5 = 60 Marks**

1	a)	Write a short note on contributions of Anton De Bary?	6 Marks	L4	CO1
	b)	Define pathogenesis, virulence, disease syndrome, single cycle disease, biotype and necrotroph?	6 Marks	L4	CO1
2		Define sign? Write a short note on different signs of plant diseases with suitable examples?	12 Marks	L3	CO2
3	a)	Write a short note on classification of parasitic plants?	6 Marks	L4	CO4
	b)	Describe in detail about different methods of asexual reproduction with diagrams?	6 Marks	L3	CO3
4	a)	Difference between monocyclic disease and polycyclic disease?	4 Marks	L4	CO1
	b)	Difference between non-parasitic and parasitic diseases?	4 Marks	L3	CO2
	c)	Differentiate between phytoplasma and spiroplasma?	4 Marks	L2	CO3
5		Describe in detail about the life cycle of *Puccinia graminis tritici* with diagram?	12 Marks	L5	CO3
6	a)	Explain in detail about the classification of plant diseases based on mode of spread and extent of infection?	6 Marks	L3	CO2
	b)	Write a short note on different physical methods of disease management?	6 Marks	L3	CO5
7	a)	Write in brief about important characteristics of fastidious vascular bacteria (FVB) with examples?	6 Marks	L3	CO4
	b)	Write a short note on copper-based fungicides?	6 Marks	L5	CO5
8	a)	List out any ten important plant viruses?	6 Marks	L3	CO5
	b)	Write a short note on septation in fungi?	3 Marks	L1	CO3
	c)	Write a short note on the chromista?	3Marks	L1	CO2

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) II Semester (SOA-24) Supplementary Examinations, June – 2026

SOIL FERTILITY MANAGEMENT

[Agriculture]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 X 1 = 20 Marks**

1	The inherent capacity of soil to provide essential plant nutrients is called as _____	1 Mark	L1	CO1
2	The essentiality of iron was given by _____	1 Mark	L1	CO1
3	The movement of ions to root surfaces via water flow is called _____	1 Mark	L1	CO1
4	Marsh spot of peas is due to the deficiency of _____	1 Mark	L1	CO1
5	The C: N ratio for mineralization of nitrogen is _____	1 Mark	L1	CO2
6	The optimum pH for availability of phosphorus is _____	1 Mark	L1	CO2
7	Pools of micronutrients was given by _____	1 Mark	L1	CO2
8	The enzyme plays an important role in S mineralization is _____	1 Mark	L1	CO2
9	A value was given by _____	1 Mark	L1	CO3
10	The chemical extractant for available sulphur is _____	1 Mark	L1	CO3
11	Rapid tissue test for nitrates is _____	1 Mark	L1	CO3
12	Applying fertilizers through irrigation water is called as _____	1 Mark	L1	CO3
13	The word "manure" originates from the French word _____,	1 Mark	L1	CO4
14	The process of composting which involves both aerobic and anaerobic decomposition is _____	1 Mark	L1	CO4
15	Growing of green manure crops and incorporating into the same field is called as _____	1 Mark	L1	CO4
16	The practice of keeping animals in the fallow land after the harvest of the last crop is called as _____	1 Mark	L1	CO4
17	The biuret content in urea should not exceed _____	1 Mark	L1	CO5
18	Bulk blending of fertilizers was first started in _____	1 Mark	L1	CO5
19	The process of introducing ammonia into super phosphate to obtain ammoniated super phosphate is called as _____	1 Mark	L1	CO5
20	The FCO came into existence in the year _____	1 Mark	L1	CO5

Multiple Choice Questions

II **20 X 0.5 = 10 Marks**

1	What are the two most mobile nutrients in mass flow a) Potassium and iron b) Nitrogen and sulfur c) Phosphorus and magnesium d) Calcium and zinc	0.5 Mark	L1	CO1
2	Which scientist attributed the growth of plants to saltpeter (KNO_3) a) Glauber b) J B Boussingault c) Jan Baptiste Van Helmont d) John Woodward	0.5 Mark	L1	CO1
3	The nutrient important for the growth of diatoms is a) Silicon b) Iodine c) Selenium d) Aluminium	0.5 Mark	L1	CO1
4	The following nutrient is involved in energy transfer reactions a) Phosphorus b) Boron c) Silicon d) All	0.5 Mark	L1	CO1

5	The conversion of organic to inorganic form of nitrogen is called a) Mineralization b) Immobilization c) Assimilation d) Denitrification	0.5 Mark	L1	CO2
6	The P fixation is highest in a) 1:2 b) 1:1 c) 2:1 d) 2:2	0.5 Mark	L1	CO2
7	Reduced crop yields without the appearance of definite symptoms; the phenomenon is called as a) Luxury Consumption b) Toxic c) Hidden Hunger d) Deficient	0.5 Mark	L1	CO2
8	The dominant ion on the exchangeable complex is a) Calcium b) Magnesium c) Sodium d) Potasium	0.5 Mark	L1	CO2
9	Gypsum requirement was given by a) Schoonover b) Olsen's c) Shoemaker d) Chesin	0.5 Mark	L1	CO3
10	Which among the following is natural nitrification inhibitor a) Neem cake b) N serve c) DCD d) 2,4 -D	0.5 Mark	L1	CO3
11	The organism cunninghamella is sensitive for a) Potassium b) Copper c) Phosphorus d) Magnesium	0.5 Mark	L1	CO3
12	The recommendation followed for foliar application of urea in dry areas is a) 2 % b) 2.5 % c) 4 % d) 3%	0.5 Mark	L1	CO3
13	Which city houses the largest compost plant in the world a) Bangkok b) Delhi c) Cairo d) Tel-Aviv	0.5 Mark	L1	CO4
14	Which of the following is not a concentrated organic manure a) Guano b) Bone meal c) Oil cakes d) Sludge	0.5 Mark	L1	CO4
15	Which of the following green manure crops is a triple-purpose crop a) Daincha b) Pillipesara c) Wild Indigo d) Horse Gram	0.5 Mark	L1	CO4
16	Which of the following is derived from night soil a) Poudrette b) Guano c) Tankage d) Bone meal	0.5 Mark	L1	CO4
17	What is the maximum permissible moisture content in urea a) 5 % b) 1.5 % c) 2% d) 2.5 %	0.5 Mark	L1	CO5
18	The materials added to improve their physical condition of fertilizers are a) Fillers b) Conditioners c) Sand d) Amendments	0.5 Mark	L1	CO5
19	When was the Fertilizer Control Order enacted a) 1955 b) 1960 c) 1957 d) 1985	0.5 Mark	L1	CO5
20	DAP contains how much nitrogen a) 11 % b) 28 % c) 18 % d) 46 %	0.5 Mark	L1	CO5

Match the Following

III **0.5 X 10 = 5 Marks**

1	Mass flow	a)	N, S	0.5 Mark	L1	CO1
2	Ultramicronurient	b)	P, K	0.5 Mark	L1	CO2
3	Mobile elements	c)	Younger leaves	0.5 Mark	L1	CO1
4	Diffusion	d)	Older leaves	0.5 Mark	L1	CO1
5	Immobile elements	e)	Boron	0.5 Mark	L1	CO1
6	Q/I concept of K	f)	Beckette	0.5 Mark	L1	CO2
7	P fixation	g)	Ramamoorthy	0.5 Mark	L1	CO2
8	Fertility gradient approach	h)	Filler	0.5 Mark	L1	CO3
9	Dolomite	i)	Clay mineral	0.5 Mark	L1	CO5
10	NH_3 fixation	j)	Thomas Way	0.5 Mark	L1	CO2

Answer the Following

IV **1 X 5 = 5 Marks**

1	EDTA	1 Mark	L1	CO1
2	NUE	1 Mark	L1	CO3
3	Dolomite	1 Mark	L1	CO5
4	Gypsum	1 Mark	L1	CO2
5	SSP	1 Mark	L1	CO5

PART - B

Answer any Five Questions

V **12 X 5 = 60 Marks**

1	a)	Explain classification of essential elements based on mobility	4 Marks	L2	CO1
	b)	Write the functions of boron	4 Marks	L2	CO1
	c)	Differentiate between Soil fertility and productivity	4 Marks	L4	CO1
2		Explain in detail Nitrogen transformations in soils	12 Marks	L2	CO2
3.		Explain different methods of application of nutrients under rainfed and irrigated conditions	12 Marks	L2	CO3
4	a)	What is NUE and factors affecting NUE	6 Marks	L2	CO3
	b)	Explain vermicomposting	6 Marks	L2	CO4
5	a)	Write about the classification of manures	6 Marks	L3	CO4
	b)	Explain green manuring	6 Marks	L2	CO4
6	a)	Write the classification of fertilizers with neat flow chart	6 Marks	L3	CO5
	b)	Write a short note on FCO	6 Marks	L2	CO5
7	a)	Explain phosphorus fixation	6 Marks	L2	CO2
	b)	Write in detail the methods to reduce P fixation	6 Marks	L2	CO2
8	a)	Differentiate between:			
		i) Manures and Fertilizer	3 Marks	L4	CO5
		ii) Complete complex and incomplete complex mixed fertilizers	3 Marks		
	b)	Write the physical and chemical properties of MOP	6 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) II Semester (SOA-24) Supplementary Examinations, June – 2026

LIVESTOCK AND POULTRY MANAGEMENT

[Agriculture]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 X 1 = 20 Marks**

1	India is ranked number _____ in Cara beef production in the world	1 Mark	L1	CO1
2	_____is a group of animals with distinct shapes and colors which produce offspring with similar shapes and colors	1 Mark	L1	CO1
3	A traditional system in which livestock owners continuously move from one place to another in search of pasture and water without any fixed base is called as _____.	1 Mark	L1	CO1
4	_____ is the collective term used for domesticated animals raised by humans for utility	1 Mark	L2	CO1
5	In which breed of Cattle horns are appeared as HALF MOON shaped _____	1 Mark	L1	CO2
6	_____ is of the crossbred strains of cattle having 5/8 Holstein Friesian and 3/8 Sahiwal inheritance, developed by ICAR-Central Institute for Research on Cattle, Meerut.	1 Mark	L1	CO2
7	The _____is considered as a world's smallest humped cattle breed.	1 Mark	L2	CO2
8	_____is a mating system in which individuals mated are more closely related than the average of the population from which they come.	1 Mark	L1	CO2
9	The phenomenon of Temporary engorgement of teat specially observed in buffaloes prior to onset of real heat and is commonly known as_____	1 Mark	L1	CO3
10	In which condition of Metabolic disease of cow acute to per-acute, afebrile, flaccid paralysis typically occurring at or shortly after parturition, caused by a drop in blood calcium levels below 7.5□mg/dL is _____	1 Mark	L1	CO3
11	_____is observed when animals exhibit sniffing behavior during estrus.	1 Mark	L1	CO3
12	The hormone which is primarily seen in Follicular phase _____	1 Mark	L1	CO3
13	Pre-weaning mortality refers to deaths occurring between _____ days of age.	1 Mark	L1	CO4
14	The Angora goat is valued for producing a special textile fibre commercially known as _____.	1 Mark	L2	CO4
15	_____ is the process of removing worms from digestive tract of the animal	1 Mark	L1	CO4
16	_____ is the process of removing of external parasites like ticks, mites and fleas which suck the blood from the animals	1 Mark	L1	CO4
17	_____ is a permanent method of identifying pigs using V-shaped cuts in specific areas of the ear.	1 Mark	L2	CO5

18	_____ is considered the "Mother Breed" due to its excellent mothering abilities and large litter sizes.	1 Mark	L1	CO5
19	The feed conversion ratio of Pig is _____	1 Mark	L1	CO5
20	Elimination of unproductive or undesirable bird is called as _____	1 Mark	L1	CO5

Multiple Choice Questions

II **20 X 0.5 = 10 Marks**

1	Animal with absence of hump is: a) Bos indicus b) Bos taurus c) Bubalus bubalis d) Bos javanicus	0.5 Mark	L1	CO1
2	Which program aims at the conservation of indigenous cattle? a) National Animal Disease Control Programme b) National Dairy Plan c) Rashtriya Gokul Mission d) Integrated Livestock Development	0.5 Mark	L1	CO1
3	Broken-mouth refers to: a) Facial deformity b) Aged animals losing teeth c) Sterile cow d) Weak jaw	0.5 Mark	L1	CO1
4	Creep feed is given to: a) Adult cows b) Calves and kids c) Lactating cows d) Draft animals	0.5 Mark	L1	CO1
5	Which system is commonly used for upgrading non-descript females into pure breed types? a) Line breeding b) Grading up c) Cross breeding d) Outcrossing	0.5 Mark	L1	CO2
6	What is the standard lactation period considered in dairy cattle? a) 180 days b) 200 days c) 305 days d) 365 days	0.5 Mark	L1	CO2
7	Which buffalo breed is named after a tribe in Nilgiri hills? a) Tarai b) Toda c) Kundi d) Sambalpuri	0.5 Mark	L1	CO2
8	Phule Triveni was developed by: a) ICAR Karnal b) Kerala Livestock Board c) MPKV Rahuri d) BAIF Pune	0.5 Mark	L1	CO2
9	Which hormone is predominant during diestrus? a) Estrogen b) LH c) Progesterone d) FSH	0.5 Mark	L1	CO3
10	Which animal is an induced ovulator? a) Mare b) Cow c) Queen d) Sow	0.5 Mark	L1	CO3
11	What is a permanent method of calf identification? a) Neck strap b) Branding c) Tattooing d) Collar tag	0.5 Mark	L1	CO3
12	In which of the following is the ideal method of milking a) Knuckling b) Fisting c) stripping d) full hand milking followed by stripping	0.5 Mark	L1	CO3
13	What is the purpose of flushing in sheep nutrition? a) Deworming b) Enhancing wool growth c) Increasing reproductive performance d) Improving digestion	0.5 Mark	L2	CO4
14	Angora goats are valued for producing: a) Cashmere b) Mohair c) Alpaca fibre d) Camel hair	0.5 Mark	L1	CO4
15	The curling of the upper lip in males during heat detection is called: a) Baring b) Flehmen response c) Snarling d) Gnashing	0.5 Mark	L2	CO4
16	Estrus cycle length in ewes averages: a) 10–12 days b) 14–19 days c) 16–17 days d) 20–21 days	0.5 Mark	L1	CO4
17	The curling of the upper lip in males during heat detection is called: a) Baring b) Flehmen response c) Snarling d) Gnashing	0.5 Mark	L1	CO5
18	What term is used to refer to the smallest or weakest piglet in a litter, which often needs special care to survive? a) Gilt b) Pigling c) Runt d) Barrow	0.5 Mark	L1	CO5
19	Proper ventilation during incubation prevents the accumulation of: a) Carbon dioxide b) Oxygen c) Nitrogen d) Ammonia	0.5 Mark	L1	CO5
20	Eggs with the air cell in the wrong position are known as: a) Clear eggs b) Contaminated eggs c) Upside down eggs d) Mid-dead eggs	0.5 Mark	L1	CO5

Match the Following

III **0.5 X 10 = 5 Marks**

1	Castrated male	a)	Homozygosity	0.5 Mark	L2	CO1
2	Buffalo	b)	Calving	0.5 Mark	L2	CO1
3	Goat	c)	stag	0.5 Mark	L2	CO1
4	Black Quarters	d)	staphylococcus	0.5 Mark	L1	CO2
5	Mastitis	e)	Pashmina	0.5 Mark	L1	CO2
6	Angora	f)	Johns disease	0.5 Mark	L1	CO2
7	Changthangi	g)	calf	0.5 Mark	L2	CO3
8	Bag of Bones	h)	kid	0.5 Mark	L2	CO3
9	Cattle	i)	C.chaveii	0.5 Mark	L1	CO3
10	In breeding	j)	Mohair	0.5 Mark	L1	CO3

Answer the Following

IV **1 X 5 = 5 Marks**

1	Expand NDDB	1 Mark	L1	CO1
2	Expand- ICAR	1 Mark	L1	CO2
3	Expand- NDRI	1 Mark	L1	CO3
4	Expand- NLM	1 Mark	L1	CO1
5	Scientific Name of sheep _____	1 Mark	L1	CO4

PART - B

Answer any Five Questions

V **12 X 5 = 60 Marks**

1	Explain in detailed about Farming system of rearing with advantages and disadvantages	12 Marks	L2	CO1
2	Explain in details about integrated farming system with advantages and disadvantages along with combinations	12 Marks	L2	CO1
3	Enlist the economic traits of livestock and explain in detailed about any 4 economic traits.	12 Marks	L3	CO2
4	Explain in detailed about different phases of oestrus cycle and oestrus symptoms.	12 Marks	L2	CO3
5	Write comprehensively about the causes, modes of infection, factors affecting incidence, and control of mastitis in cattle.	12 Marks	L2	CO3
6	Write about causes, modes of infection, factors affecting incidence, and control of Blue tongue in sheep and Goat .	12 Marks	L2	CO4
7	Explain in detail about vaccination programme in poultry.	12 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) IV Semester (SOA-22) Supplementary Examinations, June – 2026

AGRICULTURAL MARKETING TRADE AND PRICES

[Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 x 1 = 20 Marks**

1.	The word market comes from the _____word _____.	1 Mark	L1	CO1
2.	A market is defined in terms of the existence of fundamental forces of _____and _____	1 Mark	L1	CO1
3.	The term market performance refers to the _____that flow from the industry as each firm pursues its particular line of conduct.	1 Mark	L1	CO1
4.	_____is a market situation in which there is only one seller of a commodity.	1 Mark	L1	CO1
5.	A market which serves mainly the population residing in an urban area is called an _____market.	1 Mark	L1	CO1
6.	The stages through which the individual products develop over a period of time is known as _____	1 Mark	L1	CO2
7.	_____ is a stage in PLC in which sales increase at a very low rate.	1 Mark	L1	CO2
8.	_____ pricing refers to a method in which an organization considers the prices of competitors' products to set the prices of its own products.	1 Mark	L1	CO2
9	_____means, the wrapping and crating of goods before they are transported.	1 Mark	L1	CO2
10	To improve the quality of agricultural products in India, grading and marking were introduced under an Act – _____	1 Mark	L1	CO2
11	_____ Traders are petty merchants who move from village to village to purchase produce	1 Mark	L1	CO3
12	According to Kohl's and Uhl, _____refers to the consolidation of firms through additional marketing functions.	1 Mark	L1	CO3
13	_____integration refers to gaining control over the supply side of a company.	1 Mark	L1	CO3
14	Concurrent margin method measures the price difference for a commodity at_____ stages of marketing.	1 Mark	L1	CO3
15	A _____ marketing channel involves only the producer and consumer, with no intermediaries.	1 Mark	L1	CO3
16	The _____ revolution brought about significant changes in Indian agriculture by introducing high-yielding varieties and advanced technologies.	1 Mark	L1	CO4
17	Farmers often face exploitation due to the presence of _____ middlemen in the marketing chain.	1 Mark	L1	CO4
18	The Agricultural Produce (Grading and Marking) Act empowers the government to set quality standards, known as _____ standards.	1 Mark	L1	CO4
19	The Central Warehousing Corporation was established in _____ to provide storage and warehousing facilities for agricultural produce.	1 Mark	L1	CO4
20	_____ is the exchange of goods and services between countries.	1 Mark	L1	CO4

PART - B

Answer any Ten Question
All Questions Carry Equal Marks

II **10 x 3 = 30 Marks**

1	Analyze the significance of marketing mix elements (4Ps) in creating utility for agricultural products	3 Marks	L4	CO1
2	Compare the differences between regulated and unregulated markets in terms of efficiency and farmer benefits.	3 Marks	L4	CO1
3	Differentiate between price skimming and penetration pricing strategies. Provide examples of their application in agriculture	3 Marks	L4	CO2
4	Explain the importance of storage in agricultural marketing. What are the key risks associated with storage?	3 Marks	L2	CO2
5	Differentiate between horizontal and vertical market integration with examples	3 Marks	L4	CO3
6	Discuss the ways to reduce marketing costs in agricultural products.	3 Marks	L3	CO3
7	Compare and contrast the functions and roles of the **Food Corporation of India (FCI)** and **Central Warehousing Corporation (CWC)** in agricultural marketing.	3 Marks	L5	CO3
8	Explain how the **Minimum Support Price (MSP)** benefits farmers and impacts agricultural production in India	3 Marks	L2	CO4
9	Discuss the role of **APEDA** in promoting agricultural and processed food product exports from India	3 Marks	L2	CO4
10	Illustrate how cooperative marketing societies help farmers avoid exploitation by middlemen	3 Marks	L5	CO4
11	List any four objectives of the WTO	3 Marks	L1	CO4
12	Define dumping and its effect on international trade	3 Marks	L1	CO4

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) IV Semester (SOA-22) Supplementary Examinations, June – 2026

CROP PRODUCTION TECHNOLOGY –II

[Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 x 1 = 20 Marks**

1	Wheat is also known as : a) King of cereals b) minister of cereals c) queen of cereal d) poor man's cereal	1 Mark	L1	CO1
2	Seed rate of barley for 1 hectare is……..	1 Mark	L2	CO1
3	Chickpea S.N……..	1 Mark	L1	CO2
4	Lentil contains about _____% protein.	1 Mark	L1	CO2
5	Major peas producing state of India – a. Madhya Pradesh b. Odessa c. Uttar Pradesh d. Bihar	1 Mark	L2	CO2
6	Expand the BOAA……..	1 Mark	L2	CO2
7	Fruit type of mustard……	1 Mark	L1	CO3
8	Sesame family……	1 Mark	L3	CO3
9	Seed multiplication ratio of sunflower. a) 1:80 b) 1:8 c) 1:5 d) 1:50	1 Mark	L3	CO3
10	Oil seed crop which is most drought resistant ……	1 Mark	L1	CO3
11	Which oilseed oil is excellent drying oil…….	1 Mark	L2	CO3
12	One bale of cotton equals to ……kg.	1 Mark	L3	CO4
13	Under retting produces a …….. fiber which is of extremely of low value.	1 Mark	L2	CO4
14	Iinflorescence of sugarcane is called ……..	1 Mark	L2	CO4
15	Duration of Adsali sugarcane crop ……..	1 Mark	L1	CO4
16	Due to unfavorable climatic conditions, sugar beet give out seed-stalks in the first year itself which is technically called as ……	1 Mark	L3	CO4
17	Complete root parasite of tobacco……	1 Mark	L3	CO5
18	Study of grasses, their classification management and utilization called as……	1 Mark	L1	CO5
19	Mescavi is the Varity of **……**	1 Mark	L4	CO5
20	Expand IGFRI.	1 Mark	L1	CO5

PART - B

Answer any Ten Questions
All Questions Carry Equal Marks

II **10 x 3 = 30 Marks**

1	Write economic importance of wheat.	3 Marks	L2	CO1
2	Differentiate between two row and six row barley.	3 Marks	L3	CO1
3	What is nipping process in chick pea and write their advantages?	3 Marks	L3	CO2
4	Differenceate between field pea and garden pea.	3 Marks	L2	CO2
5	Write seed rate spacing and fertilizer schedule for French bean.	3 Marks	L3	CO2
6	Differentiate rapeseed and mustard.	3 Marks	L4	CO3

7	Write about Pyra/ Utera cultivation.	3 Marks	L2	CO3
8	Write nutrient and water management in cotton.	3 Marks	L1	CO4
9	Differentiate between hibiscus cannabinus and hibiscus sabdariffa.	3 Marks	L2	CO4
10	Write seed treatment of sugarcane.	3 Marks	L3	CO4
11	Write ratoon management in sugarcane.	3 Marks	L3	CO4
12	Write about raising of tobacco nursery.	3 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) IV Semester (SOA-22) Supplementary Examinations, June – 2026

FARMING SYSTEM AND SUSTAINABLE AGRICULTURE

[Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 x 1 = 20 Marks**

1	---------- is an assembly of objects or things, which are interrelated and interdependent on each other for proper functioning to achieve a common objective	1 Mark	L1	CO1
2	In India---------- ha land holding may be said large scale farming	1 Mark	L1	CO1
3	The three key principles of farming system are ----------, ----------, ----------	1 Mark	L1	CO1
4	Expand ITK ----------	1 Mark	L1	CO1
5	---------- is the repetitive growing of the sole crop on the same piece of land	1 Mark	L1	CO1
6	In dairy farming out of the total expenditure, nearly ---------- percentage of expenditure goes towards feeding of cattle.	1 Mark	L2	CO2
7	A ---------- m3 biogas plant would cater to domestic needs of a family of 6 – 8 members	1 Mark	L2	CO2
8	Cultivation of mulberry plants is called as ----------	1 Mark	L3	CO2
9	One DFL is equivalent to ---------- eggs.	1 Mark	L3	CO2
10	Each chandrika can accommodate ---------- worms depending upon the silkworm race	1 Mark	L3	CO2
11	Expand CGIAR ----------	1 Mark	L2	CO3
12	----------is based on reduction-but not necessarily elimination-of chemical fertilizers, insecticides and herbicides.	1 Mark	L3	CO3
13	Expand LEISA ----------	1 Mark	L2	CO3
14	The ---------- cultivation is like an organised and scientifically managed shifting cultivation.	1 Mark	L2	CO3
15	---------- is the direct collection of plant products from non-arable lands	1 Mark	L1	CO3
16	In ---------- zone major activity on plantation crops, cultivation of rice and pulses are the secondary agricultural activity.	1 Mark	L1	CO4
17	Give an example farming system in southern zone in AP ----------	1 Mark	L3	CO4
18	In which year green revolution started in India ----------and who is the responsible for green revolution in India----------	1 Mark	L1	CO4
19	Justify the word "Gold from Garbage"	1 Mark	L3	CO4
20	Give any three components of IFS.	1 Mark	L2	CO4

PART - B

Answer any Ten Question
All Questions Carry Equal Marks

II **10 x 3 = 30 Marks**

1	Define farming system and enlist principles of farming system.	3 Marks	L1	CO1
2	Enlist Characteristics of Rain Fed Farming.	3 Marks	L1	CO1
3	Explain about mixed farming.	3 Marks	L2	CO1

4	Describe about the bio gas plant.	3 Marks	L3	CO2
5	Enlist the procedure of silk worm rearing.	3 Marks	L1	CO2
6	What is apiculture and explain about management of bee keeping?	3 Marks	L3	CO2
7	Explain briefly about elements of sustainability.	3 Marks	L2	CO3
8	Discuss about steps for efficient use of water resource for crop production.	3 Marks	L2	CO3
9	Define IFS and enlist objectives.	3 Marks	L1	CO3
10	Write about any four Site specific development of IFS models for different agro climatic zones of India.	3 Marks	L3	CO3
11	Enlist the drawbacks of modern agriculture.	3 Marks	L2	CO4
12	Explain about IFS model under Dryland situation.	3 Marks	L3	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) IV Semester (SOA-22) Supplementary Examinations, June – 2026

RENEWABLE ENERGY AND GREEN TECHNOLOGY

[Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 x 1 = 20 Marks**

1.	Secondary energy sources are derived from the processing of _____ energy sources.	1 Mark	L1	CO1
2.	_____ energy sources are finite and take millions of years to form.	1 Mark	L1	CO1
3.	_____ energy sources are bought and sold in the market and form the backbone of industrial systems.	1 Mark	L1	CO1
4.	_____ refers to energy resources that occur naturally and repeatedly in the environmental and can be harnessed for human benefit.	1 Mark	L2	CO1
5.	The material contained in the bodies of living organisms (plants and animals) is said to be _____	1 Mark	L1	CO2
6.	_____ is a chemical process that involves heating an organic material at high temperatures in the absence of oxygen.	1 Mark	L1	CO2
7.	The ratio of carbon to nitrogen present in the feed material is called _____	1 Mark	L1	CO2
8.	Briquettes can be produced with the density of _____- g/cm^3 from loose agro residues with a bulk density of _____ g/cm^3.	1 Mark	L1	CO2
9	An effective black body temperature of sun is _____ K	1 Mark	L1	CO3
10	The rate at which solar energy arrives at the top of the atmosphere is called _____	1 Mark	L1	CO3
11	The standard value of the solar constant is _____w/m^2	1 Mark	L1	CO3
12	The solar radiation that reaches the earth's surface after passing through the atmosphere is known as _____	1 Mark	L1	CO3
13	_____ is equipment in which solar energy is collected by absorbing the radiation in an absorber and then transferring it to a fluid.	1 Mark	L1	CO4
14	_____ is a device in which food is cooked by the heat received from solar radiations.	1 Mark	L1	CO4
15	_____ is the technology of solar cells for energy by converting solar energy (sunlight, including ultraviolet radiation) directly into electricity.	1 Mark	L1	CO4
16	The _____ refers to photons of light knocking electrons into a higher state of energy to create electricity.	1 Mark	L1	CO4
17	_____ % of the solar radiation falling on the face of the earth is converted to KE in the atmosphere	1 Mark	L2	CO5
18	A _____ converts the kinetic energy of the wind's motion to mechanical energy transmitted by the shaft.	1 Mark	L1	CO5
19	_____ works on the principle of cup anemometer.	1 Mark	L1	CO5
20	_____ have their axis of rotation horizontal to the ground and almost parallel to the wind stream.	1 Mark	L1	CO5

PART - B

Answer any Ten Question
All Questions Carry Equal Marks

II **10 x 3 = 30 Marks**

1	What is meant by renewable energy sources? Explain briefly these energy sources.	3 Marks	L2	CO1
2	Define energy and forms of energy. List the classification of energy sources.	3 Marks	L2	CO1
3	Define gasification and explain the Chemical reactions in gasification.	3 Marks	L2	CO2
4	Write the procedure to design the Digester.	3 Marks	L4	CO2
5	Write the procedure for biodiesel production with a flow chart.	3 Marks	L2	CO2
6	Explain the terms: solar constant, hour angle, day length, azimuth angle, incident angle, and local solar time.	3 Marks	L2	CO3
7	Determine the local solar time and declination at a location with a latitude 23 15' N, longitude 77 30'E at 12.30 IST on June 19. The equation for time correction is given from the standard table or chart: (1' 01").	3 Marks	L4	CO3
8	Explain the physical principle of the conversion of solar radiation into heat.	3 Marks	L2	CO3
9	Explain the working of solar flat-plate collector with a neat sketch.	3 Marks	L2	CO4
10	Explain the working of PV cells.	3 Marks	L2	CO4
11	Define windmills and explain their working principle.	3 Marks	L2	CO5
12	Explain the forces acting on the blades and the thrust on turbines.	3 Marks	L2	CO5

CODE No.: 23PA101010 SOP-BPH-23

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B. Pharmacy VI Semester (SOP-BPH-23) Regular Examinations, April – 2026

QUALITY ASSURANCE

Time: 3 hours **Max. Marks: 75**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Quality Control	2 Marks	L1	CO1
	b)	Define GMP.	2 Marks	L1	CO1
	c)	Define Quality Assurance.	2 Marks	L1	CO2
	d)	Define TQM and it's elements.	2 Marks	L1	CO2
	e)	What is a quality measurement ?	2 Marks	L1	CO2
	f)	Write the benefits of ISO 9000/ ISO 14000.	2 Marks	L1	CO2
	g)	Define NABL accreditation.	2 Marks	L1	CO3
	h)	Define Team work.	2 Marks	L1	CO2
	i)	Define SOP.	2 Marks	L1	CO2
	j)	What does bench marking means	2 Marks	L1	CO3

PART - B

Answer any TWO Questions.
All Questions Carry Equal Marks

2 x 10 = 20 Marks

2.		Give a detailed note on ICH guidelines and define its purpose, participants and process of harmonization.	10 Marks	L1	CO1
3.	a)	Draw Cause and effect diagram for Tablet manufacturing process.	5 Marks	L1	CO2
	b)	Name different Parameters of Analytical method Validation.	5 Marks	L1	CO2
4.	a)	What is forced degradation stability study? Explain in short.	5 Marks	L1	CO2
	b)	Compare quality, productivity and profitability.	5 Marks	L2	CO3

PART - C

Answer any SEVEN Question.
All Questions Carry Equal Marks

7 x 5 = 35 Marks

5.	Write in detail about Equipment Validation.	5 Marks	L1	CO3
6.	Explain in short Good Laboratory Practices.	5 Marks	L2	CO3
7.	Write a short note on ISO 9000.	5 Marks	L1	CO2
8.	Define quality assurance. List and explain the three stages of achieving quality assurance.	5 Marks	L2	CO2
9.	Define Quality. List and explain the Five quality characteristics with examples.	5 Marks	L1	CO2
10	Write a detailed note on QbD.	5 Marks	L1	CO2
11.	Give difference between Quality Assurance and Quality control.	5 Marks	L1	CO2
12.	Explain the term "Validation Master plan".	5 Marks	L1	CO2
13.	What is a quality steering committee?	5 Marks	L1	CO3

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B. Pharmacy VI Semester (SOP-BPH-23) Regular Examinations, April – 2026

PHARMACOLOGY - III

Time: 3 hours **Max. Marks: 75**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Circadian rhythm.	2 Marks	L1	CO4
	b)	What is carcinogenicity give examples of drugs causing it?	2 Marks	L1	CO4
	c)	What is the treatment for morphine poisoning?	2 Marks	L1	CO4
	d)	What are the adverse effects of tetracyclins?	2 Marks	L1	CO2
	e)	Define laxative. Give examples.	2 Marks	L1	CO1
	f)	What are expectorants? Give examples.	2 Marks	L1	CO1
	g)	Write about appetite suppressant drugs.	2 Marks	L1	CO1
	h)	What are mucolytics? Give examples.	2 Marks	L1	CO1
	i)	What are the adverse effects of penicillins?	2 Marks	L1	CO2
	j)	Define Digestant. Give two examples.	2 Marks	L1	CO1

PART - B

Answer any TWO Question.
All Questions Carry Equal Marks

2 x 10 = 20 Marks

2.	Classify anticancer drugs.Write the pharmacology of alkylating agents.	10 Marks	L2	CO3
3.	Classify anti tubercular drugs. Write the pharmacology of Isoniazid.	10 Marks	L2	CO3
4.	Classify Antiulcer agents. Write the pharmacology of H2 antagonists.	10 Marks	L2	CO1

PART - C

Answer any SEVEN Question.
All Questions Carry Equal Marks

7 x 5 = 35 Marks

5.	What is biological clock? With some examples explain chronotherapy.	5 Marks	L1	CO4
6.	Explain the pharmacology of Co-trimoxazole.	5 Marks	L2	CO2
7.	Write a note on symptoms and treatment of arsenic poisoning.	5 Marks	L1	CO4
8.	Write the pharmacology of antimetabolites used in cancer therapy.	5 Marks	L1	CO3
9.	Write a note on Urinary antiseptics	5 Marks	L1	CO3
10	Classify antiamoebic agents and add a note on Metronidazole.	5 Marks	L2	CO3
11.	Classify Anti-tussives. Add a note on Anti-histaminics.	5 Marks	L2	CO1
12.	Write a note on Bronchodilators.	5 Marks	L1	CO1
13.	Classify antiemetics and write about prokinetic drugs.	5 Marks	L1	CO1

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B. Pharmacy VI Semester (SOP-BPH-23) Regular Examinations, April – 2026

BIOPHARMACEUTICS AND PHARMACOKINETICS

Time: 3 hours **Max. Marks: 75**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Justify why the intravenous route is not considered an absorption process.	2 Marks	L5	CO1
	b)	State the organ size and perfusion rate in drug distribution.	2 Marks	L3	CO1
	c)	Analyze the effect of physicochemical properties of drugs, on drug distribution and its free drug concentration.	2 Marks	L4	CO1
	d)	Assess factors affecting dissolution rate of poorly soluble drugs. Propose strategies to enhance dissolution rate and bioavailability of poorly soluble drugs	2 Marks	L3	CO3
	e)	Explain why clearance is considered a better parameter than half-life.	2 Marks	L4	CO2
	f)	Justify the use of one-compartment open model for IV bolus administration.	2 Marks	L5	CO2
	g)	Explain the term loading dose	2 Marks	L2	CO3
	h)	Differentiate between linear and non-linear pharmacokinetics.	2 Marks	L2	CO2
	i)	Explain the term saturation kinetics.	2 Marks	L2	CO2
	j)	State one clinical situation where non-linear pharmacokinetics is observed.	2 Marks	L3	CO2

PART - B

Answer any TWO Questions.
All Questions Carry Equal Marks

2 x 10 = 20 Marks

2.	Explain drug distribution in detail, including tissue permeability, protein binding, apparent volume of distribution, and factors affecting drug distribution	10 Marks	L2	CO1
3.	Describe different *invitro* drug dissolution models and apply them to predict in-vivo drug performance	10 Marks	L3	CO3
4.	Analyze the calculation of Ka of a drug following two compartment kinetics and discuss their significance in clinical settings.	10 Marks	L4	CO2

PART - C

Answer any SEVEN Questions.
All Questions Carry Equal Marks

7 x 5 = 35 Marks

5.	Design an appropriate drug administration route for a patient requiring rapid systemic action and justify your choice based on absorption principles	5 Marks	L6	CO1
6.	Evaluate the clinical significance of clearance of drugs.	5 Marks	L5	CO1
7.	Assess the factors affecting renal excretion of drugs.	5 Marks	L5	CO1
8.	Justify the need for bioequivalence studies in generic drug approval.	5 Marks	L5	CO1

9.	Suggest one formulation approach to enhance bioavailability of a poorly soluble drug.	5 Marks	L6	CO3
10	Explain why drugs following two-compartment kinetics show a biphasic plasma concentration–time curve	5 Marks	L4	CO3
11.	Analyze plasma concentration–time profiles of drugs showing non-linear pharmacokinetics.	5 Marks	L2	CO2
12.	Differentiate dose-dependent and time-dependent non-linear pharmacokinetics.	5 Marks	L2	CO2
13.	Design a patient-specific dosing regimen for a drug exhibiting non-linear pharmacokinetics.	5 Marks	L6	CO2

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SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B. Pharmacy VI Semester (SOP-BPH-23) Regular Examinations, April – 2026

PHARMACEUTICAL BIOTECHNOLOGY

Time: 3 hours **Max. Marks: 75**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define enzyme and classify them.	2 Marks	L4	CO1
	b)	Describe plasmids.	2 Marks	L3	CO1
	c)	Describe polymers used in enzyme immobilization.	2 Marks	L6	CO2
	d)	Define PCR and classify.	2 Marks	L1	CO2
	e)	What is strain improvement?	2 Marks	L6	CO3
	f)	Draw a neat label of ISFET biosensor.	2 Marks	L6	CO3
	g)	Write a note on attenuated vaccine.	2 Marks	L6	CO4
	h)	Write a applications of cell culture.	2 Marks	L6	CO4
	i)	Define ELISA.	2 Marks	L1	CO5
	j)	Write principle involved in microbial genetics.	2 Marks	L6	CO5

PART - B

Answer any TWO Question.
All Questions Carry Equal Marks

2 x 10 = 20 Marks

2.	Describe protein engineering.	10 Marks	L6	CO1
3.	Explain the producton of Hepatitis-B vaccine.	10 Marks	L6	CO2
4.	Write the processing and storage of blood products.	10 Marks	L6	CO5

PART - C

Answer any SEVEN Question.
All Questions Carry Equal Marks

7 x 5 = 35 Marks

5.	Define mutation and classify them.	5 Marks	L1	CO1
6.	Classify principles of immunity.	5 Marks	L1	CO2
7.	Explain the different types of hypersensitivity reactions.	5 Marks	L6	CO2
8.	Write about plasma substitutes.	5 Marks	L6	CO3
9.	Explain the productions of vaccines.	5 Marks	L2	CO4
10	Write the method of production of insulin.	5 Marks	L6	CO5
11.	Define and explain booster dose.	5 Marks	L1	CO1
12.	Write principle of MHC.	5 Marks	L6	CO2
13.	Write the principle, construction, working, advantages of western blotting.	5 Marks	L6	CO2

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B. Pharmacy VI Semester (SOP-BPH-23) Regular Examinations, April – 2026

HERBAL DRUG TECHNOLOGY

Time: 3 hours **Max. Marks: 75**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Explain how organic farming can improve the quality of herbal materials.	2 Marks	L2	CO1
	b)	Define Herbal medicine and Herbal medicinal product.	2 Marks	L2	CO1
	c)	Define the Herb -Drug interactions.	2 Marks	L1	CO2
	d)	Write the Herb – Drug interaction of Ephedra.	2 Marks	L1	CO2
	e)	What are the advantages of using herbal syrups compared to mixtures?	2 Marks	L1	CO3
	f)	Describe the function of viscosity builders with herbal examples.	2 Marks	L2	CO3
	g)	List any four plant-based industries in India.	2 Marks	L1	CO5
	h)	Name two major institutions involved in medicinal and aromatic plant research in India.	2 Marks	L1	CO5
	i)	Define IPR.	2 Marks	L1	CO4
	j)	Define Farmers right.	2 Marks	L1	CO4

PART - B

Answer any TWO Questions.
All Questions Carry Equal Marks

2 x 10 = 20 Marks

2.	Discuss the General aspects, Market and Growth of Nutraceuticals.	10 Marks	L3	CO2
3.	Explain Good agricultural practices in cultivation of medicinal plants including organic farming.	10 Marks	L2	CO1
4.	Explain the various herbal excipients used in formulations and discuss their importance with examples.	10 Marks	L2	CO3

PART - C

Answer any SEVEN Questions.
All Questions Carry Equal Marks

7 x 5 = 35 Marks

5.	Write different methods for processing of herbal raw materials.	5 Marks	L2	CO1
6.	Discuss the various pest control methods.	5 Marks	L3	CO1
7.	Explain the health benefits and role of nutraceuticals in cancer.	5 Marks	L2	CO2
8.	Explain the health benefits and role of nutraceuticals in Diabetes mellitus.	5 Marks	L2	CO2
9.	Describe the role of herbs in dental care.	5 Marks	L2	CO3
10	Write a note on Phytosomes.	5 Marks	L2	CO3
11.	Discuss the case study of Neem.	5 Marks	L2	CO4
12.	Write a note on ASU DTAB.	5 Marks	L2	CO4
13.	Explain the present scope and future prospects of herbal drug industry.	5 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) I Semester (SOA-24) Supplementary Examinations, June – 2026

FUNDAMENTALS OF AGRONOMY

[Agriculture]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 X 1 = 20 Marks**

1	The word Agronomy is derived from _____ language.	1 Mark	L1	CO1
2	_____ is the dwarf gene in rice.	1 Mark	L1	CO1
3	_____ revolution is responsible for increasing production of oil seeds in India.	1 Mark	L1	CO1
4	Which climatic zone has the highest cropping intensity_____.	1 Mark	L2	CO1
5	_____districts comes under southern zone.	1 Mark	L1	CO1
6	_____ is a small edible fruit usually hard on the outside, harvested from crops.	1 Mark	L1	CO2
7	_____ is the physical manipulation of soil with tools and implements to result in good tilth for better germination and subsequent growth of crops.	1 Mark	L2	CO2
8	Depth of sowing for bold seeded crops _____.	1 Mark	L1	CO2
9	Harrows used for _____ tillage.	1 Mark	L1	CO2
10	_____ is the placing of seeds in a hole or pit made at a predetermined spacing.	1 Mark	L1	CO2
11	Time of sowing for rabi season crop _____.	1 Mark	L1	CO3
12	Criteria of essentiality of nutrients is proposed by _____.	1 Mark	L1	CO3
13	Micro nutrients are also called as _____ elements.	1 Mark	L1	CO3
14	The term weed first coined by_____.	1 Mark	L2	CO4
15	Entry of water into the soil is called as _____.	1 Mark	L1	CO4
16	_____ is a noxious weed whose seed is difficult to separate from the crop seed after contamination	1 Mark	L1	CO4
17	_____ refers to the condition of soil at which all the macro and micro pores are filled with water.	1 Mark	L2	CO4
18	In _____ cropping, one crop is grown immediately after the harvesting of another crop, without leaving the land fallow.	1 Mark	L1	CO5
19	The concept allelopathy was given in the year _____.	1 Mark	L1	CO5
20	The initial phase of the growth curve, where the crop shows slow growth after germination, is called the _____ phase.	1 Mark	L1	CO5

Multiple Choice Questions

II **20 X 0.5 = 10 Marks**

1 What is the origin of the term 'Agriculture'. 0.5 Mark L1 CO1
   a) Greek words "Agros" and "Nomos"
   b) Latin words "ager" or "agri" and "cultra"
   c) Latin words "Agros" and "Nomos"
   d) Greek words "ager" or "agri" and "cultra"

2 Agriculture encompasses which of the following activities. 0.5 Mark L1 CO1
   a) Crop production b) Livestock farming
   c) Fisheries and forestry d) All of the above

3	Average annual rainfall of India_____ mm. a)1194 mm b)940 mm c)1200 mm d)500mm	0.5 Mark	L1	CO1
4	Dwarf gene in wheat is Norin 10 (T/F).	0.5 Mark	L1	CO1
5	_____is the progeny of nucleus seed of a variety. a) Breeder seed b)Certified seed c) Foundation seed d)None of the above	0.5 Mark	L1	CO2
6	Which method of sowing requires less seed rate for sowing? a) Broadcasting b) Drilling c) Dibbling d) Transplanting	0.5 Mark	L1	CO2
7	Time of sowing for kharif season crop. a) June –July b) July-September c) August-September d) January-February	0.5 Mark	L1	CO2
8	Criteria of essentiality of nutrients is first proposed in the year. a) 1939 b) 1959 c) 1975 d) 1943	0.5 Mark	L1	CO3
9	_____is accumulated in cell wall which strengthens the stem, prevails cop lodging and increases water use efficiency. a) Silicon b) Vanadium c) Nickel d) Cobalt	0.5 Mark	L1	CO3
10	Concentrated organic manures are rich in the following nutrient. a) Nitrogen b) Calcium c) Cobalt d) Carbon	0.5 Mark	L1	CO3
11	Apatite is the source of _____mineral nutrient elements. a) Boron b) Calcium c) Phosphorus d) Magnesium	0.5 Mark	L1	CO3
12	Examples of edible oil cakes. a) Groundnut cake, coconut cake b) Karanj cake, neem cake c) Castor cake d) Both B and C	0.5 Mark	L1	CO3
13	What is referred to as readily available water (RAW)? a) Groundnut cake, coconut cake b) Karanj cake, neem cake c) Castor cake d) Both B and C	0.5 Mark	L2	CO4
14	The total available water (TAW) refers to the water available between: a) Field capacity and permanent wilting point b) Field capacity and permanent wilting point c) Hygroscopic coefficient and wilting point d) Hygroscopic coefficient and wilting point	0.5 Mark	L1	CO4
15	Scientific Name of field bind weed. a) Convolvulus arvensis b) Cirsium arvense c) Carthamus oxycantha d) Mucuna pruriens	0.5 Mark	L2	CO4
16	Facultative weeds are also called as a) Apophytes b) Allophtes c) Acophytes d) None of the above	0.5 Mark	L1	CO4
17	Which of these cropping systems helps in reducing the risk of crop failure due to pest or disease outbreaks? a) Monocropping b) Mixed cropping c) Crop rotation d) Agroforestry	0.5 Mark	L1	CO5
18	The 'Rice-Wheat' cropping system is primarily practiced in which region of India. a) Western India b) Eastern India c) Northern India d) Southern India	0.5 Mark	L1	CO5
19	The growth curve of a crop typically follows a(n) _____ shape. a) Linear b) Parabolic c) Sigmoid (S-shaped) d) Circular	0.5 Mark	L1	CO5
20	_____is a system of agriculture that is committed to maintain and preserve the agriculture base of soil, water , and atmosphere ensuring future generations the capacity to feed themselves with an adequate supply of safe and wholesome food'. a) Organic Agriculture b)Sustainable Agriculture c) Modern Agriculture d) Traditional Agriculture	0.5 Mark	L1	CO5

Match the Following

III **0.5 X 10 = 5 Marks**

1	Green revolution in India	a)	Norin 10	0.5 Mark	L2	CO1
2	Dwarf gene in wheat	b)	M.S. Swaminathan	0.5 Mark	L2	CO1
3	Green revolution in World	c)	Peter de Crezensi	0.5 Mark	L2	CO1
4	Dwarf gene in Rice	d)	Norman e Bourlaug	0.5 Mark	L1	CO1
5	Father of Agronomy	e)	Dee gee Woo gene	0.5 Mark	L1	CO1
6	Urea	f)	46 % P2O5, 18% N	0.5 Mark	L1	CO3
7	Single super phosphate	g)	50 % K2O	0.5 Mark	L2	CO3
8	Muriate of potash	h)	46% N	0.5 Mark	L2	CO3
9	Sulphate of potash	i)	16% P2O5	0.5 Mark	L1	CO3
10	Di ammonium phosphate	j)	60 % K2O	0.5 Mark	L1	CO3

Answer the Following

IV **1 X 5 = 5 Marks**

1	Scientific name of Pearl millet.	1 Mark	L1	CO1
2	Expand CRIDA.	1 Mark	L1	CO1
3	What is the formula for CGR.	1 Mark	L1	CO5
4	Expand LAI.	1 Mark	L1	CO5
5	Expand SBI.	1 Mark	L1	CO2

PART - B

Answer any Five Questions

V **12 X 5 = 60 Marks**

1	a)	Write short notes of the objectives of tillage.	6 Marks	L3	CO1
	b)	Define green manuring. Write advantages and dis advantages of green manuring.	6 Marks	L2	CO3
2		List out the agro climatic zones in India and explain about each zone.	12 Marks	L1	CO2
3	a)	Mention about weed classification based on association.	6 Marks	L1	CO4
	b)	Describe about soil water constants.	6 Marks	L2	CO4
4	a)	Write about moisture extraction pattern.	4 Marks	L2	CO4
	b)	Define allelopathy. Write about types of allelopathy.	4 Marks	L2	CO5
	c)	Define agriculture, agronomy and development of agriculture in ancient India.	4 Marks	L2	CO1
5		Explain about mechanical and cultural methods of weed management.	12 Marks	L2	CO4
6	a)	Define vermicomposting. Write the preparation method of vermicomposting.	6 Marks	L3	CO3
	b)	Define weed and write harmful effects of weed.	6 Marks	L1	CO4
7	a)	Write about the different methods of sowing.	6 Marks	L2	CO2
	b)	Define agronomy and write its scope.	6 Marks	L1	CO1
8	a)	Explain about the growth curve of plant growth and development.	6 Marks	L2	CO5
	b)	Differentiate fertilizers and organic manures.	3 Marks	L4	CO3
	c)	Differentiate between square planting and rectangular planting.	3 Marks	L4	CO2

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) I Semester (SOA-24) Supplementary Examinations, June – 2026

FARMING BASED LIVELIHOOD SYSTEMS

[Agriculture]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 X 1 = 20 Marks**

1	Andhra Pradesh divided into _____ number of agro climatic zones	1 Mark	L1	CO1
2	_____ encompasses the activities, resources, and assets that allow people to earn a living, generate income, and ensure food security.	1 Mark	L1	CO1
3	_____ Focuses on the interplay between agriculture and the environment	1 Mark	L1	CO1
4	AP ranked _____ position in aquaculture sector	1 Mark	L1	CO1
5	Integration of crop cultivation with forest trees is called as _____	1 Mark	L2	CO2
6	_____ is the Soilless farming systems where plants are grown in nutrient- rich water solutions.	1 Mark	L1	CO2
7	_____describe the patterns and techniques used to grow crops over time and space.	1 Mark	L1	CO2
8	_____ means impounding of water.	1 Mark	L1	CO2
9	_____ is the practice of planting a second crop in the same field before the first crop is completely harvested.	1 Mark	L2	CO3
10	_____ is the sustainable land use system that increases the total yields and soil health.	1 Mark	L1	CO3
11	_____ enterprises invest in R&D for high-yield seeds, advanced machinery, and sustainable farming practices, benefiting farmers with innovative solutions.	1 Mark	L1	CO3
12	_____ enterprises invest in R&D for high-yield seeds, advanced machinery, and sustainable farming practices, benefiting farmers with innovative solutions	1 Mark	L1	CO3
13	Give an example for dry land agriculture crop _____	1 Mark	L1	CO4
14	Salt tolerant crops are commonly grown in _____ climatic zone	1 Mark	L1	CO4
15	_____is India's apex development bank to promote sustainable and equitable agriculture and rural development.	1 Mark	L1	CO4
16	ICAR's model of greenhouse cultivation in_____ and _____ has increased farmer incomes by 2-3 times, especially for floriculture	1 Mark	L1	CO4
17	_____ is known as the 'Mushroom city of India'	1 Mark	L1	CO5
18	Name any two public sector organizations involved in promotion of farming based livelihood models _____	1 Mark	L2	CO5
19	Amul cooperative model of dairy farming is started in _____ state in the year _____	1 Mark	L1	CO5
20	_____ provides quality fertilizers to farmers	1 Mark	L1	CO5

Multiple Choice Questions

II **20 X 0.5 = 10 Marks**

1	Following is the major challenge in rural livelihood. a) High cost of living b) Job insecurity c) Unemployment and underemployment d) Youth migration	0.5 Mark	L1	CO1
2	Which farming excludes using of synthetic fertilizers and chemical inputs. a) Sustainable agriculture b) Commercial farming c) Organic farming d) Traditional farming	0.5 Mark	L1	CO1
3	Green revolution in Indian started during the year _____ a) 1956 b) 1960 c) 1990 d) 2020	0.5 Mark	L1	CO1
4	e-Nam is related to online marketing (T/F)	0.5 Mark	L1	CO1
5	_____ type of agriculture focuses on resource conservation a) Organic agricultureb b) Subsistence agriculture c) Sustainable agriculture d) Traditional agriculture	0.5 Mark	L1	CO2
6	_____ type of cultivation is common in tribal and hill areas a) Mixed farming b) Shifting cultivation c) Zabo cultivation d) Staple cultivation	0.5 Mark	L1	CO2
7	_____ is the science of raising or maintaining colonies of bees and their hives. a) Sericulture b) Apiculture c) Moriculture d) Mushroomculture	0.5 Mark	L1	CO2
8	Which state leads in fish and shrimp farming. a) Gujarath b) Andhra Pradesh c) Tamilnadu d) Kerala	0.5 Mark	L1	CO2
9	In the following system Crops are grown one after the other in the same field within a year. a) Sequential cropping b) Crop rotation c) Inter cropping d) Mixed cropping	0.5 Mark	L1	CO3
10	The following _____ enterprice can integrate with rice cultivation a) Fishery b) Duckery c) Piggery d) Both A and B	0.5 Mark	L1	CO3
11	The following enterprise provides milk, meat and fibre. a) Poultry b) Goatry c) Duckry d) Piggery	0.5 Mark	L1	CO3
12	The following is the secondary farming based enterprise a) Value chains b) Agro – tourism c) Contract farming d) Research & development	0.5 Mark	L1	CO3
13	NABARD's dairy entrepreneurship development scheme has been successful _____ regions. a) AP and Telangana b) UP and MP c) Gujarat and Rajasthan d) Tamilnadu and Kerala	0.5 Mark	L2	CO4
14	_____Acts as a coordinator in the operations of rural credit institutions. a) NABARD b) APGB c) RBI d) SBI	0.5 Mark	L1	CO4
15	NABARD established in the year. a) 1997 b) 1982 c) 1960 d) 2022	0.5 Mark	L2	CO4
16	Following is the key farming system of tropical wet zone. a) Drought resistant crops b) Dryland agriculture c) Terraced farming d) Rainfed agriculture	0.5 Mark	L1	CO4
17	_____ Provide financial assistance to states for holistic agricultural development. a) PM-KISAN b) ICAR c) RKVY d) NABARD	0.5 Mark	L1	CO5
18	_____encourages the farmers to cultivate food grains. a) NFSM b) RKVY c) AICRP d) ICAR	0.5 Mark	L1	CO5
19	Expand KVK's. a) Krishi vikas kendras b) Krishi vignan kendras c) Kendiya vignan kendras d) Kendriya vignan kendras	0.5 Mark	L1	CO5

20	Following is the Non-Governmental organization a) SRIJAN b) Godrej agrovet c) Mahindra agri solutions d) NABARD		0.5 Mark	L1	CO5

Match the Following

III **0.5 X 10 = 5 Marks**

1	Nomadic	a)	Rice + Wheat	0.5 Mark	L2	CO1
2	Value chain	b)	Crop production + Livestock	0.5 Mark	L2	CO1
3	Value addition	c)	Pastoralism	0.5 Mark	L2	CO1
4	Precision farming	d)	Cotton	0.5 Mark	L1	CO1
5	Oilseed crop	e)	Slush and Burn agriculture	0.5 Mark	L1	CO1
6	Fibre crop	f)	Impounding water	0.5 Mark	L1	CO3
7	Shifting cultivation	g)	Post-harvest managment	0.5 Mark	L2	CO3
8	Zabo cultivation	h)	Groundnut	0.5 Mark	L2	CO3
9	Inter cropping	i)	Technology driven approach	0.5 Mark	L1	CO3
10	Mixed farming	j)	Production to Consumption	0.5 Mark	L1	CO3

Answer the Following

IV **1 X 5 = 5 Marks**

1	AMUL	1 Mark	L1	CO5
2	IFFCO	1 Mark	L1	CO5
3	PM-KISAN	1 Mark	L1	CO5
4	SFAC	1 Mark	L1	CO5
5	UNFCCC	1 Mark	L1	CO4

PART - B

Answer any Five Questions

V **12 X 5 = 60 Marks**

1		Differentiate the following.			
	a)	Subsistence farming *vs* Commercial farming.	3 Marks	L3	CO2
	b)	Mixed farming *vs* Mixed cropping.	3 Marks	L3	CO2
	c)	Traditional farming *vs* Modern farming.	3 Marks	L3	CO2
	d)	Hydroponics *vs* Aquaponics.	3 Marks	L3	CO2
2		Write about the livelihood patterns in rural areas.	12 Marks	L3	CO1
3	a)	Give a notes on value addition.	6 Marks	L4	CO3
	b)	Write about the farming based livelihood models in Gujarat, Karnataka and Andhra Pradesh.	6 Marks	L3	CO4
4	a)	Enlist the roles of NABARD.	4 Marks	L4	CO4
	b)	Write about apiculture.	4 Marks	L3	CO2
	c)	Explain about Taungya cultivation.	4 Marks	L1	CO2
5		Explain about the risk factors in farming-based livelihood systems.	12 Marks	L5	CO5
6	a)	Write your perception about current status of Indian agriculture.	6 Marks	L3	CO1
	b)	Give a notes on major farming systems of India and AP.	6 Marks	L3	CO1
7		Explain about the key components of farming-based livelihood systems.	12 Marks	L3	CO3
8		Explain about the any six central government schemes which are promoting farming based livelihood models.	12 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) I Semester (SOA-24) Supplementary Examinations, June – 2026

RURAL SOCIOLOGY AND EDUCTIONAL PSYCHOLOGY

[Agriculture]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 X 1 = 20 Marks**

1	The Father of sociology is_____	1 Mark	L1	CO1
2	The word "Socius" means_____	1 Mark	L1	CO1
3	____is the newly emerged branch of sociology which indicates that our knowledge is the product of social phenomena.	1 Mark	L2	CO1
4	Rural sociology mainly studies people engaged directly or indirectly in _____	1 Mark	L1	CO1
5	Caste system and class system are major forms of social _____.	1 Mark	L2	CO2
6	Saluting the National Flag is considered as _____	1 Mark	L1	CO2
7	_____are used for negative action	1 Mark	L3	CO2
8	_____is a self-managed, independent group of farmers with a similar goal and interest in single commodity or multiple commodity.	1 Mark	L1	CO2
9	India lives in its villages" was stated by _____.	1 Mark	L2	CO3
10	Sriniketan programme was started by _____.	1 Mark	L1	CO3
11	An authoritarian leader is also known as a _____ leader.	1 Mark	L3	CO3
12	Social change affects both _____ and institutions.	1 Mark	L1	CO3
13	Psychology has its origin from two Greek words _____ and _____.	1 Mark	L1	CO4
14	Father of psychology _____	1 Mark	L2	CO4
15	Overt behaviour is behaviour that is _____ and occurs outside the human being	1 Mark	L1	CO4
16	Bloom classified learning into _____,_____and _____domains.	1 Mark	L2	CO4
17	I.Q =	1 Mark	L2	CO5
18	The ultimate purpose of teaching is to bring about desired changes in _____	1 Mark	L1	CO5
19	The five elements of a learning situation include instructor, learner, subject matter, teaching equipment, and_____.	1 Mark	L2	CO5
20	Learning by doing is explained by the principle of _____	1 Mark	L1	CO5

Multiple Choice Questions

II **20 X 0.5 = 10 Marks**

1	Sociology mainly studies a) Plants and animals b) Social behavior and social relationships c) Economic growth d) Political power	0.5 Mark	L1	CO1
2	The branch of sociology that studies society–environment relationships is a) Political sociology b) Rural sociology c) Environmental sociology d) Industrial sociology	0.5 Mark	L1	CO1
3	Agricultural extension deals with extending a) Political knowledge b) Cultural values c) Scientific agricultural knowledge d) Legal awareness	0.5 Mark	L2	CO1
4	The dominant institution in Indian rural society is	0.5 Mark	L2	CO1

a) Family b) Religion c) Caste d) Economy

5	Social Change Includes a) Values and norms b) Social structure and institutions c) Social relationships among people d) All the above	0.5 Mark	L2	CO2
6	Which of the following is based on heredity? a) Class b) Caste c) Occupation d) Education	0.5 Mark	L1	CO2
7	Folkways are a) Rigidly enforced customs b) Customs with moral sanctions c) Socially accepted behavior without moral sanctions d) Forbidden acts	0.5 Mark	L2	CO2
8	Farmers working together during harvesting is an example of a) Competition b) Assimilation c) Cooperation d) Accommodation	0.5 Mark	L1	CO2
9	Social ecology" was given by Murray Bookchin b)Thayer c)August Comte d) J P Legans	0.5 Mark	L1	CO3
10	Which program aimed to increase agricultural production through a concentration of resources? a) Intensive Agricultural District Programme. b) High Yielding Variety Programme. c) National Demonstrations Programme. d) Operational Research Project.	0.5 Mark	L1	CO3
11	Gurgaon Project launched by a) F. L Brayne b) Ravindranath Tagore c) M.K. Gandhi d) Government	0.5 Mark	L1	CO3
12	T and V system launch year a) 1971 b) 1973 c) 1974 d) 1977	0.5 Mark	L1	CO3
13	According to C.J. Jung, individuals who are socially shy and prefer solitude are likely to be: a) Extroverts b) Introverts c)Ambiverts d) None of the above	0.5 Mark	L1	CO4
14	Feelings, attitudes, and thinking are examples of: a) Overt behaviour b) Covert behaviour c) Voluntary behaviour d) Aggressive behaviour	0.5 Mark	L1	CO4
15	Motivation can be defined as: a) The process of reducing an individual's needs. b) The ability to control one's emotions. c) The process of initiating and sustaining goal-directed behavior. d) The desire to avoid negative consequences.	0.5 Mark	L1	CO4
16	Need for achievement theory was proposed by: a) Maslow b) Herzberg c) McClelland d) Thorndike	0.5 Mark	L1	CO4
17	A leader who takes initiative to bring the group into action is called a) Group supervisor b) Group initiator c) Group planner d) Group harmonizer	0.5 Mark	L2	CO5
18	Which method is most commonly used to select professional leaders? a) Sociometry b) Election c) Interview d) Self-designating technique	0.5 Mark	L1	CO5
19	According to the principle of readiness, learning is most successful when learners are: a) Forced to participate in the learning activity. b) Intrinsically motivated to learn. c) Offered financial incentives for learning. d) Ready to learn the specific topic being taught	0.5 Mark	L2	CO5
20	Selection of leaders through voting is known as a) Interview b) Sociometry c) Election d) Observation	0.5 Mark	L1	CO5

Match the Following

III **0.5 X 10 = 5 Marks**

1	Primary group	a)	one man marries one woman	0.5 Mark	L1	CO1
2	Delegate group	b)	Rabidranath Tagore	0.5 Mark	L1	CO1
3	Secondary education institutions	c)	Family, Frendship	0.5 Mark	L1	CO2
4	Monogamy	d)	Physiological needs	0.5 Mark	L1	CO2
5	Srinikethan	e)	Self actualization	0.5 Mark	L1	CO3
6	IADP	f)	K.N. Singh	0.5 Mark	L1	CO3
7	First order needs	g)	Gram Panchayat	0.5 Mark	L1	CO4
8	Fifth order needs	h)	Maslow	0.5 Mark	L1	CO4
9	Father of Extension	i)	Coaching Centres, tutorials	0.5 Mark	L1	CO5
10	Need Hierarchy Theory	j)	1960	0.5 Mark	L1	CO5

Answer the Following

IV **1 X 5 = 5 Marks**

1	Define sociology	1 Mark	L2	CO1
2	Expand DWACRA	1 Mark	L1	CO2
3	Expand IADP	1 Mark	L1	CO3
4	Define Extrovert personality	1 Mark	L2	CO4
5	Write examples for professional leaders	1 Mark	L1	CO5

PART - B

Answer any Five Questions

V **12 X 5 = 60 Marks**

1	a)	What is sociology and write its branches?	6 Mark	L1	CO1
	b)	Write the relationship between rural sociology and extension?	6 Mark	L1	CO1
2		Briefly explain different types of groups?	12 Mark	L2	CO1
3		List out different types of institutions and explain them?	12 Mark	L3	CO2
4	a)	Differentiate between Mores and folkways	6 Mark	L1	CO2
	b)	Explain about the rituals and conventions with examples	6 Mark	L1	CO2
5		Give a brief on the weakness (demerits) of early rural experiments	12 Mark	L2	CO3
6		What is leadership and write classification of leaders?	12 Mark	L2	CO3
7	a)	Write about MASLOW'S' Theory of motivation?	6 Mark	L3	CO4
	b)	What are the types of intelligence and explain them?	6 Mark	L2	CO4
8		List out the principles of extension and explain them?	12 Mark	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) I Semester (SOA-24) Supplementary Examinations, June – 2026

COMMUNICATION SKILLS

[Agriculture]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 X 1 = 20 Marks**

1	_____ is a key element of the communication process where the receiver provides a response to the sender.	1 Mark	L1	CO1
2	_____ communication involves the use of gestures and facial expressions.	1 Mark	L1	CO1
3	The process of converting thoughts into words is called _____.	1 Mark	L1	CO1
4	Miscommunication can occur due to _____ in interpretation.	1 Mark	L2	CO1
5	The Shannon-Weaver model introduces the concept of _____ as a hindrance in communication.	1 Mark	L1	CO2
6	Overcoming _____ helps improve communication confidence.	1 Mark	L1	CO2
7	Eye contact is an example of _____ communication.	1 Mark	L2	CO2
8	_____ barriers arise from cultural differences or stereotypes.	1 Mark	L1	CO2
9	The _____ of a text refers to its main idea.	1 Mark	L1	CO3
10	Active listening requires _____ and understanding.	1 Mark	L1	CO3
11	In public speaking, _____ is important to engage the audience.	1 Mark	L1	CO3
12	The _____ is the person who initiates the communication process.	1 Mark	L1	CO3
13	Summarizing reduces content to its _____ points.	1 Mark	L1	CO4
14	A well-structured CV should be tailored to the specific _____.	1 Mark	L2	CO4
15	The purpose of a resume is to highlight _____ and experiences.	1 Mark	L1	CO4
16	Neither John nor his friends _____ (is/are) coming to the party.	1 Mark	L1	CO4
17	This is the _____ (more/most) interesting story I have ever read.	1 Mark	L2	CO5
18	If I _____ (was/were) you, I would take the offer.	1 Mark	L1	CO5
19	He gave me _____ (a/an) useful suggestion.	1 Mark	L1	CO5
20	She told us that _____ (herself/she) would handle the matter.	1 Mark	L1	CO5

Multiple Choice Questions

II **20 X 0.5 = 10 Marks**

1	Which of the following is an example of verbal communication? a) A handshake b) Writing an email c) Eye contact d) Body posture	0.5 Mark	L1	CO1
2	Self-esteem is essential in communication because: a) It ensures physical strength b) It boosts confidence in expression c) It reduces the need for listening d) It avoids communication gaps	0.5 Mark	L1	CO1
3	What is the primary purpose of effective communication? a) To share knowledge b) To express emotions c) To build relationships d) All of the above	0.5 Mark	L1	CO1

4	What is a linguistic barrier? a) Noise interference b) Differences in language c) Physical distance d) Cultural norms	0.5 Mark	L1	CO1
5	Paralanguage refers to: a) Grammar usage b) Tone, pitch, and pace of speech c) Body gestures d) Written symbols	0.5 Mark	L1	CO2
6	Which of the following is NOT a barrier to effective listening? a) Noise b) Prejudice c) Eye contact d) Distraction	0.5 Mark	L1	CO2
7	Active listening involves: a) Interrupting frequently b) Providing feedback c) Ignoring body language d) Multitasking while listening	0.5 Mark	L1	CO2
8	What is the key to improving impromptu speaking skills? a) Avoiding practice b) Preparing ahead of time c) Practicing thinking on your feet d) Memorizing common phrases	0.5 Mark	L1	CO2
9	Which is essential for effective public speaking? a) Speaking rapidly b) Monotone delivery c) Clear articulation d) Memorizing the speech	0.5 Mark	L1	CO3
10	Skimming is used to: a) Read in-depth details b) Find the main idea quickly c) Analyze complex arguments d) Memorize text	0.5 Mark	L1	CO3
11	Which is NOT a component of active reading? a) Highlighting key points b) Reading without purpose c) Asking questions d) Summarizing sections	0.5 Mark	L1	CO3
12	Which part of an essay contains the main argument? a) Introduction b) Body c) Conclusion d) Title	0.5 Mark	L1	CO3
13	What should be avoided in technical writing? a) Passive voice b) Jargon c) Clarity d) Conciseness	0.5 Mark	L2	CO4
14	A good precis should: a) Retain original words b) Be concise and clear c) Include personal opinions d) Use flowery language	0.5 Mark	L1	CO4
15	Summarizing involves: a) Writing every detail b) Reducing content to essential points c) Adding examples d) Ignoring key points	0.5 Mark	L2	CO4
16	The purpose of a resume is to: a) Showcase personal opinions b) Highlight relevant skills and experiences c) Provide a comprehensive life history d) Focus only on academic achievements	0.5 Mark	L1	CO4
17	Which method helps improve vocabulary? a) Using a thesaurus b) Avoiding difficult words c) Reading a single genre d) Memorizing a dictionary	0.5 Mark	L1	CO5
18	Analogies are used to: a) Create confusion b) Compare and clarify relationships c) Replace definitions d) Memorize facts	0.5 Mark	L1	CO5
19	The tone of technical writing is usually: a) Formal and objective b) Casual and conversational c) Emotional d) Colloquial	0.5 Mark	L1	CO5

20	Which of the following is a common mistake in resume writing? a) Tailoring it to the job application b) Using clear headings and bullet points c) Including irrelevant work experience d) Keeping it concise	0.5 Mark	L1	CO5

Match the Following

III **0.5 X 10 = 5 Marks**

1	Sender	a)	Converts the message into symbols or language	0.5 Mark	L2	CO1
2	Encoding	b)	The person or entity initiating the communication process	0.5 Mark	L2	CO1
3	Channel	c)	The pathway through which the message is transmitted	0.5 Mark	L2	CO2
4	Decoding	d)	The process of interpreting the encoded message	0.5 Mark	L1	CO2
5	Feedback	e)	The receiver's response to the message	0.5 Mark	L1	CO3
6	Listening	f)	Understanding spoken language effectively	0.5 Mark	L1	CO3
7	Speaking	g)	Expressing ideas orally in a clear manner	0.5 Mark	L2	CO4
8	Reading	h)	Grasping meaning from written content	0.5 Mark	L2	CO4
9	Writing	i)	Creating coherent and structured written messages	0.5 Mark	L1	CO5
10	Non-Verbal Communication	j)	Using gestures, facial expressions, and body language to convey meaning	0.5 Mark	L1	CO5

Answer the Following

IV **1 X 5 = 5 Marks**

1	What is meant by self-esteem in communication?	1 Mark	L1	CO1
2	Name one feature of technical writing.	1 Mark	L1	CO2
3	Give an example of a possessive case noun.	1 Mark	L1	CO3
4	What is active listening?	1 Mark	L1	CO4
5	What is the ideal speed for effective speech delivery?	1 Mark	L1	CO5

PART - B

Answer any Five Questions

V **12 X 5 = 60 Marks**

1.	Analyze the barriers to communication and suggest strategies to overcome them.	12 Marks	L4	CO4
2.	Elaborate on the reasons behind communication gaps and miscommunication, and propose methods to bridge these gaps effectively.	12 Marks	L4	CO4
3.	Describe the process of communication with a diagram. Explain each component in detail.	12 Marks	L2	CO2
4.	How do linguistic and non-linguistic barriers affect communication? Illustrate with examples. How do linguistic and non-linguistic barriers affect communication? Illustrate with examples.	12 Marks	L1	CO1
5.	Discuss the role of connecting words in sentence cohesion with suitable examples.	12 Marks	L3	CO3
6.	Explain the correct usage of articles and how they affect sentence clarity.	12 Marks	L2	CO2
7.	Explain the importance of active listening in communication and describe methods to improve it.	12 Marks	L2	CO2
8.	Define precis writing and explain its significance in technical communication.	12 Marks	L3	CO3

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) I Semester (SOA-24) Supplementary Examinations, June – 2026

FUNDAMENTALS OF HORTICULTURE

[B.Sc. Agriculture]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 X 1 = 20 Marks**

1	The branch of horticulture that deals with the scientific study of vegetable crops is known as _____	1 Mark	L1	CO1
2	India ranks _____ in fruit and vegetable production in the world	1 Mark	L1	CO1
3	NRC on Banana is located at _____	1 Mark	L1	CO1
4	Word *Pomum* is more related to _____	1 Mark	L2	CO1
5	The stock-scion relationship depends on the _____ and _____ compatibility of the plants.	1 Mark	L1	CO2
6	The process of joining two plants to grow as one is called _____.	1 Mark	L1	CO2
7	Write an example for leaf bud cuttings _____	1 Mark	L2	CO2
8	Combination of two or more types of dormancy is known as _____	1 Mark	L1	CO2
9	_____ planting system accommodates 15% more number of trees as compared to square system	1 Mark	L1	CO3
10	Proper training and pruning lead to increased _____ and better-quality produce	1 Mark	L1	CO3
11	A piece of land enclosed land planted with fruit trees called as _____	1 Mark	L1	CO3
12	At least _____ % area devoted to building establishment in orchard	1 Mark	L1	CO3
13	_____ plants are protecting orchard trees from animals	1 Mark	L1	CO3
14	Plants which bear male and female flowers on different plants are known as_____	1 Mark	L2	CO4
15	The inability of a plant to produce optimum crop is _____	1 Mark	L1	CO4
16	_____are compounds produced within plants that regulate physiological processes by moving from their production site to their action site in very low concentrations.	1 Mark	L1	CO4
17	_____ is a condition where length of the style is different heights	1 Mark	L2	CO5
18	Fertilizers applied through irrigation water is called _____	1 Mark	L1	CO5
19	Irrigation is the artificial application of _____ to crops.	1 Mark	L1	CO5
20	_____ irrigation is efficient in minimizing water loss through evaporation	1 Mark	L1	CO5

Multiple Choice Questions

II **20 X 0.5 = 10 Marks**

1	Pollination in Mango is mainly_____ a) Pepo b) Honey bees c) Pome d) Drupe	0.5 Mark	L1	CO1
2	"King of Fruits" is called _____ a) Avocado b) Mango c) Mangosteen d) Ber	0.5 Mark	L1	CO1
3	Which climate is ideal for apple cultivation? a) Tropical b) Sub-tropical c) Temperate d) Desert	0.5 Mark	L1	CO1
4	Training ensures better light distribution within the canopy (True/False).	0.5 Mark	L1	CO1
5	Polyembryony nature is present in a) Citrus b) Jamun c) Mango d) All the above	0.5 Mark	L1	CO2
6	Banana is commercially propagated by a) Slips b) Water Suckers c) Sword Suckers d) Tissue Culture	0.5 Mark	L1	CO2
7	The rooting media most commonly used in air layering. a) Sphagnum moss b) Coco peat c) Soil d) Vermiculite	0.5 Mark	L1	CO2
8	Acid used for acid scarification seed treatment. a) Sulphuric acid b) Hydrochloric acid c) Acetic acid d) Citric acid	0.5 Mark	L1	CO2
9	Removal of wedge shaped bark piece from **above** the bud is called a) Nicking b) Notching c) Pinching d) Disbudding	0.5 Mark	L1	CO3
10	_____ training system is used in most of the fruit orchards. a) Open enter b) Modified c) Central leader d) All of these	0.5 Mark	L1	CO3
11	The central leader system develops a single dominant trunk (True/False).	0.5 Mark	L1	CO3
12	Training and pruning can only be performed on mature trees (True/False).	0.5 Mark	L1	CO3
13	An example for rooting hormone. a) ABA b) GA_3 c) NAA d) IBA	0.5 Mark	L2	CO4
14	Heterostyly is found in a) Pomegranate b) Ber c) Apple d) Banana	0.5 Mark	L1	CO4
15	Inability to produce crop is termed as fruitfulness (True/False).	0.5 Mark	L2	CO4
16	An example for ripening hormone. a) Auxin b) Gibberellin c) Ethylene d)ABA	0.5 Mark	L1	CO4
17	Drip irrigation uses more water than sprinkler irrigation. (True/False)	0.5 Mark	L1	CO5
18	Flood irrigation is the most efficient method. (True/False)	0.5 Mark	L1	CO5
19	Which irrigation method delivers water efficiently to the root zone? a) Flood irrigation b) Sprinkler c)Drip irrigation d) All	0.5 Mark	L1	CO5
20	Broadcasting fertilizers is ___ a) Precise b) Labour-intensive c) Uniform over the field d) None of these	0.5 Mark	L1	CO5

Match the Following

III **0.5 X 10 = 5 Marks**

1	Ethylene	a)	Mango	0.5 Mark	L2	CO1
2	Runner	b)	Apical Dominance	0.5 Mark	L2	CO1
3	King of fruit	c)	Jamun, Nilgiri tree	0.5 Mark	L2	CO1
4	Stress hormone	d)	Pine apple	0.5 Mark	L1	CO2
5	Wind break	e)	Mangosteen	0.5 Mark	L1	CO2
6	Suckers	f)	Ethylene	0.5 Mark	L1	CO2
7	Queen of fruit	g)	Ripening Hormone	0.5 Mark	L2	CO3
8	Auxins	h)	Karonda, Ber	0.5 Mark	L2	CO3
9	Fencing	i)	Strawberry	0.5 Mark	L1	CO3
10	Ripening hormone	j)	ABA	0.5 Mark	L1	CO3

Answer the Following

IV **1 X 5 = 5 Marks**

1	Mango Scientific names _____	1 Mark	L1	CO1
2	Expand- CISH_____	1 Mark	L1	CO2
3	Expand- NRCB_____	1 Mark	L1	CO3
4	Expand- NAA_____	1 Mark	L1	CO3
5	Expand- CPCRI_____	1 Mark	L1	CO4

PART - B

Answer any Five Questions

V **12 X 5 = 60 Marks**

1	a)	Divisions of Horticulture with suitable examples.	6 Mark	L2	CO1
	b)	Write the definition and importance, scope of Horticulture	6 Mark	L3	CO1
2	a)	Classification horticultural crops based on soil requirement	6 Mark	L3	CO1
	b)	Explain different types of vegetable gardens	6 Mark	L3	CO1
3	a)	Describe different methods of vegetative propagation employed for multiplication of horticultural crops	6 Mark	L4	CO2
	b)	Define and explain sexual and asexual methods of propagation? Enlist their advantages and disadvantages	6 Mark	L3	CO2
4	a)	Define dormancy. Enlist different method of breaking seed dormancy	6 Mark	L4	CO2
	b)	Define layering? Write short notes on different methods of layering with neat diagram	6 Mark	L3	CO3
5	a)	Define orchard. Explain in detail about principles of orchard establishment	6 Mark	L5	CO3
	b)	Explain about training methods along with neat diagrams	6 Mark	L3	CO3
6		Write the definition and explain role/uses of plant growth regulators in horticulture.	12 Mark	L3	CO4
7		Define unfruitfulness. Explain factors responsible for causes of unfruitfulness.	12 Mark	L3	CO4
8	a)	Define fertigation and explain in detail about organic & inorganic fertilizers	6 Mark	L3	CO5
	b)	Define irrigation and explain various irrigation systems	6 Mark	L4	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) I Semester (SOA-24) Supplementary Examinations, June – 2026

FUNDAMENTALS OF SOIL SCIENCE

[Agriculture]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 X 1 = 20 Marks**

1	Planestimal Hypothesis was given by _____	1 Mark	L1	CO1
2	The formula for haematite is _____	1 Mark	L1	CO1
3	The branch of soil science dealing with the genesis, survey and classification is called as _____	1 Mark	L1	CO1
4	The liquid sphere of the earth is called as _____	1 Mark	L1	CO1
5	The dominant metallic element on the earth crust is _____	1 Mark	L1	CO2
6	A light weight, light colored cellular extrusive rock formed by the escaping of volatile constituents is _____	1 Mark	L1	CO2
7	An example of tectosilicate is _____	1 Mark	L1	CO2
8	The colour of Muscovite is _____	1 Mark	L1	CO2
9	The most common observed clay mineral in soils is _____	1 Mark	L1	CO3
10	The amount of exchangeable cations per unit weight of dry soil is called as _____	1 Mark	L1	CO3
11	The size of the colloidal particle is _____	1 Mark	L1	CO3
12	The Eluviated horizons is designated with letter _____	1 Mark	L1	CO3
13	The neutral range of soil pH is _____	1 Mark	L1	CO4
14	The conversion of inorganic form to organic form is called as _____	1 Mark	L1	CO4
15	The ratio of thermal conductivity to heat capacity is called as _____	1 Mark	L1	CO4
16	The porosity of soil with bulk density 1.5 Mg/m^3 and particle density 2.3 Mg/m^3 is _____	1 Mark	L1	CO4
17	The law governing the movement of gases through diffusion is _____	1 Mark	L1	CO5
18	The fraction of incident radiation that is reflected by the land surface is termed as _____	1 Mark	L1	CO5
19	The ease with which water pass through a bulk mass of soil or a layer of soil is called as _____	1 Mark	L1	CO5
20	The size of the micropore is _____	1 Mark	L1	CO5

Multiple Choice Questions

II **20 X 0.5 = 10 Marks**

1	Which branch of soil science focuses on the chemical properties and reactions of soil. a) Soil Physics b) Soil Fertility c) Soil Chemistry d) Soil Survey	0.5 Mark	L1	CO1
2	Which rock fragments are larger than 250.0 mm. a) Cobbles or flags b) Gravel or pebbles c) Stones or boulders d) Sand	0.5 Mark	L1	CO1

3	Which hypothesis explains the evolution of the Earth? a) Nebular hypothesis b) Big Bang theory c) Continental drift d) Quantum hypothesis	0.5 Mark	L1	CO1
4	Which process leads to the formation of sedimentary rocks. a) Cooling of magma b) Transportation and cementation c) Alteration of pre-existing rocks d) Eruption of magma	0.5 Mark	L1	CO2
5	What is the metamorphic form of limestone. a) Slate b) Quartzite c) Marble d) Schist	0.5 Mark	L1	CO2
6	The following is ferromagnesian mica mineral. a) Muscovite b) Olivine c) Biotite d) Pyroxene	0.5 Mark	L1	CO2
7	What type of metamorphism involves pressure. a) Thermo-metamorphism b) Hydro-metamorphism c) Dynamo-thermal metamorphism d) Dynamo-metamorphism	0.5 Mark	L1	CO2
8	Which of the following is an example of a sorosilicate. a) Epidote b) Olivine c) Tourmaline d) Biotite	0.5 Mark	L1	CO2
9	Which clay mineral exhibits the highest percentage of pH-dependent charge? a) Montmorillonite b) Kaolinite c) Illite d) Gibbsite	0.5 Mark	L1	CO3
10	Which type of clay minerals have high AEC? a) 1:1 b) 2:1 c) 1:2 d) All	0.5 Mark	L1	CO3
11	The shape of Montomorillonite is a) Flakes b) Hexagonal c) Variable d) Rods	0.5 Mark	L1	CO3
12	Soil exhibits plasticity if the clay percent of the soils is more than. a) 12 % b) 10 % c) 15 % d) 5 %	0.5 Mark	L1	CO3
13	What is the formula for percent base saturation a) (Total cations x 100) ÷ CEC b) (Basic cations ÷ Total cations) x 100 c) (Basic cations x 100) ÷ CEC d) (Exchangeable bases ÷ Anion exchange capacity) x 100	0.5 Mark	L1	CO3
14	The moisture content at which soil begins to flow like a liquid is called the a) Shrinkage limit b) Plastic limit c) Liquid limit d) Plasticity index	0.5 Mark	L1	CO4
15	Bulk density is expressed as a) Weight per unit volume of solids b) Weight per unit volume of soil (solids + pores) c) Weight per unit volume of water d) None of the above	0.5 Mark	L1	CO4
16	What is the term for the water content in soil when all pores are filled with water. a) Saturation point b) Field capacity c) Hygroscopic limit d) Permanent wilting point	0.5 Mark	L1	CO4
17	What type of soil structure occurs in sandy soils. a) Crumb structure b) Single-grain structure c) Blocky structure d) Platy structure	0.5 Mark	L1	CO4
18	Which among the following is epipedon. a) Natric b) Histic c) Argillic d) Gypsic	0.5 Mark	L1	CO5
19	The term for artificially broken soil masses is a) Peds b) Clods c) Concretions d) Fragments	0.5 Mark	L1	CO5
20	The diagnostic surface soils are called as a) Epipedons b) Endopedons c) Pedons d) All of the above	0.5 Mark	L1	CO5

Match the Following

III **0.5 X 10 = 5 Marks**

1	Acid rocks	a)	Mineralization	0.5 Mark	L1	CO1
2	Wide C: N ratio	b)	> 65%	0.5 Mark	L1	CO4
3	Narrow C: N ratio	c)	Soluble in alkali, insoluble in acid	0.5 Mark	L1	CO4
4	Humin	d)	Immobilization	0.5 Mark	L1	CO4
5	Humic acid	e)	Insoluble in both acid and alkali	0.5 Mark	L1	CO4
6	Simonson	f)	Soil as natural body	0.5 Mark	L1	CO4
7	CEC of soil	g)	Fourier	0.5 Mark	L1	CO3
8	Heat flow in soils	h)	Thomas Way	0.5 Mark	L1	CO4
9	Dokuchaev	i)	Soil Consistency	0.5 Mark	L1	CO5
10	Atterberg	j)	Basic pedogenic processes	0.5 Mark	L1	CO4

Answer the Following

IV **1 X 5 = 5 Marks**

1	Full form of CEC	1 Mark	L1	CO3
2	Full form of BD	1 Mark	L1	CO4
3	Full form of USDA	1 Mark	L1	CO4
4	Calcite	1 Mark	L1	CO2
5	Dolomite	1 Mark	L1	CO2

PART - B

Answer any Five Questions

V **12 X 5 = 60 Marks**

1		Explain in detail the classification and properties of layer silicate clay minerals along with neat diagrams	12 Mark	L2	CO2
2		Explain in detail chemical weathering	12 Marks	L2	CO2
3	a)	Define porosity. Write the factors affecting porosity.	6 Marks	L1	CO4
	b)	A soil core was taken for the determination of porosity. The measurements were: Cylinder volume 73.5 cc , Dry soil weight 87.8g, Particle density 2.65 g cc^{-1}, Soil weight 87.8g and Soil volume 73.6cc . Calculate the porosity.	6 Marks	L3	CO4
4	a)	Define structure and write the significance of soil structure.	6 Marks	L1	CO4
	b)	i) Define Mineral.	2 Marks	L1	CO2
		ii) Define stokes law.	2 Marks	L1	CO4
		iii) Infiltration vs Percolation.	2 Marks	L4	CO4
5		Explain in detail the formation of rocks and write the classification of igneous rocks based on silica content	12 Marks	L2	CO2
6	a)	Discuss Saturated flow vs Unsaturated flow.	3 Marks	L4	CO4
	b)	Compare Fulvic acid vs Humic acid	3 Marks	L4	CO4
	c)	Compare Intrusive rocks vs Extrusive rocks	3 Marks	L4	CO2
	d)	Discuss Solonization and Solodization	3 Marks	L4	CO4
7	a)	Salient features of soil taxonomy	3 Marks	L2	CO5
	b)	Diagnostic surface horizons	3 Marks	L2	CO5
	c)	Write about Humus synthesis	3 Marks	L2	CO4
	d)	Write about Biological weathering	3 Marks	L2	CO2
8		Define Soil Texture. Explain in detail the methods of determination of soil Texture. Explain the significance of soil texture .	12 Marks	L2	CO4

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) I Semester (SOA-24) Supplementary Examinations, June – 2026

INTRODUCTORY MATHEMATICS

[Agriculture]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 X 1 = 20 Marks**

1	The addition of two matrices is only defined if the matrices have the same _____.	1 Mark	L1	CO1
2	The inverse of a matrix A exists only if its determinant is _____.	1 Mark	L1	CO1
3	The transpose of a matrix is obtained by interchanging its _____ and _____.	1 Mark	L1	CO1
4	The sum of an arithmetic progression with n terms is always _____ if the common difference is positive.	1 Mark	L2	CO1
5	The derivative of a constant is _____.	1 Mark	L1	CO2
6	The derivative of $f(x)=e^x$ is _____.	1 Mark	L1	CO2
7	The chain rule is used for differentiating _____ functions.	1 Mark	L2	CO2
8	If the total revenue $R(x)=5x^2$, what is the marginal revenue _____.	1 Mark	L1	CO2
9	In optimization problems, finding the maximum or minimum of a function often involves setting the first derivative equal to _____.	1 Mark	L1	CO3
10	A critical point is classified as a saddle point if the function has _____ values in some directions and _____ values in others.	1 Mark	L1	CO3
11	The Hessian matrix is used to analyse the nature of critical points in functions of more than one variable. It is the matrix of second-order _____.	1 Mark	L1	CO3
12	The second derivative test is inconclusive when the second derivative at a critical point is _____.	1 Mark	L1	CO3
13	The integral of sin(x) with respect to x is _____.	1 Mark	L1	CO4
14	The formula for integration by parts is given by $\int u\,dv$=_____.	1 Mark	L2	CO4
15	The integral of 1/x with respect to x is_____.	1 Mark	L1	CO4
16	The area under the curve of f(x) from a to b is given by the definite integral is_____.	1 Mark	L1	CO4
17	A _____ model in agriculture represents the relationship between input factors like fertilizer, water, and yield of crops.	1 Mark	L2	CO5
18	The _____ method is commonly used to find the best-fitting line in linear regression.	1 Mark	L1	CO5
19	_____ models are used to represent growth rates, such as the increase in population of pests or plants over time.	1 Mark	L1	CO5
20	The _____ model is often used when the data shows a constant rate of growth or decay.	1 Mark	L1	CO5

Multiple Choice Questions

II **20 X 0.5 = 10 Marks**

1 What is the common difference in an arithmetic progression? 0.5 Mark L1 CO1
   a) The ratio between consecutive terms
   b) The difference between consecutive terms
   c) The sum of consecutive terms
   d) The product of consecutive terms

2	In a geometric progression, if the first term is 3 and the common ratio is 2, what is the 4th term? a) 24 b) 12 c) 18 d) 48	0.5 Mark	L1	CO1
3	Which of the following is true for matrix addition? a) Matrices must have the same order to be added. b) Matrices must have the same number of rows to be added. c) Matrices must have the same number of columns to be added. d) Matrices can be added regardless of their size.	0.5 Mark	L1	CO1
4	**True** or **False**: Matrix multiplication is commutative, i.e., AB=BA	0.5 Mark	L1	CO1
5	What is the derivative of $f(X)=x^2$ using the first principle? a) 2x b) x c) 1 d) 0	0.5 Mark	L1	CO2
6	If $f(x)=x^3+x^2$, what is $f'(x)$? a) $3x^2+2x$ b) 3x+2 c) $2x^3+3x^2$ d) $3x^2+3x$	0.5 Mark	L1	CO2
7	**True** or **False**: The derivative of f(x)= log(x) is $f'(x)= 1/x$:	0.5 Mark	L1	CO2
8	**True** or **False**: The product rule states that $(fg)'= f'g+fg'$.	0.5 Mark	L1	CO2
9	**True or False:** If a function is homogeneous of degree 2, then it satisfies Euler's theorem.	0.5 Mark	L1	CO3
10	**True or False:** The first partial derivatives of a homogeneous function of degree 1 are always constant.	0.5 Mark	L1	CO3
11	For the function y=f(x), the first derivative dy/dx represents: a) The rate of change of y with respect to x b) The second derivative of y with respect to x c) The partial derivative of y with respect to x d) The maximum value of y	0.5 Mark	L1	CO3
12	Which of the following is the necessary condition for a function to have a local maximum or minimum at a point? a) First derivative test b) Second derivative test c) Euler's theorem d) Homogeneity condition	0.5 Mark	L1	CO3
13	**True or False:** The integral of a constant is the constant multiplied by the variable of integration.	0.5 Mark	L2	CO4
14	**True or False:** The indefinite integral always includes a constant of integration.	0.5 Mark	L1	CO4
15	Which of the following is the result of the integrate the function $f(x)=e^x dx$? a) e^x+C b) e^x c) $e^x/x+C$ d) none	0.5 Mark	L2	CO4
16	Which of the following is the correct formula for integration by parts? a) $\int udv=uv-\int vdu$ b) $\int udv=uv+\int vdu$ c) $\int udv=\int vdu+uv$ d) $\int udv=uv$	0.5 Mark	L1	CO4
17	**True or False**: Mathematical models in agriculture are used to predict the growth of crops under various environmental conditions.	0.5 Mark	L1	CO5
18	**True or False**: Agricultural systems can be modeled using both deterministic and stochastic models.	0.5 Mark	L1	CO5
19	**True or False**: The complexity of agricultural models generally increases with the level of detail they incorporate.	0.5 Mark	L1	CO5
20	In a linear model, what does the equation y=mx+b represent? a) A constant relationship between x and y b) A parabolic relationship between x and y c) An exponential growth relationship between x and y d) A straight-line relationship between x and y	0.5 Mark	L1	CO5

Match the Following

III **0.5 X 10 = 5 Marks**

1	Arithmetic Progression	a)	The derivative of a constant is zero	0.5 Mark	L2	CO1
2	Geometric Progression	b)	A derivative taken with respect to one variable while keeping others constant	0.5 Mark	L2	CO1
3	Constant rule	c)	$\int f(x)dx+C$	0.5 Mark	L2	CO2
4	Chain rule	d)	Mathematical representations of real-world systems	0.5 Mark	L1	CO2
5	Minima of a function	e)	A sequence where the difference between consecutive terms is constant	0.5 Mark	L1	CO3
6	Partial derivative	f)	A sequence where each term is the product of the previous term by a constant ratio	0.5 Mark	L1	CO3
7	Definite integral	g)	A function's value is minimized at a point where its derivative is zero	0.5 Mark	L2	CO4
8	Indefinite integral	h)	Models used to describe agricultural production and growth	0.5 Mark	L2	CO4
9	Mathematical Models	i)	$\int f(x)dx$ from a to b	0.5 Mark	L1	CO5
10	Agricultural systems	j)	The rule to differentiate composite functions	0.5 Mark	L1	CO5

Answer the Following

IV **1 X 5 = 5 Marks**

1	Define a harmonic progression	1 Mark	L1	CO1
2	What is the first principle of differentiation?	1 Mark	L1	CO2
3	State the second-order condition for a function of two variables to have a local minimum at a critical point.	1 Mark	L1	CO3
4	What is the definite integral of x^2 from 0 to 2?	1 Mark	L1	CO4
5	How can we determine the coefficients of a linear model from experimental data?	1 Mark	L1	CO5

PART - B

Answer any Five Questions

V **12 X 5 = 60 Marks**

1	a)	Determine the common difference of the arithmetic progression if the 5th term is 12 and the 8th term is 18.	6 Marks	L4	CO1
	b)	Find the 5th term of the geometric progression: 2,6,18,54,……	6 Marks	L4	CO1
2	a)	Find the sum of the first 5 terms of a harmonic progression formed by the terms of the arithmetic progression 2,5,8,11,…	6 Marks	L4	CO1
	b)	Define a matrix and give an example of a 2x3 matrix.	6 Marks	L3	CO1
3	a)	Define the first principle of differentiation. Derive the derivative of $f(x)= x^2$ using the first principle.	6 Marks	L4	CO2
	b)	State and explain the rule for differentiation of the sum of two functions. Find the derivative of $f(x) = x^3+4x^2$	6 Marks	L3	CO2
4	a)	Explain the rule for differentiating the difference of two functions. Differentiate $f(x) = 5x^2 – 3x$.	6 Marks	L4	CO2
	b)	Define partial derivatives and explain their importance in multivariable calculus.	6 Marks	L3	CO3

5	a)	Calculate the second-order partial derivatives for the function $f(x, y) = x^3+y^3-3xy$.	6 Marks	L2	CO3
	b)	Verify if the mixed partial derivatives of the function $f(x, y) = x^2+2xy+y^2$ are equal.	6 Marks	L3	CO3
6	a)	Find integrate the function $f(x)= (3x^2-5x+7)$ from x=2 to x=4.	6 Marks	L3	CO4
	b)	Evaluate integrate the function $f(x)=e^{2x}$ from x=1 to x=2.	6 Marks	L3	CO4
7	a)	Compute integrate the function $f(x)=x \cos(x^2)$ from x=0 to x=1.	6 Marks	L3	CO4
	b)	Define an agricultural system. What role do mathematical models play in the analysis of these systems?	6 Marks	L4	CO5
8	a)	Classify mathematical models used in agricultural systems and provide examples for each category.	6 Marks	L3	CO5
	b)	Explain the difference between deterministic and stochastic mathematical models.	6 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) II Semester (MBU-22) Fasttrack Supplementary Examinations, June – 2026

FUNDAMENTALS OF AGRICULTURAL ECONOMICS

[Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 x 1 = 20 Marks**

1	Economics is a science of choice when faced with ---------- means and unlimited ends.	1 Mark	L1	CO1
2	---------- are the starting points for every economic activity.	1 Mark	L1	CO1
3	Micro Economics is otherwise called as ----------	1 Mark	L1	CO1
4	For production of ---------- goods, efforts are needed	1 Mark	L1	CO1
5	An example for external, material and non-transferable good is ----------	1 Mark	L1	CO1
6	---------- goods satisfy less urgent wants.	1 Mark	L1	CO1
7	The more we have of a commodity, the less we want to have more of it' is explained by ----------	1 Mark	L1	CO2
8	When marginal utility of a commodity is ----------, total utility is maximum.	1 Mark	L1	CO2
9	The slope of indifference curve indicates ----------	1 Mark	L1	CO2
10	---------- is a line indicating all possible combinations of two commodities purchased with the given outlay of funds.	1 Mark	L1	CO3
11	---------- refers to various quantities of goods purchased by the consumer at various prices of its related good.	1 Mark	L1	CO3
12	The Law of demand states that, demand for a commodity varies ---------- with price.	1 Mark	L2	CO3
13	The demand for the final product is called ----------	1 Mark	L1	CO4
14	Processing function gives ---------- utility to the product	1 Mark	L1	CO4
15	Expand TU ----------	1 Mark	L1	CO4
16	The slope of supply curve is ---------- to origin	1 Mark	L1	CO4
17	Expand AFC ----------	1 Mark	L1	CO5
18	The costs which are considered only in the long run are ----------	1 Mark	L1	CO5
19	-------- is a market situation in which there is single seller for the commodity.	1 Mark	L1	CO5
20	Write The Formula For DI ----------	1 Mark	L1	CO5

PART - B

Answer any Ten Question
All Questions Carry Equal Marks

II **10 x 3 = 30 Marks**

1	Write about traditional approach of economics?	3 Marks	L2	CO1
2	Difference between price demand and cross demand?	3 Marks	L3	CO1
3	List out the seven production cost curves along with their formulae?	3 Marks	L3	CO2
4	Define elasticity of supply? Diagrammatically explain different degrees of elasticity of supply?	3 Marks	L1	CO2
5	List out the seven production cost curves along with their formulae?	3 Marks	L2	CO3
6	Difference between price demand and cross demand?	3 Marks	L3	CO3
7	Define and explain the law of diminishing marginal utility with the help of an example in graphical and tabular form	3 Marks	L4	CO3
8	Classify the market based on structure and list out the characteristics of perfect competition.	3 Marks	L3	CO3
9	Explain different concepts of national income?	3 Marks	L1	CO4
10	Write about functions of money?	3 Marks	L3	CO4
11	What is meant by capitalism and write its characteristic features?	3 Marks	L3	CO5
12	What is an economic system? Write the characteristics of different types of economic systems?	3 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) II Semester (MBU-22) Fasttrack Supplementary Examinations, June – 2026

SOIL AND WATER CONSERVATION ENGINEERING

[Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.

All Questions Carry Equal Marks

I **20 x 1 = 20 Marks**

1	----------is a specialized field of study that focuses on sustainable management and conservation of soil and water resources.	1 Mark	L1	CO1
2	----------are two important natural resources and the basic needs for agricultural production.	1 Mark	L1	CO1
3	Water erosion, major erosive agents are ----------and ----------over the soil surface.	1 Mark	L1	CO1
4	Expand NWDPRA ----------	1 Mark	L1	CO1
5	Erosion is a three-phase process involving ----------	1 Mark	L1	CO1
6	Removal of surface soil due to natural agencies takes place at a faster rate than it can be built by the soil formation process called ----------	1 Mark	L1	CO2
7	The standard requirement of a standard USLE plot is ----------in length, ----------in width, and a ---------- percent slope.	1 Mark	L1	CO2
8	--------is the removal of soil by water and transportation of the eroded materials away from the point of removal	1 Mark	L1	CO2
9	Gully formation is initiated when the depth and width of the rill is ----------	1 Mark	L1	CO2
10	Soil particle size of the surface creep transportation process by wind is ----------	1 Mark	L2	CO2
11	Expand PGCS ----------	1 Mark	L2	CO3
12	----------check dams are made of posts and brushes and are placed across the gully.	1 Mark	L1	CO3
13	Contour farming is recommended for lands with a slope range of -----	1 Mark	L2	CO3
14	A ----------is a longer barrier than the windbreak and is installed by using more than two rows, usually at a right angle to the direction of prevailing winds.	1 Mark	L2	CO3
15	----------is a permanent vegetative measure that helps in the reduction of wind erosion.	1 Mark	L1	CO3
16	----------is a system of grouping soils primarily based on their capability to produce commonly cultivated crops and pasture plants without deterioration over a long period.	1 Mark	L1	CO4
17	----------technique is suitable for the areas where the rainfall intensity is too high and causes large surface flow to damage the contour bunds.	1 Mark	L2	CO4
18	In the land capability subclasses “e” describes ----------	1 Mark	L1	CO4
19	----------Soils are capable only of producing perennial forage crops and improvement practices are not feasible.	1 Mark	L2	CO4
20	----------can be defined as the collection and storage of creek flow for irrigation use.	1 Mark	L1	CO4

PART - B

Answer any Ten Question
All Questions Carry Equal Marks

II **10 x 3 = 30 Marks**

1	What is soil erosion, and what causes it?	3 Marks	L1	CO1
2	Write the objectives of the Watershed Development Project for the Shifting Cultivation Area program.	3 Marks	L2	CO1
3	List the different programs taken up by the government for soil conservation in India and Write the role and functions of the NAEB.	3 Marks	L2	CO1
4	a) Define USLE and write the empirical equation of USLE with all factors. b) A field is cultivated on the contour for growing maize crop. The other details regarding USLE factors are as follows: R-175 t/acre K-0.40 LS=0.70 P=0.55 C=0.50 Compute the value of soil loss likely to take place from the field. Also, make a comment on soil loss when the same field is kept under continuous pasture with 95 percent cover. Assume the value of factor C for the new crop is 0.003.	3 Marks	L4	CO2
5	Write about the different ways of soil transportation by the wind with a neat sketch.	3 Marks	L3	CO2
6	Write about the run-off plots based on size with a neat sketch.	3 Marks	L3	CO2
7	Define permanent gully control structure and write the silent features of PGCS.	3 Marks	L2	CO3
8	Differentiate between contour bunds and graded bunds?	3 Marks	L2	CO3
9	What is Sand-dune stabilization and explain Sand-dune stabilization methods.	3 Marks	L3	CO3
10	Why do we need and when do we use land capability classification?	3 Marks	L3	CO4
11	Explain the short-term runoff harvesting techniques.	3 Marks	L2	CO4
12	Write about the arable land capability classification.	3 Marks	L3	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) II Semester (SOA-22) Fasttrack Supplementary Examinations, June – 2026

AGRICULTURAL MICROBILOGY

[Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 x 1 = 20 Marks**

1	_____ are sub-microscopic, obligate parasite consisting of nucleic acid and protein that multiplies only intracellularly and is potentially pathogenic.	1 Mark	L1	CO1
2	The terms aerobic and anaerobic to designate life in the presence and absence of oxygen respectively was given by _____	1 Mark	L1	CO1
3	Pure culture method for fungi was developed by _____	1 Mark	L1	CO1
4	Penicillin was identified as an antibiotic of *Penicillium notatum* is discovered by _____	1 Mark	L1	CO1
5	Surface to volume ratio of bacteria is _____	1 Mark	L1	CO1
6	The ability of bacteria to change their movement in response to environmental stimuli is known as _____	1 Mark	L2	CO2
7	Volutin granules in bacteria are reserve source of _____	1 Mark	L2	CO2
8	Secondary metabolites include toxins, antibiotics, sterols etc were produced in _____ phase of bacterial growth	1 Mark	L3	CO2
9	Example for methane oxidizing bacteria _____	1 Mark	L3	CO2
10	_____ in which nitrogen complexes are decomposed into simpler or organic forms and converted into inorganic compounds for use by plants	1 Mark	L3	CO2
11	_____ is a process limited to anoxic soils in which bacterial reduction of NO3 - and NO2 - takes place leading to the release of NO, N2O and N2 gases	1 Mark	L2	CO3
12	_____ element is a constituent of nucleic acids and essential for the accumulation and release of energy	1 Mark	L3	CO3
13	Azolla in association with blue-green alga anabaena can fix atmospheric Nitrogen into _____	1 Mark	L2	CO3
14	Cynobacteria can fix atmospheric nitrogen in anaerobic conditions by means of specialized cells called _____	1 Mark	L2	CO3
15	Mycorrhiza are involved uptake of _____ nutrient by the higher plants from the soil	1 Mark	L1	CO3
16	The term phyllosphere was coined by _____	1 Mark	L1	CO4
17	The most commonly used method for storage of silages is _____	1 Mark	L3	CO4
18	Biofertilizer inoculant which is a chemoautotrophic in nature, free living, non-symbiotic in nature and is recommended for application to non-legume crops is _____	1 Mark	L1	CO4
19	An example for fungal microbial biopesticide is _____	1 Mark	L3	CO4
20	Biodiesel is an alternative diesel fuel, is made from renewable biological sources such as vegetable oils and _____	1 Mark	L2	CO4

PART - B

Answer any Ten Question

All Questions Carry Equal Marks

II **10 x 3 = 30 Marks**

1	Define microbiology? Write about importance of different microorganisms?	3 Marks	L1	CO1
2	Write a short note on Koch's Postulates?	3 Marks	L1	CO1
3	Write the differences between procaryotic cells and eucaryotic cells?	3 Marks	L2	CO1
4	Describe in detail about different internal structures of a bacteria?	3 Marks	L3	CO2
5	Difference between gram-positive and gram-negative bacteria?	3 Marks	L1	CO2
6	Explain in detail about conjugation in bacteria?	3 Marks	L3	CO2
7	Write a short note on Nitrogen mineralization?	3 Marks	L2	CO3
8	Describe in detail about the phosphorous cycle?	3 Marks	L2	CO3
9	What is blue green algae? Write a short note on the importance of blue green algae?	3 Marks	L1	CO3
10	Define mycorrhiza? Write a short note on ectomycorrhiza?	3 Marks	L3	CO3
11	Define biofertilizer? Write about rhizobium biofertilizer?	3 Marks	L2	CO4
12	Write about advantages and disadvantages of biodegradation of agri-wastes?	3 Marks	L3	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) II Semester (MBU-22) Fasttrack Supplementary Examinations, June – 2026

FUNDAMENTALS OF AGRICULTURAL EXTENSION EDUCATION

[Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.

All Questions Carry Equal Marks

I **20 x 1 = 20 Marks**

1	Any organized education activity outside the established formal system is ----------education.	1 Mark	L1	CO1
2	There are ----------number of extension principles.	1 Mark	L1	CO1
3	The third step of extension educational programme is .	1 Mark	L1	CO1
4	Extension programmes should fix up priority on the basis of available ----------and ----------	1 Mark	L1	CO1
5	Define agricultural extension.	1 Mark	L1	CO1
6	Shri Niketan project organized village Scout called ----------	1 Mark	L2	CO2
7	Mr. F.L. Brayne Deputy Commissioner has started the rural upliftment movement in 1920 in ----------district of Haryana state.	1 Mark	L2	CO2
8	5-fold programme under Marthandam project involves development of ----------	1 Mark	L2	CO2
9	Expand RKVY.	1 Mark	L1	CO2
10	Expand ATMA.	1 Mark	L1	CO2
11	----------of Agricultural Extension Service involves extension personnel from private agency/organization.	1 Mark	L2	CO3
12	Expand GATT----------	1 Mark	L2	CO3
13	Write any 1 anticipated benefit of Farm school----------	1 Mark	L2	CO3
14	Rural development is overall (social, economic, political and spiritual) development of rural areas to improve quality of life of ----------	1 Mark	L2	CO3
15	Expand DRDA.	1 Mark	L1	CO3
16	Any two barriers of communication----------	1 Mark	L1	CO4
17	----------is defined as the profession which concerns itself with the procurement, processing and publication of news and views.	1 Mark	L1	CO4
18	Expand ICT.	1 Mark	L1	CO4
19	Limitations of ICT enabled extension: a) High cost of installation b) Lack of usage skills c) Both a and b d) Neither a nor b	1 Mark	L3	CO4
20	----------are the last people to adopt new practices and are traditional.	1 Mark	L2	CO4

PART - B

Answer any Ten Question
All Questions Carry Equal Marks

II **10 x 3 = 30 Marks**

1	Explain the objectives of extension education.	3 Marks	L2	CO1
2	Define programme planning and write its importance.	3 Marks	L2	CO1
3	Briefly explain the steps of extension programme planning with flowchart.	3 Marks	L2	CO1
4	Briefly explain the Marthandam project concept with its objectives.	3 Marks	L3	CO2
5	List out the various extension/ agriculture development programmes launched by ICAR/ Government of India along with the year.	3 Marks	L1	CO2
6	Mention the three major components of NATP and write down the objectives of ATMA.	3 Marks	L3	CO2
7	What is rural development? Explain the objectives of rural development.	3 Marks	L2	CO3
8	Differentiate between monitoring and evaluation.	3 Marks	L4	CO3
9	Explain various types of evaluation in extension.	3 Marks	L2	CO3
10	Categorize the members of community into different groups based on the adopters of innovativeness.	3 Marks	L3	CO4
11	Discuss about different models of communication.	3 Marks	L4	CO4
12	Discuss the role of ICT in Agriculture.	3 Marks	L4	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) I Semester (MBU-22) Fasttrack Supplementary Examinations, June – 2026

FUNDAMENTALS OF HORTICULTURE

[Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 x 1 = 20 Marks**

1	The crops which are cultivated in a large scale, only utilized after processing are called ----------	1 Marks	L1	CO1
2	Deficiency of Vitamin-A causes ---------- in humans	1 Marks	L1	CO1
3	The word 'Horticulture' was first conceived by ----------	1 Marks	L2	CO1
4	---------- country is referred as world spice bowl.	1 Marks	L1	CO1
5	Fruits and vegetables supply ---------- which are required to prevent constipation.	1 Marks	L1	CO1
6	---------- dormancy is induced due to presence of hard seed coat which is impermeable to water and gases.	1 Marks	L1	CO2
7	---------- technique is used to convert inferior varieties to superior varieties.	1 Marks	L2	CO2
8	The phenomenon, where seeds do not germinate even under favourable condition is called as ----------	1 Marks	L1	CO2
9	The small piece of a plant organ used to begin an *in vitro* culture is called ----------	1 Marks	L1	CO2
10	Exposure of dormant seeds to low temperature treatment is termed as ----------	1 Marks	L2	CO2
11	The development of fruit without fertilization is called ----------	1 Marks	L1	CO3
12	In a quincunx system one additional tree is planted in the centre of each square is called ----------	1 Marks	L1	CO3
13	The practice of removing unwanted flower buds in a cluster is called ----------	1 Marks	L1	CO3
14	---------- is the process by which fruits attain their desirable flavor, quality, colour, palatable nature and other textural properties.	1 Marks	L2	CO3
15	---------- is the point on the trunk from which first branches arise.	1 Marks	L1	CO3
16	---------- is an example for informal type of garden.	1 Marks	L1	CO4
17	Repetition of the same object at equal distance is called ----------	1 Marks	L1	CO4
18	---------- involves the leading visual observation towards a feature by placement of the feature *e.g.* center of the garden.	1 Marks	L2	CO4
19	Pagoda is the main feature in ---------- garden .	1 Marks	L2	CO4
20	The medium to large parks are considered ---------- of cities.	1 Marks	L1	CO4

PART - B

Answer any Ten Question
All Questions Carry Equal Marks

II **10 x 3 = 30 Marks**

1	Give a short note on plantation, spice, medicinal and aromatic crops with examples	3 Marks	L2	CO1
2	Write a brief note on importance of horticulture in India	3 Marks	L2	CO1
3	Give a short notes on importance of horticultural crops in human nutrition	3 Marks	L3	CO1
4	What is budding. Explain about T-budding with a neat diagram.	3 Marks	L3	CO2
5	What is a cutting and write about different stem cuttings with examples	3 Marks	L3	CO2
6	Define seed dormancy. Explain methods of breaking seed dormancy.	3 Marks	L3	CO2
7	Write about criteria for site selection for an orchard	3 Marks	L2	CO3
8	What is the best training system for fruit crops and justify by mentioning its advantages with a neat diagram.	3 Marks	L3	CO3
9	How can you make a distinction between square system and quincunx system of planting?	3 Marks	L2	CO3
10	Describe the cause and control of fruit drop in horticultural crops.	3 Marks	L3	CO3
11	What are the principles of the landscape garden?	3 Marks	L2	CO4
12	Give a brief note on main features of Mughal gardens	3 Marks	L2	CO4

CODE No.: 23PA101006 SOP-BPH &MPH-23

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B. Pharmacy IV Semester (SOP-BPH &MPH-23) Regular Examinations, June – 2026

PHARMACEUTICAL ORGANIC CHEMISTRY-III

Time: 3 hours **Max. Marks: 75**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Explain plane of symmetry.	2 Marks	L5	CO1
	b)	Define racemic mixture and give examples.	2 Marks	L6	CO1
	c)	Define the terms E & Z.	2 Marks	L6	CO2
	d)	Draw the structures of any two biphenyl compounds.	2 Marks	L4	CO2
	e)	Write the medicinal uses of thiophene.	2 Marks	L6	CO3
	f)	Write medicinal uses of heterocyclic compounds.	2 Marks	L6	CO3
	g)	Write any two reactions of pyridine.	2 Marks	L6	CO4
	h)	Write any method of synthesis of imidazole.	2 Marks	L6	CO4
	i)	Define Schimdt rearrangement reaction.	2 Marks	L6	CO5
	j)	Define Claisen Schimdt rearrangement reaction.	2 Marks	L6	CO5

PART - B

Answer any TWO Questions.
All Questions Carry Equal Marks

2 x 10 = 20 Marks

2.	Define racemic mixture and write about the methods for racemic modification.	10 Marks	L6	CO1
3.	Define geometrical isomerism, classify and write in detail the nomenclature rules for geometrical isomers.	10 Marks	L6	CO2
4.	Define and write the reaction, mechanism, uses of Dakin reaction.	10 Marks	L6	CO5

PART - C

Answer any SEVEN Questions.
All Questions Carry Equal Marks

7 x 5 = 35 Marks

5.	Write a detail note on meso compounds	5 Marks	L6	CO1
6.	Write a detail note on enantiomers	5 Marks	L6	CO1
7.	Write the conditions for optical activity	5 Marks	L6	CO2
8.	Write the reactions of furan	5 Marks	L6	CO3
9.	Explain in detail the synthesis methods of thiazole	5 Marks	L5	CO4
10	Explain the mechanism involved in clemmensen reduction reaction.	5 Marks	L5	CO5
11.	Explain the mechanism involved in Oppenauer oxidation.	5 Marks	L5	CO5
12.	Differentiate between sterio specific and sterio selective reactions.	5 Marks	L5	CO2
13.	Write the reactions of pyrrole.	5 Marks	L6	CO3

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B. Pharmacy IV Semester (SOP-BPH &MPH-23) Regular Examinations, June – 2026

MEDICINAL CHEMISTRY-I

Time: 3 hours **Max. Marks: 75**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Explain factors affecting metabolism.	2 Marks	L2	CO1
	b)	Define metabolism, write examples for phase I & phase II.	2 Marks	L1	CO1
	c)	Define β adrenergic blockers and give some examples.	2 Marks	L1	CO2
	d)	Draw the structures of propranolol and phenylephrine.	2 Marks	L1	CO2
	e)	Write the medicinal uses of solanaceous alkaloids.	2 Marks	L1	CO3
	f)	Write the structures of carbachol and neostigmine.	2 Marks	L1	CO3
	g)	Write two structures of antipsychotics.	2 Marks	L1	CO4
	h)	Explain the MOA of anticonvulsants.	2 Marks	L2	CO4
	i)	Write the MOA of inhalation anesthetics.	2 Marks	L1	CO5
	j)	Write the medicinal uses of mefenamic acid and ibuprofen.	2 Marks	L1	CO5

PART - B

Answer any TWO Questions.
All Questions Carry Equal Marks

2 x 10 = 20 Marks

2.	Explain in detail the history of medicinal chemistry.	10 Marks	L2	CO1
3.	Define any five physicochemical properties that affect biological action.	10 Marks	L1	CO1
4.	Define antipsychotics, write classification MOA, SAR, medicinal uses, synthesis of chlorpromazine hydrochloride.	10 Marks	L6	CO4

PART - C

Answer any SEVEN Questions.
All Questions Carry Equal Marks

7 x 5 = 35 Marks

5.	Write a note on factors affecting drug metabolism.	5 Marks	L6	CO1
6.	Define bio-isosterism and explain in detail.	5 Marks	L6	CO1
7.	Define catecholamines and write the synthesis and catabolism of catacholamines.	5 Marks	L6	CO2
8.	Write a note on irreversible cholineric drugs.	5 Marks	L6	CO 3
9.	Explain SAR of anticonvulsants with examples.	5 Marks	L5	CO4
10	Write the synthesis of diazepam in detail.	5 Marks	L6	CO4
11.	Define narcotic and non narcotic analgesics, classify them with structures and medicinal uses.	5 Marks	L2	CO5
12.	Explain the MOA, medicinal uses of fentanyl citrate.	5 Marks	L1	CO5
13.	Explain the MOA and SAR of sympathomimetics.	5 Marks	L5	CO2

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CODE No.: 23PA101009 SOP-BPH-23

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B. Pharmacy VI Semester (SOP-BPH-23) Regular Examinations, April – 2026

MEDICINAL CHEMISTRY-III

Time: 3 hours **Max. Marks: 75**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Give two examples of first-generation cephalosporins.	2 Marks	L1	CO1
	b)	What is the 7-ACA?	2 Marks	L1	CO 1
	c)	Mention the therapeutic uses of Azithromycin.	2 Marks	L1	CO 2
	d)	Write the structure and uses of Chloroquine.	2 Marks	L1	CO 2
	e)	What is DOTS therapy?	2 Marks	L1	CO 3
	f)	Name two anti-HIV drugs.	2 Marks	L1	CO 3
	g)	Name two azole antifungal drugs.	2 Marks	L1	CO4
	h)	Give the structure and uses of Albendazole	2 Marks	L1	CO4
	i)	Define Bioisosterism.	2 Marks	L1	CO5
	j)	What are Prodrugs?.	2 Marks	L1	CO5

PART - B

Answer any TWO Questions.
All Questions Carry Equal Marks

2 x 10 = 20 Marks

2.	Outline the synthesis and uses of the following: i) Chloroquine ii) Pamaquine	10 Marks	L2	CO1
3.	Define and classify anthelmintic agents with structural examples. Provide a detailed account of the synthesis, mechanism of action, and uses of Diethylcarbamazine citrate.	10 Marks	L1	CO4
4.	Discuss the importance of Linkers and Solid Supports (Resins) in combinatorial chemistry. Mention common resins like Merrifield or Wang resin.	10 Marks	L2	CO5

PART - C

Answer any SEVEN Questions.
All Questions Carry Equal Marks

7 x 5 = 35 Marks

5.	Explain the mechanism of action of penicillins.	5 Marks	L5	CO1
6.	Discuss theSAR of cephalosporins	5 Marks	L4	CO1
7.	Write the mechanism of action, and synthesis of Chloramphenicol.	5 Marks	L1	CO2
8.	Mention the adverse effects and drug interactions of macrolides	5 Marks	L1	CO2
9.	Classify urinary tract anti-infectives with examples.	5 Marks	L2	CO3
10	Explain the mechanism of action of nitrofurantoin	5 Marks	L5	CO3
11.	Write a short note on praziquantel.	5 Marks	L3	CO4
12.	Explain about SAR of antifungal agents .	5 Marks	L5	CO4
13.	Describe the various Physicochemical properties that affect drug design.	5 Marks	L2	CO5

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CODE No.: 23PA201012 SOP-Pharm D-23

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

III Year Pharm D (SOP-Pharm D-23) Regular Examinations, April – 2026

PHARMACEUTICAL ANALYSIS

Time: 3 hours **Max. Marks: 70**

PART - A

Answer the any EIGHT of the following Questions

8 X 5 = 40 Marks

1.	a)	Write note on ISO: 9000.	5 Marks	L1	CO1
	b)	Write a detail note about types of electronic transitions in UV Spectroscopy.	5 Marks	L6	CO2
	c)	Detail note on different types of Electrophoretic techniques.	5 Marks	L1	CO1
	d)	Write short note on karlfisher titration.	5 Marks	L1	CO2
	e)	Discuss the advantages and limitations of fluorimetry.	5 Marks	L1	CO4
	f)	Explain the sample handling techniques used in IR Spectroscopy.	5 Marks	L1	CO5
	g)	Write a detail note on shielding and desheilding effect in NMR Spectroscopy.	5 Marks	L6	CO6
	h)	Write note on DTA.	5 Marks	L6	CO5
	i)	Explain about chemical shift & reference standard.	5 Marks	L1	CO4
	j)	Briefly explain about types of vibrations used in IR spectroscopy.	5 Marks	L1	CO3

PART - B

Answer any TWO of the following Questions

2 X 15 = 30 Marks

2.	Explain the importance of ICH guidelines and write four categories of ICH topics.	15 Marks	L1	CO1
3.	Write note on principle,instrumentation &applications of Gas chromatography.	15 Marks	L2	CO3
4.	Write Principle on theory,principle,instrumentation of flourimetry.	15 Marks	L1	CO5
5.	Write note on X-ray differaction methods&its applications.	15 Marks	L1	CO6

CODE No.: 23PA201013 SOP-Pharm.D-23

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

III Year Pharm D (SOP-Pharm.D-23) Regular Examinations, April – 2026

MEDICINAL CHEMISTRY

Time: 3 hours **Max. Marks: 70**

PART - A

Answer the any EIGHT of the following Questions

8 X 5 = 40 Marks

1.	a)	Define Prodrug with suitable examples.	5 Marks	L1	CO1
	b)	Define QSAR. Write one application of QSAR.	5 Marks	L6	CO2
	c)	Define anticancer agents? Write any two examples of alkylating anticancer drugs.	5 Marks	L6	CO4
	d)	Enlist the antibiotics? Write the structure, MOA and uses of Chloramphenicol.	5 Marks	L6	CO3
	e)	Write the synthesis and uses of Tolbutamide.	5 Marks	L2	CO5
	f)	Define antianginal agents. Write the mode of action and uses of nitro vasodilators .	5 Marks	L3	CO3
	g)	Define and classify Antiarrhythmic agents.	5 Marks	L1	CO5
	h)	Define and classify Antimalarials .	5 Marks	L6	CO2
	i)	Write a brief note on Antiscabies and Antipedicular agents.	5 Marks	L1	CO4
	j)	Write a short note on Diagnostic agents.	5 Marks	L2	CO1

PART - B

Answer any TWO of the following Questions

2 X 15 = 30 Marks

2.	a)	Write an elaborated view on Computer aided drug design.	7 Marks	L2	CO4
	b)	Classify antitubercular agents.Write the synthesis MOA and uses of Isoniazid.	8 Marks	L2	CO4
3.	a)	Write the synthesis and uses of Sulfacetamide.	7 Marks	L2	CO2
	b)	Explain the SAR of sulfonamide antibacterial agents.	8 Marks	L2	CO2
4.	a)	What are thiazide diuretics? Write the SAR of thiazide diuretics.	7 Marks		
	b)	Define anti-hypertensive agents? Write the MOA structure and uses of ACE inhibitors.	8 Marks	L6	CO5
5.	a)	Write a note on Projestins.	7 Marks	L1	CO3
	b)	Write the structure and uses of estradiol and diethyl stilbestrol.	8 Marks	L2	CO3

CODE No.: 23PC201002 SOP-PHARM.D-23

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

Pharm.D II Year (SOP-PHARM.D-23) Regular Examinations, May – 2026

PHARMACOLOGY - I

Time: 3 hours **Max. Marks: 70**

PART - A

Answer the any EIGHT of the following Questions

8 X 5 = 40 Marks

1.	a)	Explain the treatment of Anticholinestrase poisoning.	5 Marks	L1	CO2
	b)	Write detail note on Oral Contraceptives.	5 Marks	L1	CO 6
	c)	Explain the Pharmacology and Adverse effects of Psychotropic drugs.	5 Marks	L1	CO4
	d)	Explain the `Drugs used in Myasthenia gravis.	5 Marks	L1	CO2
	e)	Explain importance and steps involved in Pre-clinical evaluations.	5 Marks	L1	CO1
	f)	Explain the Synthesis, Types physiological and Pathological actions of Histamines and 5-Hydroxytryptamine.	5 Marks	L1	CO5
	g)	Explain the Pharmacology and Adverse effects of Cardiac glycosides.	5 Marks	L1	CO3
	h)	Describe the History and Pharmacology of H2 (Histamine) receptor agonists.	5 Marks	L1	CO5
	i)	Describe the Pharmacology of Insulin analogues.	5 Marks	L1	CO6
	j)	Explain the Drugs used for hyperlipidaemias.	5 Marks	L1	CO3

PART - B

Answer any TWO of the following Questions

2 X 15 = 30 Marks

2.	Explain the Mechanism, pharmacology and drug interactions of Drugs used in Parkinsonism.	15 Marks	L1	CO2
3.	Explain the Pharmacology of H1 (Histamine) and 5HT receptor agonist and their antagonists.	15 Marks	L1	CO5
4.	Explain the classification and Pharmacology of Analgesic drugs.	15 Marks	L1	CO4
5.	Explain the Classification, Mechanism of action and Pharmacology of Insulin, Oral hypoglycemic agents and Oxytocin.	15 Marks	L1	CO6

CODE No.: 23PC201003 SOP-Pharm D-23

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

III Year Pharm D (SOP-Pharm D-23) Regular Examinations, April – 2026

PHARMACOLOGY - II

Time: 3 hours **Max. Marks: 70**

PART - A

Answer the any EIGHT of the following Questions

8 X 5 = 40 Marks

1.	a)	Detail note about on plasma expanders.	5 Marks	L1	CO1
	b)	Describe the Pharmacology of Drugs for pancreatic diseases.	5 Marks	L1	CO1
	c)	Write a detail note on JNK signal transduction pathway.	5 Marks	L6	CO4
	d)	Write a complete note on PI3-kinase pathway.	5 Marks	L6	CO4
	e)	Describe the Mechanisms of protein synthesis.	5 Marks	L1	CO5
	f)	Detail note about pharmacology of any three drugs of immunostimulants.	5 Marks	L1	CO2
	g)	Describe the Pharmacology of gluco corticoids and anti bodies.	5 Marks	L1	CO2
	h)	Detail note on pharmacology of PenicillinV and Penicillin G.	5 Marks	L1	CO3
	i)	Describe the Pharmacology of generation of Cephalosporins.	5 Marks	L1	CO3
	j)	Discuss the gene sequencing and mapping.	5 Marks	L1	CO5

PART - B

Answer any TWO of the following Questions

2 X 15 = 30 Marks

2.		Describe the Pharmacology and adverse effects of Diuretics and anti diuretics.	15 Marks	L2	CO3
3.		Describe the Pharmacology and adverse effects of drugs used for immune stimulants and immune suppressants.	15 Marks	L2	CO2
4.		Explain the pharmacology and adverse effects if antiviral drugs	15 Marks	L1	CO1
5.	a)	Explain the stages involved in protein synthesis.	7 Marks	L1	CO4
	b)	Write a note on types and application of biosensors.	8 Marks	L6	CO4

CODE No.: 23PH201009 SOP-PHARM.D-23

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

Pharm.D II Year (SOP-PHARM.D-23) Regular Examinations, May – 2026

PHARMACEUTICAL MICROBIOLOGY

Time: 3 hours **Max. Marks: 70**

PART - A

Answer the any EIGHT of the following Questions

8 X 5 = 40 Marks

1.	a)	Explain in brief about origination of microbes.	5 Marks	L1	CO1
	b)	Write about scope and history of microbiology.	5 Marks	L6	CO2
	c)	What are the cocci?	5 Marks	L1	CO3
	d)	Define and explain dry heat sterilization.	5 Marks	L1	CO4
	e)	Discuss in detail about HIV.	5 Marks	L1	CO5
	f)	What are Igs?	5 Marks	L4	CO6
	g)	Explain in brief about hypersensitivity reactions.	5 Marks	L1	CO1
	h)	Write about precipitation tests.	5 Marks	L6	CO2
	i)	Explain various toxins.	5 Marks	L1	CO3
	j)	Define and explain TB.	5 Marks	L1	CO4

PART - B

Answer any TWO of the following Questions

2 X 15 = 30 Marks

2.	Explain the microbial world-I.	15 Marks	L1	CO1
3.	Define immunity and explain its principle.	15 Marks	L1	CO2
4.	What are the various methods of cultivation of bacteria?	15 Marks	L4	CO3
5.	Write about antiviral agents.	15 Marks	L6	CO4

CODE No.: 23PH201010 SOP-Pharm.D-23

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

III Year Pharm.D (SOP-Pharm.D-23) Regular Examinations, April – 2026

PHARMACEUTICAL JURISPRUDENCE

Time: 3 hours **Max. Marks: 70**

PART - A

Answer the any EIGHT of the following Questions

8 X 5 = 40 Marks

1.	a)	Discuss the advertisements which are prohibited under Objectionable Advertisements Act.	5 Marks	L1	CO4
	b)	Write the classes of advertisements exempted under the D&MR Act.	5 Marks	L1	CO4
	c)	Give a short note on transfer and acquisition of animals for experiment.	5 Marks	L1	CO7
	d)	What are the functions of the Institutional Animal Ethics Committee?	5 Marks	L1	CO7
	e)	Distinguish between prescription and non-prescription products.	5 Marks	L1	CO5
	f)	Define the term Patent as per the Patent act. Which inventions are not patentable under the Act.	5 Marks	L1	CO5
	g)	Write about the Mudliar and Hathi Committee.	5 Marks	L1	CO3
	h)	Discuss the code of ethics for pharmacists in relation to their job.	5 Marks	L1	CO3
	i)	What are loan licenses and repacking licenses as per the D&C act?	5 Marks	L1	CO1
	j)	Mention the classes of Drugs Prohibited to be imported into India.	5 Marks	L1	CO1

PART - B

Answer any TWO of the following Questions

2 X 15 = 30 Marks

2.	Explain the ethics of pharmacist with relation to his trade and medical profession.	15 Marks	L1	CO3
3.	Describe the good manufacturing practices to be followed as per Schedule M specified under the Drugs and Cosmetics Act 1940.	15 Marks	L1	CO1
4.	Give the constitution and function of the Institute Animal Ethics(IAE) Committee.	15 Marks	L1	CO7
5.	Write in detail about Drugs and magic remedies act.	15 Marks	L1	CO4

CODE No.: 23PH201011 SOP-Pharm.D-23

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

III Year Pharm.D (SOP-Pharm D-23) Regular Examinations, April – 2026

PHARMACEUTICAL FORMULATIONS

Time: 3 hours **Max. Marks: 70**

PART - A

Answer the any EIGHT of the following Questions

8 X 5 = 40 Marks

1.	a)	Enlist various formulation components of Tablets and write a note on binding agents and disintegrating agents.	5 Marks	L1	CO1
	b)	Describe shortly the advantages of tablet coating.	5 Marks	L2	CO1
	c)	Write a note on formulation composition of capsules.	5 Marks	L1	CO1
	d)	Write a note on evaluation parameters of soft gelatin capsules.	5 Marks	L1	CO1
	e)	Define emulsion and explain its types with examples.	5 Marks	L1	CO2
	f)	Classify suspensions with suitable examples.	5 Marks	L2	CO2
	g)	Explain the tests used for identification of emulsions.	5 Marks	L2	CO2
	h)	Define parenteral and write a note on various types of parenteral products.	5 Marks	L1	CO2
	i)	Explain in detail about the factors affecting the absorption of drugs through skin.	5 Marks	L2	CO3
	j)	Discuss about the methods used for preparation of ointments.	5 Marks	L2	CO3

PART - B

Answer any TWO of the following Questions

2 X 15 = 30 Marks

2.	a)	Explain in detail about compression cycle using neat labeled diagram.	8 Marks	L2	CO1
	b)	Discuss about various evaluation parameters of Tablets.	7 Marks	L2	CO1
3.	a)	Discuss the formulation aspects of pharmaceutical emulsions with suitable example.	8 Marks	L2	CO2
	b)	Summarize the stability problems in emulsions.	7 Marks	L2	CO2
4.	a)	Classify ointment bases and explain them in detail giving examples.	8 Marks	L2	CO3
	b)	Discuss about various evaluation tests used for ointments.	7 Marks	L2	CO3
5.		Explain in detail about the types, formulation aspects and applications of buccal drug delivery systems.	15 Marks	L2	CO4

CODE No.: 23PP201001 SOP-Pharm.D-23

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

Pharm.D II Year (SOP-PHARM.D-23) Regular Examinations, May – 2026

PATHOPHYSIOLOGY

Time: 3 hours **Max. Marks: 70**

PART - A

Answer the any EIGHT of the following Questions

8 X 5 = 40 Marks

1.	a)	Write the role of free radicals in cell injury.	5 Marks	L1	CO1
	b)	Summarize the cardinal signs of acute inflammation.	5 Marks	L5	CO1
	c)	Make detail note on vascular events in inflammation.	5 Marks	L5	CO1
	d)	Briefly summarize the allergy to drugs and food substances.	5 Marks	L2	CO2
	e)	Explain the typical characteristics of benign tumors.	5 Marks	L2	CO3
	f)	How is cardiogenic shock managed?	5 Marks	L2	CO4
	g)	List out the signs and symptoms of anaphylactic shock.	5 Marks	L4	CO4
	h)	Outline the stages in chronic renal failure.	5 Marks	L4	CO5
	i)	Explain the causes and pathogenesis of dysentery.	5 Marks	L2	CO6
	j)	Discuss the etiology, pathophysiology and manifestations of gonorrhea.	5 Marks	L3	CO6

PART - B

Answer any TWO of the following Questions

2 X 15 = 30 Marks

2.	a)	Discuss the role of T and B cells in the immune response and add a note on immune tolerance.	8 Marks	L3	CO2
	b)	Explain the concept of autoimmunity and discuss the mechanisms involved in its development.	7 Marks	L2	CO2
3.	a)	Discuss the general biology of tumor cells and extend a note on angiogenesis in tumor growth.	8 Marks	L3	CO3
	b)	Give a note on oncogenes and tumor suppressor genes in cancer.	7 Marks	L1	CO3
4.		Summarize the causes, clinical manifestations and outcomes of vitamin deficiency.	15 Marks	L5	CO4
5.	a)	Discuss the etiology, risk factors and pathophysiology of congestive heart failure.	8 Marks	L3	CO5
	b)	Summarize how dopamine deficiency causes parkinson's disease.	7 Marks	L5	CO5

CODE No.: 23PP201002 SOP-PHARM.D-23

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

Pharm.D II Year (SOP-PHARM.D-23) Regular Examinations, May – 2026

COMMUNITY PHARMACY

Time: 3 hours **Max. Marks: 70**

PART - A

Answer the any EIGHT of the following Questions

8 X 5 = 40 Marks

1.	a)	Explain in brief about selection of site, space for Community Pharmacy.	5 Marks	L1	CO1
	b)	Write about parts of prescription and explain about them.	5 Marks	L6	CO2
	c)	What are the contents and layout of patient information leaflet?	5 Marks	L1	CO3
	d)	Define health screening and explain any one method.	5 Marks	L1	CO4
	e)	Discuss in detail about AIDS & Leprosy.	5 Marks	L1	CO5
	f)	What are the GI disturbances, explain in detail?	5 Marks	L4	CO6
	g)	Explain in brief about the use of computers in community pharmacy.	5 Marks	L1	CO1
	h)	Write about legality and identification of drug related problems.	5 Marks	L6	CO2
	i)	Explain various barriers of patient counseling.	5 Marks	L1	CO3
	j)	Define health screening services for estimating blood pressure.	5 Marks	L1	CO4

PART - B

Answer any TWO of the following Questions

2 X 15 = 30 Marks

2.	Explain the layout of community pharmacy and draw the layout.	15 Marks	L1	CO1
3.	Define pharmaceutical care. Write in detail about the principles of pharmaceutical care.	15 Marks	L1	CO2
4.	What are the various methods of inventory control techniques? Explain any two methods in detail.	15 Marks	L4	CO3
5.	Write about essential drug concept and rational drug therapy.	15 Marks	L6	CO4

CODE No.: 23PP201003 SOP-PHARM.D-23

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

Pharm.D II Year (SOP-PHARM.D-23) Regular Examinations, May – 2026

PHARMACOTHERAPEUTICS - I

Time: 3 hours **Max. Marks: 70**

PART - A

Answer the any EIGHT of the following Questions

8 X 5 = 40 Marks

1.	a)	Define Essential Drugs Concept and its significance in healthcare.	5 Marks	L1	CO1
	b)	Compare and contrast diuretics and beta-blockers in hypertension management.	5 Marks	L6	CO2
	c)	Outline the pathophysiology of asthma, including inflammatory responses.	5 Marks	L1	CO3
	d)	Describe the clinical features and diagnosis of bacterial conjunctivitis.	5 Marks	L1	CO4
	e)	Outline the types of HRT, including estrogen-only and combined therapy.	5 Marks	L1	CO5
	f)	Outline the principles of pediatric dosage calculations.	5 Marks	L4	CO6
	g)	Define Pharmacovigilance and discuss its role in ensuring drug safety.	5 Marks	L1	CO1
	h)	What are the primary mechanisms contributing to hypertension development?	5 Marks	L6	CO2
	i)	List and describe common drug-induced pulmonary diseases.	5 Marks	L1	CO3
	j)	Outline the management of viral conjunctivitis, including supportive care and antiviral therapy.	5 Marks	L1	CO4

PART - B

Answer any TWO of the following Questions

2 X 15 = 30 Marks

2.	Define Rational Drug Formulations and explain its significance in pharmaceutical development.	15 Marks	L1	CO1
3.	Describe the role of coronary angiography in angina diagnosis.	15 Marks	L1	CO2
4.	Discuss the pathophysiology of asthma, including inflammatory responses, airway remodeling, and bronchospasm.	15 Marks	L4	CO3
5.	Describe the molecular mechanisms of bacterial conjunctivitis pathogenesis.	15 Marks	L6	CO4

CODE No.: 23PP201004 SOP-Pharm.D-23

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

III Year Pharm.D (SOP-Pharm.D-23) Regular Examinations, April – 2026

PHARMACOTHERAPEUTICS - II

Time: 3 hours **Max. Marks: 70**

PART - A

Answer the any EIGHT of the following Questions.

8 X 5 = 40 Marks

1.	a)	Write a note on role of pharmacist in optimizing antibiotics rational use.	5 Marks	L1	CO1
	b)	Extend a note on meningitis management.	5 Marks	L3	CO2
	c)	Briefly summarize the upper respiratory tract infections.	5 Marks	L3	CO2
	d)	Mention a note on pharmacotherapy of SLE.	5 Marks	L3	CO3
	e)	Explain the role of non-pharmacological management in gout.	5 Marks	L2	CO3
	f)	Write a note on disease modifying antirheumatoid drugs (DMRDS.	5 Marks	L1	CO3
	g)	Simplify the management of AKI.	5 Marks	L4	CO4
	h)	Explain the principle of hemodialysis and peritoneal dialysis.	5 Marks	L5	CO4
	i)	Briefly summarize cancer chemotherapy.	5 Marks	L3	CO5
	j)	Conclude the pathophysiology and clinical manifestations of impetigo.	5 Marks	L4	CO6

PART - B

Answer any TWO of the following Questions

2 X 15 = 30 Marks

2.	a)	Make a detail presentation on pharmacotherapy and evaluation of therapeutic outcomes in malaria.	8 Marks	L4	CO2
	b)	Discuss the pathophysiology and clinical manifestations of HIV/AIDS.	7 Marks	L2	CO2
3.	a)	Illustrate the pharmacotherapy of hypertension and anaemia in chronic kidney disease.	5 Marks	L2	CO4
	b)	Extend a note on drug induced renal disorders.	10 Marks	L3	CO4
4.	a)	Give a note on desired outcomes and management of breast cancer.	7 Marks	L2	CO5
	b)	Extend a note on etiology and pathophysiology of leukemia.	8 Marks	L3	CO5
5.		Give a detail note on pathophysiology, manifestations, diagnosis and management of psoriasis.	15 Marks	L2	CO6

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CODE No.: 23PP201005 SOP-Pharm.D-23

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

I Year Pharm.D (PB) (SOP-Pharm.D-23) Regular Examinations, June – 2026

PHARMACOTHERAPEUTICS-III

Time: 3 hours **Max. Marks: 70**

PART - A

Answer the ANY EIGHT of the following Questions

8 x 5 = 40 Marks

1.	a)	Explain the desired outcomes and non-pharmacological management of gastroesophageal reflux disease (GERD).	5 Marks	L2	CO 2
	b)	Recall the mechanism of drug induced liver injury.	5 Marks	L1	CO1
	c)	Simplify the diagnostic algorithm of anaemia.	5 Marks	L4	CO1
	d)	Discuss the etiology and pathophysiology of alzheimer's disease.	5 Marks	L3	CO1
	e)	Write the clinical manifestations and diagnosis of stroke.	5 Marks	L2	CO1
	f)	Describe the effectiveness of opioid analgesics in chronic pain with examples.	5 Marks	L3	CO3
	g)	Why atypical antipsychotics are safe and effective for schizophrenia management in elders.	5 Marks	L2	CO3
	h)	Give a note on therapeutic algorithm of generalized anxiety disorder (GAD).	5 Marks	L2	CO3
	i)	Write the pharmacotherapy of migraine headache.	5 Marks	L1	CO3
	j)	List out the various steps in evidence based medicine.	5 Marks	L4	CO4

PART - B

Answer any TWO of the following Questions.

2 x 15 = 30 Marks

2.	a)	Justify the therapeutic approaches in the management of peptic ulcer disease.	8 Marks	L5	CO3
	b)	Make a detail presentation on therapeutic algorithm of ulcerative colitis.	7 Marks	L3	CO3
3.	a)	Illustrate the nociception process and pain pathways.	8 Marks	L2	CO1
	b)	Classify epilepsy and mention a note on clinical manifestations of epilepsy	7 Marks	L4	CO1
4.	a)	Outline the therapeutic goals, approaches and algorithm of parkinson's disease	8 Marks	L2	CO2
	b)	Summerize the goals of therapy and management of deep vein thrombosis.	7 Marks	L3	CO2
5.	a)	Write in detail about insomnia management.	8 Marks	L1	CO2
	b)	Define evidence based medicine and explain the role of pharmacist in promoting evidence based medicine.	7 Marks	L2	CO4

CODE No.: 23PP201006 SOP-Pharm.D-23

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

I Year Pharm.D (PB) (SOP-Pharm.D-23) Regular Examinations, June – 2026

HOSPITAL PHARMACY

Time: 3 hours **Max. Marks: 70**

PART - A

Answer the ANY EIGHT of the following Questions

8 x 5 = 40 Marks

1.	a)	What is envelop method of drug distribution?	5 Marks	L 1	CO3
	b)	Write the disadvantages of Injections.	5 Marks	L6	CO4
	c)	Write the advantages of CPD programme.	5 Marks	L6	CO5
	d)	Briefly write about roles and responsibilities of hospital pharmacist.	5 Marks	L6	CO1
	e)	What is hospital News letter?	5 Marks	L1	CO2
	f)	Write the role of pharmacist in public awareness of disease prevention.	5 Marks	L2	CO5
	g)	Write the composition of total Parenteral nutrition.	5 Marks	L 6	CO4
	h)	Draw a sample purchase request form.	5 Marks	L 3	CO3
	i)	Write about location of pharmacy in hospital.	5 Marks	L6	CO1
	j)	Explain how drugs are deleted or added to hospital formulary.	5 Marks	L2	CO2

PART - B

Answer any TWO of the following Questions.

2 x 15 = 30 Marks

2.		Write the composition, functions, advantages and disadvantages of Pharmacy Therapeutic Committee.	15 Marks	L1	CO2
3.	a)	Write a note on continuing professional development for pharmacist and nurses.	7 Marks	L6	CO5
	b)	List out various methods of CPD and explain in brief about any one method.	8 Marks	L6	CO5
4.		List out quality control tests for parenterals and explain about pyrogen test, clarity test, leakage test and test for sterility.	15 Marks	L2	CO4
5.		Define budget and write about various sections of Budget.	15 Marks	L1	CO1

CODE No.: 23PP201009 SOP-Pharm.D-23

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

II Year Pharm D (PB) (SOP-Pharm.D-23) Regular Examinations, April – 2026

CLINICAL RESEARCH

Time: 3 hours **Max. Marks: 70**

PART - A

Answer the ANY EIGHT of the following Questions

8 x 5 = 40 Marks

1.	a)	Give a short note on drug development process.	5 Marks	L2	CO1
	b)	Justify the lead optimization process.	5 Marks	L5	CO1
	c)	Describe some common challenges in obtaining informed consent from participants.	5 Marks	L3	CO2
	d)	What is the process for submitting a research proposal to an IRB/IEC?	5 Marks	L1	CO2
	e)	List out the requirements for an ANDA submission.	5 Marks	L4	CO3
	f)	Give a short summary on ICH GCP guidelines.	5 Marks	L2	CO4
	g)	Make a note on regulatory body for pharmaceuticals in the European Union.	5 Marks	L4	CO5
	h)	Briefly discuss the regulatory authorities of India and USA.	5 Marks	L3	CO5
	i)	Explain the role of Safety Monitoring Committee (SMC) in clinical trial.	5 Marks	L2	CO6
	j)	Highlight the common safety monitoring activities in clinical trials.	5 Marks	L5	CO6

PART - B

Answer any TWO of the following Questions.

2 x 15 = 30 Marks

2.	a)	Exemplify the potential outcomes of an IRB/IEC review, including approval, conditional approval, or disapproval.	7 Marks	L6	CO2
	b)	Discuss the ethical considerations involved in conducting research with vulnerable populations.	8 Marks	L3	CO2
3.	a)	Compare and contrast pharmacological and toxicological drug discovery.	8 Marks	L5	CO3
	b)	List out the various factors influencing the choice of dosage form for a drug.	7 Marks	L3	CO3
4.		Discuss the role of the Central Drugs Standard Control Organization (CDSCO) in regulating pharmaceuticals in India. What are the key functions of the CDSCO, and how has it contributed to ensuring drug safety and efficacy.	15 Marks	L3	CO5
5.	a)	Discuss the importance of a well-designed Case Report Form (CRF) in clinical data management.	8 Marks	L3	CO6
	b)	List out the regulatory requirements for clinical data management.	7 Marks	L4	CO6

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CODE No.: 23PP201010 SOP-Pharm.D-23

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

II Year Pharm D (PB) (SOP-Pharm.D-23) Regular Examinations, April – 2026

PHARMACOEPIDIMOLOGY AND PHARMACOECONOMICS

Time: 3 hours **Max. Marks: 70**

PART - A

Answer the ANY EIGHT of the following Questions

8 x 5 = 40 Marks

1.	a)	Define pharmacoepidemiology and explain its scope.	5 Marks	L2	CO1
	b)	Differentiate between prevalence and incidence with examples.	5 Marks	L4	CO1
	c)	Define risk and its importance in pharmacoepidemiology.	5 Marks	L1	CO2
	d)	Explain the concept of attributable risk with an example.	5 Marks	L2	CO2
	e)	Define cohort study. Mention its advantages and disadvantages.	5 Marks	L1	CO3
	f)	Explain the significance of drug utilization review (DUR).	5 Marks	L4	CO3
	g)	Differentiate between ad hoc and automated data systems.	5 Marks	L4	CO4
	h)	Write a short note on hospital pharmacoepidemiology.	5 Marks	L6	CO4
	i)	Define pharmacoeconomics and state its historical evolution.	5 Marks	L1	CO5
	j)	Name any two software tools used in pharmacoeconomic analysis and explain them.	5 Marks	L2	CO6

PART - B

Answer any TWO of the following Questions.

2 x 15 = 30 Marks

2.	Describe the origin, scope, and need for pharmacoepidemiology. Explain its aims and applications.	15 Marks	L2	CO1
3	Explain the different methods of measuring risk: attributable risk, relative risk, and odds ratio, with examples	15 Marks	L2	CO2
4.	Discuss in detail various pharmacoepidemiological study designs:cross-sectional, cohort, case-control, and case-cohort.	15 Marks	L2	CO3
5.	Describe various data sources used in pharmacoepidemiological studies. Compare their advantages and limitations.	15 Marks	L4	CO4

CODE No.: 23PP201011 SOP-Pharm.D-23

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

II Year Pharm D (PB) (SOP-Pharm.D-23) Regular Examinations, April – 2026

CLINICAL PHARMACOKINETICS AND PHARMACOTHERAPEUTIC DRUG MONITORING

Time: 3 hours **Max. Marks: 70**

PART - A

Answer the ANY EIGHT of the following Questions

8 X 5 = 40 Marks

1.	a)	Compare and contrast the pharmacokinetic considerations for elderly patients and pediatric patients when prescribing medications. Highlight the key differences in dosing strategies?	5 Marks	L1	CO1
	b)	Explain the mechanism of drug metabolism inhibition. Describe how enzyme inhibitors can impact the plasma concentration of co-administered drugs and provide examples of commonly used inhibitors.	5 Marks	L1	CO2
	c)	Outline the general approach for adjusting drug dosages in patients with renal impairment. Include considerations for assessing renal function and the factors that influence dosage adjustments.	5 Marks	L1	CO3
	d)	Describe the role of feedback control systems in adaptive dosing.	5 Marks	L1	CO4
	e)	Explain how genetic variability influences drug pharmacokinetics and pharmacodynamics.	5 Marks	L1	CO5
	f)	Discuss the influence of genetic polymorphisms on drug transporters.	5 Marks	L1	CO6
	g)	Explain how to calculate a maintenance dose for a medication, including the importance of clearance and volume of distribution in this calculation.	5 Marks	L1	CO1
	h)	Describe the process of drug metabolism induction. Discuss how inducers affect the pharmacokinetics of other drugs, including potential clinical consequences and examples of common inducers.	5 Marks	L1	CO2
	i)	Describe the methods used to measure glomerular filtration rate (GFR) and creatinine clearance (CrCl). Explain the significance of these measurements in determining appropriate drug dosing.	5 Marks	L4	CO3
	j)	Describe the difference between prior and posterior distributions in Bayesian analysis.	5 Marks	L6	CO4

PART - B

Answer any TWO of the following Questions.

2 X 15 = 30 Marks

2.	Evaluate the use of nomograms and tabulated data in clinical pharmacokinetics. Explain their significance in designing dosage regimens. Include specific examples of drugs or clinical scenarios where these tools are particularly useful.	15 Marks	L4	CO1
3.	Evaluate the use of nomograms and tabulated data in clinical pharmacokinetics. Explain their significance in designing dosage regimens. Include specific examples of drugs or clinical scenarios where these tools are particularly useful.	15 Marks	L4	CO1
4.	Explain the methods for measuring glomerular filtration rate (GFR) and creatinine clearance (CrCl). Discuss the advantages and limitations of each method and how these measurements guide dosage adjustments for renally-excreted drugs.	15 Marks	L4	CO3
5.	Develop a feedback control system for adaptive dosing, discussing algorithm selection, parameter estimation, and clinical implementation.	15 Marks	L4	CO4

CODE No.: 23PY201004 SOP-23

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

Pharm.D II Year (SOP-PHARM.D-23) Regular Examinations, May – 2026

PHARMACOGNOSY AND PHYTOPHARMACEUTICALS

Time: 3 hours **Max. Marks: 70**

PART - A

Answer the any EIGHT of the following Questions

8 X 5 = 40 Marks

1.	a)	Define Pharmacognosy and describe its scope.	5 Marks	L1	CO1
	b)	Explain the morphological classification of crude drugs.	5 Marks	L1	CO2
	c)	Describe the process of drying crude drugs.	5 Marks	L1	CO2
	d)	Explain the role of natural pesticides in drug cultivation.	5 Marks	L1	CO3
	e)	What are the constituents of the cell wall? Give examples.	5 Marks	L1	CO3
	f)	Differentiate between powder and microscopic study of Datura.	5 Marks	L2	CO4
	g)	Briefly explain the chemical composition of carbohydrates.	5 Marks	L2	CO4
	h)	Discuss the method of analysis of proteins.	5 Marks	L1	CO5
	i)	Define lipids and describe their sources.	5 Marks	L1	CO6
	j)	What is garbling, and how is it used in crude drug processing?	5 Marks	L1	CO2

PART - B

Answer any TWO of the following Questions

2 X 15 = 30 Marks

2.	Explain the different methods of classifying crude drugs, focusing on morphological and chemical methods.	15 Marks	L1	CO1
3.	Describe in detail the factors affecting the cultivation of crude drugs, and explain the harvesting process.	15 Marks	L1	CO2
4.	Compare and contrast the microscopic characteristics of Fennel and Coriander.	15 Marks	L3	CO4
5.	Discuss the classification, chemistry, and methods of analysis of lipids, providing examples of various oils.	15 Marks	L2	CO6

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

PRINCIPLES OF MANAGEMENT

[Medical Lab Technology, Anaesthesia & Operation Theatre Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is POSDCORB?	2 Marks	L1	CO1
	b)	Is Management an Art or a Science?	2 Marks	L2	CO1
	c)	Name two types of Planning.	2 Marks	L1	CO2
	d)	What is Decision Making?	2 Marks	L1	CO2
	e)	What is 'Delegation'?	2 Marks	L1	CO3
	f)	Differentiate between Centralization and Decentralization.	2 Marks	L2	CO3
	g)	Define 'Controlling'.	2 Marks	L1	CO4
	h)	What is 'Span of Control'?	2 Marks	L1	CO4
	i)	Define 'Organizational Change'.	2 Marks	L1	CO5
	j)	What is Corporate Social Responsibility?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss the scope of Management.	8 Marks	L2	CO1
	b)	Explain the system and contingency approaches to Management.	8 Marks	L2	CO1

(OR)

3.	a)	Explain the meaning, definition and concept of Management.	8 Marks	L2	CO1
	b)	Describe the evolution of Management thought from classical to contemporary perspectives.	8 Marks	L2	CO1

MODULE-II

4.	a)	Compare strategic planning with tactical planning.	8 Marks	L2	CO2
	b)	Explain the concept of 'Management by Objectives'.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the importance and process of Planning.	8 Marks	L2	CO2
	b)	Describe the different types of Planning in an organization.	8 Marks	L2	CO2

MODULE-III

6.	a)	Discuss the principles of effective delegation.	8 Marks	L2	CO3
	b)	Explain the role of responsibility in the organizing process.	8 Marks	L2	CO3

(OR)

7.	a)	Explain the meaning, importance and principles of Organising.	8 Marks	L2	CO3
	b)	Differentiate between Formal and Informal organizations.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain the systems approach to coordination.	8 Marks	L2	CO4
	b)	Discuss the requisites for excellent coordination.	8 Marks	L2	CO4

(OR)

9.	a)	Explain the various sources of Recruitment and the selection process.	8 Marks	L3	CO4
	b)	Describe the different methods of Training in an organization.	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss the role of Leadership in managing organizational change.	8 Marks	L3	CO5
	b)	Explain the various dimensions of Corporate Social Responsibility.	8 Marks	L2	CO5

(OR)

11.	a)	Explain the concept and importance of Total Quality Management.	8 Marks	L2	CO5
	b)	Discuss the role of Technology Management in modern business.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T VI Semester (MBU-22) Regular Examinations, April – 2026

CLINICAL ORTHOPAEDICS AND TRAUMATOLOGY

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define fracture healing.	2 Marks	L1	CO1
	b)	List out the signs of infection in fractures.	2 Marks	L1	CO1
	c)	Define intertrochanteric fracture of the femur.	2 Marks	L1	CO2
	d)	What is the common mechanism of injury in femoral shaft fractures?	2 Marks	L1	CO2
	e)	What is trigger finger/thumb and mention two risk factors for developing trigger finger?	2 Marks	L1	CO3
	f)	List any two functions and risk factors of the olecranon bursa.	2 Marks	L1	CO3
	g)	What is hammer toe, and which joints are primarily involved?	2 Marks	L2	CO4
	h)	Define hallux rigidus.	2 Marks	L1	CO4
	i)	Name two key radiological feature of osteosarcoma.	2 Marks	L2	CO5
	j)	Prepare a note on enchondroma.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the pathophysiology of a bankart's lesion and its role in shoulder instability following traumatic dislocations.	8 Marks	L2	CO1
	b)	Outline the early and late complications of fractures providing examples of each.	8 Marks	L1	CO1

(OR)

3.	a)	Describe the different types of forearm fractures, mechanisms of injury, classification, and management.	8 Marks	L3	CO1
	b)	Evaluate the role of surgical interventions in the treatment of complex forearm fractures.	8 Marks	L3	CO1

MODULE-II

4.	a)	Describe the common types, mechanisms, and risk factors associated with hip dislocations. Distinguish between anterior and posterior dislocations.	8 Marks	L2	CO2
	b)	Outline the clinical presentation, diagnostic approach, and imaging modalities used to confirm pott's fracture.	8 Marks	L1	CO2

(OR)

5.	a)	Explore the causes, mechanism of injury, clinical features and medical management of supracondylar fracture of femur.	8 Marks	L3	CO2
	b)	Analyze the prevention and management of femur fracture in elderly women.	8 Marks	L3	CO2

MODULE-III

6.	a)	Describe the common sites, risk factors, and possible etiological factors contributing to the development of osteochondritis dissecans.	8 Marks	L2	CO3
	b)	Explain the clinical presentation, grading system, and diagnostic methods used to assess quadriceps strains.	8 Marks	L3	CO3
		(OR)			
7.	a)	Discuss the common causes, risk factors, and mechanisms of quadriceps muscle strains.	8 Marks	L2	CO3
	b)	Discuss the common causes, risk factors, and mechanisms of hamstring strains in athletes and the general population.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss the characteristic deformities, types, and classification of CTEV, along with the pathophysiology underlying the condition.	8 Marks	L3	CO4
	b)	Explore the indications for surgery, surgical techniques , and post-surgical rehabilitation strategies for CTEV.	8 Marks	L3	CO4
		(OR)			
9.	a)	Define osteogenesis imperfecta (OI) and discuss its clinical features, pathophysiology and how it affects bone strength.	8 Marks	L2	CO4
	b)	Explain the clinical features and symptoms associated with cervical rib syndrome.	8 Marks	L2	CO4

MODULE-V

10.	a)	Outline the risk factors, causes, and common locations of disc prolapse in the spine.	8 Marks	L1	CO5
	b)	Describe common clinical manifestations of spondylolysis and the factors influencing symptom severity and progression.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain the causes, risk factors, and pathophysiology of osteomyelitis.	8 Marks	L2	CO5
	b)	Analyze the different types of osteo myelitis and their clinical manifestations.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T. VII Semester (MBU-22) Supplementary Examinations,April – 2026

CLINICAL NEUROLOGY AND NEUROSURGERY

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Which cranial nerve controls facial expression?	2 Marks	L2	CO1
	b)	Define the extrapyramidal system.	2 Marks	L1	CO1
	c)	Mention any two investigations used in diagnosing brain tumors.	2 Marks	L1	CO2
	d)	What is the cause of post-polio syndrome?	2 Marks	L1	CO2
	e)	What are tics? Give one example.	2 Marks	L1	CO3
	f)	Identify two differences between myopathy and neuropathy.	2 Marks	L2	CO3
	g)	List two causes of dysphagia.	2 Marks	L1	CO4
	h)	What is thoracic outlet syndrome?	2 Marks	L1	CO4
	i)	List two symptoms of perceptual disorders.	2 Marks	L1	CO5
	j)	Define vertigo.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Draw and briefly explain the nerve pathways responsible for controlling bladder function.	8 Marks	L3	CO1
	b)	Describe the methods used to assess cranial nerve function.	8 Marks	L2	CO1

(OR)

3.	a)	Describe the ascending tracts of the spinal cord and their sensory functions.	8 Marks	L2	CO2
	b)	Illustrate and label the main parts visible at the base of the brain.	8 Marks	L3	CO2

MODULE-II

4.	a)	Apply your knowledge to describe the causes, clinical features, investigations, and management of hydrocephalus following traumatic brain injury.	8 Marks	L4	CO3
	b)	Illustrate spinal epidural abscess and its causes, signs, investigations, and management.	8 Marks	L3	CO3

(OR)

5.	a)	Explain the pathophysiology and clinical manifestations of poliomyelitis and post-polio syndrome.	8 Marks	L2	CO3
	b)	Classify brain tumors and explain the complications that may develop in patients with these tumors.	8 Marks	L3	CO3

MODULE-III

6.	a)	Briefly explain the causes, clinical features, and pathophysiology of athetosis and ballism.	8 Marks	L2	CO4
	b)	Summarize the causes, diagnostic approaches, and management of myasthenia gravis.	8 Marks	L2	CO4

(OR)

7.	a)	Explain the causes, clinical signs, and complications associated with myotonic dystrophy.	8 Marks	L2	CO4
	b)	Analyze the progression of neurological symptoms in syphilis.	8 Marks	L4	CO4

MODULE-IV

8.	a)	Describe thoracic outlet syndrome – causes, clinical signs, and treatment.	8 Marks	L2	CO5
	b)	Discuss lumbosacral plexus lesions with clinical significance.	8 Marks	L2	CO5

(OR)

9.	a)	Explain median nerve palsy – motor and sensory deficits.	8 Marks	L2	CO5
	b)	Describe the signs, symptoms, and management of ulnar nerve palsy.	8 Marks	L2	CO5

MODULE-V

10.	a)	Explain pituitary surgery – approaches and risks.	8 Marks	L2	CO6
	b)	Describe ablative surgeries like thalamotomy and pallidotomy.	8 Marks	L3	CO6

(OR)

11.	a)	Discuss pre- and post-operative care in common neurosurgical procedures.	8 Marks	L2	CO6
	b)	Describe complications related to major neurosurgeries.	8 Marks	L2	CO6

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T. VII Semester (MBU-22) Supplementary Examinations, April – 2026

SPORTS PHYSIOTHERAPY

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Name two products of the Krebs cycle that enter the electron transport chain.	2 Marks	L1	CO1
	b)	Write a note on stork stand test and hexagon agility test.	2 Marks	L2	CO1
	c)	Define concussion.	2 Marks	L2	CO2
	d)	Mention any two complications of concussion in sports.	2 Marks	L1	CO2
	e)	Differentiate between lean body mass and fat free mass.	2 Marks	L3	CO3
	f)	Name two methods of assessing body fat.	2 Marks	L2	CO3
	g)	What are the common mechanisms of injury for peroneal tendonitis in sports?	2 Marks	L1	CO4
	h)	Prepare a note on eccentric exercises.	2 Marks	L2	CO4
	i)	Mention any two complications of concussion in sports.	2 Marks	L1	CO2
	j)	Prepare a note on vertical jump test and back scratch test	2 Marks	L2	CO2

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss the fundamental principles of exercise training.	8 Marks	L2	CO1
	b)	Explain the principle of specificity and its application in sports training programs.	8 Marks	L2	CO1

(OR)

3.	a)	Design fitness test protocol for volleyball players focusing on power, reaction time, coordination and agility.	8 Marks	L4	CO1
	b)	Explain the concept of cross-training and its role in injury prevention.	8 Marks	L2	CO1

MODULE-II

4.	a)	Summarize the symptoms,causes,diagnosis of ankle sprain in sport injuries.	8 Marks	L1	CO2
	b)	Describe the causes,clinical features and mechanisms of cervical spine injuries in contact sports.	8 Marks	L2	CO2

(OR)

5.	a)	Evaluate the role of clothing, equipment, and protective gear in the prevention of heat illness in sports.	8 Marks	L3	CO2
	b)	Analyze the predisposing factors, clinical presentation, and emergency management of exertional heat stroke in sports.	8 Marks	L3	CO2

MODULE-III

6.	a)	Discuss the principles and procedures of skinfold thickness measurement	8 Marks	L2	CO3
	b)	Evaluate the effectiveness of anthropometric measurements in the assessment of obesity.	8 Marks	L3	CO3
		(OR)			
7.	a)	Compare fat mass and fat-free mass in terms of measurement and clinical implications.	8 Marks	L3	CO3
	b)	Differentiate between essential fat and storage fat.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Discuss the application of core strengthening and flexibility **exercises** in the rehabilitation of low back pain among rowers.	8 Marks	L2	CO4
	b)	Analyze the role of plyometric and functional training in return-to-sport following patellar tendinopathy.	8 Marks	L3	CO4
		(OR)			
9.	a)	Summarize the rehabilitation protocol for hamstring strain.	8 Marks	L1	CO4
	b)	Analyze the role of eccentric exercise in producing DOMS and its application in athletic training.	8 Marks	L3	CO4

MODULE-V

10.	a)	Write the mechanism of injury, clinical features, and causes of Colles' fracture in skating.	8 Marks	L2	CO2
	b)	Discuss the role of CPR, rescue breathing, and oxygen administration in drowning management.	8 Marks	L2	CO2
		(OR)			
11.	a)	Elucidate the diagnosis and management of SLAP lesions.	8 Marks	L2	CO3
	b)	Describe the role of neuromuscular training and proprioceptive exercises in preventing recurrent ankle sprains in football players.	8 Marks	L2	CO3

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T VIII Semester (MBU-22) Regular Examinations, April – 2026

CLINICAL CARDIOVASCULAR AND PULMONARY

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is meant by thoracic outlet syndrome?	2 Marks	L3	CO1
	b)	Define rickety rosary.	2 Marks	L1	CO1
	c)	What is PFT?	2 Marks	L3	CO2
	d)	What is arterial blood gas analysis?	2 Marks	L3	CO2
	e)	Write two differences between on-pump and off-pump CABG.	2 Marks	L2	CO3
	f)	State two advantages of minimally invasive cardiac surgery.	2 Marks	L1	CO3
	g)	What is empyema thoracis?	2 Marks	L3	CO4
	h)	Mention two causes of hemothorax.	2 Marks	L1	CO4
	i)	Mention two advantages of tracheostomy over endotracheal intubation.	2 Marks	L1	CO5
	j)	What is endotracheal suctioning.	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain depression deformities of the thoracic cage with reference to pectus excavatum.	8 Marks	L2	CO1
	b)	Describe protrusion deformities of the thorax with special reference to pectus carinatum (pigeon chest).	8 Marks	L2	CO1

(OR)

3.	a)	Explain scoliosis and kyphosis and their effects on respiratory mechanics.	8 Marks	L2	CO1
	b)	Describe rare deformities of the thoracic cage including sternal clefts, absent sternum, Poland syndrome, fused ribs, absent ribs, and Jeune's disease.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the fundamentals of ECG recording and basic interpretation.	8 Marks	L2	CO2
	b)	Briefly describe the principles of echocardiography with reference to M-mode echocardiography.	8 Marks	L3	CO2

(OR)

5.	a)	Explain the principles of Doppler echocardiography including transthoracic and trans-oesophageal echocardiography.	8 Marks	L2	CO2
	b)	Outline the principles of cardiovascular stress testing and mention its indications.	8 Marks	L3	CO2

MODULE-III

6.	a)	Discuss the pathophysiology, clinical features, and management of double outlet right ventricle.	8 Marks	L2	CO3
	b)	What is AV canal defect, its clinical manifestations, and surgical management.	8 Marks	L3	CO3

(OR)

7.	a)	Describe the clinical presentation and surgical management of patent ductus arteriosus.	8 Marks	L2	CO3
	b)	Explain the pathophysiology, clinical features, and management of coarctation of the aorta.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain the clinical features and management of carcinoma lung.	8 Marks	L2	CO4
	b)	Analyze the preoperative assessment and management of a patient posted for thoracotomy.	8 Marks	L4	CO4

(OR)

9.	a)	Explain the mechanism, clinical features, and management of cardiac tamponade following chest trauma.	8 Marks	L2	CO4
	b)	Write about stove-in chest with respect to pathophysiology, clinical presentation, and management.	8 Marks	L3	CO4

MODULE-V

10.	a)	Outline the intensive care management of a patient following acute myocardial infarction.	8 Marks	L3	CO5
	b)	Explain early mobilization and respiratory physiotherapy following myocardial infarction.	8 Marks	L2	CO5

(OR)

11.	a)	Elaborate the intensive care management of a patient with acute exacerbation of chronic obstructive pulmonary disease.	8 Marks	L3	CO5
	b)	Explain ventilatory support strategies in patients with chronic obstructive pulmonary disease.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

SOCIOLOGY

[Radiology & Imaging Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is social psychology?	2 Marks	L1	CO1
	b)	List any two methods of sociological investigation.	2 Marks	L1	CO1
	c)	List any two agencies of socialization.	2 Marks	L1	CO2
	d)	Define a social group.	2 Marks	L1	CO2
	e)	Define an urban community.	2 Marks	L1	CO3
	f)	Mention two characteristics of an urban community.	2 Marks	L1	CO3
	g)	State two effects of poverty on health.	2 Marks	L1	CO4
	h)	Define juvenile delinquency.	2 Marks	L1	CO4
	i)	What is a tribal community?	2 Marks	L1	CO3
	j)	Mention four problems faced by women in employment?	2 Marks	L2	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe the characteristics of an Interview in research.	8 Marks	L2	CO1
	b)	Describe the conditions for a successful interview.	8 Marks	L2	CO1
		(OR)			
3.	a)	Describe the process of Interview.	8 Marks	L2	CO1
	b)	Discuss the merits and limitations of Interview.	8 Marks	L2	CO1

MODULE-II

4.	a)	Discuss the role of primary and secondary groups on health and sickness.	8 Marks	L2	CO2
	b)	Discuss the characteristics of a family.	8 Marks	L2	CO2
		(OR)			
5.	a)	Discuss the functions of family.	8 Marks	L2	CO2
	b)	Describe the types of families based on resident, descent and inheritance and marriage.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the concept of health as defined by WHO.	8 Marks	L2	CO3
	b)	Discuss how cultural beliefs influence the perception of health and illness.	8 Marks	L2	CO3
		(OR)			
7.	a)	Explain about the term culture.	8 Marks	L2	CO3
	b)	Explain the role of culture in determining health practices in a community.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Discuss the relationship poverty and employment.	8 Marks	L1	CO4
	b)	Discuss the rural poverty eradication programs.	8 Marks	L2	CO4
		(OR)			
9.	a)	Discuss the causes of prostitution among men and women	8 Marks	L2	CO4
	b)	Discuss the meaning and the causes of Juvenile Delinquency.	8 Marks	L2	CO4

MODULE-V

10	a)	Discuss the characteristics of tribal community.	8 Marks	L2	CO3
	b)	Discuss the health hazards among urban communities.	8 Marks	L2	CO3
		(OR)			
11	a)	Define poverty and discuss the causes of poverty.	8 Marks	L2	CO4
	b)	Outline various social security measures for the disabled.	8 Marks	L2	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BPT IV Semester (MBU-22) Regular Examinations, April – 2026

PHYSIOTHERAPY IN ORTHOPAEDICS AND SPORTS

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Enumerate the stages of fracture healing.	2 Marks	L1	CO1
	b)	Mention two common complications of distal humerus fracture.	2 Marks	L1	CO1
	c)	Outline conservative methods of managing patella fracture.	2 Marks	L1	CO2
	d)	Write about odontoid fracture.	2 Marks	L1	CO2
	e)	Prepare a note on bursitis.	2 Marks	L1	CO3
	f)	Name two clinical features of meniscal injuries.	2 Marks	L1	CO3
	g)	Outline the management of cervical rib.	2 Marks	L1	CO4
	h)	Describe pes cavus.	2 Marks	L1	CO4
	i)	Classify bone tumors based on origin.	2 Marks	L1	CO5
	j)	Recognize the clinical signs of osteosarcoma.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Compare the mechanism of injury and clinical features of Monteggia vs. Galeazzi fracture-dislocations.	8 Marks	L2	CO1
	b)	Explain the indications for surgical intervention in olecranon fractures compared to conservative management.	8 Marks	L2	CO1

(OR)

3.	a)	Summarize the management plan for a patient with posterior dislocation of the elbow.	8 Marks	L2	CO2
	b)	Interpret the role of radiological imaging in early detection of fracture complications.	8 Marks	L2	CO2

MODULE-II

4.	a)	Discuss the effectiveness of surgical fixation in Jones' fracture and its protocol.	8 Marks	L2	CO3
	b)	Describe the conservative and surgical management in fracture neck of femur and its physiotherapy management.	8 Marks	L2	CO3

(OR)

5.	a)	Outline the surgical management in fracture of tibia and fibula and its physiotherapy management.	8 Marks	L2	CO3
	b)	Write the physiotherapy management of bladder and bowel complications in quadriplegia.	8 Marks	L2	CO3

MODULE-III

6.	a)	Recall the types and levels of amputations in upper and lower limbs.	8 Marks	L2	CO4
	b)	Define periarthritic shoulder and outline its stages.	8 Marks	L2	CO4
		(OR)			
7.	a)	Differentiate the management of calf contusion with deltoid contusion.	8 Marks	L2	CO4
	b)	Compare the clinical signs of medial collateral ligament injury to lateral collateral ligament injury.	8 Marks	L2	CO4

MODULE-IV

8.	a)	Elaborate on the complications of osteogenesis imperfecta.	8 Marks	L2	CO5
	b)	Paraphrase the management of coxa vara.	8 Marks	L2	CO5
		(OR)			
9.	a)	Explain the pathophysiology of torticollis.	8 Marks	L2	CO5
	b)	Describe the mechanism of deformity in vertical talus.	8 Marks	L2	CO5

MODULE-V

10.	a)	Review the surgical management of TB hip and its physiotherapy management.	8 Marks	L2	CO6
	b)	Contrast syphilitic arthritis with pyogenic arthritis.	8 Marks	L2	CO6
		(OR)			
11.	a)	Elaborate on the management of chronic osteomyelitis.	8 Marks	L2	CO6
	b)	Discuss the management of osteoarthritis knee.	8 Marks	L2	CO6

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T. VII Semester (MBU-22) Supplementary Examinations, April – 2026

ELECTRO DIAGNOSTICS

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define resting membrane potential.	2 Marks	L2	CO1
	b)	Outline the role of myelination in nerve impulse conduction.	2 Marks	L2	CO1
	c)	Enlist the type of muscle response does the Faradic current produce in an innervated muscle.	2 Marks	L1	CO2
	d)	What does a rightward shift or increased slope of the S-D curve indicate?	2 Marks	L1	CO2
	e)	Mention one clinical scenario where NCS can help differentiate between demyelinating and axonal pathology.	2 Marks	L1	CO3
	f)	Why are F-wave studies clinically useful in assessing peripheral nerve function?	2 Marks	L2	CO3
	g)	Prepare a note on limitations of surface EMG recordings.	2 Marks	L2	CO4
	h)	How electrode–skin interface and filtering influence EMG signal quality.	2 Marks	L2	CO4
	i)	Differentiate the Faradic and Galvanic current.	2 Marks	L3	CO2
	j)	Identify two variables that can influence measured nerve conduction velocity in NCS.	2 Marks	L2	CO3

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Define resting membrane potential and explain its significance in nerve cells.	8 Marks	L2	CO1
	b)	Explain what distinguishes excitable tissues from non-excitable tissues.	8 Marks	L2	CO1

(OR)

3.	a)	Describe the generation and propagation of an action potential in a myelinated nerve fiber.	8 Marks	L2	CO1
	b)	Analyze how motor unit recruitment adapts during low-intensity versus high-intensity activities.	8 Marks	L3	CO1

MODULE-II

4.	a)	Describe the development and clinical significance of the Faradic-Galvanic test in evaluating nerve and muscle excitability.	8 Marks	L2	CO2
	b)	What is quantitative sensory testing and describe the types of sensory modalities it evaluates, including vibration thresholds and pain detection.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the physiological basis of the resting membrane potential in excitable cells.	8 Marks	L2	CO2
	b)	Differentiate the faradic and galvanic currents.	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain the fundamental principle of nerve conduction studies.	8 Marks	L2	CO3
	b)	Discuss the physiological basis of CMAP and SNAP, and what they reveal about motor and sensory nerve integrity.	8 Marks	L2	CO3

(OR)

7.	a)	Describe the origin and mechanism of the F-wave and how it is elicited in NCS.	8 Marks	L2	CO3
	b)	List and explain the key variables of NCV and what deviations might indicate pathologically.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain the objective of electromyography and how it facilitates assessment of neuromuscular health.	8 Marks	L2	CO4
	b)	Compare and contrast needle EMG and surface EMG.	8 Marks	L3	CO4

(OR)

9.	a)	Outline the steps in performing a needle EMG examination.	8 Marks	L2	CO4
	b)	Explain how EMG differentiates neurogenic and myopathic processes, citing characteristic features of each.	8 Marks	L2	CO4

MODULE-V

10.	a)	Compare the physiological effects and typical responses elicited by Faradic current versus Galvanic current in skeletal muscle.	8 Marks	L3	CO2
	b)	Describe a common method used for measuring vibration perception thresholds in clinical settings.	8 Marks	L2	CO2

(OR)

11.	a)	Interpret how reduced amplitude and slowed NCV in CMAPs or SNAPs can distinguish between axonal vs. demyelinating neuropathies.	8 Marks	L3	CO3
	b)	What is the clinical significance of the F-wave in evaluating proximal segments of motor nerves?	8 Marks	L2	CO3

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T. VII Semester (MBU-22) Supplementary Examinations, April – 2026

PHYSIOTHERAPY IN NEUROLOGY

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Differentiate between spasticity and rigidity.	2 Marks	L4	CO1
	b)	Mention two abnormalities seen in gait.	2 Marks	L1	CO1
	c)	Name any one strengthening exercise used in neurological rehab.	2 Marks	L1	CO2
	d)	Define hypertonicity.	2 Marks	L1	CO2
	e)	Give one difference between Brunnstrom and Rood's approach.	2 Marks	L1	CO3
	f)	Name any two pediatric condition that affects postural control.	2 Marks	L1	CO3
	g)	Define brachial neuralgia.	2 Marks	L1	CO4
	h)	Give one clinical method used to manage abnormal muscle tone.	2 Marks	L1	CO4
	i)	Give one example of a reflex used in motor re-education.	2 Marks	L1	CO5
	j)	Mention one difference between pediatric and adult neurological rehabilitation.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the pathophysiology and clinical presentation of spasticity and rigidity.	8 Marks	L4	CO1
	b)	Outline the assessment of higher mental functions in neurological patients.	8 Marks	L2	CO1

(OR)

3.	a)	Summarize the assessment of cortical sensations with examples.	8 Marks	L2	CO2
	b)	Elaborate on the assessment of bladder control in neurological patients.	8 Marks	L2	CO2

MODULE-II

4.	a)	Explain treatment methods used for patients with anaesthesia.	8 Marks	L2	CO3
	b)	Illustrate physiotherapy treatment of hypotonicity with examples.	8 Marks	L3	CO3

(OR)

5.	a)	Describe physiotherapy management of spastic gait.	8 Marks	L2	CO3
	b)	Explain the use of assistive devices in lower motor neuron disorders.	8 Marks	L2	CO3

MODULE-III

6.	a)	Differentiate between Bobath and Motor Relearning Programme approaches in motor development-based therapy.	8 Marks	L4	CO4
	b)	Outline the treatment plan for a child recovering from poliomyelitis.	8 Marks	L2	CO4

(OR)

7.	a)	Outline family education and involvement in pediatric physiotherapy plans.	8 Marks	L2	CO4
	b)	Explain interdisciplinary involvement in pediatric neurorehabilitation.	8 Marks	L2	CO4

MODULE-IV

8.	a)	Compare physiotherapy approaches in managing low back pain syndrome.	8 Marks	L2	CO5
	b)	Implement a physiotherapy treatment plan for a patient diagnosed with brachial neuralgia.	8 Marks	L3	CO5

(OR)

9.	a)	Briefly describe the physiotherapy approach to managing cognitive deficits post-brain injury.	8 Marks	L3	CO5
	b)	Outline sensory rehabilitation techniques for adult neurological patients.	8 Marks	L3	CO5

MODULE-V

10.	a)	Describe various assistive devices used for gait training in neurological patients.	8 Marks	L2	CO6
	b)	Discuss management strategies for spasticity in adults and children.	8 Marks	L3	CO6

(OR)

11.	a)	Summarize the impact of assistive technology on patient independence and quality of life.	8 Marks	L2	CO6
	b)	Discuss current trends and future directions in neurological physiotherapy.	8 Marks	L4	CO6

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BPT VIII Semester (MBU-22) Regular Examinations, April – 2026

PHYSIOTHERAPY IN CARDIOVASCULAR AND PULMONARY CONDITIONS

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	List two objectives of cardiopulmonary physiotherapy.	2 Marks	L1	CO1
	b)	Mention the purpose of exercise prescription in cardiopulmonary rehabilitation.	2 Marks	L1	CO1
	c)	List two obstructive lung disorders.	2 Marks	L1	CO2
	d)	State the physiotherapy goals in postoperative respiratory care.	2 Marks	L3	CO2
	e)	Mention two physiotherapy goals in mitral stenosis.	2 Marks	L1	CO3
	f)	Name two types of diseases of the myocardium.	2 Marks	L2	CO3
	g)	Define ischemic heart disease.	2 Marks	L1	CO3
	h)	List two risk factors for coronary artery disease.	2 Marks	L1	CO3
	i)	List two vital signs routinely monitored during cardiac physiotherapy evaluation.	2 Marks	L1	CO4
	j)	What is the importance of assessing exercise tolerance before cardiac rehabilitation?	2 Marks	L3	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss in detailed about CPR procedures and techniques.	8 Marks	L2	CO1
	b)	Describe the procedures and techniques of cardiopulmonary resuscitation.	8 Marks	L2	CO1

(OR)

3.	a)	Evaluate the effectiveness of chest physiotherapy techniques in airway clearance.	8 Marks	L5	CO1
	b)	Analyze the role of physiotherapy in preventing cardiopulmonary complications.	8 Marks	L4	CO1

MODULE-II

4.	a)	Elaborate about ACBT step by step .	8 Marks	L3	CO2
	b)	Differentiate physiotherapy management strategies in obstructive versus restrictive lung disorders.	8 Marks	L3	CO2

(OR)

5.	a)	Explain about coughing and huffing technique and the use of incentive spirometry in ICU setting.	8 Marks	L2	CO2
	b)	Write about postural drainage in detail.	8 Marks	L3	CO2

MODULE-III

6.	a)	Plan physiotherapy management for ischemic heart disease patient aged 55 years male and include cardiac rehabilitation phases .	8 Marks	L3	CO3
	b)	Write in detailed about Decortication Window Operation.	8 Marks	L3	CO3
		(OR)			
7.	a)	Explain the importance of cardiac rehabilitation in patients undergoing surgeries for cardiac conditions**.**	8 Marks	L2	CO3
	b)	Explain the **role of physiotherapy in occupational lung disorders**, including prevention and rehabilitation.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Describe the role of cardiovascular risk factor assessment in cardiac physiotherapy evaluation.	8 Marks	L2	CO4
	b)	Explain assessment of post-myocardial infarction patients before initiating rehabilitation.	8 Marks	L2	CO4
		(OR)			
9.	a)	Describe the assessment of pulmonary function tests (spirometry, FVC, FEV1) before surgery.	8 Marks	L2	CO4
	b)	Describe the role of cardiovascular risk factor assessment in cardiac physiotherapy evaluation.	8 Marks	L2	CO4

MODULE-V

10.	a)	Determine how physiotherapy contributes to improving quality of life in chronic cardiac patients**.**	8 Marks	L2	CO3
	b)	Describe the physiotherapy management following trauma to the chest**,** including postural drainage, breathing exercises, and mobilization.	8 Marks	L2	CO3
		(OR)			
11.	a)	Discuss the evaluation of airway clearance needs and coughing ability pre-operatively.	8 Marks	L2	CO4
	b)	Assessment of exercise tolerance and functional capacity before pulmonary surgery.	8 Marks	L5	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BPT IV Semester (MBU-22) Regular Examinations, April – 2026

CLINICAL REASONING AND EVIDENCE BASED PHYSIOTHERAPY

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Name two types of research commonly used in EBP.	2 Marks	L1	CO1
	b)	What is the role of social media in research dissemination?	2 Marks	L2	CO1
	c)	What is meant by patient-centered care in physiotherapy?	2 Marks	L1	CO2
	d)	Define the term “functional training” in physiotherapy.	2 Marks	L2	CO2
	e)	Define the significance of proprioception in physiotherapy.	2 Marks	L3	CO3
	f)	What is the importance of evidence-based practice in physiotherapy?	2 Marks	L2	CO3
	g)	Name two methods of research dissemination.	2 Marks	L1	CO4
	h)	What is the role of stakeholders in knowledge transfer?	2 Marks	L3	CO4
	i)	Mention two barriers to effective knowledge transfer.	2 Marks	L2	CO5
	j)	Name two strategies to ensure effective knowledge transfer.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss the healthcare organizations foster a culture of evidence-based practice.	8 Marks	L2	CO1
	b)	Demonstrate methods can be used to measure the success of EBP implementation.	8 Marks	L3	CO1

(OR)

3.	a)	How does evidence-based physiotherapy differ from experience-based practice.	8 Marks	L2	CO1
	b)	Enlist the types of evidence are most relevant for physiotherapy interventions.	8 Marks	L3	CO1

MODULE-II

4.	a)	Classify the physiotherapists contribute to the body of evidence through research or case studies.	8 Marks	L2	CO2
	b)	Describe the term "evidence-based knowledge" mean in the context of physiotherapy.	8 Marks	L3	CO2

(OR)

5.	a)	Enumerate the effectiveness of evidence-based physiotherapy interventions be measured in clinical settings.	8 Marks	L3	CO2
	b)	Demonstrate the role does patient feedback play in refining evidence-based treatment plans.	8 Marks	L3	CO2

MODULE-III

6.	a)	Create the evidence-based knowledge improve decision-making and treatment planning in physiotherapy.	8 Marks	L3	CO3
	b)	Explain role do patient-reported outcomes play in refining evidence-based physiotherapy knowledge.	8 Marks	L2	CO3
		(OR)			
7.	a)	Write the case studies and clinical audits contribute to the development of new evidence-based knowledge.	8 Marks	L3	CO3
	b)	How can the development of evidence-based knowledge in physiotherapy be aligned with advancements in healthcare technologies.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Discuss the role do individual professionals play in mentoring and teaching evidence-based practice to others.	8 Marks	L2	CO4
	b)	Identify the individual physiotherapists share evidence-based knowledge with peers and colleagues.	8 Marks	L2	CO4
		(OR)			
9.	a)	Elaborate the self-assessment tools can individual physiotherapists use to evaluate their own evidence-based knowledge and practice.	8 Marks	L3	CO4
	b)	Discuss the individual professionals measure the effectiveness of their evidence-based interventions in clinical settings.	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss the role of informed consent in evidence-based physiotherapy practice.	8 Marks	L2	CO5
	b)	Write down the discipline-specific training programs enhance evidence-based knowledge in physiotherapy.	8 Marks	L2	CO5
		(OR)			
11.	a)	Describe the most effective ways for physiotherapists to engage in continuing professional development related to evidence-based practice.	8 Marks	L3	CO5
	b)	How can discipline-specific mentorship programs support the growth of evidence-based skills in new physiotherapists.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BPT VIII Semester (MBU-22) Regular Examinations, April – 2026

REHABILITATION MEDICINE

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Name any four members of the rehabilitation team.	2 Marks	L1	CO1
	b)	What is interdisciplinary teamwork?	2 Marks	L2	CO1
	c)	Give two examples of communication aids.	2 Marks	L1	CO2
	d)	Mention two causes of communication problems.	2 Marks	L1	CO2
	e)	Define prosthesis.	2 Marks	L1	CO3
	f)	What is phantom limb sensation?	2 Marks	L1	CO3
	g)	Mention two legal aspects involved in disability certification.	2 Marks	L1	CO4
	h)	Define compensation in the context of disability.	2 Marks	L1	CO4
	i)	Define diastasis recti.	2 Marks	L1	CO5
	j)	Mention two methods of pain management in palliative physiotherapy.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss the social implications of disability on an individual.	8 Marks	L4	CO1
	b)	Explain the impact of disability on the community and public health.	8 Marks	L4	CO1
		(OR)			
3.	a)	Elaborate the stages of rehabilitation and physiotherapy goals in each stage.	8 Marks	L2	CO1
	b)	Outline the importance of patient education in rehabilitation.	8 Marks	L2	CO1

MODULE-II

4.	a)	Discuss the concept and framework of Community-Based Rehabilitation.	8 Marks	L2	CO2
	b)	Explain the merits and demerits of Institution-Based Rehabilitation.	8 Marks	L4	CO2
		(OR)			
5.	a)	Outline the impact of communication problems on functional outcomes.	8 Marks	L2	CO2
	b)	Differentiate between self-help groups and peer-led support in Community-Based Rehabilitation.	8 Marks	L4	CO2

MODULE-III

6.	a)	Explain types of crutches, fitting principles, and gait patterns using crutches.	8 Marks	L2	CO3
	b)	Discuss the role of mobility aids in promoting functional independence.	8 Marks	L4	CO3

(OR)

7.	a)	Discuss upper-limb orthoses and their clinical applications.	8 Marks	L2	CO3
	b)	Elaborate on the materials used in orthotic fabrication and their advantages.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Illustrate the multidisciplinary team involved in disability evaluation and their roles.	8 Marks	L2	CO4
	b)	Discuss pre-vocational training and its importance in rehabilitation.	8 Marks	L2	CO4

(OR)

9.	a)	Enumerate commonly used disability assessment tools and their applications.	8 Marks	L2	CO4
	b)	Discuss the concept of work capacity evaluation.	8 Marks	L2	CO4

MODULE-V

10.	a)	Describe pre- and post-operative physiotherapy management in abdominal surgeries.	8 Marks	L3	CO5
	b)	Illustrate the urinary incontinence types and physiotherapy management.	8 Marks	L3	CO5

(OR)

11.	a)	Enumerate the palliative care team and the role of each member.	8 Marks	L4	CO5
	b)	Describe exercise prescription in geriatrics: FITT components and modifications.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BPT IV Semester (MBU-22) Regular Examinations, April – 2026

PHYSIOTHERAPY ADMINISTRATION AND TEACHING SKILLS

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Why ethical guidelines are important in physiotherapy practice?	2 Marks	L1	CO1
	b)	Mention two rights of a patient in physiotherapy care.	2 Marks	L1	CO1
	c)	State the principle of specificity.	2 Marks	L2	CO2
	d)	List any two tests used to measure agility.	2 Marks	L1	CO2
	e)	Differentiate between quality assurance and audit.	2 Marks	L3	CO3
	f)	Prepare a note on organizational chart.	2 Marks	L1	CO3
	g)	Differentiate between clinical supervision and administrative supervision in physiotherapy.	2 Marks	L4	CO4
	h)	What is space planning?	2 Marks	L2	CO4
	i)	Which leadership style is commonly used in health care?	2 Marks	L1	CO3
	j)	Write a note on multidisciplinary team approach.	2 Marks	L2	CO1

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	How does empathy influence the physiotherapist -patient relationship?	8 Marks	L1	CO1
	b)	Discuss the ethical and professional relationship of a physiotherapist with colleagues and peers.	8 Marks	L3	CO1

(OR)

3.	a)	Explain the responsibilities of a physiotherapist towards patients.	8 Marks	L3	CO1
	b)	Outline the role of communication and trust in the physiotherapist-patient relationship.	8 Marks	L1	CO1

MODULE-II

4.	a)	What is slimming diets? Discuss the principles, types and precautions.	8 Marks	L2	CO2
	b)	Enumerate the following physical fitness tests : i) sit and reach test ii) cooper run test	8 Marks	L3	CO2

(OR)

5.	a)	Why is hydration important during physical activity?How does dehydration affect the physical performance?	8 Marks	L1	CO2
	b)	Differentiate between essential fat and storage fat.	8 Marks	L3	CO2

MODULE-III

6.	a)	Analyze the communication barriers as a source of conflict in multidisciplinary healthcare.	8 Marks	L4	CO3
	b)	Compare and contrast quality assurance and clinical audit in physiotherapy practice.	8 Marks	L3	CO3

(OR)

7.	a)	Discuss the impact of poor communication on physiotherapy department functioning.	8 Marks	L2	CO3
	b)	Analyze the financial management in physiotherapy departments.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Analyze the relationship between manpower planning and workload management in a department.	8 Marks	L4	CO4
	b)	What are the basic requirements for organizing a department and their significance?	8 Marks	L1	CO4

(OR)

9.	a)	Differentiate between professional growth and career development.	8 Marks	L4	CO4
	b)	Evaluate the importance of self-management skills for professional success.	8 Marks	L3	CO4

MODULE-V

10.	a)	Elaborate the importance of informed consent in physiotherapy practice.	8 Marks	L3	CO1
	b)	Write about empathy in physiotherapy practice.	8 Marks	L1	CO1

(OR)

11.	a)	Outline the nutritional requirements of an athlete.	8 Marks	L1	CO2
	b)	Explain the effects of exercise on the respiratory system.	8 Marks	L2	CO2

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

PHYSICS OF MAGNETIC RESONANCE IMAGING

[Radiology & Imaging Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Prepare a note on active shielding for MRI scanner.	2 Marks	L3	CO1
	b)	Define isolator transformer.	2 Marks	L2	CO1
	c)	Name the different types of magnetism.	2 Marks	L2	CO2
	d)	Add short notes on how the resonance is used to produce MRI signals.	2 Marks	L2	CO2
	e)	List out any four factors that influence spatial resolution on MRI images.	2 Marks	L2	CO3
	f)	Name the primary function of RF coils in MRI system.	2 Marks	L2	CO3
	g)	Add a note on how EPI sequences handle rapid data acquisition.	2 Marks	L2	CO4
	h)	Identify the typical clinical applications of SSFP sequences.	2 Marks	L3	CO4
	i)	Add a note on the importance of k-space sampling in reducing truncation artifacts.	2 Marks	L2	CO5
	j)	Identify a cause of magnetic susceptibility artifacts.	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Give an outline on patient counseling in MRI.	8 Marks	L2	CO1
	b)	Describe ACR guidelines for installation of MRI.	8 Marks	L2	CO1

(OR)

3.	a)	Explain why a stable and high quality electrical supply system if an MRI machine is frequent power interruptions.	8 Marks	L3	CO1
	b)	Explain key differences between open MRI and closed MRI system.	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain how superconductivity can be utilized in MRI technology and its advantages over conventional magnetic materials.	8 Marks	L3	CO2
	b)	Outline the concepts of magnetic transfer and parallel imaging technique.	8 Marks	L3	CO2

(OR)

5.	a)	Explain in detail on T1 recovery and its process with a proper diagram.	8 Marks	L3	CO2
	b)	Discuss in detail on T2 decay and its process with a proper diagram.	8 Marks	L2	CO2

MODULE-III

6.	a)	Compare the roles of RF coils and gradient coils in achieving high-resolution MRI images.	8 Marks	L3	CO3
	b)	Describe how advancements in coil technology have improved MRI imaging over the years.	8 Marks	L2	CO3

(OR)

7.	a)	Compare Maximum Intensity Projection (MIP) with Surface Shaded Display (SSD) in terms of visual representation.	8 Marks	L3	CO3
	b)	Outline the typical post-processing steps involved in preparing MRI images for clinical analysis.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain cross excitation artifacts and describe how issues with pulse sequences contribute to their formation. What are the corrective measures?	8 Marks	L2	CO4
	b)	Discuss the implications of aliasing artifacts in anatomical imaging. How can advanced acquisition techniques help in reducing these artifacts?	8 Marks	L3	CO4

(OR)

9.	a)	Compare and contrast the types of artifacts commonly encountered in MRI.	8 Marks	L4	CO4
	b)	Explain how slice selection parameters influence cross excitation artifacts. What corrective measures can be taken to optimize slice selection?	8 Marks	L2	CO4

MODULE-V

10.	a)	Describe the basic principle of the inversion recovery (IR) pulse sequence.	8 Marks	L2	CO5
	b)	Describe the principle of the Fast Spin Echo (FSE) sequence and how it improves imaging efficiency.	8 Marks	L2	CO5

(OR)

11.	a)	Explain the role of gradient pulses in EPI sequences and their impact on imaging speed.	8 Marks	L3	CO5
	b)	Explain how incoherent gradient echo sequences differ from coherent gradient echo sequences.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) VI Semester (MBU-22) Regular Examinations, April – 2026

PAEDIATRIC OPTOMETRY AND GERIATRIC OPTOMETRY

[Optometry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	List the stages of lens development.	2 Marks	L1	CO1
	b)	Who performs subjective refraction?	2 Marks	L2	CO2
	c)	Why does retinitis pigmentosa occur?	2 Marks	L1	CO3
	d)	Define senile cataract.	2 Marks	L1	CO4
	e)	Give the counselling process.	2 Marks	L2	CO5
	f)	When is the yellow spot of the retina functionally important, and what is its use?	2 Marks	L1	CO1
	g)	How are picture identification charts used in visual acuity testing?	2 Marks	L1	CO2
	h)	Compare congenital myopia with acquired myopia.	2 Marks	L2	CO3
	i)	What are the types of cataract surgery? Name any two.	2 Marks	L1	CO4
	j)	Why is functional vision important?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Define lens, elaborate three coats of human eye.	8 Marks	L3	CO1
	b)	Enumerate the development of lacrimal apertures with diagram.	8 Marks	L3	CO1
		(OR)			
3.	a)	Explain changes of eye growth form 3rd week to 9th month.	8 Marks	L2	CO1
	b)	Differentiate prenatal and postnatal changes in eye.	8 Marks	L4	CO1

MODULE-II

4.	a)	Explain book retinoscope. And its interpretation.	8 Marks	L2	CO2
	b)	Compare static and dynamic retinoscopy.	8 Marks	L2	CO2
		(OR)			
5.	a)	Write note on spectacle dispensing in special children.	8 Marks	L2	CO2
	b)	Summarize any four types of subjective retinoscopy.	8 Marks	L2	CO2

MODULE-III

6.	a)	Elaborate treatment options and post operative complication of congenital cataract.	8 Marks	L2	CO3
	b)	Enumerate ocular assessment and systemic investigation for congenital cataract.	8 Marks	L3	CO3
		(OR)			
7.	a)	Explain about iris coloboma and its clinical features.	8 Marks	L2	CO3
	b)	Compare iris coloboma and posterior segment coloboma.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Write note on different types of spectacles prescribed for old age peoples and its advantages.	8 Marks	L2	CO4
	b)	Summarize laser iridotomy procedure and its complication.	8 Marks	L2	CO4
		(OR)			
9.	a)	Explain dry "ARMD" and its clinical features.	8 Marks	L2	CO4
	b)	Describe wet "ARMD" and its management.	8 Marks	L2	CO4

MODULE-V

10.	a)	Describe dry eye syndrome and its clinical features.	8 Marks	L2	CO5
	b)	Elaborate proptosis and its sings and symptoms.	8 Marks	L3	CO5
		(OR)			
11.	a)	Explain hypertensive retinopathy and its signs and symptoms.	8 Marks	L2	CO5
	b)	Summarize sickle cell retinopathy and its management	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

PUBLIC HEALTH, COMMUNITY AND OCCUPATIONAL OPTOMETRY

[Optometry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define blindness.	2 Marks	L1	CO1
	b)	Name primary objective of "SPECS 2030".	2 Marks	L1	CO2
	c)	What is aim of vision 2020?	2 Marks	L1	CO3
	d)	Name any two administrative controls.	2 Marks	L1	CO4
	e)	Mention any two systemic contra-indications of eye-donation.	2 Marks	L2	CO5
	f)	Add note on rehabilitation.	2 Marks	L2	CO1
	g)	What is the role of frontline workers in eye health?	2 Marks	L2	CO2
	h)	Define mission of vision 2020 India.	2 Marks	L2	CO3
	i)	What is engineering controls?	2 Marks	L2	CO4
	j)	List tools used in teleophthalmology.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Elaborate four dimensions of public health.	8 Marks	L3	CO1
	b)	Summarize integrated with general health services and social determinants of health.	8 Marks	L2	CO1

(OR)

3.	a)	Elucidate global health and its characteristics.	8 Marks	L3	CO1
	b)	What are the primary challenges faced in the field of public health ophthalmology? And explain it.	8 Marks	L3	CO1

MODULE-II

4.	a)	Discuss "SPECS 2030" vision, goals, and significance in reducing avoidable visual impairment.	8 Marks	L2	CO2
	b)	What is the aim of health and wellness center, explain about various services.	8 Marks	L2	CO2

(OR)

5.	a)	Enumerate four models' health promotion.	8 Marks	L3	CO2
	b)	Explain four intersectoral collaboration in health promotion.	8 Marks	L2	CO2

MODULE-III

6.	a)	Elaborate the initiatives taken by vision 2020 for childhood blindness and glaucoma.	8 Marks	L2	CO3
	b)	Describe potential limitations or criticisms of the Vision 2020 initiative.	8 Marks	L2	CO3

(OR)

7.	a)	Name the common causes of blindness. discuss "NPCB" how	8 Marks	L2	CO3

		vision 2020 is implemented.			
	b)	Elaborate government and non-governmental organizations collaborating to address blindness in India.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Enumerate effect of infrared, x-rays, and visible radiation in eye.	8 Marks	L3	CO4
	b)	Summarize four hazard reduction steps.	8 Marks	L2	CO4
		(OR)			
9.	a)	Describe four ocular protection devices for industries.	8 Marks	L2	CO4
	b)	Elaborate on the significance of using protective eyewear and contact lenses during sports.	8 Marks	L3	CO4

MODULE-V

10.	a)	Describe four types of storage of donor tissue.	8 Marks	L2	CO5
	b)	Explain procedure of full-thickness keratoplasty and partial lamellar keratoplasty.	8 Marks	L2	CO5
		(OR)			
11.	a)	What is enucleation and explain it?	8 Marks	L3	CO5
	b)	Explain financial sustainability and medico-legal consideration of teleophthalmology.	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) VI Semester (MBU-22) Regular Examinations, April – 2026

NEPHRO-RADIOLOGICAL AND IMAGING SCIENCES

[Dialysis Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is radionuclide clearance?	2 Marks	L1	CO1
	b)	Define plasma disappearance method.	2 Marks	L1	CO1
	c)	What is hydronephrosis?	2 Marks	L1	CO2
	d)	Name one renal infection detected by ultrasound.	2 Marks	L1	CO2
	e)	What is obstructive uropathy?	2 Marks	L1	CO3
	f)	Define vesicoureteral reflux.	2 Marks	L1	CO3
	g)	What is renal infarction?	2 Marks	L1	CO4
	h)	Define renal vein thrombosis.	2 Marks	L1	CO4
	i)	What is magnetic resonance spectroscopy?	2 Marks	L1	CO5
	j)	Name one benign renal tumor.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe plasma disappearance methodology in renal function testing.	8 Marks	L2	CO1
	b)	Explain its usefulness in patients with impaired renal function.	8 Marks	L2	CO1
		(OR)			
3.	a)	Explain non-radioactive clearance markers used in GFR estimation.	8 Marks	L2	CO1
	b)	Describe their advantages in clinical practice.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the sonographic appearance of renal cysts.	8 Marks	L2	CO2
	b)	Describe how cystic and solid renal masses are differentiated.	8 Marks	L2	CO2
		(OR)			
5.	a)	Describe ultrasound findings of renal calculi.	8 Marks	L2	CO2
	b)	Explain their relevance in patient management.	8 Marks	L2	CO2

MODULE-III

6.	a)	Describe radionuclide evaluation of vesicoureteral reflux.	8 Marks	L2	CO3
	b)	Explain its importance in pediatric patients.	8 Marks	L2	CO3
		(OR)			
7.	a)	Explain the use of renography in renal transplantation.	8 Marks	L2	CO3
	b)	Describe assessment of graft function.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain CT findings in obstructive uropathy.	8 Marks	L2	CO4
	b)	Describe assessment of obstruction severity.	8 Marks	L2	CO4
		(OR)			
9.	a)	Describe CT features of acute pyelonephritis.	8 Marks	L2	CO4
	b)	Explain its role in detecting complications.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain MRI features of renal parenchymal diseases.	8 Marks	L2	CO5
	b)	Describe their clinical interpretation.	8 Marks	L2	CO5
		(OR)			
11.	a)	Describe MRI evaluation of renal vascular disease.	8 Marks	L3	CO5
	b)	Explain its role in hypertension assessment.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) VI Semester (MBU-22) Regular Examinations, April – 2026

PRINCIPLES OF ADVANCED IMAGING AND THERAPEUTICS

[Radiology & Imaging Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define augmented reality, CADe and CADx.	2 Marks	L1	CO1
	b)	What is elastography?	2 Marks	L1	CO1
	c)	List two advantages of using harmonic imaging.	2 Marks	L2	CO1
	d)	Define virtual non-contrast imaging.	2 Marks	L2	CO2
	e)	What is spectral imaging in the context of CT scanning?	2 Marks	L1	CO2
	f)	How does spectral imaging improve the diagnostic capabilities of a CT scan?	2 Marks	L1	CO2
	g)	What is the advantage of using diffusion-weighted imaging?	2 Marks	L1	CO3
	h)	Name the type of tissue visualized using 'DTI' in brain imaging.	2 Marks	L1	CO3
	i)	What is nuclear medicine?	2 Marks	L1	CO4
	j)	Mention components of gamma camera.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Summarize dynamic digital radiography.	8 Marks	L2	CO1
	b)	Outline the applications of dynamic digital radiography.	8 Marks	L3	CO1

(OR)

3.	a)	Explain about elastography transducer and wireless transducer.	8 Marks	L2	CO1
	b)	Describe 4D ultrasound with its medical application.	8 Marks	L3	CO1

MODULE-II

4.	a)	Describe the clinical applications of functional CT imaging.	8 Marks	L2	CO2
	b)	Examine the principle behind perfusion imaging and its role in clinical diagnostics.	8 Marks	L3	CO2

(OR)

5.	a)	Evaluate the advantages and limitations of functional CT imaging.	8 Marks	L3	CO2
	b)	Discuss the clinical benefits of using perfusion imaging.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the principle behind diffusion tensor imaging and how it differs from conventional diffusion-weighted imaging.	8 Marks	L2	CO3
	b)	Summarize T1, T2, and T2* relaxation times and their significance in quantitative 'MRI'.	8 Marks	L3	CO3

(OR)

7.	a)	Describe the working principle of magnetic resonance elastography and how it measures tissue stiffness.	8 Marks	L2	CO3
	b)	Explain the principle of 'BOLD' contrast used in functional MRI.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Write in short on: i. PET crystals, and their working. ii.Clinical use of PET.	8 Marks	L1	CO4
	b)	Explain about radiotracers used in PET CT according to their use.	8 Marks	L2	CO4

(OR)

9.	a)	Apply your knowledge of patient preparation in PET.	8 Marks	L3	CO4
	b)	Describe the instrumentation of PET-CT.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain the significance of metabolites in 'MRS' and their relevance in diagnosing neurological conditions.	8 Marks	L3	CO3
	b)	Summarize the clinical applications of portable 'MRI' in emergency departments.	8 Marks	L2	CO3

(OR)

11.	a)	Write short notes on: 1. Radionuclides application in cardiology. Radionuclides application in oncology.	8 Marks	L1	CO4
	b)	Write a short note on: 1. Advantages, disadvantages and limitations of SPECT. PMT in gamma camera.	8 Marks	L1	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

CLINICAL EXAMINATION OF VISUAL SYSTEM

[Optometry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Identify the type of mirror that forms a real inverted image.	2 Marks	L2	CO1
	b)	Give the formula for Snell's law.	2 Marks	L1	CO2
	c)	List the common distance visual acuity charts.	2 Marks	L1	CO3
	d)	How is ocular motility clinically assessed?	2 Marks	L2	CO4
	e)	When is Amsler grid testing preferred?	2 Marks	L2	CO5
	f)	Define vergence.	2 Marks	L1	CO1
	g)	Mention one property of the optical centre of a lens.	2 Marks	L1	CO2
	h)	State the normal values for amplitude of accommodation.	2 Marks	L1	CO3
	i)	What are versions and ductions?	2 Marks	L1	CO4
	j)	Give two indications for performing perimetry.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Demonstrate an organized approach to documenting patient history.	8 Marks	L3	CO1
	b)	Apply history-based decision making to choose appropriate clinical tests.	8 Marks	L3	CO1

(OR)

3.	a)	Classify different types of ocular symptoms with appropriate clinical examples.	8 Marks	L4	CO1
	b)	Evaluate the role of occupational and lifestyle history in visual system assessment.	8 Marks	L4	CO1

MODULE-II

4.	a)	Outline the standard protocol for binocular balancing during refraction.	8 Marks	L2	CO2
	b)	Elaborate on the importance of preliminary tests before refraction.	8 Marks	L2	CO2

(OR)

5.	a)	Interpret contrast sensitivity results and clinical relevance.	8 Marks	L4	CO2
	b)	Explain the principles and clinical use of photostress recovery test.	8 Marks	L2	CO2

MODULE-III

6.	a)	Evaluate the diagnostic importance of the worth four-dot test.	8 Marks	L4	CO3
	b)	Interpret stereopsis results in diagnosing binocular anomalies.	8 Marks	L4	CO3

(OR)

7.	a)	Classify types of heterophoria and discuss their clinical evaluation.	8Marks	L4	CO3
	b)	Evaluate fusional vergence reserves and their role in binocular comfort.	8Marks	L4	CO3

MODULE-IV

8.	a)	Demonstrate the correct procedure for assessing tear break-up time.	8 Marks	L3	CO4
	b)	Evaluate retinal vascular changes and their clinical implications.	8 Marks	L4	CO4

(OR)

9.	a)	Explain the principles of direct and indirect ophthalmoscopy.	8 Marks	L2	CO4
	b)	Analyze corneal abnormalities and correlate them with slit lamp findings.	8 Marks	L4	CO4

MODULE-V

10.	a)	Analyze tear film abnormalities using advanced diagnostic tools.	8 Marks	L4	CO5
	b)	Compare different imaging modalities used in anterior segment assessment.	8 Marks	L4	CO5

(OR)

11.	a)	Evaluate the importance of fundus photography in disease monitoring.	8 Marks	L4	CO5
	b)	Interpret topography maps in diagnosing keratoconus.	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

TECHNIQUES IN MAGNETIC RESONANCE IMAGING

[Radiology & Imaging Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Add a note on the selection of TI in an MRI Brain study.	2 Marks	L1	CO1
	b)	Mention the significance of informed consent in MRI procedures.	2 Marks	L1	CO1
	c)	Prepare a note on DWI's importance in early stroke detection.	2 Marks	L1	CO2
	d)	Define the principle of Magnetic Resonance Spectroscopy.	2 Marks	L2	CO2
	e)	Add a note on the importance of patient positioning in MRI cervical spine imaging.	2 Marks	L2	CO3
	f)	Prepare a note on the role of diffusion-weighted imaging (DWI) in soft tissue sarcoma assessment.	2 Marks	L1	CO3
	g)	Identify the anatomical landmarks used for centering in MRI elbow imaging.	2 Marks	L2	CO4
	h)	Define the significance of proton density (PD) sequences in knee MRI.	2 Marks	L1	CO4
	i)	Mention the significance of fat suppression techniques in MRI abdomen.	2 Marks	L2	CO5
	j)	Identify the role of MR Spectroscopy in abdominal imaging.	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss the indications, contraindications, patient preparation, planning of sequences, and parameters of sequences for a DBS protocol MRI.	8 Marks	L2	CO1
	b)	Describe the indications, contraindications, patient preparation, planning of sequences, and parameters of sequences for an MRI dynamic study.	8 Marks	L3	CO1

(OR)

3.	a)	Outline the essential planning steps for creating an optimal MRI Brain protocol for epilepsy studies.	8 Marks	L4	CO1
	b)	Identify the key sequence parameters that affect MRI image resolution.	8 Marks	L2	CO1

MODULE-II

4.	a)	Identify the sequences of MRI- Brain plain, contrast and spectroscopy protocol. Mention clinical significance of sequences.	8 Marks	L3	CO2
	b)	Identify any eight advanced MRI sequences with their clinical applications.	8 Marks	L3	CO2

(OR)

5.	a)	Explain in detail on SWI and BOLD sequences in MRI.	8 Marks	L2	CO2
	b)	Discuss in detail on DWI and TOF sequences in MRI.	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain the role of axial, sagittal, and coronal planning in MRI spine imaging for disc pathology, discussing indications, contraindications, patient preparation, and sequence parameters.	8 Marks	L2	CO3
	b)	Describe the imaging technique used in spinal cord lesion assessment, including indications, contraindications, patient preparation, sequence planning, and sequence parameters.	8 Marks	L3	CO3

(OR)

7.	a)	Outline the whole spine MRI protocol, detailing its role in systemic diseases affecting the spine.	8 Marks	L2	CO3
	b)	Identify the planning considerations for MRI of lymph node assessment in oncology cases.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Identify the standard MRI protocol for knee joint imaging, covering indications, contraindications, patient preparation, planning of sequences, and sequence parameters.	8 Marks	L3	CO4
	b)	Outline the MRI approach for thigh imaging, including indications, contraindications, patient preparation, planning of sequences, and sequence parameters.	8 Marks	L2	CO4

(OR)

9.	a)	Explain the imaging protocol for leg MRI, discussing indications, contraindications, patient preparation, planning of sequences, and sequence parameters.	8 Marks	L3	CO4
	b)	Describe the role of MRI in ankle joint evaluation, focusing on indications, contraindications, patient preparation, planning of sequences, and sequence parameters.	8 Marks	L2	CO4

MODULE-V

10.	a)	Outline the indications for MRI Fistulogram in perianal fistula assessment, covering contraindications, patient preparation, planning of sequences, and sequence parameters.	8 Marks	L2	CO5
	b)	Discuss the advantages of MRI over CT in abdominal imaging, focusing on indications, contraindications, patient preparation, planning of sequences, and sequence parameters.	8 Marks	L3	CO5

(OR)

11.	a)	Describe the role of MRI in cervical cancer staging, with indications, contraindications, patient preparation, planning of sequences, and sequence parameters.	8 Marks	L3	CO5
	b)	Summarize the MRI assessment of uterine fibroids, covering indications, contraindications, patient preparation, planning of sequences, and sequence parameters.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

BINOCULAR VISION

[Optometry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is suppression?	2 Marks	L2	CO1
	b)	Name two types of extraocular muscles.	2 Marks	L1	CO2
	c)	Add note on refractive amblyopia.	2 Marks	L2	CO3
	d)	What is lag of accommodation?	2 Marks	L2	CO4
	e)	Define CA/C Ratio.	2 Marks	L1	CO5
	f)	Name the grades of binocular vision.	2 Marks	L1	CO1
	g)	What is saccadic movements?	2 Marks	L2	CO2
	h)	Define penalization.	2 Marks	L1	CO3
	i)	How does aging affect the ability to accommodate?	2 Marks	L2	CO4
	j)	What is meant prism cover test.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Illustrate the concept of Horopter along with its various types.	8 Marks	L3	CO1
	b)	Elaborate pathological diplopia and its causes.	8 Marks	L2	CO1
		(OR)			
3.	a)	Elucidate various monocular clues to spatial orientation.	8 Marks	L2	CO1
	b)	Describe the three grades of binocular vision and clinical features.	8 Marks	L2	CO1

MODULE-II

4.	a)	Write note on basic kinematics with diagram.	8 Marks	L4	CO2
	b)	Explain any four factors involved in mechanics of extraocular muscle actions.	8 Marks	L2	CO2
		(OR)			
5.	a)	Summarize Fick's axes, oblique axis, center of rotation with diagrams.	8 Marks	L4	CO2
	b)	Discuss structural characteristics of extraocular muscles and course of rectus and oblique muscle.	8 Marks	L2	CO2

MODULE-III

6.	a)	Elaborate mono-fixation syndrome and its clinical fixation.	8 Marks	L2	CO3
	b)	Demonstrate the 4D base-out prism test and its results.	8 Marks	L3	CO3
		(OR)			
7.	a)	What is the difference between strabismus and amblyopia, and how can they be related.	8 Marks	L2	CO3
	b)	Discuss the benefits and limitations of vision therapy in managing amblyopia.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Summarize excessive accommodation, clinical features and its treatment.	8 Marks	L2	CO4
	b)	Illustrate binocular accommodative facility and its description.	8 Marks	L3	CO4
		(OR)			
9.	a)	Explain hart chart distance-to-near accommodative rock and its end point.	8 Marks	L2	CO4
	b)	Elaborate spasm of accommodation and its clinical features.	8 Marks	L2	CO4

MODULE-V

10.	a)	Describe acquired motor fusion deficiency and its clinical features.	8 Marks	L2	CO5
	b)	Summarize Phoria Measured using the Von Graefe Technique and Modified Thorington Technique.	8 Marks	L2	CO5
		(OR)			
11.	a)	Discuss convergence spasm and its clinical features.	8 Marks	L2	CO5
	b)	Demonstrate different phases of vision therapy program for convergence insufficiency.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

CONTACT LENS

[Optometry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define contact lens.	2 Marks	L1	CO1
	b)	Give two methods of RGP lens manufacturing.	2 Marks	L2	CO2
	c)	List the disadvantages of RGP lenses.	2 Marks	L2	CO3
	d)	Who requires stabilization in contact lenses?	2 Marks	L2	CO4
	e)	Why are ortho-K lenses contraindicated in some patients?	2 Marks	L1	CO5
	f)	What is PMMA?	2 Marks	L1	CO1
	g)	Mention the instruments used to check base curve.	2 Marks	L2	CO2
	h)	When does high riding of a contact lens occur?	2 Marks	L1	CO3
	i)	How is truncation used for lens stabilization?	2 Marks	L2	CO4
	j)	Compare occlusion contact lenses with conventional contact lenses.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Expand "HEMA" and explain contact lens history of it.	8 Marks	L2	CO1
	b)	Elaborate classification of contact lens based on mode of ware and water content.	8 Marks	L2	CO1

(OR)

3.	a)	Define Corneal Ulcer Infected. mention its signs, Symptoms and prevention.	8 Marks	L2	CO1
	b)	Explain about edge lift and sagittal depth with diagram.	8 Marks	L2	CO1

MODULE-II

4.	a)	Write note on contact lens verification.	8 Marks	L2	CO2
	b)	Summarize polishing the lens surface, and adding the power.	8 Marks	L2	CO2

(OR)

5.	a)	Enumerate the techniques used to check diameter and lens thickness.	8 Marks	L2	CO2
	b)	Compare the difference b/w contact lens and spectacles.	8 Marks	L2	CO2

MODULE-III

6.	a)	What is disinfection. explain disinfection of contact lens?	8 Marks	L3	CO3
	b)	Explain trial lens selection and overall diameter selection.	8 Marks	L2	CO3

(OR)

7.	a)	Demonstrate external eye examination.	8 Marks	L2	CO3
	b)	Summarize instillation of fluorescein and slit lamp examination of "RGP" contact lens.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Mention soft contact lens material. explain initial patient workup.	8 Marks	L2	CO4
	b)	What is base curve. elaborate evaluation of the base curve of the soft lens.	8 Marks	L3	CO4

(OR)

9.	a)	Compare soft contact lens and rigid contact lens.	8 Marks	L3	CO4
	b)	Explain indications and contraindication for prescribing soft toric contact lens.	8 Marks	L2	CO4

MODULE-V

10.	a)	Elaborate Reverse geometry lenses with diagram.	8 Marks	L3	CO5
	b)	Explain mechanism of ortho-k lens in myopia and hypermetropia.	8 Marks	L2	CO5

(OR)

11.	a)	Mention other names of ortho-k lens. demonstrate ideal fitting in ortho-k lens.	8 Marks	L3	CO5
	b)	Describe explain indications and contraindication of ortho-k lens.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

CROSS SECTIONAL ANATOMY - II

[Radiology & Imaging Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Name the major surface landmarks of the shoulder region.	2 Marks	L1	CO1
	b)	Enumerate the structures seen in a cross section of the arm at the mid-humerus level.	2 Marks	L1	CO1
	c)	Name three bones forming the hip joint.	2 Marks	L1	CO2
	d)	Mention the contents of the tarsal tunnel as seen in cross-section.	2 Marks	L1	CO2
	e)	Draw a labeled diagram of lungs.	2 Marks	L2	CO3
	f)	Mention the structures seen in a transverse section of the liver at the level of porta hepatis.	2 Marks	L1	CO3
	g)	List the muscles identified at the level of the pelvic floor.	2 Marks	L1	CO4
	h)	Name the structures seen in a transverse section of the male pelvis at the level of the prostate.	2 Marks	L1	CO4
	i)	State how muscles and tendons appear differently on MRI.	2 Marks	L2	CO1
	j)	Name the muscles present in the anterior compartment of the thigh as seen in cross section.	2 Marks	L1	CO2

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the cross-sectional anatomy of the upper limb in CT.	8 Marks	L2	CO1
	b)	Describe the role of the coronal plane in visualizing the shoulder joint and provide an example of its use in radiology.	8 Marks	L2	CO1

(OR)

3.	a)	Describe the anatomy of shoulder joint and its radiological features.	8 Marks	L2	CO1
	b)	Analyze the role of 'CT' scans in upper extremity.	8 Marks	L4	CO1

MODULE-II

4.	a)	Describe the anatomical boundaries of the gluteal region and their relevance in cross-sectional CT.	8 Marks	L2	CO2
	b)	Discuss how tendons and ligaments differ in appearance on "MRI" of the lower limb.	8 Marks	L2	CO2

(OR)

5.	a)	Describe the components of the knee jointvisible in cross-sectional imaging.	8 Marks	L2	CO2
	b)	Explain the relationship between the popliteal artery and tibial nerves on axial CT.	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain about types of ribs and add a note on radiological features of ribs.	8 Marks	L2	CO3
	b)	Discuss about sternum and add a note on radiological features of sternum.	8 Marks	L2	CO3
		(OR)			
7.	a)	Explain the cross sectional anatomy of lungs.	8 Marks	L1	CO3
	b)	Describe the role of the respiratory system in blood oxygenation and purification.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Discuss the anatomy of pelvis and add a note on radiological features of pelvis.	8 Marks	L2	CO4
	b)	Summarize the pathologies of female reproductive system.	8 Marks	L2	CO4
		(OR)			
9.	a)	Explain the position and orientation of the uterus in cross-sectional imaging and how anteversion/retroversion affects its appearance on sagittal MRI.	8 Marks	L2	CO4
	b)	Summarize the pathologies of male reproductive system.	8 Marks	L2	CO4

MODULE-V

10.	a)	Evaluate the importance of cross-sectional anatomy of the upper limb in diagnosing nerve and vascular injuries.	8 Marks	L5	CO1
	b)	Describe the anatomical basis of foot arches and their appearance in imaging.	8 Marks	L2	CO2
		(OR)			
11.	a)	Explain the anatomy of pancreas and its functions.	8 Marks	L2	CO3
	b)	Analyze the cross-sectional relationship of the rectum, bladder, uterus/prostate, and major vessels in pelvis "MRI" with clinical relevance.	8 Marks	L4	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) VI Semester (MBU-22) Regular Examinations, April – 2026

DISASTER MANAGEMENT AND INDUSTRIAL EMERGENCIES

[Emergency Medical and Critical Care Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

10 X 2 = 20 Marks

1.	a)	Mention any four names of disaster committee.	2 Marks	L1	CO1
	b)	Identify the type of fire in class-A and its management.	2 Marks	L2	CO1
	c)	Prepare a brief note on crash disaster.	2 Marks	L1	CO2
	d)	Expand DISASTER.	2 Marks	L2	CO2
	e)	Describe crush injury.	2 Marks	L1	CO3
	f)	Define compartment syndrome.	2 Marks	L1	CO3
	g)	Name any four types of physical hazards.	2 Marks	L1	CO4
	h)	Define mechanical hazards.	2 Marks	L2	CO4
	i)	Define hurricanes.	2 Marks	L2	CO5
	j)	List out the impact of tsunamis on human life.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Outline the role of paramedics in disaster management.	8 Marks	L3	CO1
	b)	Differentiate natural and man-made disaster.	8 Marks	L3	CO1
		(OR)			
3.	a)	Define triage and explain its types and management.	8 Marks	L2	CO1
	b)	Discuss the role of technology and digital tools in improving triage efficiency during disasters.	8 Marks	L2	CO1

MODULE-II

4.	a)	Describe radiational injuries and explain ionizing and non-ionizing radiation.	8 Marks	L2	CO2
	b)	Elaborate on types of fire and fire safety.	8 Marks	L3	CO2
		(OR)			
5.	a)	Describe maritime disaster and list out any four types of it.	8 Marks	L2	CO2
	b)	Define air crash disaster and explain its management.	8 Marks	L2	CO2

MODULE-III

6.	a)	Illustrate the common types of injuries associated with falls from height.	8 Marks	L3	CO3
	b)	Explain the different types of assaults and their medical implications.	8 Marks	L2	CO3
		(OR)			
7.	a)	Explain the difference between electric shock, electrocution, and arc flash injuries.	8 Marks	L2	CO3
	b)	Explain the surgical procedures involved in amputation.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss risk assessment and hazard control strategies for physical hazards	8 Marks	L2	CO4
	b)	Describe risk assessment strategies for mechanical hazards in an industrial setting.	8 Marks	L2	CO4

(OR)

9.	a)	Enumerate the role of workplace safety measures in preventing occupational hazards.	8 Marks	L3	CO4
	b)	Describe the common sources of biological hazards in the workplace.	8 Marks	L3	CO4

MODULE-V

10.	a)	Describe the different types of winter storms.	8 Marks	L2	CO5
	b)	Explain the primary and secondary hazards associated with hurricanes.	8 Marks	L2	CO5

(OR)

11.	a)	Discuss the impact of earthquakes on human settlements and infrastructure.	8 Marks	L2	CO5
	b)	Illustrate four phases of the disaster cycle.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

CRITICAL CONCEPTS AND DECISION MAKING IN EMERGENCY MEDICINE

[Emergency Medical and Critical Care Technology, Dialysis Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define edema.	2 Marks	L1	CO1
	b)	Write a brief note on psoriasis.	2 Marks	L2	CO1
	c)	Define congestive cardiac failure.	2 Marks	L1	CO2
	d)	Prepare a brief note on management of hypotension.	2 Marks	L1	CO2
	e)	List out any four symptoms of hyperglycemia.	2 Marks	L2	CO3
	f)	Prepare a brief note on frost bite.	2 Marks	L1	CO3
	g)	Write any four investigations of ascites.	2 Marks	L2	CO4
	h)	Define rectal bleeding.	2 Marks	L1	CO4
	i)	Identify any two types of hypotension.	2 Marks	L1	CO5
	j)	Write a brief note on management of dyspnea.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the pathophysiology of edema, including its causes and types.	8 Marks	L2	CO1
	b)	Enumerate the causes and management of allergic rhinitis.	8 Marks	L3	CO1

(OR)

3.	a)	Define dermatitis and describe its pathophysiology.	8 Marks	L2	CO1
	b)	Discuss the different types of psoriasis, including their clinical features and distinguishing characteristics.	8 Marks	L2	CO1

MODULE-II

4.	a)	Elaborate on congestive cardiac failure.	8 Marks	L3	C02
	b)	Define hypotension and explain its management.	8 Marks	L2	CO2

(OR)

5.	a)	Explain pathophysiology and management of Cor Pulmonale.	8 Marks	L2	CO2
	b)	Enumerate the steps in diagnosis and management of patient with breathing difficulty.	8 Marks	L3	CO2

MODULE-III

6.	a)	Discuss the various types of hyperthermia, including heat exhaustion, heat stroke, and malignant hyperthermia.	8 Marks	L2	CO3
	b)	Define dysphagia and explain the management and treatment strategies for dysphagia.	8 Marks	L2	CO3

(OR)

7.	a)	Discuss the physiological and metabolic changes that occur in hypothermia.	8 Marks	L2	CO3
	b)	Explain the pathophysiology of heartburn and its relationship with gastroesophageal reflux disease (GERD).	8 Marks	L2	CO3

MODULE-IV

8.	a)	Differentiate upper gastrointestinal and lower gastrointestinal bleeding.	8 Marks	L3	CO4
	b)	Discuss the pharmacological treatment options available for constipation.	8 Marks	L2	CO4

(OR)

9.	a)	Differentiate between cardiac and non-cardiac chest pain based on clinical features and diagnostic approach.	8 Marks	L3	CO4
	b)	Define Irritable Bowel Syndrome (IBS) and describe its pathophysiology.	8 Marks	L2	CO4

MODULE-V

10.	a)	Describe the clinical features and diagnostic criteria for psoriasis. What investigations can be used to confirm the diagnosis?	8 Marks	L2	CO5
	b)	Define pruritus and describe its causes with clinical features.	8 Marks	L2	CO5

(OR)

11.	a)	Explain the clinical approach to diagnosing edema and discuss the management strategies for edema.	8 Marks	L2	CO5
	b)	Define erythroderma and explain its pathophysiology.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

RESPIRATORY ACTION PLANS FOR OPTIMAL CARE

[Respiratory Therapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	How can the use of accessory muscles indicate a severe asthma exacerbation?	2 Marks	L3	CO1
	b)	Name any two oral corticosteroids.	2 Marks	L2	CO1
	c)	How does airflow limitation contribute to dyspnoea in asthma?	2 Marks	L3	CO2
	d)	Why might dyspnoea worsen at night in individuals with asthma?	2 Marks	L1	CO2
	e)	Mention the signs of COPD exacerbation.	2 Marks	L2	CO3
	f)	Define cyanosis.	2 Marks	L1	CO3
	g)	What is the role of healthcare providers in COPD patient education?	2 Marks	L1	CO4
	h)	Draw a schematic sketch showing bullae emphesema.	2 Marks	L3	CO4
	i)	What is dyspnoea, and how is it related to asthma exacerbations?	2 Marks	L2	CO5
	j)	How does airflow limitation contribute to dyspnoea in asthma?	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe the precautions that asthma patients need to take to prevent exacerbations.	8 Marks	L2	CO1
	b)	How can they identify and manage asthma triggers effectively?	8 Marks	L3	CO1

(OR)

3.	a)	Describe the precautions that are necessary for safe medication use and symptom control on pregenent womens?	8 Marks	L2	CO1
	b)	**Clinical case studies:** Sarah, 19 years old **Presenting Complaint:** Wheezing, shortness of breath, and chest tightness.	8 Marks	L4	CO1

History:

Sarah has a history of asthma diagnosed in childhood. She has been managing her asthma well with a combination inhaler (ICS + LABA) and has only had mild symptoms during the colder months. However, she recently started exercising more frequently and has been experiencing increased shortness of breath during workouts. Today, she had an asthma attack after running on the track for 20 minutes. She used her inhaler, but the symptoms didn't improve as expected.

Question:

i) What steps should Sarah take to manage her symptoms during an asthma exacerbation?

What might have caused her worsening symptoms during exercise, and how can she better prepare for future exercise-induced asthma attacks?

MODULE-II

4.	a)	Discuss the role and benefits of Peak Expiratory Flow Measurement (PEFM) in asthma management.	8 Marks	L2	CO2
	b)	What is a rescue inhalers? and what factors should patients consider when using the inhaler medications?	8 Marks	L2	CO2

(OR)

5.	a)	Discuss the potential complications of poorly controlled asthma.	8 Marks	L2	CO2
	b)	What impact can frequent exacerbation's have on a patient's quality of life and long-term health?	8 Marks	L2	CO2

MODULE-III

6.	a)	Describe the role of smoking cessation in managing COPD	8 Marks	L2	CO3
	b)	Discuss the implications of COPD on physical activity and exercise capacity.	8 Marks	L2	CO3

(OR)

7.	a)	What are the roles and responsibilities of family caregivers in managing COPD at home.	8 Marks	L2	CO3
	b)	What is the role of diet in managing COPD, particularly in relation to weight loss or weight gain?	8 Marks	L2	CO3

MODULE-IV

8.	a)	Chart down the CPAP and BIPAP , its indication, contraindications and uses on a COPD patients.	8 Marks	L3	CO4
	b)	Differentiate blue blotters and pink puffers, and its pathophysiology condition.	8 Marks	L3	CO4

(OR)

9.	a)	How would you identify pulmonary and cardiac vascular structures related to COPD in a Chest X - Ray.	8 Marks	L3	CO4
	b)	Discuss the indications for mechanical ventilation in COPD patients.	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss effective strategies for avoiding common environmental asthma triggers, such as allergens, air pollution, and irritants.	8 Marks	L2	CO5
	b)	Explain the role of medications in overcoming asthma triggers and preventing exacerbations.	8 Marks	L3	CO5

(OR)

11.	a)	What role does stress management play in overcoming asthma triggers, and what techniques can be used to manage stress effectively?	8 Marks	L2	CO5
	b)	Discuss how avoiding respiratory infections can help prevent asthma exacerbations.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) VI Semester (MBU-22) Regular Examinations, April – 2026

RESPIRATORY CARE IN SPORTS AND PHYSIOLOGY

[Respiratory Therapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	How does lactate threshold affect endurance performance?	2 Marks	L3	CO1
	b)	Mention the importance of respiratory muscle function in athletic performance.	2 Marks	L1	CO1
	c)	How can breathing techniques improve exercise performance?	2 Marks	L3	CO2
	d)	What is the role of recovery breathing in post-exercise recovery?	2 Marks	L1	CO2
	e)	Write any two signs of hypoxia.	2 Marks	L2	CO3
	f)	Define acclimatization.	2 Marks	L1	CO3
	g)	Write a brief note on rhythmic breathing.	2 Marks	L2	CO4
	h)	What are the devices used for inspiratory muscle training?	2 Marks	L1	CO4
	i)	Define edurance.	2 Marks	L1	CO5
	j)	Mention any two relaxation breathing techniques.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss the role of respiratory muscle function in exercise and its effect on athletic performance.	8 Marks	L2	CO1
	b)	What is lactate threshold, and how does it impact an athlete's performance in endurance sports?	8 Marks	L2	CO1

(OR)

3.	a)	Explain the potential benefits and limitations of using Hyperbaric Oxygen Therapy (HBOT) in endurance training and recovery.	8 Marks	L3	CO1
	b)	How do controlled breathing and relaxation exercises contribute to reducing lactate levels and promoting faster recovery?	8 Marks	L3	CO1

MODULE-II

4.	a)	Discuss the potential risks associated with prolonged exposure to high altitudes.	8 Marks	L2	CO2
	b)	Discuss how does increased oxygen availability support tissue repair and healing.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the role of Respiratory Muscle Training (RMT) in enhancing endurance performance.	8 Marks	L3	CO2
	b)	Describe the role of Post-Exercise Respiratory Care in enhancing muscle recovery.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain how exercise influences respiratory function in individuals with asthma.	8 Marks	L3	CO3
	b)	How exercise can be integrated into asthma management plans?	8 Marks	L3	CO3

(OR)

7.	a)	Describe the physiological changes that occur during altitude training.	8 Marks	L2	CO3
	b)	Explain how hypoxic training devices work.	8 Marks	L3	CO3

MODULE-IV

8.	a)	How does the anaerobic threshold relate to lactate accumulation.	8 Marks	L3	CO4
	b)	What physiological changes occur as an athlete approaches and surpasses the lactate threshold during exercise?	8 Marks	L2	CO4

(OR)

9.	a)	Discuss the implications of anaerobic metabolism transition for performance, fatigue, and recovery.	8 Marks	L2	CO4
	b)	Explain how does the respiratory system adjust to meet the increased oxygen demand during physical activity.	8 Marks	L3	CO4

MODULE-V

10.	a)	How does exposure to low oxygen levels at high altitudes lead to an increase in erythropoiesis.	8 Marks	L3	CO5
	b)	Discuss the role of medication, environmental control, and exercise modifications in preventing exercise-induced asthma symptoms.	8 Marks	L2	CO5

(OR)

11.	a)	Describe the chronic respiratory adaptations that occur in response to long-term endurance training.	8 Marks	L2	CO5
	b)	Compare and contrast hypoxic training and traditional altitude training.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

RECENT ADVANCE IN DIALYSIS TECHNOLOGY

[Dialysis Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Identify two complications that may occur during MARS dialysis.	2 Marks	L1	CO1
	b)	What is the role of albumin in the MARS detoxification process?	2 Marks	L1	CO1
	c)	Mention two indications for short daily dialysis.	2 Marks	L1	CO2
	d)	State the typical duration of a short daily dialysis session.	2 Marks	L1	CO2
	e)	Mention two contraindications for PD.	2 Marks	L1	CO3
	f)	What is meant by peritoneal membrane permeability?	2 Marks	L1	CO3
	g)	Name any two common PD catheter complications.	2 Marks	L1	CO4
	h)	What is meant by intra-abdominal pressure complications in PD?	2 Marks	L1	CO4
	i)	State two roles of a transplant coordinator.	2 Marks	L1	CO5
	j)	What is meant by cadaver donor maintenance?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe the complications commonly encountered during MARS dialysis.	8 Marks	L2	CO1
	b)	Explain the management strategies for hypotension, clotting, and bleeding.	8 Marks	L2	CO1

(OR)

3.	a)	Discuss the pathophysiology of hypocalcemia during MARS therapy.	8 Marks	L2	CO1
	b)	Describe how hypocalcemia is monitored and managed.	8 Marks	L2	CO1

MODULE-II

4.	a)	Write the equipment requirements and safety considerations for nocturnal hemodialysis.	8 Marks	L2	CO2
	b)	Describe safety and monitoring parameters during short daily dialysis.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the role of nocturnal hemodialysis in fluid overload reduction.	8 Marks	L2	CO2
	b)	Describe how short daily dialysis helps patients with poor dialysis tolerance.	8 Marks	L2	CO2

MODULE-III

6.	a)	Compare the advantages and disadvantages of newer biocompatible PD solutions.	8 Marks	L2	CO3
	b)	Explain how these newer solutions affect the long-term function of the peritoneal membrane.	8 Marks	L2	CO3

(OR)

7.	a)	Describe how low-GDP PD fluids reduce inflammation and fibrosis.	8 Marks	L2	CO3
	b)	Explain the effect of reduced inflammation on patient outcomes.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain the steps involved in maintaining environmental cleanliness in dialysis units.	8 Marks	L2	CO4
	b)	Describe disinfection procedures for dialysis equipment and surfaces.	8 Marks	L2	CO4

(OR)

9.	a)	Describe the types of records maintained for hemodialysis patients.	8 Marks	L2	CO4
	b)	Explain the importance of accurate documentation in patient management.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain the counselling process for the family of a cadaver (deceased) donor.	8 Marks	L2	CO5
	b)	Describe the ethical considerations involved in deceased donor organ retrieval.	8 Marks	L2	CO5

(OR)

11.	a)	Define brain death and describe the criteria used to determine it.	8 Marks	L2	CO5
	b)	Explain the importance of brain death certification in organ transplantation.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

CARDIAC CATHETERIZATION - II

[Cardio Vascular Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	List out equipment used for percutaneous interventions.	2 Marks	L1	CO1
	b)	What is a guiding catheter?	2 Marks	L2	CO1
	c)	Define coronary angioplasty.	2 Marks	L1	CO2
	d)	List out indications of coronary angioplasty.	2 Marks	L2	CO2
	e)	Classify types of VSD.	2 Marks	L1	CO3
	f)	Write a brief note on "Swiss cheese type of VSD".	2 Marks	L3	CO3
	g)	Define balloon mitral valvotomy.	2 Marks	L1	CO4
	h)	What is "Lautenbacher's Syndrome"?	2 Marks	L2	CO4
	i)	Draw labelled diagram of cardiac action potential.	2 Marks	L3	CO4
	j)	Define RF ablation.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe characteristics and functions of a guiding catheter.	8 Marks	L2	CO1
	b)	Summarize "Judkins" guiding catheter.	8 Marks	L2	CO1
		(OR)			
3.	a)	Prepare a detailed note on over the wire balloon catheter.	8 Marks	L2	CO1
	b)	Describe the structure, and characteristics of a guidewire.	8 Marks	L2	CO1

MODULE-II

4.	a)	Outline indications and contraindications of PTCA.	8 Marks	L2	CO2
	b)	Explain materials used, and patient preparation of coronary angioplasty.	8 Marks	L2	CO2
		(OR)			
5.	a)	Summarize the procedure and complications of renal angioplasty.	8 Marks	L2	CO2
	b)	Outline indications and contraindications of carotid angioplasty.	8 Marks	L2	CO2

MODULE-III

6.	a)	Prepare a note on materials used, and patient preparation for ASD device closure.	8 Marks	L2	CO3
	b)	Summarize procedure of ASD device closure.	8 Marks	L3	CO3
		(OR)			
7.	a)	Prepare a note on diagnostic studies to be performed before VSD device closure.	8 Marks	L3	CO3
	b)	Apply your knowledge and prepare a note on role of echo in VSD device closure.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Describe indications, contraindications and complications of balloon mitral valvotomy.	8 Marks	L2	CO4
	b)	Prepare a note on pre medication, and materials used for balloon mitral valvotomy.	8 Marks	L3	CO4

(OR)

9.	a)	Describe aortic stenosis, and prepare a note on patient selection for balloon aortic valvuloplasty.	8 Marks	L2	CO4
	b)	Summarize procedure of aortic balloon valvuloplasty.	8 Marks	L3	CO4

MODULE-V

10.	a)	Tabulate indications, contraindications and complications of alcohol septal ablation procedure.	8 Marks	L2	CO5
	b)	Explain materials used and procedure of alcohol septal ablation.	8 Marks	L2	CO5

(OR)

11.	a)	Describe components of the pacemaker.	8 Marks	L2	CO5
	b)	Prepare a detailed note on single chamber pacemaker.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

CARDIAC EVALUATION AND THERAPIES - II

[Cardio Vascular Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define Ejection Fraction (EF).	2 Marks	L2	CO1
	b)	Draw labelled diagram of ECG features in dilated cardiomyopathy.	2 Marks	L3	CO1
	c)	Mention two uses of Exercise Stress Test (TMT).	2 Marks	L1	CO1
	d)	List out the abnormalities of aorta.	2 Marks	L2	CO1
	e)	Mention causes of hypertrophic cardiomyopathy.	2 Marks	L2	CO4
	f)	Draw labelled ECG diagram of SI, QIII, TIII pattern.	2 Marks	L3	CO4
	g)	What is Pacemaker Spike in ECG?	2 Marks	L1	CO3
	h)	Define infective endocarditis.	2 Marks	L2	CO3
	i)	What is Pulmonary Artery Pressure?	2 Marks	L2	CO5
	j)	Define diabetes milletus.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	List any two complications of Cardiac Catheterization. Explain the physical examination findings, ECG and X ray findings of dilated cardiomyopathy.	8 Marks	L3	CO1
	b)	Describe the types of cardiac pacemakers. Summarize echocardiographic assessment of dilated cardiomyopathy.	8 Marks	L2	CO2

(OR)

3.	a)	Write a detailed notes on 24-hour Holter Monitoring.	8 Marks	L2	CO2
	b)	Explain types and diagnostic features of infiltrative cardiomyopathy.	8 Marks	L2	CO1

MODULE-II

4.	a)	Define aortic aneurysm, and classify its types.	8 Marks	L2	CO1
	b)	Prepare a detailed note on etiology, clinical features and physical examination findings of thoracic aortic aneurysm.	8 Marks	L2	CO1

(OR)

5.	a)	Describe the procedure and indications of Treadmill Test (TMT).	8 Marks	L3	CO2
	b)	Define ruptured sinus of valsalva, and classify its types.	8 Marks	L1	CO1

MODULE-III

6.	a)	Describe causes, and pathophysiology of pulmonary artery hypertension.	8 Marks	L2	CO3
	b)	Illustrate 2D and M-mode echocardiographic features of pulmonary hypertension with neat labelled diagram.	8 Marks	L3	CO4

(OR)

7.	a)	Describe causes and pathophysiology of COPD.	8 Marks	L2	CO4
	b)	Summarize diagnostic features of COPD.	8 Marks	L3	CO4

MODULE-IV

8.	a)	Explain eustachian valve and chairi network and how to identify them on echo?	8 Marks	L3	CO4
	b)	Discuss Coronary Artery Disease (CAD) – evaluation methods and therapeutic interventions.	8 Marks	L3	CO4

(OR)

9.	a)	Describe types of mechanical prosthetic valves.	8 Marks	L2	CO4
	b)	Describe ECG changes in myocardial infarction with neat diagrams.	8 Marks	L3	CO4

MODULE-V

10.	a)	Summarize echocardiographic features seen in hypovolemic shock.	8 Marks	L3	CO5
	b)	Describe the role of ECG in arrhythmia diagnosis.	8 Marks	L2	CO5

(OR)

11.	a)	How does diabetes mellitus effect the heart? What changes are seen on echo in a patient with diabetes mellitus?	8 Marks	L3	CO5
	b)	What is obesity? Describe its risk factors and causes.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) VI Semester (MBU-22) Regular Examinations, April – 2026

ADVANCED CARDIAC CARE TECHNOLOGY

[Cardio Vascular Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define fusion and capture beat.	2 Marks	L1	CO1
	b)	Write a brief note on early after depolarization.	2 Marks	L3	CO1
	c)	What is pseudo infarct pattern, and in which condition it is seen?	2 Marks	L2	CO2
	d)	Write a brief note on "Osborn Wave".	2 Marks	L3	CO2
	e)	Enlist applications of contrast echo.	2 Marks	L2	CO3
	f)	Name the types of agents used in left sided contrast echo.	2 Marks	L2	CO3
	g)	Define anteflexion and retroflexion.	2 Marks	L1	CO4
	h)	Enlist advantages of transesophageal echo.	2 Marks	L2	CO4
	i)	Define perfusion pressure.	2 Marks	L1	CO5
	j)	Enlist four complications of "TAVI" procedure.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	What is supraventricular arrhythmia, and outline its types?	8 Marks	L2	CO1
	b)	Describe the types of premature atrial contractions, and outline its causes.	8 Marks	L2	CO1

(OR)

3.	a)	Describe ECG characteristics, and causes of SA block.	8 Marks	L3	CO1
	b)	Describe causes, and ECG characteristics of right bundle branch block.	8 Marks	L3	CO1

MODULE-II

4.	a)	Tabulate the differences between physiological and pathological Q waves.	8 Marks	L3	CO2
	b)	Describe the ECG characteristics of hypertrophic cardiomyopathy.	8 Marks	L3	CO2

(OR)

5.	a)	Explain shorthand code, and single chamber pacemaker programming.	8 Marks	L3	CO2
	b)	Summarize ECG characteristics seen in paced rhythm.	8 Marks	L3	CO2

MODULE-III

6.	a)	Describe different strain parameters measured by speckle tracking echo with their clinical significance.	8 Marks	L3	CO3
	b)	Prepare a detailed note on global longitudinal strain.	8 Marks	L3	CO3

(OR)

7.	a)	Outline advantages and limitations of 3D echo.	8 Marks	L2	CO3
	b)	Describe the principles of 3D echo image acquisition.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Draw labelled diagram of mid esophageal TEE views, and describe probe angulation, orientation, diagnostic uses.	8 Marks	L3	CO4
	b)	Describe the complications of transesophageal echo.	8 Marks	L2	CO4

(OR)

9.	a)	Explain the role of dobutamine stress echo in diagnosing valvular heart disease.	8 Marks	L2	CO4
	b)	Apply your knowledge, and prepare a note on how artificial intelligence can be used in echocardiography.	8 Marks	L3	CO4

MODULE-V

10.	a)	Define intravascular ultrasound, and explain its clinical significance.	8 Marks	L2	CO5
	b)	Describe indications and contraindications of intravascular ultrasound.	8 Marks	L2	CO5

(OR)

11.	a)	Explain materials used, and patient preparation for "TAVI" procedure.	8 Marks	L2	CO5
	b)	Summarize vascular access, and procedure of "TAVI".	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

ADVANCED ANAESTHETICS AND SURGICAL PROCEDURE TECHNIQUES

[Anaesthesia & Operation Theatre Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Mention two methods of temperature management during CPB.	2 Marks	L1	CO1
	b)	Give two examples of systemic complications associated with CPB.	2 Marks	L2	CO1
	c)	Give two indications for awake craniotomy.	2 Marks	L1	CO2
	d)	Mention two advantages of awake craniotomy.	2 Marks	L2	CO2
	e)	Mention two postoperative respiratory complications.	2 Marks	L2	CO3
	f)	Define total intravenous anesthesia (TIVA).	2 Marks	L1	CO3
	g)	Define artificial intelligence (AI) in anesthesia.	2 Marks	L1	CO4
	h)	List two current applications of machine learning in anesthesia.	2 Marks	L2	CO4
	i)	Mention two ventilation strategies used in raised ICP.	2 Marks	L2	CO2
	j)	List two anesthetic agents used in neuroanesthesia.	2 Marks	L1	CO2

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe anticoagulation strategies used during CPB and their monitoring.	8 Marks	L3	CO1
	b)	Discuss anesthetic techniques used during cardiopulmonary bypass.	8 Marks	L3	CO1

(OR)

3.	a)	Explain monitoring modalities required during CPB and their importance.	8 Marks	L2	CO1
	b)	Describe the different phases of cardiopulmonary bypass.	8 Marks	L2	CO1

MODULE-II

4.	a)	Describe postoperative care of a neurosurgical patient.	8 Marks	L2	CO2
	b)	Discuss preoperative optimization of patients undergoing neurosurgery.	8 Marks	L3	CO2

(OR)

5.	a)	Describe anesthetic management in patients with raised ICP.	8 Marks	L3	CO2
	b)	Discuss the role of ventilation strategies in ICP management.	8 Marks	L3	CO2

MODULE-III

6.	a)	Discuss preoperative considerations in patients requiring mechanical ventilation.	8 Marks	L3	CO3
	b)	Explain assessment and choice of ventilator in anesthetic practice.	8 Marks	L3	CO3

(OR)

7.	a)	Describe intraoperative management of a mechanically ventilated patient.	8 Marks	L3	CO3
	b)	Discuss initiation, adjustment, and monitoring of mechanical ventilation.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain postoperative considerations and complications in geriatric anesthesia.	8 Marks	L3	CO4
	b)	Discuss delirium and postoperative cognitive dysfunction in elderly patients.	8 Marks	L3	CO4

(OR)

9.	a)	Explain pain management strategies in geriatric patients.	8 Marks	L3	CO4
	b)	Discuss patient safety measures in anesthesia for the elderly.	8 Marks	L4	CO4

MODULE-V

10.	a)	Explain troubleshooting of common problems during mechanical ventilation.	8 Marks	L4	CO3
	b)	Discuss anesthetic considerations during mechanical ventilation.	8 Marks	L3	CO3

(OR)

11.	a)	Define obesity and describe its classification.	8 Marks	L2	CO4
	b)	Discuss medical and lifestyle management of obesity prior to surgery.	8 Marks	L2	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

PRINCIPLES AND PRACTICE OF PERITONEAL DIALYSIS AND TRANSPLANTATION

[Dialysis Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is effective peritoneal surface area?	2 Marks	L1	CO1
	b)	List the factors affecting solute and "UF" removal in pd.	2 Marks	L2	CO1
	c)	Enlist newer peritoneal dialysis fluids.	2 Marks	L2	CO2
	d)	What are the solutions used for peritoneal dialysis?	2 Marks	L3	CO2
	e)	What is tidal peritoneal dialysis?	2 Marks	L3	CO3
	f)	Define peritoneal equilibration test.	2 Marks	L2	CO3
	g)	Mention the causes of fungal peritonitis.	2 Marks	L2	CO4
	h)	Define ultrafiltration failure in peritoneal dialysis.	2 Marks	L1	CO4
	i)	List the risks and complications of the recipient in kidney transplant?	2 Marks	L1	CO5
	j)	What is the significant of thymoglobulin in renal transplantation?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe the physiology of peritoneal transport.	8 Marks	L2	CO1
	b)	Discuss the indications and contraindications of chronic peritoneal dialysis.	8 Marks	L2	CO1

(OR)

3.	a)	Explain in detail about complications of acute peritoneal dialysis.	8 Marks	L3	CO1
	b)	Describe the physiological principles of peritoneal dialysis.	8 Marks	L2	CO1

MODULE-II

4.	a)	Describe the catheter break-in procedures in "CAPD".	8 Marks	L2	CO2
	b)	Discuss in detail about exit site care performed.	8 Marks	L1	CO2

(OR)

5.	a)	Enumerate the currently available "PD" solutions.	8 Marks	L2	CO2
	b)	Illustrate the indications for use of icodextrin.	8 Marks	L1	CO2

MODULE-III

6.	a)	What is "PET"? Explain the transport characteristic of Peritoneum.	8 Marks	L2	CO3
	b)	Explain the different forms of Automated Peritoneal Dialysis.	8 Marks	L3	CO3

(OR)

7.	a)	Enumerate in detail note on types of "PET".	8 Marks	L3	CO3
	b)	Illustrate the causes of fluid overload in "CAPD".	8 Marks	L2	CO3

MODULE-IV

8.	a)	What are the causes of pain during "CAPD" inflow? How will you manage it?	8 Marks	L2	CO4
	b)	Explain in detail about peritonitis.	8 Marks	L2	CO4
		(OR)			
9.	a)	Briefly describe the management of peritonitis based on the culture results.	8 Marks	L3	CO4
	b)	Acute peritonitis in "CAPD" patient.	8 Marks	L3	CO4

MODULE-V

10.	a)	Discuss in detail about patient trained for home peritoneal dialysis?	8 Marks	L3	CO5
	b)	Illustrate the role of a transplant coordinator.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain the contraindications of renal transplantation.	8 Marks	L2	CO5
	b)	Describe the post-transplant management and follow up.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

APPLIED DIALYSIS TECHNOLOGY - III

[Dialysis Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is meant by a renal diet?	2 Marks	L1	CO1
	b)	List any two foods rich in potassium that should be avoided in CKD.	2 Marks	L1	CO1
	c)	Define infection in dialysis patients.	2 Marks	L1	CO2
	d)	List two common infections seen in dialysis patients.	2 Marks	L1	CO2
	e)	Define uremic neuropathy.	2 Marks	L1	CO3
	f)	What is uremic pericarditis?	2 Marks	L1	CO3
	g)	What is a kidney biopsy?	2 Marks	L1	CO4
	h)	Define nephrectomy.	2 Marks	L1	CO4
	i)	Define nutritional anthropometry.	2 Marks	L1	CO5
	j)	List two biochemical markers of nutrition.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe the method of cooking recommended for renal diet patients.	8 Marks	L2	CO1
	b)	Discuss nutritional requirements of a patient on maintenance hemodialysis.	8 Marks	L2	CO1

(OR)

3.	a)	Describe foods to avoid in CKD with reasons.	8 Marks	L2	CO1
	b)	Explain fluid restriction and its importance in dialysis patients.	8 Marks	L2	CO1

MODULE-II

4.	a)	Describe endocrine disturbances in CKD.	8 Marks	L2	CO2
	b)	Explain management strategies.	8 Marks	L2	CO2

(OR)

5.	a)	Explain renal bone disease with causes and diagnosis.	8 Marks	L2	CO2
	b)	Discuss treatment options.	8 Marks	L2	CO2

MODULE-III

6.	a)	Describe nervous system involvement in CRF.	8 Marks	L2	CO3
	b)	Explain uremic encephalopathy.	8 Marks	L2	CO3

(OR)

7.	a)	Explain musculoskeletal complications in CRF.	8 Marks	L2	CO3
	b)	Discuss management strategies of musculoskeletal complications.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain kidney biopsy procedure.	8 Marks	L2	CO4
	b)	Discuss complications and management of kidney biopsy procedure.	8 Marks	L2	CO4
		(OR)			
9.	a)	Describe AV fistula creation.	8 Marks	L2	CO4
	b)	Describe care and maintenance of AV fistula.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain nutritional anthropometric measurements.	8 Marks	L2	CO5
	b)	Discuss their clinical significance.	8 Marks	L2	CO5
		(OR)			
11.	a)	Describe dietary management in renal diseases.	8 Marks	L3	CO5
	b)	Explain stage-wise dietary modification.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

APPLIED CARDIAC CARE TECHNOLOGY

[Cardio Vascular Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Name the three key factors that determine myocardial oxygen demands.	2 Marks	L2	CO1
	b)	Write a brief note on myocardial blood supply.	2 Marks	L2	CO1
	c)	Define T – Pa segment.	2 Marks	L2	CO1
	d)	Draw labelled ECG diagram of "Brugada Type 1 Sign".	2 Marks	L3	CO1
	e)	Define Acute Corpulmonale.	2 Marks	L1	CO2
	f)	Enlist bradyarrhythmia's seen in hyperkalemia.	2 Marks	L2	CO2
	g)	Define M-mode echo.	2 Marks	L1	CO3
	h)	Enlist four applications of M-mode echo.	2 Marks	L2	CO3
	i)	Name the views used to assess mitral valve on TEE.	2 Marks	L2	CO4
	j)	List out four applications of Transesophageal Echocardiography.	2 Marks	L2	CO4

PART - B

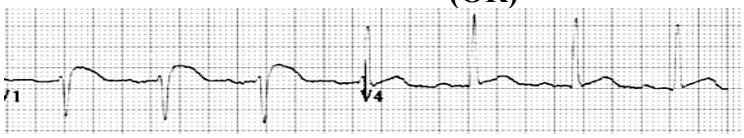
Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

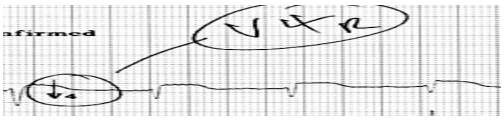
MODULE-I

2.	a)	Explain coronary artery blood supply, and the concept of myocardial ischemia.	8 Marks	L2	CO1
	b)	Tabulate the ECG features difference between "STEMI" and "NSTEMI".	8 Marks	L2	CO1

(OR)

3. a) 

8 Marks L3 CO1



Interpret the ECG findings and explain the typical features to diagnose this MI.

	b)	Explain in detail about mirror image concept in posterior wall MI.	8 Marks	L2	CO1

MODULE-II

4.	a)	Define acute pulmonary embolism, and describe the ECG characteristics seen in acute pulmonary embolism.	8 Marks	L2	CO2
	b)	Describe pre renal acute kidney injury mechanisms and cardiorenal syndrome.	8 Marks	L2	CO2

(OR)

5.	a)	Describe the criteria for a positive, negative, and inconclusive Exercise Stress Test and their clinical significance.	8 Marks	L2	CO2
	b)	Summarize the use of ambulatory ECG monitoring in postoperative and post-myocardial infarction patients.	8 Marks	L2	CO2

MODULE-III

6.	a)	Describe how M-Mode echocardiography is used to assess left ventricular function and their clinical significance.	8 Marks	L2	CO3
	b)	Explain normal M-Mode of the mitral valve and describe abnormal patterns of mitral valve seen in common cardiac diseases with a labelled diagram.	8 Marks	L3	CO3

(OR)

7.	a)	Summarize the role of echo in acute coronary syndrome.	8 Marks	L2	CO3
	b)	Describe the clinical applications and limitations of Color M-Mode echocardiography.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Prepare a detailed note on 2D LV Systolic function assessment by transesophageal echo.	8 Marks	L2	CO4
	b)	Discuss the importance of Transesophageal Echocardiography in the assessment of aortic valve diseases.	8 Marks	L2	CO4

(OR)

9.	a)	Describe interventricular and intraventricular dyssynchrony and their echocardiographic assessment.	8 Marks	L2	CO4
	b)	Discuss the method of acquisition and interpretation of infective endocarditis on TEE.	8 Marks	L3	CO4

MODULE-V

10.	a)	Describe the basic mechanism of ST segment depression and its forms with neat labelled diagram.	8 Marks	L3	CO1
	b)	Define chronic kidney injury and explain the progression of ECG changes seen in hyperkalemia.	8 Marks	L2	CO2

(OR)

11.	a)	Describe the principles, advantages and disadvantages of M- mode echocardiography.	8 Marks	L2	CO3
	b)	Discuss the application of TEE during cardiac arrest and peri-resuscitation in the emergency department.	8 Marks	L3	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

PRINCIPLES OF GENERAL MEDICINE

[Anaesthesia & Operation Theatre Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define 'Icterus'.	2 Marks	L1	CO1
	b)	Define 'Nosocomial infections'.	2 Marks	L1	CO1
	c)	Discuss briefly about serum markers used for acute myocardial infarction (M.I).	2 Marks	L2	CO2
	d)	Describe the usefulness of pulmonary function tests.	2 Marks	L2	CO2
	e)	What is 'Dementia'?	2 Marks	L2	CO3
	f)	Discuss briefly about 'hypocalcemia'.	2 Marks	L2	CO3
	g)	List out any two liver function tests.	2 Marks	L1	CO4
	h)	Define 'Ascites'.	2 Marks	L1	CO4
	i)	Discuss briefly about 'Rheumatoid Factor' (R.F).	2 Marks	L2	CO5
	j)	What is 'Tophi'?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Illustrate various key areas evaluated in the general examination of a patient.	8 Marks	L3	CO1
	b)	Comment in detail about the etiopathogenesis and clinical features of 'Malaria'.	8 Marks	L3	CO1

(OR)

3.	a)	Discuss in detail about the key areas covered while taking the history of present illness (HPI) of a patient and provide an example HPI.	8 Marks	L2	CO1
	b)	Discuss the etiopathogenesis and clinical features of 'Diarrhea'	8 Marks	L2	CO1

MODULE-II

4.	a)	Prepare a detailed note about the clinical features of infective endocarditis.	8 Marks	L3	CO2
	b)	Prepare a detailed note about the clinical features and treatment of bronchial asthma.	8 Marks	L3	CO2

(OR)

5.	a)	Discuss the various causes and organ manifestations of systemic hypertension.	8 Marks	L2	CO2
	b)	Discuss the clinical features and investigations helpful in the diagnosis of pulmonary tuberculosis	8 Marks	L2	CO2

MODULE-III

6.	a)	Discuss in detail about the clinical features and treatment of 'Diabetes mellitus'.	8 Marks	L2	CO3
	b)	Prepare a detailed note on the different investigations that are helpful in diagnosing the 'Diabetes mellitus' and its associated complications.	8 Marks	L3	CO4

(OR)

7.	a)	Describe the clinical features and investigations done for diagnosing 'Hypothyroidism'.	8 Marks	L2	CO4
	b)	Prepare a detailed note about the uses of antiepileptic medications and their side effects.	8 Marks	L3	CO1

MODULE-IV

8.	a)	Describe the clinical features and investigations helpful in diagnosing the acute pancreatitis.	8 Marks	L2	CO4
	b)	Prepare a detailed note about the causes of acute renal failure.	8 Marks	L3	CO4

(OR)

9.	a)	Prepare a detailed note about the causes of gastrointestinal bleeding.	8 Marks	L3	CO4
	b)	Prepare a detailed note about the etiology and clinical features of 'Urinary Tract infections (U.T. I's)'.	8 Marks	L3	CO4

MODULE-V

10.	a)	Prepare a detailed note about the value of blood smear examination in clinical practice.	8 Marks	L3	CO5
	b)	Describe the pre-transfusion work, consent process and post-transfusion monitoring for a patient undergoing an elective major surgery requiring blood.	8 Marks	L2	CO5

(OR)

11.	a)	Write in detail about the clinical features of 'Systemic Lupus Erythematosus (SLE)'.	8 Marks	L2	CO5
	b)	Prepare a detailed note about the radiological findings in a case presenting with arthritic pain.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) VI Semester (MBU-22) Regular Examinations, April – 2026

PRINCIPLES OF GENERAL SURGERY

[Anaesthesia & Operation Theatre Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What are two common complications of a Massive Blood Transfusion protocol?	2 Marks	L1	CO1
	b)	Name two types of shock.	2 Marks	L2	CO1
	c)	List two types of Wounds.	2 Marks	L1	CO2
	d)	Define NPWT.	2 Marks	L1	CO2
	e)	Name the two main types of palate anomalies.	2 Marks	L1	CO3
	f)	Define Lipoma and Neurofibroma.	2 Marks	L1	CO3
	g)	Name the symptoms of Acute Appendicitis.	2 Marks	L1	CO4
	h)	Describe GERD.	2 Marks	L2	CO4
	i)	Where is the most common site for a Pilonidal Sinus?	2 Marks	L1	CO5
	j)	Define BPH.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Differentiate between various types of Biopsy techniques.	8 Marks	L2	CO1
	b)	Explain the usage of anesthesia and pain relief methods in chronic pain management.	8 Marks	L4	CO1

(OR)

3.	a)	Summarize the pathophysiology of septic shock and compare it with two other types of shock.	8 Marks	L2	CO1
	b)	Develop a perioperative management plan for a patient undergoing day-care surgery.	8 Marks	L3	CO1

MODULE-II

4.	a)	Describe the clinical presentation of gas gangrene	8 Marks	L2	CO2
	b)	Differentiate between a keloid and a hypertrophic scar	8 Marks	L2	CO2

(OR)

5.	a)	Discuss the mechanism of frostbite injury	8 Marks	L2	CO2
	b)	Demonstrate how to assess for inhalation injury after a fire	8 Marks	L3	CO2

MODULE-III

6.	a)	Outline the management of a common skin infection.	8 Marks	L3	CO3
	b)	Illustrate the steps for examining a suspected thyroid nodule.	8 Marks	L3	CO3

(OR)

7.	a)	How would you identify the signs of a hemangioma in a newborn?	8 Marks	L3	CO3
	b)	Classify the types of cleft palate and how they affect feeding and speech.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain the pathogenesis of gallstone formation.	8 Marks	L2	CO4
	b)	How do you monitor a surgical drain after an Appendectomy?	8 Marks	L3	CO4

(OR)

9.	a)	What preoperative investigations are needed for a patient with Surgical Jaundice?	8 Marks	L2	CO4
	b)	Describe the anatomy of the esophagus and its surrounding structures.	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss the causes of urethral strictures and the symptoms of obstructive uropathy.	8 Marks	L2	CO5
	b)	Describe the grading system for hemorrhoids and the anatomy of the anal cushions.	8 Marks	L2	CO5

(OR)

11.	a)	Illustrate the bowel preparation protocol for a major colorectal surgery.	8 Marks	L3	CO5
	b)	Demonstrate the correct technique for inserting a Foley catheter.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

ADVANCED EMERGECY AIRWAY AND RESPIRATORY PROCEDURES

[Respiratory Therapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Differentiate between partial and complete airway obstruction.	2 Marks	L1	CO1
	b)	Mention two anatomical differences between adult and pediatric airways.	2 Marks	L1	CO1
	c)	Define Rapid Sequence Intubation .	2 Marks	L1	CO2
	d)	What is a difficult airway?	2 Marks	L1	CO2
	e)	Write a brief note on implantable cardioverter defibrillator.	2 Marks	L1	CO3
	f)	What is the Mallampati score used for?	2 Marks	L1	CO3
	g)	List two signs of severe asthma exacerbation.	2 Marks	L1	CO4
	h)	Define pulmonary edema.	2 Marks	L1	CO4
	i)	Mention two precautions during transport of ventilated patients.	2 Marks	L1	CO5
	j)	Define ventilatory support.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe airway management in trauma patients with cervical spine injury.	8 Marks	L2	CO1
	b)	Explain the steps of systematic airway assessment in emergency patients	8 Marks	L3	CO1

(OR)

3.	a)	Describe causes, signs, and management of partial airway obstruction.	8 Marks	L1	CO1
	b)	Explain i-gel airway device with advantages over other supraglottic devices.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain Rapid Sequence Intubation including preparation, drugs, and complications.	8 Marks	L3	CO2
	b)	Discuss the difficult airway algorithm and management strategies.	8 Marks	L2	CO2

(OR)

5.	a)	Describe supraglottic airway devices with advantages and limitations.	8 Marks	L2	CO2
	b)	Explain cricothyrotomy as an emergency airway procedure.	8 Marks	L2	CO2

MODULE-III

6.	a)	Write notes on cardioversion including its types and procedure.	8 Marks	L2	CO3
	b)	Discuss chemical cardioversion, and commonly used drugs	8 Marks	L2	CO3

(OR)

7.	a)	Describe transvenous pacing, and its indications, procedure, and complications.	8 Marks	L2	CO3
	b)	Compare defibrillation, cardioversion, and pacing.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Write notes on management of severe asthma and COPD exacerbation.	8 Marks	L2	CO4
	b)	Describe pulmonary edema and its emergency management.	8 Marks	L2	CO4

(OR)

9.	a)	Explain pneumothorax, hemothorax, and tension pneumothorax.	8 Marks	L3	CO4
	b)	Discuss management of drowning and smoke inhalation injuries.	8 Marks	L2	CO4

MODULE-V

10.	a)	How would you manage airway challenges in pregnant patients?	8 Marks	L3	CO5
	b)	Explain ventilatory changes and airway considerations in pregnancy.	8 Marks	L3	CO5

(OR)

11.	a)	Discuss legal responsibilities of healthcare providers during airway management.	8 Marks	L3	CO5
	b)	What is a consent and refusal of care in emergencies.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

CLINICAL LABORATORY PRACTICES

[Medical Lab Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define a primary level laboratory.	2 Marks	L1	CO1
	b)	Expand WHO and ICMR.	2 Marks	L1	CO2
	c)	List any two reasons for specimen contamination.	2 Marks	L1	CO3
	d)	What is the main purpose of an SOP in a laboratory?	2 Marks	L1	CO4
	e)	What is non-maleficence?	2 Marks	L1	CO5
	f)	Mention two functions of a secondary level laboratory.	2 Marks	L2	CO1
	g)	What is the main purpose of a biomedical waste room in a laboratory?	2 Marks	L1	CO2
	h)	Mention any two essential details required on specimen labeling.	2 Marks	L2	CO3
	i)	Mention any two types of SOP.	2 Marks	L2	CO4
	j)	Give one example of a laboratory emergency.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe the role and services provided by secondary level laboratories.	8 Marks	L2	CO1
	b)	Compare primary, secondary, and tertiary level laboratories.	8 Marks	L3	CO1

(OR)

3.	a)	Explain the staff and equipment requirements of tertiary level laboratories.	8 Marks	L3	CO1
	b)	Discuss the hierarchical laboratory system in India, with a neat labeled diagram.	8 Marks	L2	CO1

MODULE-II

4.	a)	Write about the functions of the reception and specimen collection areas.	8 Marks	L2	CO2
	b)	Outline the safety measures followed while handling biological samples.	8 Marks	L2	CO2

(OR)

5.	a)	Write about the importance of proper specimen, sample, and slide storage	8 Marks	L2	CO2
	b)	Explain the importance of training programs for laboratory staff.	8 Marks	L3	CO2

MODULE-III

6.	a)	Describe the procedure for maintaining specimen rejection records.	8 Marks	L2	CO3
	b)	Explain safety measures followed while handling infectious specimens.	8 Marks	L3	CO3

(OR)

7.	a)	Outline the essential steps followed before and during specimen collection.	8 Marks	L2	CO3
	b)	Explain the role of laboratory worksheets in routine laboratory work.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Describe the standard format followed in writing an SOP.	8 Marks	L2	CO4
	b)	Explain the characteristics, use, and safety requirements of a BSL-2 laboratory.	8 Marks	L3	CO4

(OR)

9.	a)	Describe the features, uses, and precautions of a BSL-4 laboratory.	8 Marks	L2	CO4
	b)	Explain common laboratory accidents related to biosafety and methods to prevent them.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain the principle of non-maleficence in laboratory and clinical research practices.	8 Marks	L3	CO5
	b)	Describe fire-related accidents in laboratories and their preventive measures.	8 Marks	L2	CO5

(OR)

11.	a)	Explain the objectives and components of internal quality control.	8 Marks	L3	CO5
	b)	Describe tools and techniques used in internal quality control.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) VI Semester (MBU-22) Regular Examinations, April – 2026

INTRODUCTION TO QUALITY AND PATIENT SAFETY

[Medical Lab Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define quality in healthcare and give one example.	2 Marks	L1	CO1
	b)	Define sterilization.	2 Marks	L1	CO2
	c)	Mention the role of plasmids in resistance.	2 Marks	L2	CO3
	d)	Name two components of resource management.	2 Marks	L1	CO4
	e)	What is the PDCA cycle?	2 Marks	L1	CO1
	f)	State two main objectives of quality assurance in healthcare.	2 Marks	L2	CO1
	g)	Mention any two types of Personal Protective Equipment.	2 Marks	L2	CO2
	h)	Name one method by which resistance spreads in bacteria.	2 Marks	L1	CO3
	i)	Define incident command system.	2 Marks	L1	CO4
	j)	What is the purpose of an infection control program?	2 Marks	L2	CO2

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the concept of quality of care and describe its major components in a healthcare setting.	8 Marks	L3	CO1
	b)	Describe the steps of the Quality Improvement cycle with a suitable example.	8 Marks	L2	CO1

(OR)

3.	a)	Describe the structure, process, and outcome indicators used to measure healthcare quality.	8 Marks	L2	CO1
	b)	Explain the importance of NABH accreditation and describe its basic guidelines.	8 Marks	L3	CO1

MODULE-II

4.	a)	Define hand hygiene and explain the techniques and importance in infection prevention.	8 Marks	L3	CO2
	b)	Describe the components of Personal Protective Equipment and their proper use.	8 Marks	L2	CO2

(OR)

5.	a)	Discuss chemical sterilization methods and their advantages and limitations.	8 Marks	L2	CO2
	b)	Explain the principle and procedure of autoclaving. What types of materials are suitable?	8 Marks	L3	CO2

MODULE-III

6.	a)	Define intrinsic resistance and acquired resistance, and compare their mechanisms.	8 Marks	L4	CO3
	b)	Explain how antibiotic resistance spreads between bacteria and describe the role of horizontal gene transfer.	8 Marks	L3	CO3
		(OR)			
7.	a)	Describe barriers to implementing antimicrobial stewardship in hospitals.	8 Marks	L2	CO3
	b)	Explain the tools used in antimicrobial stewardship programs and their applications.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain the principles of on-site disaster management and their application in healthcare settings.	8 Marks	L3	CO4
	b)	Describe the core elements of emergency management and discuss how each component supports the others.	8 Marks	L2	CO4
		(OR)			
9.	a)	Explain the recovery phase in disaster management and its critical components.	8 Marks	L3	CO4
	b)	Discuss rehabilitation and reconstruction strategies post-disaster.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain any four Quality Improvement tools and describe how each tool is used in healthcare.	8 Marks	L3	CO1
	b)	Discuss the importance of standards and norms in maintaining quality in hospitals.	8 Marks	L2	CO1
		(OR)			
11.	a)	What are JCI standards? Explain their role in infection prevention and control.	8 Marks	L3	CO2
	b)	Describe the chain of infection and how infection control practices interrupt it.	8 Marks	L2	CO2

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

BLOOD BANKING AND GENETICS

[Medical Lab Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Who discovered the ABO blood group system?	2 Marks	L1	CO1
	b)	List two immediate complications of blood transfusion.	2 Marks	L1	CO2
	c)	Write any two therapeutic uses of cryoprecipitate.	2 Marks	L2	CO3
	d)	Name the types of RNA.	2 Marks	L1	CO4
	e)	Mention one common source of error in ABO grouping.	2 Marks	L2	CO1
	f)	Mention one use of Rh typing in blood banking.	2 Marks	L2	CO1
	g)	Write any two criteria for selecting a blood donor.	2 Marks	L2	CO2
	h)	What are blood substitutes?	2 Marks	L1	CO1
	i)	What is gene mapping?	2 Marks	L1	CO4
	j)	Elaborate TRALI.	2 Marks	L1	CO2

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe the ABO blood group system, its antigens, and antibodies.	8 Marks	L2	CO1
	b)	Apply Mendelian inheritance to the ABO blood group system and determine the possible offspring blood groups for the following parental genotypes.	8 Marks	L3	CO1

Example 1	Father	Mother
Blood group	A	A
Genotype	AA	AO

Example 2	Father	Mother
Blood group	A	B
Genotype	AO	BO

(OR)

3.	a)	Describe the steps of compatibility testing in blood transfusion.	8 Marks	L2	CO1
	b)	Explain the principle, procedure, and clinical importance of the Weak D (D^u) test.	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain the types, causes, and management of adverse donor reactions.	8 Marks	L3	CO2
	b)	Describe the anticoagulants used for donor blood collection in blood bank.	8 Marks	L2	CO2

(OR)

5.	a)	Write about the pre and post-donation care of a blood donor.	8 Marks	L2	CO2
	b)	Describe in detail blood transfusion reactions.	8 Marks	L2	CO2

MODULE-III

6.	a)	Discuss the preparation, storage, and indications of Fresh Frozen Plasma.	8 Marks	L2	CO3
	b)	Explain hard spin and soft spin centrifugation and describe how they are applied in the preparation of different blood components.	8 Marks	L3	CO3

(OR)

7.	a)	Write about the storage conditions, shelf-life, and transport requirements for all major blood components.	8 Marks	L2	CO3
	b)	Discuss the indications, contraindications, and advantages of whole blood transfusion.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Describe Mendel's laws of inheritance with suitable examples.	8 Marks	L2	CO4
	b)	Describe the structure and function of DNA as the genetic material.	8 Marks	L2	CO4

(OR)

9.	a)	Compare the structure of chromosomes in bacterial and eukaryotic cells.	8 Marks	L3	CO4
	b)	Define genome. Describe the organization of genomes in prokaryotes and eukaryotes.	8 Marks	L2	CO4

MODULE-V

10.	a)	Describe the ABO grouping by the tube method.	8 Marks	L2	CO1
	b)	Explain the major milestones in the evolution of transfusion medicine.	8 Marks	L3	CO1

(OR)

11.	a)	Explain in detail the laboratory investigations of blood transfusion reactions.	8 Marks	L3	CO2
	b)	Name the Transfusion Transmitted Infections. Describe HBsAg testing of donor blood.	8 Marks	L2	CO2

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) VI Semester (MBU-22) Regular Examinations, April – 2026

CYTOGENETICS PROCEDURES AND INTERPRETATIONS

[Medical Lab Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is a karyotype?	2 Marks	L1	CO1
	b)	Mention any two types of banding techniques used in cytogenetics.	2 Marks	L2	CO2
	c)	Give two differences between genetic disorders and congenital disorders.	2 Marks	L1	CO3
	d)	Mention two steps in preparing fetal cells for analysis.	2 Marks	L2	CO4
	e)	Mention two precautions needed while collecting forensic DNA samples.	2 Marks	L2	CO5
	f)	Write the difference between p-arm and q-arm of a chromosome.	2 Marks	L2	CO1
	g)	What does the term "chromosomal aberration" refer to?	2 Marks	L1	CO2
	h)	Mention two causes of genetic disorders.	2 Marks	L2	CO3
	i)	Name two features of Klinefelter syndrome.	2 Marks	L1	CO4
	j)	Write two differences between nuclear DNA and mitochondrial DNA in forensics.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the steps involved in preparing peripheral blood lymphocyte cultures for cytogenetic analysis.	8 Marks	L3	CO1
	b)	Discuss the essential equipment and instruments required in a tissue culture laboratory and outline their functions.	8 Marks	L2	CO1

(OR)

3.	a)	Explain the procedure for preparing a karyotype and discuss its clinical applications.	8 Marks	L3	CO1
	b)	Explain the role of cell culture in identifying chromosomal abnormalities and genetic disorders.	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain any two common chromosome banding methods used in constitutional studies.	8 Marks	L3	CO2
	b)	Describe the common problems encountered during chromosome preparation.	8 Marks	L2	CO2

(OR)

5.	a)	Describe the procedure of harvesting cells for chromosome analysis.	8 Marks	L2	CO2
	b)	Explain the role of mitotic inhibitors during chromosome preparation.	8 Marks	L3	CO2

MODULE-III

6.	a)	Compare autosomal and sex-linked inheritance patterns.	8 Marks	L4	CO3
	b)	Discuss two examples of genetic disorders and their key features.	8 Marks	L2	CO3
		(OR)			
7.	a)	Describe two amino acid metabolism disorders in newborns and their clinical manifestations.	8 Marks	L2	CO3
	b)	Describe two carbohydrate metabolism disorders in newborns and their clinical manifestations.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Describe the clinical features, causes, and cytogenetic findings in Down syndrome.	8 Marks	L2	CO4
	b)	Explain the etiology and chromosomal basis of Turner syndrome.	8 Marks	L3	CO4
		(OR)			
9.	a)	Describe Breakage syndrome, its genetic defect, cytogenetic features, and clinical importance.	8 Marks	L2	CO4
	b)	Describe the importance of early detection of chromosomal disorders in preventing congenital anomalies.	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss the sources of DNA in forensic samples and their advantages.	8 Marks	L2	CO5
	b)	Explain how mitochondrial DNA is used in forensic analysis and its benefits.	8 Marks	L3	CO5
		(OR)			
11.	a)	Discuss the advantages and limitations of using PCR in forensic DNA testing.	8 Marks	L2	CO5
	b)	Describe the steps involved in preparing DNA for PCR amplification.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

ESSENTIALS OF STEM CELL TECHNOLOGY

[Medical Lab Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Mention two types of stem cells found in humans.	2 Marks	L2	CO1
	b)	Name any two features of embryonic stem cells.	2 Marks	L1	CO2
	c)	State two limitations of cloning in humans.	2 Marks	L2	CO3
	d)	Name two key properties of hematopoietic stem cells.	2 Marks	L1	CO4
	e)	Mention one clinical application of liver stem cells.	2 Marks	L2	CO5
	f)	List any two tissues where adult stem cells are found.	2 Marks	L1	CO1
	g)	What are progenitor cells?	2 Marks	L1	CO2
	h)	Name two cell types commonly used in therapeutic cloning.	2 Marks	L1	CO3
	i)	Name two substances that help hematopoietic stem cells grow.	2 Marks	L1	CO4
	j)	Mention one marker used to identify liver stem cells.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe the ethical considerations associated with the use of embryonic stem cells.	8 Marks	L2	CO1
	b)	Discuss the concept of the stem cell niche and its importance.	8 Marks	L2	CO1

(OR)

3.	a)	Explain the importance of culture media in blastocyst culture and the factors influencing its selection.	8 Marks	L3	CO1
	b)	Describe in vitro fertilization (IVF) and its role in obtaining embryonic stem cells.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the concept of transdifferentiation in stem cells with suitable examples.	8 Marks	L3	CO2
	b)	Explain totipotent, pluripotent, and multipotent stem cells, and discuss their developmental relevance.	8 Marks	L3	CO2

(OR)

5.	a)	Discuss adult stem cells, their distribution in the body, and their therapeutic applications.	8 Marks	L2	CO2
	b)	Differentiate between in vivo and in vitro differentiation, and discuss their advantages and limitations.	8 Marks	L2	CO2

MODULE-III

6.	a)	Define therapeutic cloning and explain the general strategy used to produce patient-specific stem cells.	8 Marks	L3	CO3
	b)	Describe the steps of reproductive cloning using somatic cell nuclear transfer (SCNT).	8 Marks	L2	CO3

(OR)

7.	a)	Compare embryonic stem cells and adult stem cells in terms of potency, sources, and therapeutic applications.	8 Marks	L4	CO3
	b)	Define a stem cell niche and explain its importance in therapy and research ethics.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain the advantages and limitations of hematopoietic stem cell transplantation in clinical therapy.	8 Marks	L3	CO4
	b)	Define mesenchymal stem cells and describe their characteristics.	8 Marks	L2	CO4

(OR)

9.	a)	Describe the laboratory methods used to identify and characterize mesenchymal stem cells.	8 Marks	L2	CO4
	b)	Describe the advantages of induced pluripotent stem cells over embryonic stem cells.	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss the molecular factors that regulate skeletal muscle stem cell proliferation and differentiation.	8 Marks	L2	CO5
	b)	Describe the organization of liver stem cells within the liver and explain their role in liver regeneration.	8 Marks	L2	CO5

(OR)

11.	a)	Describe the advantages of using animal models to assess the safety and efficacy of new stem cell therapies.	8 Marks	L2	CO5
	b)	Explain the role of stem cells in repairing damaged tissues and restoring organ functions in human disorders.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

MEDICAL PARASITOLOGY

[Medical Lab Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Mention the type of motility seen in Giardia lamblia.	2 Marks	L2	CO1
	b)	Name two anti-parasitic drugs.	2 Marks	L1	CO1
	c)	List the morphological forms of Trypanosoma.	2 Marks	L1	CO2
	d)	Define hemoflagellates with example.	2 Marks	L1	CO2
	e)	List two prevention measures to be followed to avoid Taenia infections.	2 Marks	L1	CO3
	f)	Name the definitive host and intermediate host of Taenia solium.	2 Marks	L1	CO3
	g)	Name the parasite whose eggs are detected in urine during the chronic stage of infection	2 Marks	L1	CO4
	h)	List the preventive measures to avoid trematode infections.	2 Marks	L1	CO4
	i)	Define larva migrans.	2 Marks	L1	CO5
	j)	What is the diagnostic method used to identify Enterobius vermicularis?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Enumerate the lifecycle, laboratory diagnosis and preventive stratagies of Leishmania donovani.	8 Marks	L2	CO1
	b)	Explain the morphology, lifecycle and laboratory diagnosis of Entamoeba histolytica.	8 Marks	L2	CO1

(OR)

3.	a)	Draw a neat labelled diagram of trophozoite and cyst of Giardia lamblia, discuss the life cycle and laboratory diagnosis of Giardia infection in humans.	8 Marks	L1	CO1
	b)	Discuss the various tests that are used to diagnose parasitic diseases in humans.	8 Marks	L2	CO1

MODULE-II

4.	a)	A patient presents with acute febrile illness associated with chills and rigors. The physician suspects malaria and requests laboratory investigations for screening and confirmation. Enumerate the various laboratory diagnostic methods used for screening and confirmation of malaria.	8 Marks	L3	CO2
	b)	Outline the stepwise procedure for modified Ziehl–Neelsen staining method for stool smear, used for diagnosis of Isospora.	8 Marks	L3	CO2

(OR)

5.	a)	Define hemoflagellates. Describe the life cycle of Trypanosoma cruzi.	8 Marks	L1	CO2
	b)	Discuss the principle and procedure of rapid card test used for diagnosis of malaria infection.	8 Marks	L2	CO2

MODULE-III

6.	a)	Describe the morphology of Echinococcus granulosus and add a note on its life cycle	8 Marks	L2	CO3
	b)	Describe the morphology, mode of transmission and laboratory diagnosis Taenia solium.	8 Marks	L2	CO3

(OR)

7.	a)	Discuss the pathogenesis, clinical features, and laboratory diagnosis of Diphyllobothrium latum.	8 Marks	L2	CO3
	b)	Explain the life cycle of Hymenolepis nana, highlight the mechanism of autoinfection.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Write in detail about life cycle, laboratory diagnosis and prevention of Clonorchis sinensis.	8 Marks	L2	CO4
	b)	Discuss the life cycle and laboratory diagnosis of Schistosoma haematobium.	8 Marks	L2	CO4

(OR)

9.	a)	With the help of a schematic diagram, explain the developmental stages of Paragonimus westermani in intermediate and definitive hosts, highlighting the stages important for laboratory diagnosis.	8 Marks	L3	CO4
	b)	Describe the morphology of Fasciola hepatica. Add a detailed note on the laboratory diagnosis.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain the morphology & lifecycle of Ascaris lumbricoides.	8 Marks	L2	CO5
	b)	Discuss the role of the cellophane tape test in the diagnosis of Enterobius vermicularis infection. i) Principle ii) Procedure iii) Interpretation of results iv) Reasons for repeated sampling	8 Marks	L2	CO5

(OR)

11.	a)	Discuss Trichuris trichiura under the following headings: i) Life cycle ii) Laboratory diagnosis iii) Preventive and control measures	8 Marks	L2	CO5
	b)	Discuss the life cycle & lab diagnosis of Wuchereria bancrofti.	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

NUCLEAR CARDIOLOGY

[Cardio Vascular Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define 'Radioactivity'.	2 Marks	L1	CO1
	b)	Define 'Scintigraphy'.	2 Marks	L1	CO1
	c)	Comment briefly about 'Well counter' used in the nuclear medicine.	2 Marks	L3	CO2
	d)	Define 'Hybrid imaging' in nuclear medicine'.	2 Marks	L1	CO2
	e)	Elaborate 'MUGA'.	2 Marks	L3	CO3
	f)	Mention any two revascularization procedures in cardiology.	2 Marks	L1	CO3
	g)	List the radiotracer molecules used in Cardiac CT imaging.	2 Marks	L1	CO4
	h)	What is 'Black Blood Imaging' technique of Cardiac Magnetic Resonance (CMR).	2 Marks	L2	CO4
	i)	Describe briefly about the significance of Cardiac PET in nuclear medicine.	2 Marks	L2	CO5
	j)	What are the maximum permissible dose levels used in the context of nuclear medicine applications?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Comment in detail about the biological effects of radiation.	8 Marks	L3	CO1
	b)	Describe the physical (somatic) effects of radiation.	8 Marks	L2	CO1

(OR)

3.	a)	Explain the spectrum of myocardial ischemia.	8 Marks	L2	CO1
	b)	Discuss the clinical utility of radiopharmaceuticals for non-cardiac conditions.	8 Marks	L2	CO1

MODULE-II

4.	a)	Illustrate the working principle of an ionization chamber and its specific applications in nuclear medicine.	8 Marks	L3	CO2
	b)	Describe the working mechanism of proportional counter and its specific applications in nuclear medicine.	8 Marks	L2	CO2

(OR)

5.	a)	Discuss various instruments used in radiation survey.	8 Marks	L2	CO2
	b)	Describe in detail about the quality control steps that are taken in nuclear medicine and their functional significance.	8 Marks	L2	CO2

MODULE-III

6.	a)	Discuss how MPI (Myocardial Perfusion Imaging) identifies scar vs hibernating myocardium.	8 Marks	L2	CO3
	b)	Discuss the diagnostic and prognostic value of 'Myocardial Perfusion Imaging (MPI)' in acute coronary disease.	8 Marks	L2	CO3

(OR)

7.	a)	Describe in detail about the contraindications for myocardial perfusion imaging.	8 Marks	L2	CO3
	b)	Discuss the common artifacts and pitfalls that occur during myocardial perfusion imaging and strategies used for accurate interpretation. .	8 Marks	L2	CO3

MODULE-IV

8.	a)	Compare Cardiac CT Angiography (CCTA) over invasive angiography, detailing situations where one is preferred and their limitations.	8 Marks	L3	CO4
	b)	Prepare a detailed note about the preparation of patients to undergo Cardiac MRI scan.	8 Marks	L3	CO4

(OR)

9.	a)	Describe the appropriate indications for cardiac CT for both symptomatic and asymptomatic patients.	8 Marks	L2	CO4
	b)	Prepare a detailed note about the contraindications and alternatives to Cardiac CT..	8 Marks	L3	CO4

MODULE-V

10.	a)	Discuss about the generator produced radionuclides in nuclear medicine with examples.	8 Marks	L2	CO5
	b)	Discuss the key differences of function between PET and SPECT cameras.	8 Marks	L2	CO5

(OR)

11.	a)	Enumerate various protocols used in MPI and write about any one such protocol detailing its potential advantages and limitations.	8 Marks	L3	CO5
	b)	Comment in detail about how Cardiac MRI estimates myocardial viability.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

HOSPITAL AND EMERGENCY ROOM MANAGEMENT

[Emergency Medical and Critical Care Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define leadership in management.	2 Marks	L1	CO1
	b)	What is decision-making in management?	2 Marks	L1	CO1
	c)	Define hospital bed strength.	2 Marks	L1	CO2
	d)	What is triage?	2 Marks	L2	CO2
	e)	Define laboratory services.	2 Marks	L1	CO3
	f)	What is biomedical equipment maintenance?	2 Marks	L2	CO3
	g)	Define marketing in healthcare.	2 Marks	L1	CO4
	h)	What is quality audit?	2 Marks	L2	CO4
	i)	Define health insurance.	2 Marks	L1	CO5
	j)	What is organ donation?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the role of leadership in hospital administration.	8 Marks	L2	CO1
	b)	Describe different types of organizational structures.	8 Marks	L3	CO1
		(OR)			
3.	a)	Discuss planning and decision-making models used in management.	8 Marks	L4	CO1
	b)	Explain the steps involved in staffing and human resource allocation.	8 Marks	L3	CO1

MODULE-II

4.	a)	Elaborate on space and design considerations in hospital architecture.	8 Marks	L2	CO2
	b)	Describe the workflow and staffing pattern in emergency services.	8 Marks	L2	CO2
		(OR)			
5.	a)	Explain the principles of equipment procurement and tendering process.	8 Marks	L3	CO2
	b)	Discuss the importance of clinical departments integration for patient flow.	8 Marks	L3	CO3

MODULE-III

6.	a)	Describe the functions of radiology and imaging services.	8 Marks	L3	CO3
	b)	Explain the role of Central Sterile Supply Department (CSSD) in infection control.	8 Marks	L3	CO3
		(OR)			
7.	a)	Elaborate on hospital supply chain and inventory management.	8 Marks	L1	CO3
	b)	Describe responsibilities of housekeeping and sanitation services.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain conflict management in healthcare organizations.	8 Marks	L3	CO4
	b)	Discuss the role of training and development in workforce improvement.	8 Marks	L2	CO4

(OR)

9.	a)	Explain audit cycle and its applications in quality management.	8 Marks	L2	CO4
	b)	Describe the concept of strategic planning in hospitals.	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss medicolegal significance of documentation in hospitals.	8 Marks	L2	CO5
	b)	Explain the ethics in patient confidentiality and data privacy.	8 Marks	L2	CO5

(OR)

11.	a)	Describe disaster management roles & responsibilities in hospitals.	8 Marks	L4	CO5
	b)	Explain the legal and ethical considerations of telemedicine.	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

NEONATAL AND PEDIATRIC RESPIRATORY CARE

[Respiratory Therapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is the role of the fetal pulmonary circulation in lung development before birth?	2 Marks	L1	CO1
	b)	How does surfactant replacement therapy help in managing neonatal respiratory distress syndrome (RDS)?	2 Marks	L3	CO1
	c)	What is "grunting" during neonatal auscultation?	2 Marks	L1	CO2
	d)	List any two indications ,Why you need to measure ABG for neonates.	2 Marks	L3	CO2
	e)	Define Respiratory acidosis.	2 Marks	L2	CO3
	f)	List any two causes for respiratory distress syndrome.	2 Marks	L2	CO3
	g)	What is pulmonary hypertension?	2 Marks	L1	CO4
	h)	What is neonatal care in NICU?	2 Marks	L1	CO4
	i)	Define nasal cannula.	2 Marks	L2	CO5
	j)	Write any two uses of oxygen hood.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	What special considerations should be taken into account regarding medication use and breathing exercises for pregnant women with asthma?	8 Marks	L3	CO1
	b)	List out the contraindications and indications of using oral corticosteroids.	8 Marks	L3	CO1

(OR)

3.	a)	Table down the tapering of hydrocortisone and prednisone dosage according to the protocol of tapering doses.	8 Marks	L2	CO1
	b)	Differentiate between a mild flare-up and a severe asthma attack that requires emergency medical attention.	8 Marks	L3	CO1

MODULE-II

4.	a)	Describe the process and significance of auscultation in neonatal respiratory assessment.	8 Marks	L3	CO2
	b)	Discuss Respiratory distress syndrome in neonates.	8 Marks	L2	CO2

(OR)

5.	a)	Differentiate between neonatal respiratory distress syndrome (RDS) and transient tachypnea of the newborn (TTN).	8 Marks	L3	CO2
	b)	How do you manage a neonate with suspected meconium aspiration syndrome (MAS)?	8 Marks	L2	CO2

MODULE-III

6.	a)	Describe Respiratory Distress Syndrome (RDS): Pathophysiology, Risk Factors, and Diagnosis	8 Marks	L2	CO3
	b)	What is Surfactant Therapy? Describe the mechanical ventilation in neonates with respiratory distress syndrome (RDS).	8 Marks	L2	CO3

(OR)

7.	a)	What is Transient Tachypnoea of the Newborn (TTN)? write its Causes, and Clinical Features.	8 Marks	L3	CO3
	b)	Describe Meconium Aspiration Syndrome (MAS).	8 Marks	L2	CO3

MODULE-IV

8.	a)	What are the special considerations for the mechanical ventilator settings for neonates.	8 Marks	L2	CO4
	b)	Chart down the criteria for weaning from mechanical ventilator in pediatrics.	8 Marks	L3	CO4

(OR)

9.	a)	Discuss how to maintain a patent airway in neonates with tracheotomies, including the importance of humidification.	8 Marks	L2	CO4
	b)	Explain proper suctioning techniques and how to prevent complications such as infections and tracheal trauma?	8 Marks	L3	CO4

MODULE-V

10.	a)	Discuss the oxygen therapy, its Indications, methods of administration, and monitoring in neonates.	8 Marks	L2	CO5
	b)	Describe the role of nasal cannula in neonatal oxygen therapy.	8 Marks	L2	CO5

(OR)

11.	a)	Mention the use of “Oxygen Hood’ n neonates and explain its flow/min and its indication.	8 Marks	L2	CO5
	b)	What is an incubator? Mention the role of incubators for pre matured babies.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

EMERGENCY ORTHOPAEDICS - II

[Emergency Medical and Critical Care Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Prepare a note on clenched fist injuries.	2 Marks	L1	CO1
	b)	List out typical mechanism of injury for a scaphoid fracture.	2 Marks	L2	CO1
	c)	What is compartment syndrome?	2 Marks	L1	CO2
	d)	Mention any three ligaments in human body.	2 Marks	L2	CO2
	e)	What are the indications for immediate needle decompression in a trauma patient?	2 Marks	L1	CO3
	f)	List out the common causes of vascular injuries.	2 Marks	L2	CO3
	g)	Define primary survey.	2 Marks	L1	CO4
	h)	Expand SAMPLE.	2 Marks	L2	CO4
	i)	Write down the parts of snuffbox bone in hand.	2 Marks	L2	CO5
	j)	What are the common causes of mallet finger?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe Bennett's fracture including its mechanism, clinical features, diagnosis, and treatment.	8 Marks	L3	CO1
	b)	What are the common causes of metacarpal fractures? Write a brief note of treatment.	8 Marks	L2	CO1

(OR)

3.	a)	Explain flexor tendon injuries, and its management.	8 Marks	L2	CO1
	b)	Elaborate the three main groups of bones in the human hand.	8 Marks	L3	CO1

MODULE-II

4.	a)	How do ligaments differ from tendons? What types of collagens are found in ligaments, and what roles do they play?	8 Marks	L3	CO2
	b)	Classify types of injuries that commonly affect the femoral condyles.	8 Marks	L2	CO2

(OR)

5.	a)	Enumerate three types of muscle injury, and explain its management.	8 Marks	L2	CO2
	b)	Explain the acromioclavicular Joint Sprain and scapholunate ligament Tear.	8 Marks	L2	CO2

MODULE-III

6.	a)	Outline the precautions should be taken to protect ourself when controlling bleeding and add a note on circulation.	8 Marks	L3	CO3
	b)	List out the main objectives of the primary survey in trauma care.	8 Marks	L2	CO3

(OR)

7.	a)	Explain the anatomy of muscle and ligament with a neat diagram.	8 Marks	L3	CO3
	b)	Distinguish sprain and strain.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Describe primary survey in trauma patient.	8 Marks	L2	CO4
	b)	Elaborate on vascular injury.	8 Marks	L3	CO4

(OR)

9.	a)	Explain spinal cord injury.	8 Marks	L2	CO4
	b)	Explain anatomy of spinal cord with a neat diagram.	8 Marks	L3	CO4

MODULE-V

10.	a)	Elaborate primary survey in paediatrics.	8 Marks	L3	CO5
	b)	Describe immobilization.	8 Marks	L3	CO5

(OR)

11.	a)	Explain log roll management.	8 Marks	L2	CO5
	b)	Define splinting and classify its types.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences). VI Semester (MBU-22) Regular Examinations, April – 2026

EMERGENCY MEDICINE-II

[Emergency Medical and Critical Care Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	List out any four symptoms of hematuria.	2 Marks	L2	CO1
	b)	Prepare a brief note on management of urolithiasis.	2 Marks	L1	CO1
	c)	How do you manage acute myelogenous leukemia?	2 Marks	L1	CO2
	d)	Prepare a brief note on aplastic anemia.	2 Marks	L1	CO2
	e)	Write any four causes of vomiting.	2 Marks	L2	CO3
	f)	Prepare a brief note on insulin management in DKA.	2 Marks	L1	CO3
	g)	Write any four examples of autoimmune disorders.	2 Marks	L1	CO4
	h)	Define acute erythroderma.	2 Marks	L1	CO4
	i)	List out any four symptoms of chicken pox.	2 Marks	L2	CO5
	j)	Define tetanus.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe the clinical presentation, diagnosis, and management of a patient with a urolithiasis.	8 Marks	L2	CO1
	b)	Differentiate between microscopic and gross hematuria based on clinical features, laboratory findings, and potential causes.	8 Marks	L3	CO1

(OR)

3.	a)	Enumerate the treatment options for end-stage renal failure, and how effective is kidney transplantation?	8 Marks	L3	CO1
	b)	What are the common causes of urinary tract infections and how can urinary tract infections be diagnosed?	8 Marks	L2	CO1

MODULE-II

4.	a)	Define pernicious anemia and explain its etiology, clinical manifestations, diagnostic techniques, and treatment.	8 Marks	L3	CO2
	b)	What are the causes of secondary polycythemia, and how is it differentiated from primary polycythemia?	8 Marks	L2	CO2

(OR)

5.	a)	Distinguish acute and chronic lymphocytic leukemia.	8 Marks	L3	CO2
	b)	Explain the concept of hemolytic anemia. What are its causes, and how is it managed?	8 Marks	L2	CO2

MODULE-III

6.	a)	Discuss the management of Diabetic Ketoacidosis (DKA), including fluid resuscitation, insulin therapy, and electrolyte correction.	8 Marks	L2	CO3
	b)	What are the causes and management strategies for diarrhea in immunocompromised patients?	8 Marks	L2	CO3

(OR)

7.	a)	Elaborate on thyroid crisis.	8 Marks	L3	CO3
	b)	Explain the management of acute vomiting, including pharmacological and non-pharmacological treatments.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss the various treatment options available for severe pruritus, including topical, systemic, and alternative therapies.	8 Marks	L2	CO4
	b)	Summarize the complications of untreated scabies, and how can secondary bacterial infections develop?	8 Marks	L3	CO4

(OR)

9.	a)	Define leprosy and explain "Ridley-Jopling classification."	8 Marks	L2	CO4
	b)	Discuss the diagnostic criteria and laboratory tests used to confirm SLE.	8 Marks	L2	CO4

MODULE-V

10.	a)	Elaborate pathophysiology and risk factors of tuberculosis.	8 Marks	L3	CO5
	b)	Describe the prevention and control measures for dengue fever.	8 Marks	L2	CO5

(OR)

11.	a)	Define AIDS and explain its risk factors.	8 Marks	L3	CO5
	b)	Explain the stages of measles with management.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

DYNAMIC RESPIRATORY FUNCTION ASSESMENT TECHNIQUE

[Respiratory Therapy Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is the function of helium dilution method?	2 Marks	L1	CO1
	b)	Mention any two indications for pulmonary function testing.	2 Marks	L2	CO1
	c)	What is the difference between FVC and SVC?	2 Marks	L1	CO2
	d)	Define Maximum Voluntary Ventilation.	2 Marks	L2	CO2
	e)	Write down the formula for HDM.	2 Marks	L2	CO3
	f)	What is the principle of lung volumes?	2 Marks	L1	CO3
	g)	Define restrictive ventilatory defect.	2 Marks	L3	CO4
	h)	What is a mixed ventilatory defect?	2 Marks	L1	CO4
	i)	What is meant by a restrictive ventilatory defect?	2 Marks	L1	CO5
	j)	Define mixed ventilatory defect.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the clinical indications for spirometry.	8 Marks	L3	CO1
	b)	Describe the limitations of spirometry in pulmonary function testing.	8 Marks	L2	CO1

(OR)

3.	a)	Explain the infection control measures in a pulmonary function laboratory.	8 Marks	L2	CO1
	b)	Write a detailed note on patient safety protocols during pulmonary function testing.	8 Marks	L2	CO1

MODULE-II

4.	a)	Describe the procedure for bronchodilator reversibility testing.	8 Marks	L3	CO2
	b)	Discuss the indications and limitations of MVV testing.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the clinical significance of bronchodilator reversibility testing in asthma and COPD.	8 Marks	L2	CO2
	b)	Describe the factors affecting spirometry results.	8 Marks	L3	CO2

MODULE-III

6.	a)	Describe the advantages and limitations of the Helium Dilution Method in lung volume measurement.	8 Marks	L3	CO3
	b)	Explain the physiological basis of diffusion across the alveolar-capillary membrane.with a suitable diagram.	8 Marks	L3	CO3

(OR)

7.	a)	Discuss the structure and function of the alveolar-capillary membrane in gas diffusion.with a suitable diagram.	8 Marks	L2	CO3
	b)	Explain the principle and clinical importance of DLCO measurement.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Describe the characteristics and interpretation of obstructive ventilatory defects.	8 Marks	L2	CO4
	b)	Discuss the diagnostic criteria and interpretation of mixed ventilatory defects.	8 Marks	L3	CO4

(OR)

9.	a)	Describe the risk factors associated with postoperative pulmonary complications.	8 Marks	L2	CO4
	b)	Illustrate SVC, MVV Wave form, with a detailed description.	8 Marks	L3	CO4

MODULE-V

10.	a)	Discuss the interpretation of DLCO in pulmonary vascular disorders.	8 Marks	L2	CO5
	b)	Describe the principles and clinical applications of exercise-induced respiratory function testing.	8 Marks	L3	CO5

(OR)

11.	a)	Explain the methods used to assess respiratory function during exercise testing.	8 Marks	L3	CO5
	b)	Discuss the special considerations for pulmonary function testing in pediatric patients.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

SYSTEMATIC BACTERIOLOGY

[Medical Lab Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Write the examples of catalase positive & catalase negative bacteria?	2 Marks	L1	CO1
	b)	Classify bacteria based on gram staining technique.	2 Marks	L1	CO1
	c)	Define septicemia.	2 Marks	L1	CO2
	d)	Name four sexually transmitted diseases.	2 Marks	L1	CO2
	e)	Define swarming, how do we inhibit swarming.	2 Marks	L1	CO3
	f)	Name two special media used for Shigella.	2 Marks	L1	CO3
	g)	Name four diseases caused by Clostridium perfringens.	2 Marks	L1	CO4
	h)	Classify Tuberculosis, List the diseases under it.	2 Marks	L1	CO4
	i)	Name four infections caused by Pseudomonas.	2 Marks	L1	CO5
	j)	Write note on Neil-mooser reaction.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Enumerate the procedure & modifications of ZN stain.	8 Marks	L3	CO1
	b)	Explain indole test under following headings i) Principle, ii) Procedure, iii) Examples	8 Marks	L2	CO1

(OR)

3.	a)	Explain the principle, procedure of albert's staining with examples.	8 Marks	L3	CO1
	b)	Describe the principle, procedure, examples of citrate utilization test.	8 Marks	L3	CO1

MODULE-II

4.	a)	What is satelliteism? Name the bacteria showing satelliteism and lab diagnosis of the same?	8 Marks	L3	CO2
	b)	Name two bacteria causing pyogenic lesions? Explain the lab diagnosis of staphylococcus aureus.	8 Marks	L1	CO2

(OR)

5.	a)	Describe the morphology, cultural characteristics, diseases caused & laboratory diagnosis of Neisseria meningitides.	8 Marks	L4	CO2
	b)	Name four sexually transmitted diseases, explain the laboratory diagnosis of Neisseria gonorrhoeae.	8 Marks	L3	CO2

MODULE-III

6.	a)	Discuss the factors contributing to the spread of Shigella infection, add note on pathogenesis, lab diagnosis of Shigella.	8 Marks	L3	CO3
	b)	Classify spirochete. Describe the pathogenesis and laboratory diagnosis of syphilis.	8 Marks	L3	CO3
		(OR)			
7.	a)	Define Nosocomial infections, list for agents causing nosocomial infections, enumerate the lab diagnosis of Klebsiella.	8 Marks	L3	CO3
	b)	Define zoonosis? Name four zoonotic diseases explain the lab diagnosis of Yersenia pestis.	8 Marks	L3	CO3
		MODULE-IV			
8.	a)	Describe the morphology, cultural characteristics, disease caused & lab diagnosis of anthrax bacilli.	8 Marks	L2	CO4
	b)	Enumerate the procedure & interpretation for Standard tube agglutination test.	8 Marks	L3	CO4
		(OR)			
9.	a)	Discuss the mode of transmission, risk factors, pathogenesis and lab diagnosis of Mycobacterium tuberculosis.	8 Marks	L2	CO4
	b)	Explain the morphology, cultural characteristics of Mycobacterium tuberculosis, add note on Anti tubercular drugs & prophylaxis of Pulmonary tuberculosis.	8 Marks	L2	CO4
		MODULE-V			
10.	a)	Define nosocomial infection, name four agents causing nosocomial infection, describe the lab diagnosis of Pseudomonas.	8 Marks	L3	CO5
	b)	Write brief note on sample collection methods, prophylaxis of Bordetella pertusis.	8 Marks	L3	CO5
		(OR)			
11.	a)	List the Predominant factors responsible for Pseudomonas aeruginosa causing hospital acquired infections, add note on control measures to combat hospital acquired infections.	8 Marks	L3	CO5
	b)	Describe the general characteristics, morphology of Rickettsiae, add note on lab diagnosis of Murine typhus.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

HAEMATOLOGY-II

[Medical Lab Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Which of the condition MCV and MCHC Normal but RBC is less?	2 Marks	L1	CO1
	b)	List the causes of iron deficiency.	2 Marks	L1	CO1
	c)	Which of the methods used for estimation of ESR?	2 Marks	L1	CO2
	d)	What is composition of Hayems fluid?	2 Marks	L1	CO2
	e)	How many differential cells count in the DLC, and add normal interpretation?	2 Marks	L1	CO3
	f)	Write short note on Oxyhemoglobin.	2 Marks	L1	CO3
	g)	What is the pleural fluid?	2 Marks	L1	CO4
	h)	Write short note on autoimmune disease.	2 Marks	L1	CO4
	i)	Write symptoms of buerger's disease.	2 Marks	L1	CO5
	j)	Write full form of UFH.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Write a brief note on following WBCs' Disorders. Pelger-Huet Anomaly and Alder-Reilly Anomaly	8 Marks	L3	CO1
	b)	Explain the clinical features in neutropenia.	8 Marks	L2	CO1
		(OR)			
3.	a)	Explain the atypical lymphocytes disorders.	8 Marks	L3	CO1
	b)	Classify the differential leukocytes, and explain morphology of DLC.	8 Marks	L3	CO1

MODULE-II

4.	a)	How would you Estimate absolute eosinophils count by using hemocytometer?	8 Marks	L3	CO2
	b)	How would you utilize hemocytometer for blood cell counting and add suitable diagram?	8 Marks	L4	CO2
		(OR)			
5.	a)	Solve below problem of the total WBC count by using standard formula. box 1:30, Box 2: 25, Box 3: 45, and Box 4: 35.	8 Marks	L4	CO2
	b)	How would you estimate erythrocyte sedimentation rate by Westergren method?	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain the sample collection and test procedure of hemoglobin color scale method.	8 Marks	L3	CO3
	b)	List the hemoglobin estimation methods and write the sahli's method in detailed.	8 Marks	L3	CO3

(OR)

7.	a)	What are the steps involved in semen specimen collection for analysis?	8 Marks	L3	CO3
	b)	Explain the semen motility test in detailed.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Discuss on toxic granulation of neutrophil.	8 Marks	L2	CO4
	b)	Explain the abnormal neutrophil of *toxic vacuolation* and *Döhle Bodies*.	8 Marks	L3	CO4

(OR)

9.	a)	Illustrate the thoracentesis procedure and add suitable diagram.	8 Marks	L2	CO4
	b)	List the what are the tests can be performed by CSF specimen.	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss on clinical symptoms of thrombosis.	8 Marks	L3	CO5
	b)	Summarize the hyper fibrinolysis.	8 Marks	L3	CO5

(OR)

11.	a)	Explain the types of anticoagulants used for bleeding disorders and add note on M/40 Calcium chloride reagents preparation.	8 Marks	L3	CO5
	b)	Determine the types, causes and diagnosis of thrombosis.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

IMMUNOLOGY AND BACTERIAL SEROLOGY

[Medical Lab Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Name the antibodies involved in acute & chronic infections.	2 Marks	L2	CO1
	b)	List four nosocomial infections.	2 Marks	L1	CO1
	c)	Define precipitation reaction.	2 Marks	L3	CO2
	d)	List four tube agglutination test.	2 Marks	L1	CO2
	e)	Define immunodeficiency.	2 Marks	L3	CO3
	f)	Name the types of immune responses produced in the body.	2 Marks	L1	CO3
	g)	Define autoimmunity.	2 Marks	L2	CO4
	h)	List four autoimmune diseases.	2 Marks	L3	CO4
	i)	Name four serological tests performed by slide agglutination method.	2 Marks	L2	CO5
	j)	List four infectious agents transmitted via blood transfusion.	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Define monoclonal antibodies, explain the production and clinical applications of monoclonal antibodies.	8 Marks	L2	CO1
	b)	Add note on superantigens.	8 Marks	L3	CO1

(OR)

3.	a)	Define antibody, draw a neat labelled diagram of antibody, add note on IgG.	8 Marks	L1	CO1
	b)	Discuss the clinical applications of immunoglobulins, explain any two.	8 Marks	L3	CO1

MODULE-II

4.	a)	Classify immune response, add note on T cell maturation.	8 Marks	L1	CO2
	b)	Discuss the procedure and interpretation on direct coombs test.	8 Marks	L3	CO2

(OR)

5.	a)	Define fluorescence, write the clinical applications immunofluorescence test, explain sandwich immunofluorescence test.	8 Marks	L3	CO2
	b)	Discuss the procedure and interpretation on indirect coombs test.	8 Marks	L1	CO2

MODULE-III

6.	a)	Explain the various phases of antibody production during primary immune response with graphical representation.	8 Marks	L2	CO3
	b)	Explain cellular immune response.	8 Marks	L3	CO3

(OR)

7.	a)	Describe the various cells of immune system and add note on its functions.	8 Marks	L3	CO3
	b)	Define and classify immunodeficiency diseases. Explain humoral immunodeficiency diseases.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Explain the mechanism of serumsickness.	8 Marks	L3	CO4
	b)	List the clinical features seen in anaphylaxis, explain passive cutaneous anaphylaxis.	8 Marks	L3	CO4

(OR)

9.	a)	Enumerate delayed hypersensitivity reaction, explain the reaction to poison oak.	8 Marks	L3	CO4
	b)	Explain the clinical condition & mechanism of Myasthenia gravis.	8 Marks	L1	CO4

MODULE-V

10.	a)	List the clinical features in graft vs host reactions, explain sites at which allografts survive from immunological attack.	8 Marks	L1	CO5
	b)	Describe the principle of ABO blood grouping.	8 Marks	L3	CO5

(OR)

11.	a)	Describe the procedure to perform HIV tridot test with interpretation.	8 Marks	L3	CO5
	b)	Describe immunosurveillance. List the mechanisms of escape of immunosurveillance.	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

APPLIED HISTOPATHOLOGY

[Medical Lab Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is the gross examination?	2 Marks	L2	CO1
	b)	Define Histopathology.	2 Marks	L1	CO1
	c)	Write brief note on tissue floating bath.	2 Marks	L3	CO2
	d)	Write the safety precautions for pathological specimens.	2 Marks	L1	CO2
	e)	Name any two equipment's that used for staining procedure.	2 Marks	L3	CO3
	f)	Write a short note on dyes.	2 Marks	L1	CO3
	g)	What is temperature of cryostat microtome?	2 Marks	L2	CO4
	h)	Write full form PTAH add note on Principle of it.	2 Marks	L3	CO4
	i)	Name any four stains which are used in histopathology lab.	2 Marks	L2	CO5
	j)	Write a brief note on Ionic binding.	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the basic concept and routine methods of tissue examination.	8 Marks	L2	CO1
	b)	Discuss the characteristics for Ideal fixatives and explain it.	8 Marks	L3	CO1
		(OR)			
3.	a)	How would you label histopathological specimens?	8 Marks	L1	CO1
	b)	Explain the types of biopsy procedures its important.	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain the celloidin Embedding and its disadvantages.	8 Marks	L4	CO2
	b)	Determine the automation tissue procedure schedule and add brief note on advantages of it.	8 Marks	L4	CO2
		(OR)			
5.	a)	Illustrate the honing and stropping procedure.	8 Marks	4	CO2
	b)	Demonstrate the instrumentation of microtome.	8 Marks	L1	CO2

MODULE-III

6.	a)	Explain classification of dye based on their action on tissue.	8 Marks	L2	CO3
	b)	Demonstrate the trouble shooting in H&E Stain.	8 Marks	L3	CO3
		(OR)			
7.	a)	Explain the automatic cover slipper and add note on advantages of it.	8 Marks	L3	CO3
	b)	Write the composition and preparation of Glycerin jelly, Apathy's medium and Highman's modification of Apathy's medium.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Write Clinical significance, method, principle and reagents to determine connective tissue staining.	8 Marks	L3	CO4
	b)	Write the principle, reagents, procedure, precautions and result of silver nitrate method.	8 Marks	L3	CO4

(OR)

9.	a)	Explain the general working procedure of cryostat.	8 Marks	L3	CO4
	b)	Which of the tissue particle observed by Weigert-van Gieson stain, explain the procedure and interpretation?	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain the periodic acid-schiff stain.	8 Marks	L1	CO5
	b)	How would you prepare tissue for electron microscopy?	8 Marks	L3	CO5

(OR)

11.	a)	Explain the scanning electron microscope and Transmission electron microscope.	8 Marks	L3	CO5
	b)	How would you prepare specimen for museum?	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

MOLECULAR BIOLOGY IN LABORATORY MEDICINE

[Medical Lab Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Name the components of the Lac operon.	2 Marks	L1	CO1
	b)	What is DNA mutation?	2 Marks	L1	CO1
	c)	Define Nucleic Acid Hybridization.	2 Marks	L1	CO2
	d)	What is a liquid-phase hybridization assay?	2 Marks	L1	CO2
	e)	What is the clinical significance of PCR?	2 Marks	L1	CO3
	f)	Name two essential components of a PCR reaction.	2 Marks	L1	CO3
	g)	What is radioactive probe labeling?	2 Marks	L1	CO4
	h)	What is non-radioactive probe labeling?	2 Marks	L1	CO4
	i)	What is Strand displacement amplification?	2 Marks	L1	CO5
	j)	What is the principle of Cleavage/Invader technology?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the Tryptophan Operon.	8 Marks	L2	CO1
	b)	Compare Base Excision Repair with Double-Strand Break Repair.	8 Marks	L2	CO1
		(OR)			
3.	a)	Explain the regulation of gene expression in prokaryotes.	8 Marks	L2	CO1
	b)	Describe the operation of the Lac Operon.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the procedure for performing a Northern blot.	8 Marks	L2	CO2
	b)	Explain the procedure for performing a Western blot.	8 Marks	L2	CO2
		(OR)			
5.	a)	Compare and contrast Southern, Northern, and Western blotting techniques.	8 Marks	L2	CO2
	b)	Differentiate between liquid-phase and solid-support hybridization assays.	8 Marks	L2	CO2

MODULE-III

6.	a)	Describe the practical applications of PCR in research.	8 Marks	L2	CO3
	b)	Explain the principle and procedure of nested PCR.	8 Marks	L2	CO3
		(OR)			
7.	a)	Explain how to determine the length of a cDNA product.	8 Marks	L2	CO3
	b)	Describe the equipment used for PCR.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain the DNA-Probe methodology.	8 Marks	L2	CO4
	b)	Describe the Fluorescent in situ hybridization technique.	8 Marks	L2	CO4

(OR)

9.	a)	Describe the principle and application of multiplex PCR.	8 Marks	L2	CO4
	b)	Compare radioactive and non-radioactive probe labeling.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain the concept of signal amplification methods.	8 Marks	L2	CO5
	b)	Describe the technology and application of hybridization arrays.	8 Marks	L2	CO5

(OR)

11.	a)	Explain the advantages of isothermal amplification methods like NASBA.	8 Marks	L2	CO5
	b)	Describe the mechanism of Nucleic acid sequence-based amplification.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T IV Semester (MBU-22) Regular Examinations, June – 2026

ERGONOMICS AND HEALTH PROMOTION

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define COG, LOG.	2 Marks	L1	CO1
	b)	What is NIOSH?	2 Marks	L1	CO1
	c)	Define disc sequestration.	2 Marks	L1	CO2
	d)	Why is the shoulder joint more prone to dislocation?	2 Marks	L2	CO2
	e)	Name the psychomotor tests in measuring fatigue.	2 Marks	L1	CO3
	f)	What is monotomy allowances?	2 Marks	L2	CO3
	g)	Identify challenges in promoting community health.	2 Marks	L1	CO4
	h)	Define circuit training.	2 Marks	L1	CO4
	i)	What are the risk factors of hamstring strain?	2 Marks	L1	CO2
	j)	How does environmental design affect productivity?	2 Marks	L1	CO3

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Enumerate about circulatory system of heart.	8 Marks	L2	CO1
	b)	Explain about conduction system of heart.	8 Marks	L1	CO1
		(OR)			
3.	a)	How do human body systems contribute to ergonomic design?	8 Marks	L1	CO1
	b)	Elaborate about the tests for hearing.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the effects of aging on musculoskeletal health.	8 Marks	L2	CO2
	b)	Name and describe different types of fractures in long bones.	8 Marks	L2	CO2
		(OR)			
5.	a)	What are the common workplace activities, signs and symptoms, diagnosis of carpal tunnel syndrome?	8 Marks	L1	CO2
	b)	Analyze the effect of muscle imbalance on joint stability and injury risk.	8 Marks	L4	CO2

MODULE-III

6.	a)	Describe the principles for designing the workplace.	8 Marks	L1	CO3
	b)	Predict the key challenges of managing shift work in hospitals.	8 Marks	L3	CO3
		(OR)			
7.	a)	How can environmental design reduce workplace fatigue and discomfort?	8 Marks	L1	CO3
	b)	Evaluate the measurements of mental work load.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss about the health promotion in rural settings.	8 Marks	L2	CO4
	b)	Explain the role of physiotherapist in health promotion.	8 Marks	L2	CO4
		(OR)			
9.	a)	Describe in detail about the barriers of physical activity.	8 Marks	L2	CO4
	b)	Compare and contrast the effects of aging on physiological functions.	8 Marks	L3	CO4
		MODULE-V			
10.	a)	What is lever? Explain types of levers with one example.	8 Marks	L2	CO1
	b)	Write about principles of anthropometric design.	8 Marks	L1	CO1
		(OR)			
11.	a)	Explain the relationship between body metabolism and energy expenditure.	8 Marks	L2	CO4
	b)	How does the holistic approach of physiotherapy contribute to overall health promotion?	8 Marks	L2	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T. IV Semester (MBU-22) Regular Examinations, June – 2026

PHARMACOLOGY

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define the terms Drug and Pharmacology.	2 Marks	L2	CO1
	b)	How the drug metabolites are eliminated from the body?	2 Marks	L2	CO1
	c)	Write the mechanism of action of metoprolol.	2 Marks	L2	CO2
	d)	Give a summary on atypical antidepressants.	2 Marks	L2	CO2
	e)	List out various drugs used in spasticity.	2 Marks	L1	CO3
	f)	Write the indications of Diuretics.	2 Marks	L3	CO3
	g)	What are the indications of beta blockers?	2 Marks	L3	CO4
	h)	Prepare a note on mechanism of action of digoxin.	2 Marks	L3	CO4
	i)	List out the side effects of NSAID's.	2 Marks	L2	CO5
	j)	Mention about the mechanism of action of proton pump inhibitors.	2 Marks	L2	CO6

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss in detail about Adrenergic drugs.	8 Marks	L3	CO1
	b)	Summarize the phenomena of drug absorption and add a short note on factors affecting it.	8 Marks	L2	CO1

(OR)

3.	a)	Relate how the drug lithium managing the mood disorders and add a brief note on its side effects.	8 Marks	L2	CO2
	b)	Explain in detail about distribution of drugs.	8 Marks	L3	CO2

MODULE-II

4.	a)	Mention a detail note on antiparkinsonian drugs.	8 Marks	L4	CO3
	b)	Extend the pharmacology of benzodiazepines in epilepsy management.	8 Marks	L2	CO3

(OR)

5.	a)	Elaborate the pharmacology of anticonvulsants.	8 Marks	L6	CO3
	b)	Justify the pharmacological role of dopamine precursor levodopa in parkinson's disease.	8 Marks	L5	CO3

MODULE-III

6.	a)	Relate the role of diuretics in the management of hypertension and add a brief note on its side effects.	8 Marks	L2	CO4
	b)	Explain in detail about drugs used for peripheral vascular disease.	8 Marks	L3	CO4

(OR)

7.	a)	Write an overview on drugs used in the treatment of heart failure.	8 Marks	L2	CO4

	b)	Formulate the pharmacological responses, indications and contraindications of central acting alpha agonist.	8 Marks	L6	CO4

MODULE-IV

8.	a)	Discuss the mechanism of action, pharmacological actions, indications and side effects of glucocorticoids.	8 Marks	L2	CO5
	b)	Relate the role of xanthine oxidase inhibitors in gout management	8 Marks	L3	CO5

(OR)

9.	a)	Describe myasthenia gravis and explain the pharmacology of drugs used in myasthenia gravis.	8 Marks	L2	CO5
	b)	Summarize the pharmacological management of systemic lupus erythematosus.	8 Marks	L3	CO5

MODULE-V

10.	a)	Define constipation and elaborate the drugs used in constipation.	8 Marks	L2	CO6
	b)	Make a detail presentation on pharmacology of insulin in diabetes mellitus management.	8 Marks	L5	CO6

(OR)

11.	a)	Appraise the therapeutic considerations in selecting drugs for elderly people.	8 Marks	L5	CO6
	b)	Extend a note on classification and pharmacology of oral hypoglycemic	8 Marks	L4	CO6

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T. IV Semester (MBU-22) Regular Examinations, June – 2026

EXERCISE THERAPY - II

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Write about Convex-Concave Rule.	2 Marks	L1	CO1
	b)	Differentiate between nuclear bag and nuclear chain fibers.	2 Marks	L3	CO1
	c)	Define Prosthesis.	2 Marks	L1	CO2
	d)	Write about Floor walking rules in crutch gait pattern.	2 Marks	L2	CO2
	e)	Add a note on Deconditioning.	2 Marks	L2	CO3
	f)	What are Anti gravity muscles?	2 Marks	L1	CO3
	g)	Write about equines gait.	2 Marks	L2	CO4
	h)	What is Hydrotherapy?	2 Marks	L1	CO4
	i)	Name the crutch muscles.	2 Marks	L1	CO2
	j)	Define Orthosis.	2 Marks	L1	CO2

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe kinematics. Explain about its types.	8 Marks	L1	CO1
	b)	Describe joint receptors. Mention about its types.	8 Marks	L2	CO1
		(OR)			
3.	a)	Explain about the uses and indications of proprioceptive neuromuscular facilitation.	8 Marks	L3	CO1
	b)	Discuss about the indications and contraindications of stretching.	8 Marks	L3	CO1

MODULE-II

4.	a)	Discuss about Classification of Orthosis	8 Marks	L3	CO2
	b)	Describe wheel chair and discuss about its parts.	8 Marks	L2	CO2
		(OR)			
5.	a)	What are principles of inco-ordination and add a brief note on cerebellar ataxia.	8 Marks	L3	CO2
	b)	Elucidate about pre crutch training.	8 Marks	L2	CO2

MODULE-III

6.	a)	What are the key principles behind utilizing postural mechanism.	8 Marks	L2	CO3
	b)	Interpretation of Postural Reflexes.	8 Marks	L2	CO3
		(OR)			
7.	a)	Explain about COG, LOG and BOS.	8 Marks	L1	CO3
	b)	Describe Good and Poor Posture. Discuss about predisposing factors.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain about Rancho Los Angious (RLA) method of gait cycle.	8 Marks	L3	CO4
	b)	Describe in detail about improper gait patterns due to Muscular Weakness.	8 Marks	L3	CO4

(OR)

9.	a)	Explain about Whirlpool and Hubbard tank.	8 Marks	L1	CO4
	b)	Elaborate about the physiological effects of hydrotherapy.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain about characteristics of postural muscles.	8 Marks	L2	CO3
	b)	Explain about Postural Mal alignment.	8 Marks	L2	CO3

(OR)

11.	a)	Interpretation of improper gait patterns due to Neurological problems.	8 Marks	L3	CO4
	b)	Discuss about the normal movement and muscle action in stance and swing phase of knee.	8 Marks	L3	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T. IV Semester (MBU-22) Regular Examinations, June – 2026

ELECTRO THERAPY - II

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define 'MWD'.	2 Marks	L1	CO1
	b)	List the effects of SWD.	2 Marks	L1	CO1
	c)	List out the contraindications of ultrasound.	2 Marks	L3	CO2
	d)	What are the effects of phonophoresis?	2 Marks	L1	CO2
	e)	Define super luminous diode laser.	2 Marks	L1	CO3
	f)	Draw the diagram PUVA apparatus.	2 Marks	L1	CO3
	g)	Write the any four side effects of cryotherapy.	2 Marks	L1	CO4
	h)	Define moist heat therapy.	2 Marks	L1	CO4
	i)	Draw a diagram of electrodiagnostic equipment.	2 Marks	L2	CO5
	j)	Define evoked potential.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Classify the various application methods of shortwave diathermy and outline the dangers and contraindications of shortwave diathermy.	8 Marks	L4	CO1
	b)	Describe the production of micro wave and add a note on technique of application.	8 Marks	L2	CO1

(OR)

3.	a)	Discuss the microwave diathermy. Add its therapeutic and physiological effects in detail.	8 Marks	L2	CO1
	b)	Explain in detail about application of various high-frequency currents.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the physical effects of heat and the laws governing radiations.	8 Marks	L2	CO2
	b)	Illustrate about the cervical spondylosis and effects of traction in cervical Spine.	8 Marks	L2	CO2

(OR)

5.	a)	Mention the principles indications and contraindications of traction and add a note on traction fraction.	8 Marks	L2	CO2
	b)	Explain the lumbar spondylosis and effects of lumbar traction.	8 Marks	L2	CO2

MODULE-III

6.	a)	What are fluorescent tubes? Discuss their construction and principles of fluorescent tube.	8 Marks	L2	CO3
	b)	Describe the techniques and application methods of UVR.	8 Marks	L2	CO3
		(OR)			
7.	a)	Describe the production of laser and explain its physiological effects.	8 Marks	L2	CO3
	b)	Summarize the technique of application of ultraviolet radiation and provide a note on its indications and contraindications.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Write about the advanced application techniques of moist heat therapy.	8 Marks	L2	CO4
	b)	Discuss in detail the physiological effects and various application of paraffin wax. Add note on contraindications.	8 Marks	L2	CO4
		(OR)			
9.	a)	Mention the physiological effects of nerve conduction velocity.	8 Marks	L3	CO4
	b)	Write about electro-diagnostic tests.	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss the applications of EMG in biofeedback therapy for muscle rehabilitation and motor control training.	8 Marks	L2	CO5
	b)	List the types of ultra violet lamps. Discuss in detail the mercury vapor lamp. Add a note on the physiological effects of UVR.	8 Marks	L3	CO5
		(OR)			
11.	a)	Define biofeedback. Explain the technique of application and effects of EMG biofeedback.	8 Marks	L3	CO5
	b)	Write a note on physiological and therapeutic effects of hydrotherapy.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T. IV Semester (MBU-22) Regular Examinations, June – 2026

BIOMECHANICS – II

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Name two key ligaments contributing to hip joint stability.	2 Marks	L1	CO1
	b)	Which muscle group is primarily responsible for hip extension?	2 Marks	L1	CO1
	c)	Define Q angle.	2 Marks	L1	CO2
	d)	Write the genuvarum and genuvalgum.	2 Marks	L2	CO2
	e)	Define hammer toe deformity and hallux valgus.	2 Marks	L2	CO3
	f)	Prepare a note on calcaneo valgus and varus.	2 Marks	L2	CO3
	g)	List out any four determinants of gait analysis.	2 Marks	L1	CO4
	h)	Write phases of gait cycle in stance phase.	2 Marks	L2	CO4
	i)	Define Q angle.	2 Marks	L1	CO2
	j)	Write a note on acetabular labrum.	2 Marks	L2	CO1

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain about active and passive insufficiency of hip flexor muscles.	8 Marks	L3	CO1
	b)	Elaborate about bilateral stance of hip joint.	8 Marks	L3	CO1
		(OR)			
3.	a)	Elaborate about anterior and posterior pelvic tilt with labelled diagram.	8 Marks	L3	CO1
	b)	Explain the effects of aging on trabecular system of hip.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explore the patella joint motions.	8 Marks	L4	CO2
	b)	Elaborate the structure and role of menisci.	8 Marks	L3	CO2
		(OR)			
5.	a)	Discuss the structural components of the knee complex and their roles in functional ability.	8 Marks	L2	CO2
	b)	Outline the mechanics of knee flexor muscles.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explore about plantar aponeurosis.	8 Marks	L2	CO3
	b)	Explain about supination twist.	8 Marks	L2	CO3
		(OR)			
7.	a)	Outline the weight distribution of ankle joint.	8 Marks	L1	CO3
	b)	Define ray. Explain the axes of tarsometatarsal joint.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Analyze the running gait cycle.	8 Marks	L4	CO4
	b)	Summarize the analysis of sitting posture.	8 Marks	L2	CO4

(OR)

9.	a)	Elucidate about lordosis and kyphosis.	8 Marks	L2	CO4
	b)	Enumerate the following : i) muscle activity in sitting and standing ii) intradiskal pressure and compressive loads on spine.	8 Marks	L2	CO4

MODULE-V

10.	a)	Write about pelvi femoral rhythm.Add a note on leg length discrepancy.	8 Marks	L1	CO1
	b)	Discuss the angle of inclination of femur.write about coxa valga and coxa vara.	8 Marks	L1	CO1

(OR)

11.	a)	Explain the patella influence on quadriceps muscle function.	8 Marks	L2	CO2
	b)	Elucidate about anterior cruciate ligament and medial collateral ligaments.	8 Marks	L2	CO2

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

FUNDAMENTALS OF RADIOLOGY AND RADIATION PROTECTION

[Radiology & Imaging Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is the full form of ICRP & IAEA?	2 Marks	L2	CO1
	b)	Define effective dose.	2 Marks	L1	CO1
	c)	Write the principle of scintillation counter.	2 Marks	L2	CO2
	d)	Name any four advantages of TLD badge.	2 Marks	L1	CO2
	e)	Add a note on stochastic effects.	2 Marks	L2	CO3
	f)	Prepare a note on radiolysis of water.	2 Marks	L3	CO3
	g)	Draw the diagram of characteristic curve.	2 Marks	L3	CO4
	h)	Which material used for making of front side of the cassette?	2 Marks	L2	CO4
	i)	What is the thickness of emulsion in X-ray film?	2 Marks	L2	CO5
	j)	Define grid ratio.	2 Marks	L1	CO6

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Add a long note any four radiation quantities with units.	8 Marks	L2	CO1
	b)	Explain in detail on Radiation regulating bodies.	8 Marks	L2	CO1
		(OR)			
3.	a)	Define MPD and explain dose limits recommended by ICRP.	8 Marks	L2	CO1
	b)	Describe i) Radioactivity ii) LET	8 Marks	L3	CO1

MODULE-II

4.	a)	Discuss in detail on Pocket dosimeter with a neat diagram.	8 Marks	L3	CO2
	b)	Explain in detail on Ionization chamber with a neat diagram.	8 Marks	L2	CO2
		(OR)			
5.	a)	Apply your knowledge on PMTs used in Scintillation detector.	8 Marks	L3	CO2
	b)	Summarize various windows present in film badge.	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain in detail on direct and indirect action of radiation to cell.	8 Marks	L2	CO3
	b)	Discuss in detail on Radiation protection devices.	8 Marks	L3	CO3
		(OR)			
7.	a)	As a Radiation technologist, in which way you protect from radiation.	8 Marks	L2	CO3
	b)	Demonstrate latent image formation in X-ray film.	8 Marks	L4	CO6

MODULE-IV

8.	a)	Explain Filters used in X- ray tube.	8 Marks	L2	CO4
	b)	Explain Beam restricting devices used in department of radiology.	8 Marks	L2	CO4
		(OR)			
9.	a)	Outline AEC.	8 Marks	L4	CO4
	b)	Draw the characteristic curve with a proper explanation.	8 Marks	L3	CO5

MODULE-V

10.	a)	Write in detail on construction of radiographic cassette.	8 Marks	L2	CO5
	b)	Explain different types of radiographic cassette.	8 Marks	L2	CO5
		(OR)			
11.	a)	Write in detail on construction of film.	8 Marks	L2	CO6
	b)	Explain in detail on construction of intensifying screen.	8 Marks	L2	CO6

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

PATIENT CARE IN HOSPITAL AND RADIOLOGY

[Radiology & Imaging Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define medico legal cases.	2 Marks	L1	CO1
	b)	Interpret identification marks in 'MLC'.	2 Marks	L2	CO1
	c)	Describe 10 day rule in females.	2 Marks	L1	CO2
	d)	Interpret hand wash technique.	2 Marks	L2	CO2
	e)	What are velcro straps?	2 Marks	L1	CO3
	f)	List out four properties of immobilizing devices.	2 Marks	L2	CO3
	g)	Identify any four materials present in first aid kit.	2 Marks	L2	CO3
	h)	Define ACLS.	2 Marks	L1	CO4
	i)	Describe avulsed fracture.	2 Marks	L2	CO5
	j)	Interpret seizures.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Illustrate the roles and qualities of radiographer.	8 Marks	L2	CO1
	b)	Discuss in detail about organizational structure of radiology department.	8 Marks	L3	CO1

(OR)

3.	a)	Illustrate ethical responsibilities of radiographer.	8 Marks	L3	CO1
	b)	Describe about waste x-ray film and storage of waste x-ray film.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain about different types of measurement of pulse rate.	8 Marks	L2	CO2
	b)	Discuss on blood pressure with symptoms of hypertension and hypotension.	8 Marks	L3	CO2

(OR)

5.	a)	Discuss in detail about care of eyes and nails in common health problems of poor personal hygiene.	8 Marks	L2	CO2
	b)	Analyze about the handling of amputated patients.	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain about restraints and its purpose.	8 Marks	L2	CO3
	b)	Elaborate the steps of lifting techniques.	8 Marks	L3	CO3

(OR)

7.	a)	Illustrate about first aid kit.	8 Marks	L3	CO3
	b)	Explain the methods of transporting patient from stretcher to x-ray table.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss in detail about the emergency codes.	8 Marks	L2	CO4
	b)	Elaborate on ACLS.	8 Marks	L3	CO4
		(OR)			
9.	a)	Apply your knowledge on basic life support.	8 Marks	L3	CO4
	b)	Explain about fracture and its types.	8 Marks	L2	CO4

MODULE-V

10.	a)	Illustrate the importance and maintenance of medico legal record.	8 Marks	L3	CO1
	b)	Explain the handling of cancer patient in radiology department.	8 Marks	L2	CO2
		(OR)			
11.	a)	Apply your knowledge on restraint techniques in children and trauma cases.	8 Marks	L3	CO3
	b)	Explain about the principle management of fractures.	8 Marks	L2	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

OPTOMETRIC OPTICS

[Optometry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	List geometrical shapes of ophthalmic lens.	2 Marks	L1	CO1
	b)	Write any two points about effective power.	2 Marks	L2	CO2
	c)	Define abbe value.	2 Marks	L1	CO3
	d)	What is dip coating?	2 Marks	L2	CO5
	e)	Define prism.	2 Marks	L1	CO4
	f)	Mention the phenomenon of absorptive filters.	2 Marks	L1	CO5
	g)	What do you mean by decentration?	2 Marks	L2	CO4
	h)	Explain refractive index?	2 Marks	L2	CO3
	i)	Define front vertex power.	2 Marks	L1	CO2
	j)	What is transposition?	2 Marks	L2	CO1

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe the factors that influence the selection of lens forms for different eye conditions.	8 Marks	L2	CO1
	b)	Discuss in detail about base curve and how to select base curve with two formulae.	8 Marks	L2	CO1

(OR)

3.	a)	Elaborate meniscus lens and its importance.	8 Marks	L2	CO1
	b)	Explain toric transposition with any two examples.	8 Marks	L2	CO1

MODULE-II

4.	a)	Describe the different manufacturing defects of Ophthalmic lenses.	8 Marks	L2	CO2
	b)	Derive sagittal depth formula with diagram.	8 Marks	L3	CO2

(OR)

5.	a)	If the ocular refraction is -10.00D and the vertex distance for his/her spectacle is 13.00mm. Then what will be contact lens power and mention practical application of vertex distance.	8 Marks	L4	CO2
	b)	What is fault, explain faults occurs during production of ophthalmic lens.	8 Marks	L3	CO2

MODULE-III

6.	a)	Describe eight key characteristics of optical lenses.	8 Marks	L2	CO3
	b)	Explain the optical properties of glass lenses with its advantage and disadvantages.	8 Marks	L2	CO3

(OR)

7.	a)	Add note on manufacturing of ophthalmic blank.	8 Marks	L2	CO3
	b)	Elaborate about four types of glazing.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Write about compounding and resolving prims.	8 Marks	L3	CO4
	b)	Explain Fresnel prisms and its advantages and disadvantages.	8 Marks	L2	CO4

(OR)

9.	a)	Describe any four section where Fresnel prisms used?	8 Marks	L2	CO4
	b)	What is Fresnel lens and its clinical uses?	8 Marks	L3	CO4

MODULE-V

10.	a)	Write about minus lenticular lenses with its types and diagram.	8 Marks	L3	CO5
	b)	Enumerate iseikonic , aniseikonic lens and its advantages.	8 Marks	L3	CO5

(OR)

11.	a)	Summarize polarized filters, advantages and disadvantages.	8 Marks	L3	CO5
	b)	Define absorptive lens and explain it types.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

OCULAR DISEASE - I

[Optometry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is subconjunctival hemorrhage?	2 Marks	L2	CO1
	b)	Name any two types cornea surgeries.	2 Marks	L1	CO2
	c)	Define endophthalmitis.	2 Marks	L1	CO3
	d)	Explain lenticonus.	2 Marks	L2	CO5
	e)	What is recurrence of hypertelorism?	2 Marks	L2	CO4
	f)	Recall phacoemulsification.	2 Marks	L1	CO5
	g)	Define epiphora.	2 Marks	L1	CO4
	h)	Explain coloboma?	2 Marks	L2	CO3
	i)	What is microcornea?	2 Marks	L2	CO2
	j)	Define chemosis.	2 Marks	L1	CO1

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain external hordeolum and its clinical features.	8 Marks	L2	CO1
	b)	Summarize Basel cell carcinoma and Squamous cell carcinoma.	8 Marks	L2	CO1

(OR)

3.	a)	Define ptosis and explain it.	8 Marks	L2	CO1
	b)	Enumerate bacterial blepharitis, its treatment and clinical features.	8 Marks	L3	CO1

MODULE-II

4.	a)	Describe keratoconus and its sings, symptoms, and treatment.	8 Marks	L2	CO2
	b)	Write note on staphyloma and its types.	8 Marks	L3	CO2

(OR)

5.	a)	Enumerate herpes simplex keratitis and its management.	8 Marks	L3	CO2
	b)	Elaborate bacterial keratitis and its clinical features.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain four types of uveitis.	8 Marks	L2	CO3
	b)	Describe systemic ophthalmia and its clinical features.	8 Marks	L2	CO3

(OR)

7.	a)	Summarize panuveitis its classification.	8 Marks	L2	CO3
	b)	Discuss signs and symptoms of uveitis.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Demonstrate schirmer -I and schirmer -II procedures.	8 Marks	L3	CO4
	b)	Enumerate Tear break-up time test and its uses.	8 Marks	L3	CO4

(OR)

9.	a)	Explain optic nerve glioma and it clinical features.	8 Marks	L2	CO4
	b)	Write note on hypertelorism and its management.	8 Marks	L3	CO4

MODULE-V

10.	a)	Elaborate congenital cataract associated with intrauterine and systematic infection.	8 Marks	L3	CO5
	b)	Demonstrate any two Biometry tests which performed preoperative assessment of cataract.	8 Marks	L3	CO5

(OR)

11.	a)	Write note on congenital cataract Association with metabolism.	8 Marks	L3	CO5
	b)	Explain ectopia lentis and its causes.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

SPECIAL INVESTIGATIONS IN RADIOLOGY

[Radiology & Imaging Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is the atomic number and atomic weight of iodine?	2 Marks	L1	CO1
	b)	Mention any four examples of non-ionic monomers.	2 Marks	L2	CO1
	c)	Name any four parts of large intestine.	2 Marks	L1	CO2
	d)	Mention any four differences between endoscopy and barium meal.	2 Marks	L2	CO2
	e)	What are the uses of taking post void film in "IVU" procedure?	2 Marks	L1	CO3
	f)	Recall percutaneous nephrostomy.	2 Marks	L2	CO3
	g)	What are the contraindications of "HSG" procedure?	2 Marks	L1	CO4
	h)	Interpret "HSG".	2 Marks	L2	CO4
	i)	List any four equipment required for sialography.	2 Marks	L1	CO5
	j)	Mention any two techniques for cannulating the salivary ducts.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the classification of contrast media.	8 Marks	L2	CO1
	b)	Summarize iodinated contrast media with examples.	8 Marks	L3	CO1
		(OR)			
3.	a)	Classify water soluble iodinated contrast media.	8 Marks	L3	CO1
	b)	Describe about conventional high osmolar contrast media.	8 Marks	L2	CO1

MODULE-II

4.	a)	Describe the indications, contraindications, contrast media and procedure for barium swallow.	8 Marks	L3	CO2
	b)	Explain the correct sequence of parts in the human "GIT".	8 Marks	L2	CO2
		(OR)			
5.	a)	Discuss about the indications, contraindications, contrast media and procedure for single contrast "BMFT".	8 Marks	L3	CO2
	b)	Explain the indications, contraindications, contrast media and procedure for barium meal.	8 Marks	L1	CO2

MODULE-III

6.	a)	Describe the indications, contraindications, risk factors and contrast media for intravenous urethrogram.	8 Marks	L2	CO3
	b)	Discuss about the preparation for intravenous urethrogram in adults and children.	8 Marks	L2	CO3
		(OR)			

7.	a)	Elaborate the procedure performed during intravenous urethrogram.	8 Marks	L3	CO3
	b)	Explain filming technique for intravenous urethrogram.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Illustrate hysterosalphingography.	8 Marks	L3	CO4
	b)	Describe the technique of percutaneous trans hepatic cholangiography.	8 Marks	L2	CO4

(OR)

9.	a)	Explain preoperative cholangiography.	8 Marks	L2	CO4
	b)	Discuss the indications and contraindications of "HSG".	8 Marks	L2	CO4

MODULE-V

10.	a)	Enumerate sialography procedure.	8 Marks	L3	CO5
	b)	Discuss about the advantages and disadvantages of sialography.	8 Marks	L2	CO5

(OR)

11.	a)	Illustrate sialography.	8 Marks	L3	CO5
	b)	Explain ascending phlebography.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

PHYSIC AND TECNIQUES OF ULTRASOUND AND MAMMOGRAPHY

[Radiology & Imaging Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Write a brief note on areola.	2 Marks	L2	CO1
	b)	Draw the structure of one lobe of the mammary gland.	2 Marks	L1	CO1
	c)	List out four breast implant.	2 Marks	L3	CO2
	d)	Identify routine X ray parameters study of mammography.	2 Marks	L1	CO2
	e)	Mention any four advantages of ultrasound.	2 Marks	L3	CO3
	f)	What is the speed of sound in vacuum?	2 Marks	L1	CO3
	g)	Define ring down time.	2 Marks	L2	CO4
	h)	Write a brief note on formula for Doppler shift.	2 Marks	L3	CO4
	i)	Write any four points about preparation of US abdomen.	2 Marks	L2	CO5
	j)	Add a note on US probe used in liver studies.	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain in detail on steps of Self examination of breast.	8 Marks	L2	CO1
	b)	Define BIRADS, and explain briefly about standard reporting & final assessment categories of breast.	8 Marks	L2	CO1

(OR)

3.	a)	Explain about Lymphatic drainage of the breast with a neat diagram.	8 Marks	L2	CO1
	b)	Describe in detail about development and histology of breast.	8 Marks	L3	CO1

MODULE-II

4.	a)	Write detail discussion on filters and heel effect used in mammography.	8 Marks	L2	CO2
	b)	Give an outline on compression peddle used in mammography.	8 Marks	L4	CO2

(OR)

5.	a)	Explain about following techniques: i) Lateral projections ii) Cleopatra view	8 Marks	L2	CO2
	b)	Explain about following techniques: i) Spot and magnification views ii) Tangential views	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain in detail on modes of ultrasound display.	8 Marks	L2	CO3
	b)	Summarize artifacts of ultrasound imaging.	8 Marks	L4	CO3
		(OR)			
7.	a)	Add a long note on the following : i) Endocavitary probes with diagram. ii) Sector probe with diagram.	8 Marks	L2	CO3
	b)	Explain characteristics of sound waves.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Write detail on continuous Doppler with a neat diagram, its advantages & disadvantages.	8 Marks	L2	CO4
	b)	Discuss in detail on pulsed Doppler with a neat diagram, its advantages & disadvantages.	8 Marks	L3	CO4
		(OR)			
9.	a)	Give an outline on Doppler effect with examples and with a neat diagram.	8 Marks	L4	CO4
	b)	Define Doppler frequency shift and explain factors affecting Doppler shift.	8 Marks	L2	CO4

MODULE-V

10.	a)	Outline scanning technique of US abdomen.	8 Marks	L4	CO5
	b)	Discuss in detail on US testis.	8 Marks	L3	CO5
		(OR)			
11.	a)	Discuss in detail on TRUS ultrasound.	8 Marks	L3	CO5
	b)	Add a long note on carotid Doppler.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

PHYSICS OF COMPUTERIZED TOMOGRAPHY

[Radiology & Imaging Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define windowing.	2 Marks	L1	CO1
	b)	What are pixels and voxels?	2 Marks	L2	CO1
	c)	Present any three functions of slip rings.	2 Marks	L3	CO2
	d)	Write in brief about the working of EBCT.	2 Marks	L2	CO2
	e)	Define curved planar reconstruction.	2 Marks	L1	CO3
	f)	List three uses of Multi planar reconstruction.	2 Marks	L1	CO3
	g)	Write in brief about noise and its causes.	2 Marks	L2	CO4
	h)	Classify artifacts.	2 Marks	L3	CO4
	i)	Define chromosomal aberration.	2 Marks	L1	CO5
	j)	State inverse square law, and its relation with distance.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Interpret with components of CT gantry.	8 Marks	L3	CO1
	b)	Elaborate on the history of CT scanner, advantages and limitations of CT.	8 Marks	L2	CO1

(OR)

3.	a)	Classify types of CT detectors based on their efficiency.	8 Marks	L3	CO1
	b)	Explain pixels, voxels and matrix.	8 Marks	L2	CO1

MODULE-II

4.	a)	Elaborate on pencil beam, and narrow fan beam CT scanners.	8 Marks	L2	CO2
	b)	Add a short note on: i) CVCT. ii) Wide beam CT scanner.	8 Marks	L1	CO2

(OR)

5.	a)	Summarize on MDCT and MSCT.	8 Marks	L2	CO2
	b)	Write a note on: i) Helical CT. ii) Seventh generation.	8 Marks	L1	CO2

MODULE-III

6.	a)	Discuss in detail about image acquisition in 6th and 7th generation CT scanners.	8 Marks	L2	CO3
	b)	Write a short note about: i) Importance of post processing ii) Image acquisition in 7th generation CT scanner.	8 Marks	L1	CO3

(OR)

7.	a)	Present the techniques of image acquisition in CT scanner with a suitable diagram.	8 Marks	L3	CO3
	b)	Apply your knowledge in representing image acquisition in various generations of CT scanner.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Write a note on: i) Patient motion and its remedies. ii) Coan beam artifacts and its remedies.	8 Marks	L1	CO4
	b)	Summarize on physics-based artifacts.	8 Marks	L2	CO4

(OR)

9.	a)	Describe patient-based artifacts.	8 Marks	L2	CO4
	b)	Explain scanner-based artifacts.	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss in detail about chromosomal aberration.	8 Marks	L3	CO5
	b)	Summarize CTDI and DLP, Elaborate radiation protective measures.	8 Marks	L3	CO5

(OR)

11.	a)	Explain increasing radiation burden on human life from medical imaging.	8 Marks	L3	CO5
	b)	Write a short note on: i) Stochastic effect. ii) KERM	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

VISUAL OPTICS

[Optometry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is the refractive index of cornea and vitreous?	2 Marks	L2	CO1
	b)	Brief the concept of refractive anomalies in your own words.	2 Marks	L2	CO2
	c)	Define inertia of accommodation.	2 Marks	L1	CO3
	d)	Write any two differences b/w light and dark adaptation.	2 Marks	L2	CO4
	e)	Define how magnification differs in the axial and the refractive ametropia.	2 Marks	L1	CO5
	f)	Mention two types of manual keratometry.	2 Marks	L1	CO1
	g)	Expand JCC and its use in clinical refraction.	2 Marks	L1	CO2
	h)	Add note dynamic accommodation.	2 Marks	L2	CO3
	i)	Enlist three types of cones.	2 Marks	L1	CO4
	j)	What is retinal blur?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss the composition of vitreous humor and its importance.	8 Marks	L2	CO1
	b)	Who introduced schematic eye and describe it.	8 Marks	L2	CO1

(OR)

3.	a)	Prepare brief note on crystalline lens in your own words.	8 Marks	L3	CO1
	b)	What are the impacts of axial length on human eye? And mention normal axial length.	8 Marks	L2	CO1

MODULE-II

4.	a)	Find out the causes of Hypermetropia and its clinical features.	8 Marks	L3	CO2
	b)	What is the Prevalence of myopia within the world and elaborate on the necessary steps to control this.	8 Marks	L3	CO2

(OR)

5.	a)	Showcase ray diagrams for astigmatism and its clinical features.	8 Marks	L3	CO2
	b)	Identify the clinical types of the following astigmatism examples: -1.00D/-2.00Dcyl X 180^0, +2.00D/-2.00Dcyl X 180^0, -4.00Dcyl X 170^0, + 3.00 Dcyl X 70^0, and explain each type.	8 Marks	L2	CO2

MODULE-III

6.	a)	Describe procedure of RAF Ruller test and mention its parts.	8 Marks	L2	CO3
	b)	Illustrate minus lens method and its importance in ophthalmology.	8 Marks	L3	CO3

(OR)

7.	a)	Summarize the recording techniques of accommodative response and amplitude.	8 Marks	L2	CO3
	b)	Describe the techniques of dynamic and static retinoscopy	8 Marks	L2	CO3

MODULE-IV

8.	a)	Mention the tests of color vision and explain Ishihara chart test.	8 Marks	L2	CO4
	b)	Explain Structure of the eye and enlist layers of cornea.	8 Marks	L2	CO4

(OR)

9.	a)	Write note on trichromatic theory and opponent color theory.	8 Marks	L3	CO4
	b)	Draw the neat labelled diagram of visual pathway and mention lesions of visual path way.	8 Marks	L3	CO4

MODULE-V

10.	a)	Describe relative spectacle magnification and its formula.	8 Marks	L2	CO5
	b)	Compare RSM in refractive and axial ametropia.	8 Marks	L3	CO5

(OR)

11.	a)	Describe ocular accommodation and spectacle accommodation.	8 Marks	L2	CO5
	b)	Write the difference between optical and spectacle refraction.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

CLINICAL EXAMINATION OF VISUAL SYSTEM

[Optometry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

			Marks	BL	COs
1.	a)	When is a wavefront considered spherical?	2 Marks	L2	CO1
	b)	Mention one property of the optical centre of a lens.	2 Marks	L1	CO2
	c)	What is the purpose of doing a cover–uncover test?	2 Marks	L1	CO3
	d)	Give two symptoms of binocular vision anomalies.	2 Marks	L1	CO4
	e)	Define visual field.	2 Marks	L1	CO5
	f)	Identify the type of mirror that forms a real inverted image.	2 Marks	L2	CO1
	g)	When does lateral shift occur in a glass slab?	2 Marks	L2	CO2
	h)	How is near visual acuity assessed in the clinic?	2 Marks	L2	CO3
	i)	Compare concomitant and incomitant strabismus.	2 Marks	L1	CO4
	j)	Identify the visual pathway lesion indicated by homonymous hemianopia.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Elaborate on the importance of drug history with focus on ocular side effects.	8 Marks	L2	CO1
	b)	Interpret non-verbal cues and patient behavior to support clinical judgment.	8 Marks	L4	CO1

(OR)

3.	a)	Outline the guidelines for pediatric ocular history in clinical practice.	8 Marks	L2	CO1
	b)	Summarize how detailed history contributes to evidence-based diagnosis in eye care.	8 Marks	L2	CO1

MODULE-II

4.	a)	Classify accommodation tests and explain their interpretation.	8 Marks	L4	CO2
	b)	Apply vergence tests to assess binocular visual function.	8 Marks	L3	CO2

(OR)

5.	a)	Analyze how refractive errors affect visual acuity outcomes.	8 Marks	L4	CO2
	b)	Demonstrate the correct procedure for retinoscopy in clinical practice.	8 Marks	L3	CO2

MODULE-III

6.	a)	Compare strabismic and non-strabismic binocular vision disorders.	8 Marks	L4	CO3
	b)	Elaborate on the significance of vergence facility testing.	8 Marks	L2	CO3

(OR)

7.	a)	Classify types of heterophoria and discuss their clinical evaluation.	8 Marks	L4	CO3
	b)	Evaluate fusional vergence reserves and their role in binocular comfort.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Evaluate retinal vascular changes and their clinical implications.	8 Marks	L4	CO4
	b)	Interpret macular changes using slit lamp biomicroscopy with fundus lens.	8 Marks	L4	CO4

(OR)

9.	a)	Elaborate the importance of optic disc evaluation in systemic disease diagnosis.	8 Marks	L2	CO4
	b)	Summarize posterior segment changes associated with high myopia.	8 Marks	L2	CO4

MODULE-V

10.	a)	Apply contrast sensitivity results in evaluating functional vision.	8 Marks	L3	CO5
	b)	Demonstrate the clinical method for measuring corneal sensitivity.	8 Marks	L3	CO5

(OR)

11.	a)	Evaluate the importance of fundus photography in disease monitoring.	8 Marks	L4	CO5
	b)	Interpret topography maps in diagnosing keratoconus.	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

SYSTEM FOR OPHTHALMIC DISPENSING

[Optometry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Mention two types of Vertex Power.	2 Marks	L2	CO1
	b)	Define trifocal lens.	2 Marks	L1	CO2
	c)	What kind of population needs anti-scratch lenses and why?	2 Marks	L1	CO3
	d)	Write about frontal angle and splay angle.	2 Marks	L2	CO5
	e)	Recall spherical equivalent.	2 Marks	L2	CO4
	f)	Name the types of nose bridge.	2 Marks	L1	CO5
	g)	List instruments used to check final power.	2 Marks	L1	CO4
	h)	Explain polarized filters.	2 Marks	L2	CO3
	i)	What is cemented bifocal?	2 Marks	L2	CO2
	j)	Recall lens edging.	2 Marks	L1	CO1

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Write note on ANSI.	8 Marks	L2	CO1
	b)	Elaborate labeling guidance for nonprescription sunglasses and direction of use.	8 Marks	L2	CO1

(OR)

3.	a)	Summarize history of lens development and its importance.	8 Marks	L2	CO1
	b)	Explain four types of conic sections, with diagram.	8 Marks	L3	CO1

MODULE-II

4.	a)	Describe types of bifocal lens based on shapes and manufacturing method.	8 Marks	L2	CO2
	b)	Write note on: i) Mono and multi design PAL. ii) Symmetric design PALs versus asymmetric design PALs	8 Marks	L3	CO2

(OR)

5.	a)	Clarify the process of eliminating visible markings and provide guidance to the wearer during the dispensing procedure.	8 Marks	L3	CO2
	b)	How select the appropriate style of progressive lenses and frames and elaborate it?	8 Marks	L2	CO2

MODULE-III

6.	a)	Examine the OSHA regulations for safety eyewear and explain the impact thickness requirements for ensuring adequate protection.	8 Marks	L2	CO3
	b)	Summarize surface coated lens, advantages and disadvantages.	8 Marks	L2	CO3

(OR)

7.	a)	What are the pros and cons of wearing tinted eye lenses?	8 Marks	L2	CO3
	b)	Outline the common causes of eye injuries and describe the different types of protective measures to prevent them.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Define is on-face adjustment and summarize seven adjustments.	8 Marks	L3	CO4
	b)	Add note on lens insertion into following frames: i) Nylon frame. ii) Polyamide frame. iii) Polycarbonate frame. iv) Optyl frame.	8 Marks	L3	CO4

(OR)

9.	a)	How should frames be selected based on facial type and fitting considerations?	8 Marks	L2	CO4
	b)	Write about any four types of tools to adjust the spectacle parts.	8 Marks	L3	CO4

MODULE-V

10.	a)	Demonstrate about the boxing system with diagram.	8 Marks	L3	CO5
	b)	Discuss about frame and lens marking with the respective diagram.	8 Marks	L3	CO5

(OR)

11.	a)	Add note on different plastic material used in frame making with its advantages and disadvantages.	8 Marks	L3	CO5
	b)	Compare the availability and popularity of metal and plastic spectacle frames in the Indian market.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

CONCEPTS OF DISEASE RELATED TO DIALYSIS TECHNOLOGY - I

[Dialysis Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define glomerulonephritis.	2 Marks	L1	CO1
	b)	List two primary glomerular diseases.	2 Marks	L1	CO1
	c)	Define Acute Renal Failure.	2 Marks	L1	CO2
	d)	What are the types of Acute Kidney Injury (AKI)?	2 Marks	L1	CO2
	e)	Define metabolic acidosis.	2 Marks	L1	CO3
	f)	What is anion gap?	2 Marks	L2	CO3
	g)	What is a balanced diet?	2 Marks	L2	CO4
	h)	Mention two dietary considerations for CKD patients.	2 Marks	L2	CO4
	i)	What is the significance of renal dysplasia?	2 Marks	L2	CO5
	j)	Name two renal vascular disorders.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the pathophysiology of Acute Glomerulonephritis.	8 Marks	L2	CO1
	b)	Describe the clinical features and diagnosis of Rapidly Progressive Glomerulonephritis.	8 Marks	L3	CO1

(OR)

3.	a)	Compare and contrast Minimal Change Disease and Focal Segmental Glomerulosclerosis.	8 Marks	L3	CO1
	b)	Explain the etiopathogenesis and management of Membranous Glomerulonephritis.	8 Marks	L2	CO1

MODULE-II

4.	a)	Describe the etiology and classification of Acute Renal Failure.	8 Marks	L3	CO2
	b)	Explain the pathophysiology of each type of Acute Renal Failure.	8 Marks	L2	CO2

(OR)

5.	a)	Discuss the medical and surgical management of Acute Renal Failure.	8 Marks	L3	CO2
	b)	Explain the stages of Chronic Kidney Disease and its progression.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the pathophysiology of metabolic acidosis.	8 Marks	L2	CO3
	b)	Describe the compensatory mechanisms in respiratory alkalosis.	8 Marks	L2	CO3

(OR)

7.	a)	Discuss the disorders of potassium metabolism and their management.	8 Marks	L3	CO3
	b)	Explain the pathophysiology and clinical features of sodium imbalance.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain the renal function in congestive heart failure.	8 Marks	L2	CO4
	b)	Describe renal involvement in systemic vasculitis.	8 Marks	L3	CO4
		(OR)			
9.	a)	Discuss the impact of nutrition on renal health.	8 Marks	L3	CO4
	b)	Explain the dietary management of CKD patients.	8 Marks	L2	CO4

MODULE-V

10.	a)	Describe the pathophysiology of polycystic kidney disease.	8 Marks	L2	CO5
	b)	Discuss the clinical features of Alport Syndrome.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain the congenital anomalies of the kidney.	8 Marks	L2	CO5
	b)	Discuss renal tumors and their management.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

PRINCIPLES OF ANESTHESIA

[Anaesthesia & Operation Theatre Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define General Anesthesia.	2 Marks	L1	CO1
	b)	What is Regional Anesthesia?	2 Marks	L1	CO1
	c)	Name two routine haematological tests.	2 Marks	L1	CO2
	d)	Define TEE.	2 Marks	L1	CO2
	e)	What is informed consent?	2 Marks	L1	CO3
	f)	Define premedication.	2 Marks	L1	CO3
	g)	Why is patient identification confirmed?	2 Marks	L1	CO4
	h)	What is non-invasive monitoring?	2 Marks	L1	CO4
	i)	What is the use of Cimetidine?	2 Marks	L1	CO5
	j)	What is the dose of Thiopentone?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the fundamental principles of anesthesia.	8 Marks	L2	CO1
	b)	Describe the differences between General, Regional, and Local Anaesthesia.	8 Marks	L2	CO1

(OR)

3.	a)	Describe four stages and planes of general Anesthesia.	8 Marks	L2	CO1
	b)	Describe the components of a pre-anesthetic assessment.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the significance of routine lab tests (urine, haematological).	8 Marks	L2	CO2
	b)	Describe how to interpret a chest X-ray for anesthetic purposes.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the Transesophageal Echocardiography procedure in anaesthesia.	8 Marks	L2	CO2
	b)	Explain the Procedure and role of Angiography in pre-anesthetic assessment	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the importance of obtaining informed consent.	8 Marks	L2	CO3
	b)	Describe the NPO guidelines for adults and children.	8 Marks	L2	CO3

(OR)

7.	a)	Explain the advantages of premedication.	8 Marks	L2	CO3
	b)	Describe the different drugs used for premedication and their effects.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain the importance of confirming patient identification.	8 Marks	L2	CO4
	b)	Describe the minimum monitoring standards required during anesthesia.	8 Marks	L2	CO4

(OR)

9.	a)	Differentiate between non-invasive and invasive monitoring.	8 Marks	L2	CO4
	b)	Explain the process of induction of anesthesia.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain the mechanism of action and uses of H2 blockers.	8 Marks	L2	CO5
	b)	Describe the pharmacology of Thiopentone as an induction agent.	8 Marks	L2	CO5

(OR)

11.	a)	Explain the uses and side effects of Diazepam and Midazolam.	8 Marks	L2	CO5
	b)	Describe the pharmacology and uses of Ketamine.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

TOXICOLOGY AND ENVIRONMENTAL EMERGENCY

[Emergency Medical and Critical Care Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is the different inhalation method for using hydrocarbons?	2 Marks	L1	CO1
	b)	Define coma cocktail.	2 Marks	L2	CO1
	c)	Write any five common poisonous snakes in India.	2 Marks	L1	CO2
	d)	Define clenched fist bite.	2 Marks	L2	CO2
	e)	What is Aliphatic and aromatic hydrocarbons	2 Marks	L1	CO3
	f)	Difference between classic and exertional heat stroke	2 Marks	L2	CO3
	g)	Write the clasification of poisonous pland	2 Marks	L2	CO4
	h)	Write the Steps taken after cat bite	2 Marks	L1	CO4
	i)	How to identify the severity of injury?	2 Marks	L1	CO5
	j)	What is cardinal rule of production against radiation?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe the signs and symptoms of digoxin toxicity, and how do they manifest based on the level of digoxin in the blood?	8 Marks	L2	CO1
	b)	What are the pesticides used for agriculture and explain the common pesticide presented in ED?	8 Marks	L2	CO1

(OR)

3.	a)	Draw the diagram of SVT and atrial flutter, and detail note on treatment.	8 Marks	L1	CO1
	b)	Elaborate the organophosphate poisoning, and explain about antidote.	8 Marks	L4	CO1

MODULE-II

4.	a)	What preventive measures can be taken to reduce the risk of spider bites, and detail note on poisonous spider bite?	8 Marks	L4	CO2
	b)	Describe the differences between bee and wasp stings and clinical manifestations.	8 Marks	L2	CO2

(OR)

5.	a)	How does a scorpion sting affect the human body?	8 Marks	L2	CO2
	b)	What is the recommended initial management for a person who has been bitten by another human?	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the risk factors that predispose individuals to heat-related disorders, such as environmental conditions, physical exertion, age, and certain medical conditions.	8 Marks	L2	CO3
	b)	Describe the diagnostic process for identifying hydrocarbon toxicity, and imaging studies (such as chest X-rays).	8 Marks	L2	CO3
		(OR)			
7.	a)	Describe the physiological effects of hydrocarbons on the body.	8 Marks	L2	CO3
	b)	Difference between heat cramp, heat stress and heat stroke and explain about heat stroke and heat cramp.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss the physiological mechanisms of drowning, including the stages of immersion, breath-holding, and respiratory distress.	8 Marks	L2	CO4
	b)	Environmental impact of poisoning plant.	8 Marks	L3	CO4
		(OR)			
9.	a)	Describe the stages of frostbite, and the clinical manifestations associated with each stage.	8 Marks	L2	CO4
	b)	What are the common poisonous plants encountered in different regions, including history and physical examination, identification of the plant.	8 Marks	L4	CO4

MODULE-V

10.	a)	Enumerate the different triage systems used in emergency medicine.	8 Marks	L2	CO5
	b)	Describe the diagnostic process for identifying radiation injuries.	8 Marks	L2	CO5
		(OR)			
11.	a)	Describe the principles of management for electrical injuries, including immediate first aid measures and prompt transport to a medical facility.	8 Marks	L2	CO5
	b)	What are the common sources of ionizing radiation, and their effects on biological tissues?	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

MEDICAL PSYCHOLOGY

[Optometry, Anaesthesia & Operation Theatre Technology, Cardio Vascular Technology, Dialysis Technology, Respiratory Therapy Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Discuss briefly about the 'Rewards' according to the theory of Operant Conditioning'.	2 Marks	L2	CO1
	b)	Define 'Psychology'.	2 Marks	L1	CO1
	c)	Comment briefly on any two hazards of 'Middle Adulthood' (Middle age) stage of human development.	2 Marks	L3	CO2
	d)	Mention any two developmental tasks of 'Early Adulthood' (Young Age).	2 Marks	L1	CO2
	e)	Prepare a brief note on 'Illusion'.	2 Marks	L3	CO3
	f)	Name any two disorders of Sensation.	2 Marks	L1	CO3
	g)	Describe briefly about 'Self-Actualization'.	2 Marks	L2	CO4
	h)	Comment briefly on the concept of 'Need' in the context of Motivation.	2 Marks	L3	CO4
	i)	Comment briefly on the 'Fluid Intelligence'.	2 Marks	L3	CO5
	j)	Mention the personality features (characteristics) of 'Creative Personality'.	2 Marks	L3	CO6

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss in detail about the branches of 'Pure Psychology'.	8 Marks	L2	CO1
	b)	Prepare a note on the various branches of 'Applied Psychology'.	8 Marks	L3	CO1

(OR)

3.	a)	Discuss in detail about the 'Observational Methods' used in the psychological research.	8 Marks	L2	CO1
	b)	Prepare a note on the character and functions of 'Id', 'Ego' and 'Superego' with relevant examples.	8 Marks	L3	CO1

MODULE-II

4.	a)	Describe briefly about the role of heredity on the development.	8 Marks	L2	CO2
	b)	Prepare a note on the different stages of 'Developmental Cycle' across the human life span.	8 Marks	L3	CO2

(OR)

5.	a)	Comment on the developmental, physical and psychological implications in the stage of adolescence.	8 Marks	L3	CO2
	b)	Comment in detail about the old age changes in the perspective of development.	8 Marks	L3	CO2

MODULE-III

6.	a)	Describe 'Hallucinations' with clinical relevance.	8 Marks	L2	CO3
	b)	Prepare a detailed note on the 'Gestalt laws of grouping'.	8 Marks	L3	CO3
		(OR)			
7.	a)	Define 'attention' and compare different types of attention.	8 Marks	L3	CO3
	b)	Prepare a detailed note on the factors affecting the process of attention.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Define 'conflict' and prepare a comparative note on different types of conflicts.	8 Marks	L3	CO4
	b)	Define 'frustration' and comment on sources and management of frustration.	8 Marks	L3	CO4
		(OR)			
9.	a)	Illustrate the Abraham Maslow's humanistic theory of "The Hierarchy of Needs".	8 Marks	L3	CO4
	b)	Describe the various features of 'motivation cycle'.	8 Marks	L2	CO4

MODULE-V

10.	a)	What is 'Stress'? Make a note on various physical, psychological and social implications of stress.	8 Marks	L1	CO5
	b)	A child of 16 years scores 75 in an IQ test. Calculate the mental age equivalent to his performance on the IQ test. Prepare a note on any one method of assessment of Intelligence (IQ Testing).	8 Marks	L3	CO5
		(OR)			
11.	a)	Comment on any three defense mechanisms in Psychology.	8 Marks	L3	CO6
	b)	Mention the usefulness of personality testing. List out the different methods of personality testing and make a detailed note on any one such method.	8 Marks	L1	CO6

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

POLYSOMNOGRAPHY-I

[Respiratory Therapy Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define snoring.	2 Marks	L1	CO1
	b)	How do you scale down "AHI"?	2 Marks	L3	CO1
	c)	Write about the normal architecture of sleep.	2 Marks	L1	CO2
	d)	Define "K- Complex".	2 Marks	L2	CO2
	e)	Write brief notes on bradypnea.	2 Marks	L2	CO3
	f)	Illustrate alpha and beta waveform in sleep pattern.	2 Marks	L1	CO3
	g)	Define general anesthesia.	2 Marks	L3	CO4
	h)	Define sleep pathway.	2 Marks	L1	CO4
	i)	Write down any four adverse conditions of OSA.	2 Marks	L1	CO5
	j)	Define anesthesia.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain "CPAP" and "BIPAP" indications and contraindications.	8 Marks	L3	CO1
	b)	Describe sleeping hygiene and positions for patients in sleep apnoea.	8 Marks	L2	CO1

(OR)

3.	a)	Explain non invasive ventilation and its modes.	8 Marks	L3	CO1
	b)	Write a brief note on "RDI" ans "AHI".	8 Marks	L2	CO1

MODULE-II

4.	a)	Enumerate the common sleep disorder.and its symptoms.	8 Marks	L2	CO2
	b)	Discuss about the shift -work sleep disorder and its symptoms.	8 Marks	L3	CO2

(OR)

5.	a)	List out the adverse effect of melatonin and cortisol.	8 Marks	L2	CO2
	b)	Explain any two conditions of drugs that effect sleep.	8 Marks	L2	CO2

MODULE-III

6.	a)	Discuss in detail about the N4 stage of sleep along with associated hypoxemia.	8 Marks	L3	CO3
	b)	Discuss the sleep apnoea pattern.	8 Marks	L2	CO3

(OR)

7.	a)	Explain sleep rebound , and its impact on sleep hygiene.	8 Marks	L3	CO3
	b)	Describe restless leg syndrome .	8 Marks	L2	CO3

MODULE-IV

8.	a)	Table down the sleep pattern for children and adult.	8 Marks	L2	CO4
	b)	Describe "CPAP" and its setting for chronic obstructive patient.	8 Marks	L3	CO4
		(OR)			
9.	a)	Discuss the importance of use of "BIPAP", and lifestyle modification in sleep .	8 Marks	L2	CO4
	b)	Discuss patient assessment for sleep disruption during anesthesia.	8 Marks	L3	CO4
		MODULE-V			
10.	a)	Describe the autonomic nervous system.	8 Marks	L3	CO5
	b)	Discuss sleep disturbance and give its effect on breathing pattern in sleep.	8 Marks	L2	CO5
		(OR)			
11.	a)	A 40 years old patient smoker 10 packs /year , has complaints of heavy snoring, fatigue ,daytime sleepiness, on examination vitals Spo2- 75%,HR:135bpm BP: of 140/60mmhg.On hypertensive medications. i) How would you assess the patient for a sleep study. ii) What mode of ventilation is suggested for this patient and why.	8 Marks	L3	CO5
	b)	Discuss about the REM Sleep behaviour Disorder.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

CONGENENTAL HEART DISEASE - I

[Cardio Vascular Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define congenital heart diseases.	2 Marks	L1	CO1
	b)	What is jugular venous pressure?	2 Marks	L1	CO1
	c)	Name the structures seen in anterior view of chest x ray.	2 Marks	L1	CO2
	d)	Differentiate between underexposure and over exposure of chest x ray.	2 Marks	L2	CO2
	e)	Write a brief note on gerbode defect.	2 Marks	L2	CO3
	f)	Enlist the morphological classification of VSD.	2 Marks	L1	CO3
	g)	Define GOSE score.	2 Marks	L1	CO4
	h)	What are the carpentier classification?	2 Marks	L1	CO4
	i)	Difference between co-triatriatum sinister and dexter.	2 Marks	L3	CO5
	j)	Name any one surgical intervention for coarctation of the aorta.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the embryological development of the heart.	8 Marks	L2	CO1
	b)	Define and explain the different types of heart murmurs.	8 Marks	L2	CO1
		(OR)			
3.	a)	Classify congenital heart diseases.	8 Marks	L3	CO1
	b)	Describe apical impulse and point of maximal impulse.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the basics of chest x ray.	8 Marks	L2	CO2
	b)	Describe the systematic approach of chest x ray interpretation.	8 Marks	L3	CO2
		(OR)			
5.	a)	Define cardiac position and explain in detail about cardiac malposition.	8 Marks	L2	CO2
	b)	Write in detail about morphological features of right and left atrium.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain atrial septal defect, and its types.	8 Marks	L2	CO3
	b)	Describe patent ductus arteriosus and its embryological basis.	8 Marks	L2	CO3
		(OR)			
7.	a)	Classify ventricular septal defects based on location, size, and associated anomalies.	8 Marks	L3	CO3
	b)	Add a short note on pathophysiology of atrioventricular septal	8 Marks	L2	CO3

defect.

MODULE-IV

8.	a)	Apply your knowledge on hemodynamic consequences of partial anomalous pulmonary venous connection, and its impact on cardiac physiology.	8 Marks	L3	CO4
	b)	Elaborate on management strategies for ebstein's anomaly.	8 Marks	L2	CO4
		(OR)			
9.	a)	Discuss in detail surgical management options for patients with aortopulmonary window.	8 Marks	L2	CO4
	b)	Describe ebsteins anomaly, and its classification with diagrams.	8 Marks	L2	CO4

MODULE-V

10.	a)	Summarize on etiology and risk factors associated with tricuspid stenosis.	8 Marks	L2	CO5
	b)	Write in detail about management strategies for tricuspid regurgitation.	8 Marks	L3	CO5
		(OR)			
11.	a)	Describe pathophysiology of mitral stenosis and the hemodynamic consequences on left atrial and ventricular function.	8 Marks	L2	CO5
	b)	Discuss in detail about etiology and classification of pulmonary stenosis.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

EMERGENCY CARDIAC TECHNIQUES

[Emergency Medical and Critical Care Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define electrocardiogram (ECG).	2 Marks	L1	CO1
	b)	List any four ECG leads.	2 Marks	L1	CO1
	c)	Define defibrillation.	2 Marks	L1	CO2
	d)	What is cardioversion?	2 Marks	L1	CO2
	e)	Define cardiopulmonary resuscitation (CPR).	2 Marks	L1	CO3
	f)	Expand BLS.	2 Marks	L1	CO3
	g)	Define cardiac pacemaker.	2 Marks	L1	CO4
	h)	What is transcutaneous pacing?	2 Marks	L1	CO4
	i)	Define myocardial infarction.	2 Marks	L1	CO5
	j)	List any four drugs used in cardiac emergencies.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the anatomy and physiology of the cardiac conduction system.	8 Marks	L2	CO1
	b)	Describe the normal ECG waveform and its interpretation.	8 Marks	L3	CO1
		(OR)			
3.	a)	Explain the principle and working of electrocardiography.	8 Marks	L1	CO1
	b)	Describe the procedure for ECG recording and lead placement.	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain the indications and procedure of defibrillation.	8 Marks	L1	CO2
	b)	Describe the types of defibrillators used in emergency care.	8 Marks	L3	CO2
		(OR)			
5.	a)	Explain synchronized cardioversion and its indications.	8 Marks	L3	CO2
	b)	Describe safety precautions during cardioversion.	8 Marks	L1	CO2

MODULE-III

6.	a)	Explain the steps involved in cardiopulmonary resuscitation (CPR).	8 Marks	L2	CO3
	b)	Describe the causes and management of cardiac arrest.	8 Marks	L3	CO3
		(OR)			
7.	a)	Explain the chain of survival in cardiac emergencies.	8 Marks	L3	CO3
	b)	Describe the role of automated external defibrillator (AED) in CPR.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Explain the types and functions of cardiac pacemakers.	8 Marks	L3	CO4
	b)	Describe the procedure for transcutaneous pacing.	8 Marks	L3	CO4
		(OR)			
9.	a)	Explain temporary cardiac pacing and its indications.	8 Marks	L3	CO4
	b)	Describe complications associated with pacemaker therapy.	8 Marks	L1	CO4

MODULE-V

10.	a)	Explain the principles of Advanced Cardiac Life Support (ACLS).	8 Marks	L1	CO5
	b)	Describe the emergency management of myocardial infarction.	8 Marks	L3	CO5
		(OR)			
11.	a)	Explain ventricular tachycardia and its management.	8 Marks	L2	CO5
	b)	Describe ventricular fibrillation and its treatment.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

APPLIED DIALYSIS TECHNOLOGY - I

[Dialysis Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	List the uses of Erythropoietin.	2 Marks	L1	CO1
	b)	What are hemodialysis concentrate ? Give examples.	2 Marks	L1	CO1
	c)	What are the indications for antibiotic and heparin lock?	2 Marks	L2	CO2
	d)	Name the newer types of fistula in HD patients.	2 Marks	L1	CO2
	e)	Reaction to formaldehyde residue in the dialysis system – recognition and treatment.	2 Marks	L1	CO3
	f)	Tests for dialyzer performance after reuse.	2 Marks	L2	CO3
	g)	What is urea reduction ratio and how is it calculated?	2 Marks	L1	CO4
	h)	What modifications can be made to dialysis prescription in order to increase Kt/V?	2 Marks	L2	CO4
	i)	What are the Solutions used for Peritoneal Dialysis?	2 Marks	L1	CO5
	j)	What are the immediate post operative care in PD catheter insertion?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe detail about causes, clinical features ,pathogenesis and management of peritonitis.	8 Marks	L2	CO1
	b)	Explain the principles of peritoneal dialysis. .	8 Marks	L2	CO1
		(OR)			
3.	a)	Describe detail about the clinical features,pathogenesis and management of AVF stenosis.	8 Marks	L2	CO1
	b)	Explain the causes, clinical features,pathogenesis and management of AVF thrombosis .	8 Marks	L2	CO1

MODULE-II

4.	a)	Describe detail about causes, clinical features, and management of header sepsis.	8 Marks	L3	CO2
	b)	Explain in detail about temporary vascular access.	8 Marks	L2	CO2
		(OR)			
5.	a)	Explain in detail about permanent vascular access.	8 Marks	L2	CO2
	b)	Explain the causes, clinical feature ,pathogenesis and management of steal syndrome .	8 Marks	L2	CO2

MODULE-III

6.	a)	Write about the synthetic membranes used in dialyzers.	8 Marks	L2	CO3
	b)	What are the types of dialyzer membranes available? Which dialyzer membranes are preferred and why?	8 Marks	L2	CO3
		(OR)			
7.	a)	What are the differences between Synthetic and cellulosic dialyzer membranes?	8 Marks	L2	CO3
	b)	What are the chemicals used in reuse process?	8 Marks	L2	CO3

MODULE-IV

8.	a)	Write about heparin anticoagulation and the monitoring techniques for bleeding tendencies.	8 Marks	L2	CO4
	b)	Dialysis delivery systems: Definition and types.	8 Marks	L2	CO4
		(OR)			
9.	a)	What is the composition of a standard dialysate solution? How can this be modified in a patient with hyperkalemia?	8 Marks	L2	CO4
	b)	Draw the Hemodialysis circuit and label its parts.	8 Marks	L2	CO4

MODULE-V

10.	a)	What is PET? Explain the transport characteristic of Peritoneum.	8 Marks	L2	CO5
	b)	Explain the different forms of Automated Peritoneal Dialysis.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain the Types of PET.	8 Marks	L2	CO5
	b)	What are the causes of Fluid overload in CAPD.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

EMERGENCY SURGERY – I

[Emergency Medical and Critical Care Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Give four examples of absorbable suture material.	2 Marks	L2	CO1
	b)	Define disarticulation.	2 Marks	L1	CO1
	c)	Define ERCP.	2 Marks	L3	CO2
	d)	List out three hallmark sign for cholecystitis.	2 Marks	L1	CO2
	e)	Draw the diagram of calot's triangle for cholecystectomy.	2 Marks	L3	CO3
	f)	Define jaundice.	2 Marks	L1	CO3
	g)	List out the common causes of Hematuria.	2 Marks	L2	CO4
	h)	Name the stages of CKD.	2 Marks	L3	CO4
	i)	List out three medication used for anal fissure.	2 Marks	L2	CO5
	j)	Abbreviation of "FIBRE" hemorrhoids.	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Elaborate the compartment syndrome, and what diagnostic tests may be used.	8 Marks	L2	CO1
	b)	Describe the differences between traumatic and surgical amputations.	8 Marks	L3	CO1

(OR)

3.	a)	Explain the potential complications associated with untreated or poorly managed wounds.	8 Marks	L1	CO1
	b)	Describe the typical signs and symptoms of a child who has ingested a coin.	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain the cholecystitis and its treatment.	8 Marks	L1	CO2
	b)	Detail note on intravaginal and extravaginal testicular torsion.	8 Marks	L3	CO2

(OR)

5.	a)	Describe the differences between prehepatic, intrahepatic, and posthepatic causes of portal hypsertension.	8 Marks	L3	CO2
	b)	What are the treatment options for hepatic failure, including medical therapies and liver transplantation?	8 Marks	L1	CO2

MODULE-III

6.	a)	Describe the surgical techniques used in the treatment of gallstones, including cholecystectomy.	8 Marks	L2	CO3
	b)	Discuss the pathophysiology of acute cholecystitis.	8 Marks	L3	CO3
		(OR)			
7.	a)	What are the common causes of jaundice, including liver diseases such as hepatitis, liver cirrhosis.	8 Marks	L3	CO3
	b)	Define GI bleeding and describe its significance in clinical practice.	8 Marks	L1	CO3

MODULE-IV

8.	a)	What are the common causes of urethral injury, including urinary tract infections.	8 Marks	L3	CO4
	b)	Discuss the pathophysiology of cystitis, including the mechanisms underlying bladder inflammation and the immune response to bacterial invasion.	8 Marks	L3	CO4
		(OR)			
9.	a)	Explain the diagnostic evaluation for testicular torsion, including physical examination findings.	8 Marks	L3	CO4
	b)	Describe the clinical presentation of pancrititis.	8 Marks	L1	CO4

MODULE-V

10.	a)	Discuss the anatomy of the rectum and surrounding structures and how it relates to the development and presentation of rectal prolapse.	8 Marks	L1	CO5
	b)	Discuss the classification systems used to categorize anorectal malformations, such as the Wingspread classification or the Krickenbeck classification.	8 Marks	L3	CO5
		(OR)			
11.	a)	Describe the clinical presentation of hemorrhoids, write its classification.	8 Marks	L3	CO5
	b)	List out rectal abnormalities, write its management.	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

CLINICAL PROCEDURE IN EMERGENCY CARE

[Emergency Medical and Critical Care Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Short note on Double syringe technique in adenosine infusion.	2 Marks	L2	CO1
	b)	Define absolute refractory period.	2 Marks	L1	CO1
	c)	Draw the landmark for femoral vein catherization.	2 Marks	L3	CO2
	d)	List out three approach of pericardiocentesis.	2 Marks	L1	CO2
	e)	What is the alternative procedure for urethral catherization?	2 Marks	L3	CO3
	f)	List out five sites for intramuscular injection.	2 Marks	L1	CO3
	g)	Expand AEIOU in AV shunt.	2 Marks	L2	CO4
	h)	Define anion gap.	2 Marks	L3	CO4
	i)	Write down the measurement of NG tube	2 Marks	L2	CO5
	j)	Difference between transcutaneous and transvenous pacing	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Define capnography and elaborate the waveform seen in monitor.	8 Marks	L2	CO1
	b)	Describe the differences between a surgical cricothyrotomy and a needle cricothyrotomy, detail note on surgical cricothyrotomy.	8 Marks	L3	CO1

(OR)

3.	a)	Enumerate the different types of nebulizers available and how they work.	8 Marks	L1	CO1
	b)	How does the LMA differ from an endotracheal tube and explain the techniques of LMA.	8 Marks	L3	CO1

MODULE-II

4.	a)	List out the steps involved in performing endotracheal intubation. How is the correct placement of an endotracheal tube confirmed?	8 Marks	L1	CO2
	b)	Describe the anatomical landmarks used to guide pericardiocentesis. Describe the steps involved in performing pericardiocentesis.	8 Marks	L3	CO2

(OR)

5.	a)	Difference between OPA and NPA airway.	8 Marks	L3	CO2
	b)	Detail note on steps involved in performing central venous catheterization using the landmark technique.	8 Marks	L1	CO2

MODULE-III

6.	a)	Explain the purpose of umbilical cannulation in neonatal care and explain the procedure.	8 Marks	L2	CO3
	b)	Describe the steps involved in properly preparing and positioning a patient for intravenous line placement.	8 Marks	L3	CO3
		(OR)			
7.	a)	Define parenteral nutrition and briefly about types and components present in the nutrition.	8 Marks	L3	CO3
	b)	Elaborate the technique used for performing an intramuscular injection, including patient positioning, injection site selection and insertion method of IM.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Detail note on male urethral catheterization procedure.	8 Marks	L3	CO4
	b)	26 years women presented with a 3 hrs history of breathlessness. On examination, she is appeared distress and tachypnoeic.ABG shown: pH 7.55, PaCO2 30, HCO3 21,	8 Marks	L3	CO4
		(OR)			
9.	a)	Define arteriovenous (AV) shunt. List out the types and its insertion.	8 Marks	L3	CO4
	b)	What are the principles included in peritoneal dialysis (PD) and its role in the management of end-stage renal disease (ESRD)?	8 Marks	L1	CO4

MODULE-V

10.	a)	Discuss the technique for inserting a nasogastric (NG) tube and its measurement.	8 Marks	L1	CO5
	b)	Define transcutaneous pacing and position used for placing pads along with procedure.	8 Marks	L3	CO5
		(OR)			
11.	a)	Discuss the technique for performing a lumbar puncture, and the steps involved in collecting cerebrospinal fluid (CSF).	8 Marks	L3	CO5
	b)	Explain the technique for performing gastric lavage, and the steps involved in inserting a gastric lavage tube.	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

EMERGENCY MEDICINE AND CARDIAC LIFE SUPPORT - I

[Anaesthesia & Operation Theatre Technology, Cardio Vascular Technology, Respiratory Therapy Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is stroke?	2 Marks	L1	CO1
	b)	Name two condition of Gastro intestinal bleed.	2 Marks	L2	CO1
	c)	List out the normal vitals of a patient.	2 Marks	L2	CO2
	d)	Define tachycardia.	2 Marks	L1	CO2
	e)	Write any two precautions taken while using a defibrillator.	2 Marks	L1	CO3
	f)	Illustrate Atrial fibrillation.	2 Marks	L3	CO3
	g)	Define cardio version.	2 Marks	L1	CO4
	h)	Define arrhythmia.	2 Marks	L1	CO4
	i)	Illustrate a normal ECG waveform.	2 Marks	L3	CO5
	j)	List out the condition of a secondary PAE.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	How would you manage a post cardiac arrest patient?	8 Marks	L1	CO1
	b)	Differentiate respiratory attack and cardiac attack.	8 Marks	L3	CO1
		(OR)			
3.	a)	Write short notes on: i) cardiac output ii) lung volumes	8 Marks	L1	CO1
	b)	Illustrate a normal ECG waveform.	8 Marks	L3	CO1

MODULE-II

4.	a)	How do you recognize cardiac arrest rhythm?	8 Marks	L3	CO2
	b)	List out the symptoms of tachycardia.	8 Marks	L2	CO2
		(OR)			
5.	a)	Discuss the causes of pulse less VT.	8 Marks	L2	CO2
	b)	List out the condition of a secondary PAE.	8 Marks	L1	CO2

MODULE-III

6.	a)	What are the parameters identified while using a defibrillator and why?	8 Marks	L1	CO3
	b)	Table down the algorithm of BLS.	8 Marks	L3	CO3
		(OR)			
7.	a)	Enumerate the complications of the wearable defibrillator.	8 Marks	L1	CO3
	b)	Enumerate the indications and contraindication of a holter.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Enumerate the treatment management of anaphylaxis.	8 Marks	L2	CO4
	b)	Enumerate the different type of modes of ambulation.	8 Marks	L1	CO4
		(OR)			
9.	a)	Differentiate respiratory and cardiac arrest.	8 Marks	L2	CO4
	b)	Table down the bradycardia and tachycardia.	8 Marks	L3	CO4

MODULE-V

10.	a)	Write down the modes of mechanical ventilator. And explain any two ventilatory modes.	8 Marks	L1	CO5
	b)	Discuss about the high-pressure alarm.	8 Marks	L1	CO5
		(OR)			
11.	a)	Explain Valsalva manure.	8 Marks	L2	CO5
	b)	List out the uses and indication of cadioversion.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

STERILIZATION AND INFECTION CONTROL

[Anaesthesia & Operation Theatre Technology, Cardio Vascular Technology, Respiratory Therapy Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Name the veins used for placing a Central venous catheter.	2 Marks	L1	CO1
	b)	Define MRSA, Mention its types.	2 Marks	L1	CO1
	c)	List four sources of acquiring blood born infections.	2 Marks	L1	CO2
	d)	Define herpatic witflow.	2 Marks	L1	CO2
	e)	List the sterilization conditions followed in autoclave.	2 Marks	L1	CO3
	f)	Define disinfection.	2 Marks	L1	CO3
	g)	Mention four protective gears for biomedical waste handlers.	2 Marks	L2	CO4
	h)	Name the disinfectant used in managing a blood spill.	2 Marks	L1	CO4
	i)	Define pulmonary & extra pulmonary tuberculosis.	2 Marks	L1	CO2
	j)	Name four bacteria causing CAUTI.	2 Marks	L1	CO1

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Define significant bacteriuria, asymptomatic bacteriuria and explain four routes of bacterial entry into urinary tract.	8 Marks	L2	CO1
	b)	Enumerate the core preventive strategies to avoid MRSA infection.	8 Marks	L2	CO1
		(OR)			
3.	a)	Define CAUTI, enumerate the causes & pathogenesis of CAUTI.	8 Marks	L2	CO1
	b)	Define central venous catheter (CVC), discuss CVC under following headings i) Types ii) Uses	8 Marks	L2	CO1

MODULE-II

4.	a)	Enumerate the mode of transmission of hepatitis B in health care professionals, add note on preventive measures to be taken to stop the spread of hepatitis B in them.	8 Marks	L2	CO2
	b)	Discuss the pathogenesis and preventive measures to be followed to avoid tuberculosis infection.	8 Marks	L2	CO2
		(OR)			
5.	a)	Define opportunistic infections. List four opportunistic infections occurring in HIV Patient and add a note on ART.	8 Marks	L2	CO2
	b)	Classify tuberculosis, discuss the mode of transmission & preventive measures to be taken by a person infected with tuberculosis?	8 Marks	L2	CO2

MODULE-III

6.	a)	Discuss the construction & working of hot air oven.	8 Marks	L2	CO3
	b)	Discuss about a. Ethylene oxide b. Formaldehyde gas Sterilization methods.	8 Marks	L2	CO3

(OR)

7.	a)	List the tests used for testing of disinfectants. Explain rideal walker test.	8 Marks	L1	CO3
	b)	Explain the construction & working of autoclave.	8 Marks	L2	CO3

MODULE-IV

8.	a)	List the different color coded bins used in biomedical waste management, explain the waste products discarded into them in a neat tabular column.	8 Marks	L2	CO4
	b)	Explain various categories included in biomedical waste, explain the treatment protocol for the same.	8 Marks	L2	CO4

(OR)

9.	a)	Elucidate the process of blood spill management.	8 Marks	L3	CO4
	b)	Explain standard universal health precautions.	8 Marks	L2	CO4

MODULE-V

10.	a)	Define Catheter. Describe different types of urinary catheters, add note on precautions to be followed while inserting a urinary catheter.	8 Marks	L2	CO1
	b)	Enumerate the donning & doffing procedure while wearing protective body clothing.	8 Marks	L2	CO1

(OR)

11.	a)	Define ventilator associated pneumoniae (VAP). Discuss the pathogenesis of VAP.	8 Marks	L2	CO1
	b)	Define hospital acquired infections (HAI), categorize the preventive measures to be taken to prevent HAI.	8 Marks	L4	CO1

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

CARDIAC INSTRUMENTATION

[Cardio Vascular Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define compression and rarefaction.	2 Marks	L1	CO1
	b)	Enlist types of echocardiography.	2 Marks	L2	CO1
	c)	Write a brief note on cartesian format.	2 Marks	L3	CO2
	d)	Name the components of a pulse.	2 Marks	L2	CO2
	e)	Define knobology.	2 Marks	L1	CO3
	f)	What is front end and back-end processor?	2 Marks	L2	CO3
	g)	Write a brief note on "Fast Fourier Transform Technique".	2 Marks	L3	CO4
	h)	Name the types of Doppler echo.	2 Marks	L2	CO4
	i)	Define cardiac catheterization.	2 Marks	L1	CO5
	j)	Enlist four non cardiac equipments used in cathlab.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the concept of sound wave mechanics.	8 Marks	L2	CO1
	b)	Discuss history of echocardiography.	8 Marks	L2	CO1
		(OR)			
3.	a)	Describe concept of piezoelectric effect.	8 Marks	L2	CO1
	b)	Draw neat labelled diagram of transducer, and explain its parts.	8 Marks	L3	CO1

MODULE-II

4.	a)	Summarize the descriptors of pulsed ultrasound.	8 Marks	L2	CO2
	b)	Describe the components of echograph with neat labelled diagram.	8 Marks	L3	CO2
		(OR)			
5.	a)	Tabulate the differences between display modes in echocardiography.	8 Marks	L3	CO2
	b)	Illustrate how a sector shaped echo image is created and describe the factors that affect it.	8 Marks	L3	CO2

MODULE-III

6.	a)	Describe the system hardware and theory of echo machine.	8 Marks	L1	CO3
	b)	Outline the knobs on control panel of an echo machine and describe its importance in clinical setting.	8 Marks	L2	CO3
		(OR)			
7.	a)	Define 2D artifact, and explain side lobe artifacts.	8 Marks	L2	CO3
	b)	Explain the principles of tissue harmonic imaging.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Outline types of Doppler ultrasound, and add a note on continuous wave Doppler.	8 Marks	L2	CO4
	b)	Define pulse wave Doppler, and add a note on Nyquist limit.	8 Marks	L2	CO4
		(OR)			
9.	a)	Summarize Doppler artifacts.	8 Marks	L2	CO4
	b)	Prepare a note on methods to quantify regurgitations and intracardiac shunts using Doppler echocardiography.	8 Marks	L3	CO4

MODULE-V

10.	a)	Tabulate indications and contraindications of cardiac catheterization.	8 Marks	L2	CO5
	b)	Describe the production of X rays.	8 Marks	L2	CO5
		(OR)			
11.	a)	Discuss basic principles of radiation protection, and radiation safety protocol to be used in cathlab.	8 Marks	L3	CO5
	b)	Prepare a note on image intensifier and flat panel detectors used in angiographic room.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

FUNDAMENTALS OF ANESTHETIC TECHNIQUES

[Anaesthesia & Operation Theatre Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	List the types of drains used in surgery.	2 Marks	L1	CO1
	b)	What are haemostatic instruments?	2 Marks	L2	CO1
	c)	List two orthopedic surgical instruments.	2 Marks	L1	CO2
	d)	Mention two types of artificial prosthetic implants.	2 Marks	L1	CO2
	e)	Define anorectal surgery.	2 Marks	L1	CO3
	f)	Mention two thoracic surgery instruments.	2 Marks	L1	CO3
	g)	Differentiate between autograft and allograft transplants.	2 Marks	L2	CO4
	h)	What are the primary complications in organ transplantation?	2 Marks	L2	CO4
	i)	Mention two factors affecting OT environment.	2 Marks	L1	CO5
	j)	Differentiate between emergency and elective surgeries.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe the classification of surgical instruments with examples.	8 Marks	L3	CO1
	b)	Discuss the impact of different blade sizes on surgical precision.	8 Marks	L3	CO1

(OR)

3.	a)	Discuss the ergonomic considerations in the design of surgical scissors.	8 Marks	L3	CO1
	b)	Explain the advantages and disadvantages of various haemostatic instruments.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the classification and functions of biliary tract surgical instruments.	8 Marks	L2	CO2
	b)	Describe the applications of orthopedic and plastic surgical instruments.	8 Marks	L3	CO2

(OR)

5.	a)	Explain the advancements in general surgical instruments over time.	8 Marks	L2	CO2
	b)	Discuss the differences between manual and powered surgical instruments.	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain the working principle of robotic surgical systems.	8 Marks	L2	CO3
	b)	Discuss the advantages and disadvantages of robotic-assisted surgery.	8 Marks	L2	CO3

(OR)

7.	a)	Analyze the contraindications and limitations of robotic surgery.	8 Marks	L4	CO3
	b)	Explain the significance of robotic surgery in pediatric procedures.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss the ethical concerns related to organ transplantation.	8 Marks	L3	CO4
	b)	Evaluate the effectiveness of various transplantation instruments.	8 Marks	L3	CO4

(OR)

9.	a)	Explain the impact of artificial organ technology on transplantation.	8 Marks	L2	CO4
	b)	Compare the different surgical methods used in multi-organ transplants.	8 Marks	L4	CO4

MODULE-V

10.	a)	Explain the principles of infection control in the operation theatre.	8 Marks	L2	CO5
	b)	Discuss the significance of scrubbing in surgical procedures.	8 Marks	L3	CO5

(OR)

11.	a)	Explain automated OT sterilization techniques	8 Marks	L2	CO5
	b)	Discuss the impact of improper infection control on patient safety.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

EMERGENCY MEDICINE - I

[Emergency Medical and Critical Care Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Add a brief note on albumin.	2 Marks	L1	CO1
	b)	What is Atropine? Mention its dosage.	2 Marks	L1	CO1
	c)	Write a brief note on albumin.	2 Marks	L1	CO2
	d)	What is Atropine? Mention its dosage.	2 Marks	L1	CO2
	e)	Name any three surgical procedures in hernia management.	2 Marks	L1	CO3
	f)	Write a brief note on abdominal aortic aneurysm.	2 Marks	L1	CO3
	g)	Identify the augmented leads and limb leads in ECG.	2 Marks	L1	CO4
	h)	What are the types of heart blocks?	2 Marks	L1	CO4
	i)	List out the causes of seizure.	2 Marks	L1	CO5
	j)	Identify the signs of stroke.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss in detail about dopamine and its action.	8 Marks	L3	CO1
	b)	What is salbutamol? Explain its indications, contra indications and dosage of it.	8 Marks	L2	CO1

(OR)

3.	a)	Describe a detail note on Midazolam.	8 Marks	L2	CO1
	b)	Classify calcium channel blockers and write its indications, contra indications.	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain in detail about crystalloids.	8 Marks	L2	CO2
	b)	Elaborate on colloids, and list out indications with contra indications.	8 Marks	L3	CO2

(OR)

5.	a)	Differentiate COPD and asthma.	8 Marks	L3	CO2
	b)	Elaborative on pulmonary edema.	8 Marks	L3	CO2

MODULE-III

6.	a)	Classify the types of aortic aneurysm with neat diagram, and explain its pathophysiology.	8 Marks	L3	CO3
	b)	Explain hernia, and write its causes with management.	8 Marks	L2	CO3

(OR)

7.	a)	Discuss in detail about viral and non-viral hepatitis.	8 Marks	L2	CO3
	b)	Illustrate types of bowel obstruction and list out the causes of it.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Illustrate on basics of ECG and draw a diagram.	8 Marks	L3	CO4
	b)	Explain hypertensive emergency, and explain its causes with management.	8 Marks	L2	CO4

(OR)

9.	a)	Discuss a detail note on cardiac arrhythmias.	8 Marks	L2	CO4
	b)	What are the types of angina pectoris and list out its characteristics with pathophysiology?	8 Marks	L2	CO4

MODULE-V

10.	a)	Illustrate types of stroke with clinical features and management.	8 Marks	L3	CO5
	b)	Identify the types of seizures with causes and clinical features.	8 Marks	L3	CO5

(OR)

11.	a)	Distinguish meningitis and meningoencephalitis.	8 Marks	L3	CO5
	b)	Describe a detail note on syncope.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester (MBU-22) Regular Examinations, June – 2026

TRAUMA AND CARDIAC CARE MANAGEMENT

[Dialysis Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Name two types of intracranial hemorrhages.	2 Marks	L1	CO1
	b)	Define epidural hematoma.	2 Marks	L1	CO1
	c)	Define cardiac tamponade.	2 Marks	L1	CO2
	d)	Mention two differences between open and closed pneumothorax.	2 Marks	L2	CO2
	e)	Differentiate between penetrating and blunt abdominal trauma.	2 Marks	L3	CO3
	f)	State the clinical importance of FAST (Focused Assessment with Sonography in Trauma).	2 Marks	L2	CO3
	g)	Mention any two characteristics of a shockable rhythm.	2 Marks	L2	CO4
	h)	List two signs of bradycardia that require intervention.	2 Marks	L2	CO4
	i)	What is the rate and depth of chest compressions in adult CPR?	2 Marks	L1	CO5
	j)	Differentiate between respiratory arrest and cardiac arrest.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe the various causes of head injuries in trauma patients.	8 Marks	L3	CO1
	b)	Explain the clinical features of subdural hematoma.	8 Marks	L2	CO1
		(OR)			
3.	a)	Discuss the pathophysiology of epidural hematoma.	8 Marks	L2	CO1
	b)	Explain the treatment options for subarachnoid hemorrhage.	8 Marks	L2	CO1

MODULE-II

4.	a)	Differentiate between tension pneumothorax and simple pneumothorax.	8Marks	L2	CO2
	b)	Explain the pathophysiology and clinical features of cardiac tamponade.	8Marks	L2	CO2
		(OR)			
5.	a)	Explain the sequence of events in the development of hemothorax following chest trauma.	8 Marks	L2	CO2
	b)	Describe how to clinically identify and differentiate thoracic injuries.	8 Marks	L2	CO2

MODULE-III

6.	a)	List the common causes and complications of splenic injury.	8 Marks	L1	CO3
	b)	Explain the pathophysiology of abdominal trauma.	8 Marks	L2	CO3
		(OR)			
7.	a)	Discuss the clinical features of retroperitoneal injuries.	8 Marks	L2	CO3
	b)	Describe the steps in the diagnostic evaluation of abdominal trauma.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Describe different types of rhythms encountered during cardiac arrest.	8 Marks	L2	CO4
	b)	Explain the difference between shockable and non-shockable rhythms.	8 Marks	L2	CO4

(OR)

9.	a)	Explain the importance of early defibrillation in survival outcomes.	8 Marks	L2	CO4
	b)	A patient collapses in front of you. Apply the BLS steps as per current guidelines.	8 Marks	L3	CO4

MODULE-V

10.	a)	Write a detailed note on the role of circulation assessment in trauma patients.	8 Marks	L2	CO5
	b)	Explain how ITLS improves patient outcomes in trauma cases.	8 Marks	L2	CO5

(OR)

11.	a)	Describe the process of airway management in a trauma patient.	8 Marks	L2	CO5
	b)	Explain how the disability assessment is performed in a primary survey.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) I Semester (MBU-22) Regular Examinations, May – 2026

HUMAN ANATOMY – I

[Anaesthesia & Operation Theatre Technology, Emergency Medical and Critical Care Technology, Medical Lab Technology, Respiratory Therapy, Cardio Vascular Technology, Optometry, Dialysis Technology, Radiology & Imaging Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Write a brief note on cadaveric anatomy.	2 Marks	L2	CO1
	b)	Name the parts of a muscle.	2 Marks	L1	CO1
	c)	What is a muscle spindle?	2 Marks	L3	CO2
	d)	Define synovial joint.	2 Marks	L1	CO2
	e)	Prepare a brief note on cardiomegaly.	2 Marks	L3	CO3
	f)	Name the valves present in the heart.	2 Marks	L1	CO3
	g)	Write a brief note on pharyngitis and tonsilitis.	2 Marks	L2	CO4
	h)	Outline any two functions of the gall bladder.	2 Marks	L3	CO4
	i)	Prepare a brief note on pseudo-stratified epithelium.	2 Marks	L3	CO5
	j)	What is perichondrium and mention its functions.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe the different types of body movements with examples.	8 Marks	L2	CO1
	b)	Write a note on the different positions of human body used in clinical studies with examples.	8 Marks	L3	CO1

(OR)

3.	a)	List out the terms used for describing muscles.	8 Marks	L1	CO1
	b)	Explain structural classification of the bone (Macroscopic and Microscopic) with suitable examples.	8 Marks	L3	CO1

MODULE-II

4.	a)	Write a note on features of the femur bone with its muscle attachments.	8 Marks	L3	CO2
	b)	What are the terms used to describe bone features?	8 Marks	L2	CO2

(OR)

5.	a)	Explain the types of muscles with examples.	8 Marks	L3	CO2
	b)	Discuss in detail about blood supply of the long bone with a neat labeled diagram.	8 Marks	L2	CO2

MODULE-III

6.	a)	Illustrate conducting system of heart with a diagram and mention it's clinical importance.	8 Marks	L2	CO3
	b)	What is aorta? Add a note on the parts of aorta, relations of aorta and it's branches.	8 Marks	L3	CO3

(OR)

7.	a)	Illustrate blood supply of the heart with a diagram.	8 Marks	L2	CO3
	b)	Describe external features of the heart, and internal features of the right atrium.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Write differences between the right lung and the left lung with a neat labeled diagram.	8 Marks	L3	CO4
	b)	List out the parts of digestive system. Outline the structure of stomach under the following headings: i) External features ii) Internal features iii) Relations iv) Blood supply & Nerve supply v) Applied anatomy.	8 Marks	L3	CO4

(OR)

9.	a)	Explain structure of the spleen under the following headings: i) External features ii) Internal features iii) Relations iv) Blood supply & Nerve supply v) Applied anatomy.	8 Marks	L3	CO4
	b)	Describe structure of the liver under following headings: i) External features ii) Internal features iii) Relations iv) Blood supply & Nerve supply v) Applied anatomy.	8 Marks	L1	CO4

MODULE-V

10.	a)	Illustrate microscopic structure of the hyaline cartilage with a diagram.	8 Marks	L2	CO5
	b)	Draw a neat labeled diagram of the compound microscope.	8 Marks	L1	CO5

(OR)

11.	a)	Illustrate microscopic structure of the elastic cartilage with a neat labeled diagram.	8 Marks	L2	CO5
	b)	Define cell division. Explain the stages of meiosis with suitable diagrams.	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) I Semester (MBU-22) Regular Examinations, May – 2026

HUMAN PHYSIOLOGY – I

[Anaesthesia & Operation Theatre Technology, Emergency Medical and Critical Care Technology, Medical Lab Technology, Respiratory Therapy, Cardio Vascular Technology, Optometry, Dialysis Technology, Radiology & Imaging Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define Polycythemia and mention its types with examples.	2 Marks	L2	CO1
	b)	What are steps involved in collection & storage of blood?	2 Marks	L1	CO1
	c)	Mention the types of Summation in nerve fiber.	2 Marks	L3	CO2
	d)	What are various types of muscle contraction?	2 Marks	L1	CO2
	e)	Add a note on defecation reflex.	2 Marks	L3	CO3
	f)	Add a note on peristalsis.	2 Marks	L1	CO3
	g)	Write a few points on Chloride shift.	2 Marks	L2	CO4
	h)	Add a note on Haldane effect.	2 Marks	L3	CO4
	i)	Add a note on vasa recta.	2 Marks	L2	CO5
	j)	Write about composition of Urine.	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain various functions of plasma proteins.	8 Marks	L2	CO1
	b)	Add a note on abnormal haemoglobins.	8 Marks	L3	CO1
		(OR)			
3.	a)	List out various clotting factors. Add a note on afibrinigenemia.	8 Marks	L1	CO1
	b)	Explain the composition, formation, circulation and functions of lymph.	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain excitation – contraction coupling.	8 Marks	L1	CO2
	b)	Define excitability. Describe the excitability curve.	8 Marks	L3	CO2
		(OR)			
5.	a)	Explain the stages in action potential with a neat labeled diagram.	8 Marks	L3	CO2
	b)	Add a note on Myasthenia gravis and rigor mortis.	8 Marks	L1	CO2

MODULE-III

6.	a)	What is ulcer? Discuss different types of ulcers.	8 Marks	L2	CO3
	b)	Discuss the details,causes, diagnosis and treatment of gall stones.	8 Marks	L3	CO3
		(OR)			
7.	a)	Write an essay on gastric motility. What are the factors influencing gastric emptying?	8 Marks	L3	CO3

	b)	Add a note on vomiting reflex and defecation reflex.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Define cyanosis and it's types.	8 Marks	L3	CO4
	b)	Add a note on SCUBA.	8 Marks	L3	CO4
		(OR)			
9.	a)	Explain the effect of exercise on respiration.	8 Marks	L3	CO4
	b)	Add a note on physiological anatomy of respiratory tract.	8 Marks	L1	CO4

MODULE-V

10.	a)	Describe the absorption of Na^+ in nephron with suitable diagrams.	8 Marks	L1	CO5
	b)	Discuss the Significance of renal circulation.	8 Marks	L3	CO5
		(OR)			
11.	a)	Write the composition of urine, add a note on renal calculi.	8 Marks	L3	CO5
	b)	Draw a neat labeled diagram of urinary bladder along with nerve innervations.	8 Marks	L1	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.P.T. III Semester (MBU-22) Regular Examinations, June – 2026

CLINICAL ORTHOPAEDICS

[Orthopedics]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Write the functions of Thomas splint.	2 Marks	L2	CO1
	b)	What is Phantom limb?	2 Marks	L1	CO1
	c)	Write the radiological findings of Lumbar spondylosis.	2 Marks	L3	CO2
	d)	Distinguish the rickets and osteomalacia.	2 Marks	L1	CO2
	e)	Define ectopic ossification.	2 Marks	L3	CO3
	f)	Add a note on Hansen's disease.	2 Marks	L1	CO3
	g)	How to do Roos test. Positive test indicates?	2 Marks	L2	CO4
	h)	Differentiate between a positive and negative Finkelstein test result.	2 Marks	L3	CO4
	i)	Define Quadriceps fibrosis.	2 Marks	L2	CO5
	j)	Define polyarthritis.	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss the causes, classification, and management of supracondylar fracture of humerus.	8 Marks	L2	CO1
	b)	Explain the causes, clinical features, diagnosis and management of scoliosis.	8 Marks	L3	CO1

(OR)

3.	a)	Elucidate the Bennetts fracture dislocation.	8 Marks	L1	CO1
	b)	Differentiate the three types of classification of fracture neck of femur.	8 Marks	L3	CO1

MODULE-II

4.	a)	Write the causes, clinical features, and radiological findings of spondylolisthesis.	8 Marks	L1	CO2
	b)	Discuss the pathology and the management of spondylolisthesis.	8 Marks	L3	CO2

(OR)

5.	a)	Define osteoarthritis. Write the clinical features, and management of osteoarthritis.	8 Marks	L3	CO2
	b)	Write the pathology and radiological findings of osteoarthritis.	8 Marks	L1	CO2

MODULE-III

6.	a)	Differentiate benign and malignant tumor. Explain the pathology, investigations, and management of giant cell tumor.	8 Marks	L2	CO3
	b)	Write the causes, types, clinical features and management of cerebral palsy.	8 Marks	L3	CO3

(OR)

7.	a)	Write the causes, clinical features, and pathophysiology of poliomyelitis.	8 Marks	L3	CO3
	b)	What is Arthrogryposis multiplex congenita? Add a note on causes, clinical features, and management.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Elucidate the causes, symptoms, and management of supraspinatus syndrome.	8 Marks	L3	CO4
	b)	Explain the causes, clinical features and management of golfers elbow.	8 Marks	L3	CO4

(OR)

9.	a)	Outline the causes, clinical features, and management of swimmer's shoulder.	8 Marks	L3	CO4
	b)	Explain the causes, clinical features, and management of the De Quervain's tenosynovitis.	8 Marks	L1	CO4

MODULE-V

10.	a)	Explain the pathophysiology, and clinical features of tarsal tunnel syndrome.	8 Marks	L1	CO5
	b)	Define sciatica. Write the causes, and management of sciatica.	8 Marks	L3	CO5

(OR)

11.	a)	Explain how lumbarization affects the normal arrangement of lumbar and sacral vertebrae.	8 Marks	L3	CO5
	b)	What is Legg-calve-Perthes disease? Compare the radiographic findings in early stage with late stage Perthes disease.	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.P.T. III Semester (MBU-22) Regular Examinations, June – 2026

CLINICAL SPORTS MEDICINE

[Sports]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Write any four causes of Rotator cuff injury.	2 Marks	L1	CO1
	b)	Define painful arc syndrome.	2 Marks	L2	CO1
	c)	Define tendonitis.	2 Marks	L1	CO1
	d)	Write about dinner fork deformity.	2 Marks	L1	CO1
	e)	Define patella Alta and Baja.	2 Marks	L3	CO3
	f)	Define Meniscectomy.	2 Marks	L1	CO3
	g)	Difference between SCFE and Perthe's disease.	2 Marks	L1	CO4
	h)	Define spinal stenosis.	2 Marks	L1	CO4
	i)	Write about the MOI in SC and AC joint injury?	2 Marks	L1	CO1
	j)	Define Bankart and hillsachs lesion.	2 Marks	L1	CO1

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss about classification of Epiphyseal injuries.	8 Marks	L2	CO1
	b)	Discuss about the anatomy, aetiology, clinical features and medical management of Osgood scatler disease.	8 Marks	L3	CO1

(OR)

3.	a)	Describe proximal humerus fracture and explain about Neer's classification of PHF.	8 Marks	L2	CO1
	b)	Discuss about the sternoclavicular joint injuries.	8 Marks	L3	CO1

MODULE-II

4.	a)	Describe Valgus extension overload. Mention about its clinical relevance.	8 Marks	L3	CO3
	b)	Explain epidemology, clinical features, medical management and prevention of little league elbow.	8 Marks	L1	CO3

(OR)

5.	a)	Define tennis elbow. Mention about its cause, clinical features, medical management and prevention.	8 Marks	L1	CO3
	b)	Elaborate carpel bones fractures. Discuss in detail about scaphoid fracture.	8 Marks	L3	CO3

MODULE-III

6.	a)	Explain about causes, MOI, grades of sprain, prevention and medical management of ACL injury.	8 Marks	L2	CO3
	b)	Explain about signs and symptoms, etiology, risk factors and surgical management of Patellar fractures.	8 Marks	L3	CO3

(OR)

7.	a)	Interpret the clinical features, relevant anatomy, pathological process and medical management of Patellar tendinopathy.	8 Marks	L2	CO3
	b)	Discuss about intrinsic and extrinsic factors risk factors, conservative and surgical management of Achilles Tendonitis.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Describe in detail about classification of Spondylolisthesis.	8 Marks	L2	CO4
	b)	Differentiate between hamstring muscle strain and referred hamstring pain.	8 Marks	L2	CO4

(OR)

9.	a)	Describe iliotibial band syndrome? Discuss about its clinical features, prevention and management.	8 Marks	L3	CO4
	b)	Explain about epidemiology,causes, clinical symptoms and management of retrocalcaneal bursitis.	8 Marks	L2	CO4

MODULE-V

10.	a)	Interpretation of gastrocnemius flap and mention about its operative technique.	8 Marks	L2	CO3
	b)	Explain about types, MOI, signs and symptoms and prevention of Achilles tendinopathy.	8 Marks	L2	CO3

(OR)

11.	a)	Elaborate carpel bones fractures. Discuss in detail about hamate fracture.	8 Marks	L1	CO2
	b)	Discuss about hand deformities.	8 Marks	L3	CO2

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.P.T. III Semester (MBU-22) Regular Examinations, June – 2026

CLINICAL NEUROLOGY

[Neurology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	List the pathological types of Neuroma.	2 Marks	L1	CO1
	b)	Define Angioma and mention its effects on the brain.	2 Marks	L1	CO1
	c)	Define Progressive Bulbar Palsy.	2 Marks	L1	CO2
	d)	Enumerate the types of Cerebral Palsy.	2 Marks	L1	CO2
	e)	State the etiology of Transverse Myelitis.	2 Marks	L1	CO3
	f)	What is Intervertebral Disc Prolapse?	2 Marks	L1	CO3
	g)	List the types of peripheral neuropathy.	2 Marks	L1	CO4
	h)	Define Motor Neuron Disease.	2 Marks	L2	CO4
	i)	Differentiate Ischemic Stroke and Hemorrhagic Stroke.	2 Marks	L3	CO5
	j)	Define Vestibular Disorders.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss neuroma in detail, including its types, clinical manifestations, and multidisciplinary management.	8 Marks	L2	CO1
	b)	Explain hepatic encephalopathy with emphasis on its pathogenesis, stages, neurological manifestations, and management.	8 Marks	L3	CO1

(OR)

3.	a)	Discuss hypoglycemic encephalopathy and its effects on the central nervous system, including clinical presentation and management.	8 Marks	L3	CO1
	b)	Explain angioma and craniopharyngioma with respect to their pathology, clinical presentation, and therapeutic interventions.	8 Marks	L3	CO1

MODULE-II

4.	a)	Differentiate Ischemic Stroke and Hemorrhagic Stroke based on etiology, pathophysiology, clinical presentation, and imaging findings.	8 Marks	L3	CO2
	b)	Discuss the types and clinical features of Multiple Sclerosis, including relapsing-remitting and progressive forms.	8 Marks	L2	CO2

(OR)

5.	a)	Discuss various Cerebellar Disorders and their common clinical manifestations such as ataxia, dysmetria, and intention tremor.	8 Marks	L3	CO2
	b)	Explain the pathophysiology, clinical features, and neuroimaging techniques used in diagnosing Traumatic Brain Injury.	8 Marks	L3	CO2

MODULE-III

6.	a)	Classify disorders of the Spinal Cord and describe any one condition in detail, including its pathophysiology and clinical presentation.	8 Marks	L3	CO3
	b)	Discuss Acute Disseminated Encephalomyelitis, including its pathophysiology, clinical features, and treatment options.	8 Marks	L3	CO3
		(OR)			
7.	a)	Describe the types of Spinal Tumors with reference to clinical features and treatment.	8 Marks	L2	CO3
	b)	Discuss the etiology, diagnostic approaches, and treatment of Guillain–Barré Syndrome, including electrophysiological studies.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Classify Nerve Injuries and describe their clinical significance.	8 Marks	L3	CO4
	b)	Describe the adverse effects of immobilization on the Musculoskeletal System, including muscle atrophy, joint stiffness, and bone demineralization.	8 Marks	L2	CO4
		(OR)			
9.	a)	Summarize the causes and types of Visual Impairment, including neurological and ocular origins.	8 Marks	L2	CO4
	b)	Explain the types and clinical features of Peripheral Neuropathy, including sensory, motor, and autonomic involvement.	8 Marks	L3	CO4

MODULE-V

10.	a)	Evaluate diagnostic methods used to identify neurodegenerative diseases and their role in differentiating various conditions.	8 Marks	L4	CO5
	b)	Discuss the psychological and social challenges faced by individuals with neurodegenerative diseases, including disability, dependence, and quality of life.	8 Marks	L3	CO5
		(OR)			
11.	a)	Discuss the management and rehabilitation of patients with Neurological Infections.	8 Marks	L3	CO5
	b)	Explain diagnostic tools used in the evaluation of Central Nervous System infections and tumors, including imaging and laboratory investigations.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.P.T. III Semester (MBU-22) Regular Examinations, June – 2026

BASIC SCIENCE - ORTHOPAEDICS

[Orthopedics]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Name the auditory ossicles.	2 Marks	L1	CO1
	b)	List the joint receptors	2 Marks	L2	CO1
	c)	What is pronator teres syndrome?	2 Marks	L1	CO2
	d)	Which muscle weakness lead to winging of scapula.	2 Marks	L1	CO2
	e)	What is Hoffa's fat pad syndrome?	2 Marks	L2	CO3
	f)	Define Q-angle.	2 Marks	L1	CO3
	g)	What is torsional force?	2 Marks	L3	CO4
	h)	Define torticollis.	2 Marks	L2	CO4
	i)	Define waddling gait.	2 Marks	L1	CO5
	j)	What is dowagers hump?	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe about Embryological development of skeletal system.	8 Marks	L2	CO1
	b)	Explain the ossification of bones.	8 Marks	L1	CO1

(OR)

3.	a)	Enumerate the sciatic nerve under the following headings. i) Origin and root value ii) Course and relations iii) Clinical anatomy	8 Marks	L1	CO1
	b)	Explain origin, insertion, action, nerve supply of iliocoastalis, longissimus muscles	8 Marks	L1	CO1

MODULE-II

4.	a)	Explain about pathomechanics of upper cross syndrome.	8 Marks	L2	CO2
	b)	Name the axis, planes of wrist joint movements and add a note on pathomechanics of wrist joint instability.	8 Marks	L2	CO2

(OR)

5.	a)	Describe the mechanics and pathomechanics of the flexor mechanism of finger.	8 Marks	L2	CO2
	b)	Describe the pathomechanics of elbow flexors.	8 Marks	L1	CO2

MODULE-III

6.	a)	What is the mechanics of the cruciate ligament and menisci in knee flexion and extension.write about the pathomechanics of meniscal entrapment in knee.	8 Marks	L2	CO3
	b)	Explain about the mechanics and pathomechanics of patellar influence on quadriceps muscle.	8 Marks	L3	CO3

(OR)

7.	a)	Describe about mechanics and pathomechanics of anterior pelvic tilt and posterior pelvic tilt.	8 Marks	L2	CO3
	b)	Discuss about pathomechanics of hip extensor muscles.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Describe about the mechanics of the craniovertebral region .	8 Marks	L2	CO4
	b)	Write about the mechanics and pathomechanics of scalene muscles.	8 Marks	L1	CO4

(OR)

9.	a)	Discuss about pelvic floor muscles. Elucidate about the pregnancy impact on sacral mechanics.	8 Marks	L2	CO4
	b)	Explain the mechanics of injury prevention while lifting weights.	8 Marks	L2	CO4

MODULE-V

10.	a)	Describe the analysis of standing posture in sagittal plane.	8 Marks	L2	CO5
	b)	Explain the deviations of foot,toes,knee of standing posture in sagittal plane.	8 Marks	L2	CO5

(OR)

11.	a)	Describe about equinus gait and ataxic gait.	8 Marks	L1	CO5
	b)	Discuss about phases of gait cycle.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.P.T. III Semester (MBU-22) Regular Examinations, June – 2026

BASIC SCIENCE IN SPORTS MEDICINE

[Sports]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Give an example of strap muscle.	2 Marks	L2	CO1
	b)	Name the types ossification of bones.	2 Marks	L1	CO1
	c)	Define myasthenia gravis.	2 Marks	L1	CO2
	d)	What is referred pain?	2 Marks	L1	CO2
	e)	What is concussion and contusion?	2 Marks	L1	CO3
	f)	Which ligament is known as Y ligament of Bigelow?	2 Marks	L2	CO3
	g)	Define SAID principle.	2 Marks	L2	CO4
	h)	What is gamekeepers thumb?	2 Marks	L1	CO4
	i)	What is circuit training?	2 Marks	L1	CO4
	j)	Write about spring ligament.	2 Marks	L2	CO3

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the types of muscle fibers.	8 Marks	L1	CO1
	b)	Describe the course, relations and branches of ulnar nerve.	8 Marks	L1	CO1
		(OR)			
3.	a)	Explain about bucket handle and pump handle motion of thorax.	8 Marks	L2	CO1
	b)	Describe the origin,insertion,action,nerve supply of diaphragm,scalene muscles.	8 Marks	L1	CO1

MODULE-II

	a)	Explain about neuro muscular junction.	8 Marks	L2	CO2
	b)	What are dermatomes and myotomes? Draw a neat labelled diagram of dermatome.	8 Marks	L3	CO2
		(OR)			
5.	a)	Explain about deep sea physiology. Add a note on decompression sickness.	8 Marks	L1	CO2
	b)	Describe about sliding filament theory of skeletal muscle.	8 Marks	L2	CO2

MODULE-III

6.	a)	Discuss about flexibility and its physiological effects? Explain about sit and reach test,back scratch test.	8 Marks	L3	CO3
	b)	Describe about types of sports injuries.	8 Marks	L2	CO3
		(OR)			
7.	a)	Describe the mechanics and pathomechanics of anterior cruciate ligament	8 Marks	L1	CO3
	b)	Explain the pathomechanics of Medial and lateral collateral ligament injuries.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Discuss about use and application of biomechanics in throwing sport events.	8 Marks	L3	CO4
	b)	Discuss in detail about psychological factors of sports injuries.	8 Marks	L2	CO4
		(OR)			
9.	a)	Explain about physical properties of water,physiological effects and therapeutic value of aquatic therapy.	8 Marks	L2	CO4
	b)	Discuss in detail about effects of immobilization.	8 Marks	L2	CO4

MODULE-V

10.	a)	Elaborate the pathomechanics of lateral ankle sprain	8 Marks	L2	CO3
	b)	Discuss about mechanics and pathomechanics of dorsiflexor muscles of ankle.	8 Marks	L1	CO3
		(OR)			
11.	a)	Write about banned drugs and its effects.	8 Marks	L2	CO4
	b)	Explain about physiological changes occur during aerobic exercise. Explain about cooper run test.	8 Marks	L3	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.P.T. III Semester (MBU-22) Regular Examinations, June – 2026

BASIC SCIENCE – NEUROLOGY

[Neurology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	List four important functions of the Medulla Oblongata.	2 Marks	L1	CO1
	b)	Enumerate the components of the Basal Ganglia.	2 Marks	L1	CO1
	c)	Identify the major connections of the Limbic System.	2 Marks	L1	CO2
	d)	Define the Reticular Formation.	2 Marks	L1	CO2
	e)	Name the clinical conditions associated with Cerebellum dysfunction.	2 Marks	L1	CO3
	f)	State the functions of Cerebrospinal Fluid.	2 Marks	L1	CO3
	g)	Define pathomechanics of joints in relation to gait and posture in neurological disorders.	2 Marks	L1	CO4
	h)	Outline the structure and functions of Cerebrospinal Fluid.	2 Marks	L2	CO4
	i)	Draw and label the parts of the Brainstem.	2 Marks	L2	CO5
	j)	Enlist the cranial nerves emerging from the Pons.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe the nuclei, course, relations, branches, and distribution of the Facial Nerve. Add a note on Bell's Palsy.	8 Marks	L2	CO1
	b)	Explain the anatomical organization of the Brachial Plexus and discuss muscle involvement in Erb's Palsy.	8 Marks	L3	CO1

(OR)

3.	a)	Discuss the anatomical divisions and functional roles of the Cerebellum.	8 Marks	L2	CO1
	b)	Explain the structure and functional significance of the Internal Capsule in motor and sensory pathways.	8 Marks	L3	CO1

MODULE-II

4.	a)	Examine the anatomy and functions of the Cranial Nerves and their nuclei.	8 Marks	L2	CO2
	b)	Summarize the Ventricular System and explain its role in circulation of Cerebrospinal Fluid.	8 Marks	L2	CO2

(OR)

5.	a)	Evaluate the role of the Pons in regulation of respiration.	8 Marks	L4	CO2
	b)	Compare the sympathetic and parasympathetic divisions of the Autonomic Nervous System.	8 Marks	L3	CO2

MODULE-III

6.	a)	Analyze the physiological mechanisms that enable excitable cells to generate and propagate action potentials.	8 Marks	L4	CO3
	b)	Illustrate the structural organization of the Cerebellum and explain its role in motor coordination.	8 Marks	L3	CO3

(OR)

7.	a)	Explain the physiological mechanisms of nerve impulse conduction in nerve fibers.	8 Marks	L2	CO3
	b)	Discuss the physiological mechanisms occurring at the Neuromuscular Junction.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Describe the structure and functions of the Brainstem including the Midbrain, Pons, and Medulla Oblongata.	8 Marks	L2	CO4
	b)	Discuss the Thalamus and Hypothalamus with reference to their connections and functions.	8 Marks	L2	CO4

(OR)

9.	a)	Describe the Ventricular System and the circulation of Cerebrospinal Fluid in the brain.	8 Marks	L2	CO4
	b)	Explain the structure and function of the Blood–Brain Barrier and discuss its clinical significance.	8 Marks	L2	CO4

MODULE-V

10.	a)	Describe the structure and components of the peripheral nervous system.	8 Marks	L2	CO5
	b)	Explain the ascending and descending tracts of the Spinal Cord.	8 Marks	L3	CO5

(OR)

11.	a)	Elaborate the special senses of the human body.	8 Marks	L2	CO5
	b)	Discuss the structure of a neuron and its classification.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. IV Semester (MBU-22) Regular Examinations, April – 2026

GENERAL CHEMISTRY

[Forensic Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What are the characteristics of metals?	2 Marks	L1	CO1
	b)	State metallic lustre.	2 Marks	L1	CO1
	c)	Differentiate natural and artificial ceramics.	2 Marks	L1	CO2
	d)	State organic polymers.	2 Marks	L1	CO2
	e)	What is stationary phase?	2 Marks	L1	CO3
	f)	Tell about the nature of adsorbents.	2 Marks	L1	CO3
	g)	State chemical bonding.	2 Marks	L1	CO4
	h)	What is homo nuclear diatomic molecule?	2 Marks	L1	CO4
	i)	What is gold number?	2 Marks	L1	CO5
	j)	Differentiate Physisorption and chemisorption.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain in brief of free electron theory with drawbacks.	8 Marks	L2	CO1
	b)	Discuss the thermal and electrical conductivity of metals in VBT.	8 Marks	L2	CO1
		(OR)			
3.	a)	Explain the drawbacks of VBT and free electron theory.	8 Marks	L2	CO1
	b)	Illustrate the bands formation in band theory.	8 Marks	L4	CO1

MODULE-II

4.	a)	Describe conducting polymers and the types of it in brief.	8 Marks	L2	CO2
	b)	Discuss the advantages and applications of composites.	8 Marks	L2	CO2
		(OR)			
5.	a)	Discuss in brief of metals and ceramics with examples.	8 Marks	L2	CO2
	b)	Explain fiber reinforced, particulate and layered composites with examples.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the principle of thin layer chromatography with applications.	8 Marks	L2	CO3
	b)	Explain the classification of paper chromatography.	8 Marks	L2	CO3
		(OR)			
7.	a)	Discuss briefly about classification of chromatography.	8 Marks	L2	CO3
	b)	Explain Ion exchange chromatography and affinity chromatography.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Describe MOT. What are the rules for filling Molecular orbitals?	8 Marks	L2	CO4
	b)	Explain LCAO method of formation of molecular orbitals.	8 Marks	L2	CO4
		(OR)			
9.	a)	Discuss the MO diagram of CO and calculate the bond order of it using MOT.	8 Marks	L2	CO4
	b)	Compare valence bond theory and molecular orbital theory.	8 Marks	L2	CO4

MODULE-V

10.	a)	What are colloids? Discuss the classification of it.	8 Marks	L2	CO5
	b)	Differentiate lyophilic and lyophobic sols.	8 Marks	L2	CO5
		(OR)			
11.	a)	Discuss Freundlich isotherm with its applications.	8 Marks	L2	CO5
	b)	Compare physisorption and chemisorption.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. IV Semester (MBU-22) Regular Examinations, April – 2026

BASIC CONCEPTS OF MICROBIAL GENETICS

[Microbiology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Write about semiconservative replication.	2 Marks	L1	CO1
	b)	Define the 3'-5' exonuclease enzyme.	2 Marks	L1	CO1
	c)	What is lac operon?	2 Marks	L1	CO2
	d)	What is gene expression?	2 Marks	L1	CO2
	e)	What is m-RNA?	2 Marks	L1	CO3
	f)	Name the examples of chemical mutagen.	2 Marks	L1	CO3
	g)	Define transformation and write the examples.	2 Marks	L1	CO4
	h)	What is specialized transduction?	2 Marks	L1	CO4
	i)	What is replicative transposons?	2 Marks	L1	CO5
	j)	What are the uses of transposons?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the fidelity of Replication.	8 Marks	L2	CO1
	b)	Summarize initiation of replication in prokaryotes.	8 Marks	L2	CO1
		(OR)			
3.	a)	Summarize any four enzymes involved in replication.	8 Marks	L2	CO1
	b)	Brief about types of DNA replication.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain about translation factors involved in initiation, elongation and termination.	8 Marks	L2	CO2
	b)	Summarize the genetic code.	8 Marks	L2	CO2
		(OR)			
5.	a)	Summarize the structure of ribosomes.	8 Marks	L2	CO2
	b)	Explain in detail about types of RNA and their functions.	8 Marks	L2	CO2

MODULE-III

6.	a)	Summarize about concept of gene.	8 Marks	L2	CO3
	b)	Explain about one gene one enzyme hypothesis.	8 Marks	L2	CO3
		(OR)			
7.	a)	Summarize about gene mutation and its disease.	8 Marks	L2	CO3
	b)	Describe how mutation are taking place.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss about mechanisms of genetic exchange.	8 Marks	L2	CO4
	b)	Describe the transformation process.	8 Marks	L2	CO4
		(OR)			

9.	a)	Describe the process of general transduction.	8 Marks	L2	CO4
	b)	Explain the process of specialized transduction.	8 Marks	L2	CO4

MODULE-V

10.	a)	Describe in detail about types of plasmids.	8 Marks	L2	CO5
	b)	Summarize functions of plasmids.	8 Marks	L2	CO5

(OR)

11.	a)	Explain about importance of transposons.	8 Marks	L2	CO5
	b)	Identify and explain how plasmids important in environment cleansing.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. IV Semester (MBU-22) Regular Examinations, April – 2026

MICROBES IN SUSTAINABLE AGRICULTURE AND DEVELOPMENT

[Microbiology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Write the processes involved in soil formation.	2 Marks	L1	CO1
	b)	What is the concept of soil horizons and their role in soil development?	2 Marks	L1	CO1
	c)	Agricultural practices can influence nitrous oxide emissions and potential control measures. How?	2 Marks	L3	CO2
	d)	What microbial processes can be targeted for the control of nitric oxide emissions in soil?	2 Marks	L1	CO2
	e)	What is the role of *Azospirillum* in promoting plant growth?	2 Marks	L1	CO3
	f)	How *Azotobacter* enhances nutrient availability in soil.	2 Marks	L3	CO3
	g)	Provide two advantages of using biomanure as an organic fertilizer in agriculture.	2 Marks	L1	CO4
	h)	Identify one critical processing parameter during the production of biomanure.	2 Marks	L3	CO4
	i)	Name one environmental or ecological concern associated with the widespread cultivation of BT crops.	2 Marks	L1	CO5
	j)	What is the primary purpose of developing Golden Rice?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss their contributions to nutrient cycling, organic matter decomposition, and soil structure formation.	8 Marks	L2	CO1
	b)	Discuss the impact of soil texture on plant growth.	8 Marks	L2	CO1

(OR)

3.	a)	Discuss factors influencing soil structure and methods for improving it.	8 Marks	L2	CO1
	b)	Discuss weathering, leaching and organic matter accumulation in soil formation.	8 Marks	L2	CO1

MODULE-II

4.	a)	Discuss the sources of nitrous oxide in soil and explore the role of nitrification and denitrification.	8 Marks	L2	CO2
	b)	Discuss potential microbial control strategies to mitigate nitric oxide emissions.	8 Marks	L2	CO2

(OR)

5.	a)	Discuss strategies for controlling carbon dioxide emissions from soil, considering both natural and anthropogenic sources.	8 Marks	L2	CO2
	b)	Discuss the impact of wetland management, livestock practices, and alternative energy sources.	8 Marks	L2	CO2

MODULE-III

6.	a)	Examine the challenges associated with the large-scale implementation of novel microbial combinations as biofertilizers.	8 Marks	L4	CO3
	b)	Discuss the mechanisms by which PGPR suppress soil-borne diseases.	8 Marks	L2	CO3

(OR)

7.	a)	Discuss the potential of PGPR in promoting sustainable agriculture.	8 Marks	L2	CO3
	b)	Discuss the impact of PGPB on soil structure, organic matter, and microbial diversity.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss the composition of biomanure and its nutrient content.	8 Marks	L2	CO4
	b)	Discuss the advantages of using biomanure as an organic fertilizer.	8 Marks	L2	CO4

(OR)

9.	a)	Discuss the key processing parameters that influence the quality of biomanure. Explore factors such as composting techniques, microbial activity, and maturation.	8 Marks	L2	CO4
	b)	Outline the anaerobic digestion process for biogas production.	8 Marks	L1	CO4

MODULE-V

10.	a)	Discuss challenges and controversies associated with transgenic animal research.	8 Marks	L2	CO5
	b)	Examine the future prospects of transgenic animals and to ensure responsible and ethical practices.	8 Marks	L4	CO5

(OR)

11.	a)	Evaluate the potential role of GM crops in addressing global food security challenges.	8 Marks	L5	CO5
	b)	Discuss how genetic modification can contribute to increased yields and crop resilience.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. IV Semester (MBU-22) Regular Examinations, April – 2026

BASIC STATISTICS

[Forensic Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define mutually exclusive event.	2 Marks	L1	CO1
	b)	Write the sample space for rolling two dice.	2 Marks	L1	CO1
	c)	Define quantitative classification.	2 Marks	L1	CO2
	d)	Write characteristics of statistics.	2 Marks	L1	CO2
	e)	Find the arithmetic mean for the following series: 1600, 1590, 1560, 1610, 1640,10.	2 Marks	L1	CO3
	f)	Write the merits of mode.	2 Marks	L1	CO3
	g)	Write the formula for variance.	2 Marks	L1	CO4
	h)	Find the range of the distribution 0.15, 0.25, 0.02,0.3,0.4,0.26.	2 Marks	L1	CO4
	i)	Define zero correlation.	2 Marks	L1	CO5
	j)	Write the properties of correlation coefficient.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Two dice are rolled, if it is known that atleast one of the dice always shows 4, find the probability that the numbers appeared on the dice have a sum 8.	8 Marks	L1	CO1
	b)	A bag contains 3 red and 7 black balls. Two balls are drawn at random without replacement. If the second ball is red, what is the probability that the first ball is also red?	8 Marks	L3	CO1

(OR)

3.	a)	If $P(A \cup B) = 0.65$ and $P(A \cap B) = 0.15$, find i) $P(A)+P(B)$ ii) $P(\bar{A})+P(B)$	8 Marks	L1	CO1
	b)	A number is chosen from the first 100 natural numbers. Find the probability that it is a number of 4 or 6.	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain the types of methods of data classification.	8 Marks	L2	CO2
	b)	Draw a blank table to show the number of candidates sex-wise, appearing the pre-university, First year, Second year and Third year examinations of a university in the faculties of Art, Science and Commerce in the year 2002.	8 Marks	L3	CO2

(OR)

5.	a)	Explain the types of statistical investigation.	8 Marks	L2	CO2

b) The following table shows a student's grades in various subjects. 8 Marks L3 CO2

Subject	English	Hindi	Maths	Science	Social
Marks	73	62	81	58	68

create a bar graph

MODULE-III

6. a) Compute the arithmetic mean for the following distribution 8 Marks L1 CO3

x	2	3	4	5	6
f	34	55	45	62	48

b) Calculate the median for the following distribution 8 Marks L3 CO3

Class	0-10	10-20	20-30	30-40	40-50
Frequency	5	13	20	32	60

(OR)

7. a) Calculate the mode for the following distribution 8 Marks L3 CO3

Class	10-20	20-30	30-40	40-50	50-60
Frequency	3	5	12	18	14

b) Find the Harmonic mean for the following x: 3,16,20,48,54 8 Marks L1 CO3

MODULE-IV

8. a) The first four raw moments of a distribution are 2,136,320 and 400. Find the coefficient of skewness and kurtosis. 8 Marks L1 CO4

b) Find the mean deviation for the given data: 3, 10 ,15,12,18,20. 8 Marks L1 CO4

(OR)

9. a) Calculate Quartile deviation for a frequency distribution 8 Marks L3 CO4

Class	1-5	5-9	9-13	13-17	17-21
Frequency	12	18	14	6	2

b) Calculate the standard deviation for the given data: 8,5,12,4,3,6. 8 Marks L3 CO4

MODULE-V

10. The lengths and weights of a sample of six articles manufactured by a factory are given here. Find Karl Pearson's Coefficient 16 Marks L1 CO5

Length (x)	3	5	6	7	10	11
Weight (y)	8	12	11	14	16	17

(OR)

11. From the following data, compute the spearman's rank correlation 16 Marks L1 CO5

X	180	155	170	174	160	172	166	170	170
Y	170	165	180	180	164	169	172	170	174

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. IV Semester (MBU-22) Regular Examinations, April – 2026

FORENSIC BALLISTICS AND EXPLOSIVES

[Forensic Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is a percussion lock firearm?	2 Marks	L1	CO1
	b)	Name the types of projectiles used in ammunition.	2 Marks	L1	CO1
	c)	What is recoil in firearms?	2 Marks	L1	CO2
	d)	Define external ballistics.	2 Marks	L1	CO2
	e)	Differentiate between smooth bore and rifled bore firearms.	2 Marks	L2	CO3
	f)	Define stopping power in terminal ballistics.	2 Marks	L1	CO3
	g)	Differentiate between bullet marks and cartridge case marks.	2 Marks	L2	CO4
	h)	What is the forensic significance of gunshot residue?	2 Marks	L2	CO4
	i)	What is post-blast residue?	2 Marks	L1	CO5
	j)	Name two forensic methods for examining explosives.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the forensic importance of ammunition identification.	8 Marks	L4	CO1
	b)	Compare and contrast country-made firearms with modern firearms.	8 Marks	L5	CO1

(OR)

3.	a)	Analyze the historical evolution of firearms from hand cannons to modern automatic weapons.	8 Marks	L5	CO1
	b)	Describe the advantages and disadvantages of percussion lock firearms.	8 Marks	L4	CO1

MODULE-II

4.	a)	Compare effective range and extreme range in firearms.	8 Marks	L4	CO2
	b)	Discuss the significance of projectile stability in forensic ballistics.	8 Marks	L5	CO2

(OR)

5.	a)	Explain the forensic relevance of muzzle velocity in crime scene investigations.	8 Marks	L4	CO2
	b)	Discuss how yaw affects the flight path and accuracy of a projectile.	8 Marks	L4	CO2

MODULE-III

6.	a)	Analyze the cavitation effect's contribution to tissue damage in gunshot wounds.	8 Marks	L5	CO3
	b)	Explain the significance of wound ballistics in determining shooting incidents.	8 Marks	L4	CO3

(OR)

7.	a)	Compare close-range and long-range firearm injuries in terms of forensic characteristics.	8 Marks	L5	CO3
	b)	Discuss the importance of determining the range of fire in homicide cases.	8 Marks	L5	CO3

MODULE-IV

8.	a)	Compare the marks produced on bullets by different types of firearms.	8 Marks	L4	CO4
	b)	Analyze the forensic significance of linking bullets and cartridge cases to specific firearms.	8 Marks	L6	CO4

(OR)

9.	a)	Explain the forensic methods used for evaluating gunshot residue in criminal cases.	8 Marks	L4	CO4
	b)	Discuss the challenges in analyzing degraded or fragmented bullets.	8 Marks	L5	CO4

MODULE-V

10.	a)	Discuss the forensic methods used to analyze IEDs.	8 Marks	L5	CO5
	b)	Explain the process of post-blast residue collection at a crime scene.	8 Marks	L3	CO5

(OR)

11.	a)	Analyze the forensic relevance of the explosion process in criminal investigations.	8 Marks	L6	CO5
	b)	Compare the forensic characteristics of different types of explosives.	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. IV Semester (MBU-22) Regular Examinations, April – 2026

COMPUTATIONAL BIOLOGY

[Bioinformatics]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define local and Global sequence alignment.	2 Marks	L1	CO1
	b)	What is Dynamic programming?	2 Marks	L1	CO1
	c)	Name the programs for Phylogenetic tree generation.	2 Marks	L1	CO2
	d)	Recall UPGMA.	2 Marks	L1	CO2
	e)	List few structure visualization programs.	2 Marks	L1	CO3
	f)	List the different types of alpha helices.	2 Marks	L1	CO3
	g)	Name the method for analysis of different biomolecules on chip.	2 Marks	L1	CO4
	h)	What is Gene finder?	2 Marks	L1	CO4
	i)	Name the Bioinformatics languages.	2 Marks	L1	CO5
	j)	Recall different versions of Linux.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain in detail different types of Next generation sequence methods.	9 Marks	L2	CO1
	b)	Classify biological databases.	7 Marks	L2	CO1
		(OR)			
3.	a)	Explain Heuristic methods of sequence alignment.	10 Marks	L2	CO1
	b)	Summarize different Multiple sequence alignment methods.	6 Marks	L2	CO1

MODULE-II

4.		Discuss about Phylogenetic trees generation.	16 Marks	L6	CO2
		(OR)			
5.	a)	Explain steps in the distance based methods of Phylogenetic tree generation.	9 Marks	L2	CO2
	b)	Summarize ultra metric and mini ultra metric methods .	7 Marks	L2	CO2

MODULE-III

6.	a)	Explain the organizational elements of proteins.	8 Marks	L2	CO3
	b)	Summarize how Molecular dimension simulations are useful.	8 Marks	L2	CO3
		(OR)			
7.	a)	Outline the different docking tools.	8 Marks	L2	CO3
	b)	Compare Local and Global docking methods.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Summarize the applications of Systems biology.	8 Marks	L2	CO4
	b)	Explain Neural networking and their role in different types of predictions.	8 Marks	L2	CO4
		(OR)			
9.	a)	Explain Protein secondary structure prediction methods.	8 Marks	L2	CO4
	b)	Summarize the steps in Microarrays.	8 Marks	L2	CO4

MODULE-V

10	a)	Explain the file handling in perl.	8 Marks	L2	CO5
.	b)	Analyze the significance of perl in bioinformatics.	8 Marks	L4	CO5
		(OR)			
11	a)	Explain Unix programming and few commands.	8 Marks	L2	CO5
.	b)	Identify the Unix significance.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. IV Semester (MBU-22) Regular Examinations, April – 2026

ADVANCED CHEMISTRY - II

[Bioinformatics, Biotechnology, Microbiology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define ozonolysis.	2 Marks	L1	CO1
	b)	Write any two applications of tartaric acid.	2 Marks	L1	CO1
	c)	What is the main ore of Th and U?	2 Marks	L1	CO2
	d)	Give a few instances and uses for metal powders.	2 Marks	L2	CO2
	e)	What is eutectic system?	2 Marks	L1	CO3
	f)	What is the role of freezing point in colligative property?	2 Marks	L2	CO3
	g)	Mention the product with suitable cation of Ca: M^+ + EDTA → M-EDTA.	2 Marks	L1	CO4
	h)	Write few examples of indicators in acid base titration.	2 Marks	L1	CO4
	i)	Mention the few advantages of microwave assisted saponification.	2 Marks	L1	CO5
	j)	Write the reactants and microwave conditions in microwave assisted reaction in Classic Diels-Alder reaction.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the Acetoacetic ester synthesis with suitable reactions.	8 Marks	L3	CO1
	b)	Explain the Malonic ester synthesis with suitable reactions.	8 Marks	L3	CO1

(OR)

3.	a)	Discuss the higher alkane synthesis with any four naming reactions	8 Marks	L3	CO1
	b)	How could you use organometallic compounds in the cancer treatment with your known ideas?	8 Marks	L3	CO1

MODULE-II

4.	a)	Discuss the methods in the production of metal powders.	8 Marks	L3	CO2
	b)	Explain the advantages and applications of powder metallurgy in industrial production activities.	8 Marks	L3	CO2

(OR)

5.	a)	Discuss the production of tungsten powder from wolframite.	8 Marks	L3	CO2
	b)	Write the definition of metallurgy and general introduction to isolation and purification of metals from its ore.	8 Marks	L3	CO2

MODULE-III

6.	a)	State the following: i) Triple point ii) Phase diagrams iii) Equilibrium.	8 Marks	L3	CO3
	b)	Analyze your understanding on phase equilibria and its application in industrial processes with suitable illustration.	8 Marks	L3	CO3

(OR)

7.	a)	State the following: i) Phase ii) Components iii) Critical point iv) Degrees of freedom.	8 Marks	L3	CO3
	b)	Explain the thermodynamic derivation of Gibbs phase rule.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Discuss your understanding on theory of potentiometric titrations. Write the Nernst equation and mention its terminology.	8 Marks	L3	CO4
	b)	Discuss in detail about the acid base titration with suitable example.	8 Marks	L3	CO4

(OR)

9.	a)	Explain in detail about the redox titration with suitable example.	8 Marks	L3	CO4
	b)	Write your understanding on complexometric titration with suitable example.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain the microwave assisted reactions in organic solvents.	8 Marks	L3	CO5
	b)	State few examples of microwave assisted reactions in organic solvents. Mention the concept of reaction, solvent and advantages in each reactions.	8 Marks	L3	CO5

(OR)

11.	a)	Explain the process of microwave assisted synthesis of organic compounds with suitable examples.	8 Marks	L3	CO5
	b)	Discuss the microwave assisted reactions in diels-alder reaction.	8 Marks	L3	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. IV Semester (MBU-22) Regular Examinations, April – 2026

FUNDAMENTALS OF ANALYTICAL CHEMISTRY

[Bioinformatics, Biotechnology, Microbiology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is alkalimetry?	2 Marks	L1	CO1
	b)	State titration.	2 Marks	L1	CO1
	c)	What is accuracy?	2 Marks	L1	CO2
	d)	Define precision.	2 Marks	L1	CO2
	e)	What are dissolved solids?	2 Marks	L1	CO3
	f)	Differentiate hard and soft water.	2 Marks	L1	CO3
	g)	Differentiate stationary and mobile phase.	2 Marks	L1	CO4
	h)	What is reverse phase column?	2 Marks	L1	CO4
	i)	Name two applications of IR.	2 Marks	L1	CO5
	j)	Define SEM.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Name the different types of titrations and explain the choice of indicators for the titrations.	8 Marks	L2	CO1
	b)	Discuss about the coagulation and peptization.	8 Marks	L2	CO1

(OR)

3.	a)	Explain different steps involved in gravimetric analysis.	8 Marks	L2	CO1
	b)	Define the terms: i) Normality ii) Molarity iii) Molality iv) Mole fraction.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the types of determinate errors with examples.	8 Marks	L2	CO2
	b)	Define precision. Explain the methods of expressing precision.	8 Marks	L1	CO2

(OR)

5.	a)	Discuss the use of burette, pipette, conical flask and standard flask in the laboratory.	8 Marks	L2	CO2
	b)	The values of replicate measurements in an analysis are 48.32, 48.36, 48.23, 48.11 and 48.38. Find the mean and median.	8 Marks	L2	CO2

MODULE-III

6.	a)	Discuss in brief of chemical oxygen demand (COD).	8 Marks	L2	CO3
	b)	Explain the estimation of chloride present in water by Mohr's method.	8 Marks	L2	CO3

(OR)

7.	a)	Describe the batch, continuous and counter current methods of solvent extraction.	8 Marks	L2	CO3
	b)	Explain the application of solvent extraction and factors affecting solvent extraction.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain Pumping system and guard column in HPLC.	8 Marks	L2	CO4
	b)	Discuss the applications of HPLC and column chromatography.	8 Marks	L2	CO4

(OR)

9.	a)	Define the terms: i) Isocratic elution ii) Gradient elution iii) Normal phase HPLC and iv) Reversed phase HPLC.	8 Marks	L2	CO4
	b)	Explain the experimental procedure of column chromatography in detail with neat block diagram.	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss in brief of chromophore and auxochrome.	8 Marks	L2	CO5
	b)	Explain the instrumentation of UV-Vis spectrophotometer.	8 Marks	L2	CO5

(OR)

11.	a)	Explain Bathochromic shift and Hypsochromic shift.	8 Marks	L2	CO5
	b)	Describe the applications of Mass spectrometry.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. IV Semester (MBU-22) Regular Examinations, April – 2026

MEDICAL MICROBIOLOGY

[Biotechnology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What are the factors contributing to the occurrence of nosocomial infections?	2 Marks	L1	CO1
	b)	What are the infection control measures in hospitals?	2 Marks	L1	CO1
	c)	Outline the typical symptoms of cholera.	2 Marks	L1	CO2
	d)	Define the mode of transmission of typhoid.	2 Marks	L1	CO2
	e)	How does HIV spread within populations?	2 Marks	L3	CO3
	f)	What are the preventive measures for sexual transmitted diseases?	2 Marks	L1	CO3
	g)	Explain the general mode of transmission for cutaneous mycoses.	2 Marks	L2	CO4
	h)	List common symptoms associated with malaria. How does the presentation differ between uncomplicated and severe cases?	2 Marks	L1	CO4
	i)	What is the primary mechanism of action of penicillin?	2 Marks	L1	CO5
	j)	Name the bacterial infections commonly treated with streptomycin.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Examine the benefits of integrating multiple diagnostic methods in the laboratory. How does combining cultural, biochemical, serological, and molecular methods?	8 Marks	L4	CO1
	b)	Explore the ways in which the normal flora interacts with the immune system. How does the presence of normal flora contribute to the development and maintenance of immune tolerance?	8 Marks	L3	CO1

(OR)

3.	a)	Elaborate on the role of adaptive immunity in responding to pathogenic infections. How do B cells and T cells contribute to the elimination of pathogens, and what is the concept of immunological memory?	8 Marks	L5	CO1
	b)	Analyze the impact of nosocomial infections on patient morbidity, mortality, and overall healthcare costs. How do these infections affect patient recovery and length of hospital stays?	8 Marks	L4	CO1

MODULE-II

4.	a)	Evaluate the effectiveness of global initiatives aimed at eradicating cholera.	8 Marks	L5	CO2
	b)	Describe the spectrum of symptoms associated with tuberculosis, including pulmonary and extra pulmonary manifestations.	8 Marks	L2	CO2

(OR)

5.	a)	Provide an in-depth discussion on the clinical features of typhoid fever and potential complications.	8 Marks	L2	CO2
	b)	Describe the clinical symptoms of cholera, emphasizing the rapid onset of dehydration.	8 Marks	L2	CO2

MODULE-III

6.	a)	How does the immune response contribute to both protection and pathology in Chikungunya infection?	8 Marks	L3	CO3
	b)	How do measures such as mosquito control, environmental management, and community involvement contribute to preventing transmission of Japanese Encephalitis.?	8 Marks	L5	CO3

(OR)

7.	a)	Discuss immunization strategies for dengue, including the use of vaccines and the challenges in achieving widespread coverage.	8 Marks	L2	CO3
	b)	Explain the various modes of transmission of HIV, including sexual contact, bloodborne transmission, and mother-to-child transmission.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Name the primary vector responsible for the transmission of malaria. How does the life cycle of the malaria parasite involve both the mosquito vector and human host?	8 Marks	L1	CO4
	b)	Examine the strategies used to control Kala-azar outbreaks, considering early detection, treatment, and community involvement.	8 Marks	L4	CO4

(OR)

9.	a)	Evaluate the role of public health campaigns in preventing fungal diseases, including awareness programs and education initiatives.	8 Marks	L5	CO4
	b)	Discuss prophylactic measures for Kala-azar, including vector control strategies and personal protection methods in endemic areas?	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss indications, limitations, and any emerging issues with resistance of tetracycline	8 Marks	L2	CO5
	b)	Explore the mechanism of action and clinical applications of Antifungal drugs in treating fungal infections and potential side effects	8 Marks	L3	CO5

(OR)

11.	a)	Provide a comprehensive account of Griseofulvin, covering its mechanism of action against fungi, and therapeutic applications.	8 Marks	L2	CO5
	b)	Explain the antiviral properties to prevent viral diseases?	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. IV Semester (MBU-22) Regular Examinations, April – 2026

FORENSIC CHEMISTRY

[Forensic Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Give an example of a natural alkaloid poison that can be found in food and describe its toxic effect.	2 Marks	L1	CO1
	b)	What are the types of food adulteration?	2 Marks	L1	CO1
	c)	What is the process of distillation in petroleum refining?	2 Marks	L2	CO2
	d)	What is the significance of analyzing petroleum products in forensic investigations?	2 Marks	L1	CO2
	e)	What information can be obtained from smoke staining at a fire scene?	2 Marks	L2	CO3
	f)	How can fire debris analysis help in identifying the cause of a fire?	2 Marks	L1	CO3
	g)	What are high explosives, and how do they differ from low explosives?	2 Marks	L1	CO4
	h)	What are homemade explosives, and why do they pose a significant threat to public safety?	2 Marks	L2	CO4
	i)	What happens during the explosion process, and how is energy released?	2 Marks	L1	CO5
	j)	What are the key considerations when searching a scene of an explosion for evidence?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	List any six common adulterants and their harmful effects.	6 Marks	L5	CO1
	b)	What is food adulteration? Explain the types of food adulteration.	10 Marks	L6	CO1

(OR)

3.	a)	Explain the effects of metallic adulteration and packaging hazards on human health.	6 Marks	L1	CO1
	b)	Define food adulteration and describe its types, providing examples of common adulterants and their effects on health.	10 Marks	L2	CO1

MODULE-II

4.	a)	What are the common substances used for adulterating petroleum products? How can adulteration be detected in gasoline?	6 Marks	L6	CO2
	b)	Explain the process of distillation and fractionation of petroleum. Discuss the importance of these processes in separating different components of crude oil and how these fractions are utilized in various industries.	10 Marks	L6	CO2

(OR)

5.	a)	What is the principle behind the distillation of petroleum? Briefly describe the process and its importance in obtaining specific fractions from crude oil.	6 Marks	L2	CO2

	b)	Explain the concept of adulteration in petroleum products. Discuss the legal consequences and economic impacts of adulterated petroleum products, with examples from both the consumer and industrial sectors.	10 Marks	L5	CO2

MODULE-III

6.	a)	What are the key characteristics of post-flashover burning, and how can these burning patterns provide forensic investigators with clues about the fire's origin and cause?	6 Marks	L6	CO3
	b)	Describe the process of analyzing fire debris in forensic investigations. Discuss the techniques used to identify accelerants, including the use of gas chromatography, and the importance of such analysis in arson cases.	10 Marks	L6	CO3

(OR)

7.	a)	Explain the concept of flashover and post-flashover burning in fire investigations. How do these phenomena affect the interpretation of burn patterns and the determination of fire origin?	6 Marks	L2	CO3
	b)	Explain the role of fire science in arson investigations. Discuss how understanding fire behavior, combustion, and heat transfer helps forensic investigators analyze fire scenes and make determinations about the cause of the fire.	10 Marks	L2	CO3

MODULE-IV

8.	a)	List and describe two types of homemade explosives. How can law enforcement agencies detect and prevent the illegal production of HMEs?	6 Marks	L5	CO4
	b)	Discuss the classification of explosives into low explosives and high explosives. Provide a detailed comparison of their characteristics, properties, and common uses in various industries, including their behavior when ignited.	10 Marks	L6	CO4

(OR)

9.	a)	Briefly explain the chemical structure of PETN and its role in explosive formulations.	6 Marks	L1	CO4
	b)	What forensic methods are used to identify and analyze explosive residues at crime scenes? Discuss how trace evidence of explosives, such as residues from TNT or RDX, is collected and analyzed in forensic investigations.	10 Marks	L5	CO4

MODULE-V

10.	a)	How do blast injuries affect forensic investigations? Discuss how the nature of blast injuries can be used to determine the type of explosive used and the position of the victim relative to the blast.	6 Marks	L2	CO5
	b)	Explain the process and mechanism of an explosion. Discuss the different stages involved in an explosion, including initiation, propagation, and the effects of pressure and temperature on the surrounding environment.	10 Marks	L5	CO5

(OR)

11.	a)	What are the different types of injuries caused by an explosion? Briefly explain primary, secondary, and tertiary blast injuries.	6 Marks	L2	CO5
	b)	What are the key considerations when searching the scene of an explosion? Discuss how investigators collect evidence, prioritize safety, and deal with potential secondary devices or hazards while searching the scene.	10 Marks	L6	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. IV Semester (MBU-22) Regular Examinations, April – 2026

FORENSIC SEROLOGY

[Forensic Science]

Time: 3 hours **Max. Marks: 100**

10 x 2 = 20 Marks

1.	a)	What precautions should be taken while collecting and preserving blood evidence?	2 Marks	L2	CO1
	b)	Explain how human and non-human blood can be differentiated.	2 Marks	L2	CO1
	c)	Explain the structure and function of spermatozoa.	2 Marks	L2	CO2
	d)	List and explain two methods of collecting semen evidence.	2 Marks	L2	CO2
	e)	Briefly describe the functions of sweat in the human body.	2 Marks	L2	CO3
	f)	Explain how milk can serve as forensic evidence.	2 Marks	L2	CO3
	g)	What is the role of antigens and antibodies in forensic investigations?	2 Marks	L2	CO4
	h)	Briefly describe the process of determining blood groups.	2 Marks	L2	CO4
	i)	What is the significance of impact bloodstain patterns?	2 Marks	L2	CO5
	j)	Explain how cast-off bloodstain patterns are formed.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Outline the methods for typing dried bloodstains in forensic investigations.	8 Marks	L3	CO1
	b)	Evaluate the role of blood enzymes in forensic biology.	8 Marks	L5	CO1

(OR)

3.	a)	How are blood proteins significant in forensic identification?	8 Marks	L4	CO1
	b)	Discuss the legal and forensic importance of proper blood preservation.	8 Marks	L5	CO1

MODULE-II

4.	a)	Discuss the role of sperm morphology in identifying perpetrators.	8 Marks	L4	CO2
	b)	Explain the biochemical composition of semen and its forensic implications.	8 Marks	L2	CO2

(OR)

5.	a)	Compare presumptive and confirmatory tests for semen analysis.	8 Marks	L4	CO2
	b)	Evaluate the importance of semen examination in forensic individualization.	8 Marks	L5	CO2

MODULE-III

6.	a)	Explain the forensic relevance of saliva in bite mark analysis.	8 Marks	L2	CO3
	b)	Evaluate the role of bodily fluids in linking a suspect to a crime.	8 Marks	L5	CO3

(OR)

7.	a)	Compare the forensic analysis of saliva and sweat.	8 Marks	L4	CO3
	b)	Discuss the challenges in detecting bodily fluids at crime scenes.	8 Marks	L5	CO3

MODULE-IV

8.	a)	Explain the role of genetic markers in sexual assault investigations.	8 Marks	L2	CO4
	b)	Analyze the challenges in antigen-antibody reaction interpretation in forensics.	8 Marks	L4	CO4

(OR)

9.	a)	Compare extracellular proteins and intracellular enzymes in forensic analysis.	8 Marks	L4	CO4
	b)	Evaluate the significance of genetic marker typing data in forensic biology.	8 Marks	L5	CO4

MODULE-V

10.	a)	Discuss the forensic significance of projected bloodstain patterns and how they can be used to determine the position of the victim or perpetrator.	8 Marks	L3	CO5
	b)	Compare contact bloodstain patterns with blood trails, highlighting the differences in their formation and forensic significance.	8 Marks	L4	CO5

(OR)

11.	a)	Analyze the drying times of bloodstains and discuss their importance in determining the timing of a crime.	8 Marks	L4	CO5
	b)	Explain how bloodstain pattern analysis contributes to crime scene reconstruction and provide examples of its application in real cases.	8 Marks	L3	CO5

CODE No.: 22CA101015 MBU-22

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. IV Semester (MBU-22) Regular Examinations, April – 2026

CLOUD COMPUTING

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Explain Ubuntu as a virtualization platform.	2 Marks	L2	CO1
	b)	What is the role of Ubuntu in virtualization?	2 Marks	L2	CO1
	c)	List the design objectives of cloud computing.	2 Marks	L2	CO2
	d)	What is mean by SaaS?	2 Marks	L2	CO2
	e)	What is Platform as a Service (PaaS)?	2 Marks	L2	CO3
	f)	Define (IaaS).	2 Marks	L2	CO3
	g)	What is the purpose of an Amazon Machine Image (AMI)?	2 Marks	L2	CO4
	h)	What does cloud administration involve?	2 Marks	L2	CO4
	i)	Define encryption in cloud security.	2 Marks	L2	CO5
	j)	What is meant by brokered cloud storage access?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the steps involved in setting up a virtual machine using VMware?	8 Marks	L2	CO1
	b)	Describe the features and use cases of Microsoft Hyper-V as a virtualization solution?	8 Marks	L4	CO1

(OR)

3.	a)	What are the different types of virtualization? Explain operating system virtualization?	8 Marks	L2	CO1
	b)	What are the advantages and disadvantages of virtualization?	8 Marks	L4	CO1

MODULE-II

4.	a)	Differentiate between Infrastructure as a Service (IAAS) & Platform (PAAS) with appropriate example?	8 Marks	L2	CO2
	b)	Discuss the key benefits of cloud computing for enterprises and individual users?	8 Marks	L4	CO2

(OR)

5.	a)	Explain the concept of a cloud computing stack. Describe its key layers and their functionalities?	8 Marks	L2	CO2
	b)	Discuss the concept of composability in cloud computing and its significance for modular architecture?	8 Marks	L4	CO2

MODULE-III

6.	a)	Discuss the key features and capabilities of VMware vSphere as a virtualization and cloud management platform?	8 Marks	L2	CO3
	b)	Analyze the role of SaaS in transforming customer relationship management (CRM) systems with examples?	8 Marks	L4	CO3

(OR)

7.	a)	Define virtualization and explain its role in modern cloud computing architectures?	8 Marks	L2	CO3
	b)	Explain load balancing in virtualized environments. Discuss how it enhances the performance and availability of cloud services?	8 Marks	L4	CO3

MODULE-IV

8.		Discuss the importance of pricing models in AWS for cost optimization. Provide recommendations for selecting a suitable model for different use cases?	16 Marks	L2	CO4

(OR)

9.	a)	What are the steps involved in setting up and configuring an EC2 instance for a web application?	8 Marks	L2	CO4
	b)	What is lifecycle management in cloud computing? Discuss its stages and importance in maintaining a robust cloud infrastructure?	8 Marks	L4	CO4

MODULE-V

10.		How does Windows Azure implement identity standards? Discuss its mechanisms and their role in cloud security.	16 Marks	L2	CO5

(OR)

11.	a)	Compare and contrast the different identity protocol standards used in cloud environments.	8 Marks	L2	CO5
	b)	How can organizations establish identity and presence in cloud systems? Discuss challenges and solutions.	8 Marks	L4	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T & B.Sc (Allied Sciences) I Semester (MBU-22) Regular Examinations, May – 2026

NATIONAL HEALTH CARE DELIVERY SYSTEM AND MEDICAL RECORDS MANAGEMENT

[Anaesthesia & Operation Theatre Technology, Emergency Medical and Critical Care Technology, Medical Lab Technology, Respiratory Therapy, Cardio Vascular Technology, Optometry, Dialysis Technology, Radiology & Imaging Technology, Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is the full form of BLS & CPR?	2 Marks	L2	CO1
	b)	Name any four common abbreviations used in medical terminology.	2 Marks	L1	CO1
	c)	What are the physiological factors of euthanasia?	2 Marks	L2	CO2
	d)	Why do sentinel events occur?	2 Marks	L2	CO2
	e)	Define PHC and GGH.	2 Marks	L1	CO3
	f)	Define RNTCP.	2 Marks	L1	CO3
	g)	Mention any four benefits of yoga.	2 Marks	L1	CO4
	h)	Name any four objectives of ayush system of medicine.	2 Marks	L1	CO4
	i)	List out any four endocrine disorders.	2 Marks	L1	CO5
	j)	List out any four hazards of irrational drug usage.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain about divisions of spine and its pathology.	8 Marks	L2	CO1
	b)	Explain briefly about lab investigations and procedures related to cardiovascular system.	8 Marks	L2	CO1

(OR)

3.	a)	Identify any sixteen root words commonly used in medical terminology.	8 Marks	L3	CO1
	b)	Identify any sixteen common abbreviations used in medical terminology.	8 Marks	L3	CO1

MODULE-II

4.	a)	Define euthanasia and explain classification of euthanasia.	8 Marks	L2	CO2
	b)	Discuss about euthanasia and its types.	8 Marks	L3	CO2

(OR)

5.	a)	What is rational drug usage and Discuss steps of rational drug usage?	8 Marks	L2	CO2
	b)	Define sentinel event and discuss about types of sentinel events.	8 Marks	L1	CO2

MODULE-III

6.	a)	Summarize national health policy.	8 Marks	L3	CO3
	b)	What are the steps for implantation and key elements of health policy?	8 Marks	L4	CO3

(OR)

7.	a)	Apply your knowledge on National health programs for communicable diseases.	8 Marks	L2	CO3
	b)	Outline National health programs for Non-communicable diseases.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Discuss in detail Siddha system of medicine.	8 Marks	L3	CO4
	b)	List out details about Homeopathy.	8 Marks	L4	CO4

(OR)

9.	a)	What is the definition, purpose, uses and sources of vital events?	8 Marks	L2	CO4
	b)	Demonstrate census collection.	8 Marks	L4	CO4

MODULE-V

10.	a)	Elaborate full forms of AIDS, AED, AKA, CABG, CA, PAD, CNS, CVA.	8 Marks	L3	CO5
	b)	Explain any four types of sentinel events.	8 Marks	L2	CO5

(OR)

11.	a)	Explain national health programs for communicable and non-communicable diseases.	8 Marks	L2	CO5
	b)	Distinguish between ayurveda and yoga.	8 Marks	L4	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) I Semester (MBU-22) Regular Examinations, May – 2026

MEDICAL BIOCHEMISTRY

[Anaesthesia & Operation Theatre Technology, Emergency Medical and Critical Care Technology, Medical Lab Technology, Respiratory Therapy, Cardio Vascular Technology, Optometry, Dialysis Technology, Radiology & Imaging Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define mutarotation.	2 Marks	L1	CO1
	b)	Add a note on refsums disease.	2 Marks	L1	CO1
	c)	What is Chargaff's rule in DNA base pairing?	2 Marks	L3	CO2
	d)	Name the specialized products formed from arginine.	2 Marks	L1	CO2
	e)	Add a note on niacin deficiency.	2 Marks	L1	CO3
	f)	Differentiate between water and fat soluble vitamins.	2 Marks	L2	CO3
	g)	Define specific dynamic action.	2 Marks	L1	CO4
	h)	Mention the calorific values for carbohydrates and proteins.	2 Marks	L2	CO4
	i)	Define respiratory acidosis.	2 Marks	L1	CO5
	j)	Give the normal range for glucose and uricacid.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe about glycogenesis..	8 Marks	L2	CO1
	b)	Describe the structure of mitochondria.	8 Marks	L2	CO1
		(OR)			
3.	a)	Classify carbohydrates.	8 Marks	L4	CO1
	b)	Enumerate the steps of aerobic glycolysis.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain how ammonia is transported in the body and converted to less toxic forms.	8 Marks	L2	CO2
	b)	Describe the structure of DNA.	8 Marks	L2	CO2
		(OR)			
5.	a)	Classify aminoacids based on nutritional requirements.	8 Marks	L4	CO2
	b)	Discuss the structure and function of biologically active peptides.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the role of vitamin C in the immune system.	8 Marks	L2	CO3
	b)	Outline the deficiency disorders of iron.	8 Marks	L1	CO3
		(OR)			
7.	a)	Explain the role of vitamin A in wald's visual cycle.	8 Marks	L2	CO3
	b)	Describe the deficiency manifestations of vitamin D.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Interpret the significance of cardiac enzymes in diagnosing myocardial infarction.	8 Marks	L2	CO4
	b)	Analyze the effect of substrate concentration on enzyme activity.	8 Marks	L4	CO4
		(OR)			
9.	a)	Discuss the sources, chemical nature, and beneficial effects of dietary fiber.	8 Marks	L2	CO4
	b)	Mention the types of protein energy malnutrition and explain any one type in detail.	8 Marks	L2	CO4

MODULE-V

10.	a)	Name the instrument used for estimation of acid base disorders and give the normal values of it.	8 Marks	L2	CO5
	b)	Interpret liver enzymes such as ALT and AST aid in the diagnosis of liver damage.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain the causes for metabolic alkalosis and interpret ABG values in acute state metabolic alkalosis.	8 Marks	L2	CO5
	b)	Describe about 3rd line of defense system in acid base balance.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) I Semester (MBU-22) Regular Examinations, May – 2026

METABOLISM OF BIO-MOLECULES

[Medical Lab Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define carbohydrates.	2 Marks	L1	CO1
	b)	Write general formula of carbohydrates.	2 Marks	L1	CO1
	c)	Define aminoacids.	2 Marks	L1	CO2
	d)	Name the specialized products formed from arginine.	2 Marks	L1	CO2
	e)	Add a note on refsums disease.	2 Marks	L2	CO3
	f)	List the products of lipid digestion in the jejunum.	2 Marks	L1	CO3
	g)	Define vitamins.	2 Marks	L1	CO4
	h)	List four water soluble vitamins.	2 Marks	L1	CO4
	i)	Tabulate purines and pyramidines.	2 Marks	L1	CO5
	j)	Add a note on functions of nucleotides.	2 Marks	L4	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Enumerate the steps of aerobic glycolysis.	8 Marks	L2	CO1
	b)	Outline the steps of the krebs cycle.	8 Marks	L4	CO1
		(OR)			
3.	a)	Discuss glycogen storage disorders.	8 Marks	L2	CO1
	b)	Define gluconeogenesis, trace the pathway of gluconeogenesis.	8 Marks	L2	CO1

MODULE-II

4.	a)	Describe the transamination reaction with one example.	8 Marks	L2	CO2
	b)	Discuss the structure and function of biologically active peptides.	8 Marks	L2	CO2
		(OR)			
5.	a)	Classify aminoacids based on nutritional requirements.	8 Marks	L2	CO2
	b)	How is ammonia detoxified and excreted to prevent toxicity?	8 Marks	L3	CO2

MODULE-III

6.	a)	Describe the steps involved in beta oxidation of fatty acids.	8 Marks	L2	CO3
	b)	Name the plasma lipoproteins and describe their functions.	8 Marks	L3	CO3
		(OR)			
7.	a)	Describe the role of carnitine in the oxidation of fatty acids.	8 Marks	L3	CO3
	b)	Summarize the properties of phospholipids.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain the role of vitamin A in wald's visual cycle.	8 Marks	L2	CO4
	b)	Describe the deficiency manifestations of vitamin D.	8 Marks	L2	CO4
		(OR)			
9.	a)	Describe the factors regulating blood calcium levels.	8 Marks	L2	CO4
	b)	Mention dietary sources, RDA and functions of iron.	8 Marks	L2	CO4

MODULE-V

10.	a)	Describe the factors affecting enzyme activity.	8 Marks	L2	CO5
	b)	Compare and contrast competitive and non-competitive enzyme inhibition.	8 Marks	L3	CO5
		(OR)			
11.	a)	Analyze the effect of substrate concentration on enzyme activity.	8 Marks	L2	CO5
	b)	Describe how temperature and pH influence enzyme activity.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T I Semester (MBU-22) Regular Examinations, May – 2026

MEDICAL BIOCHEMISTRY-I

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define isomers.	2 Marks	L1	CO1
	b)	Add a note on ionophores.	2 Marks	L1	CO1
	c)	Name ketone bodies.	2 Marks	L1	CO2
	d)	List four non-polar aminoacids.	2 Marks	L1	CO2
	e)	Name prostate cancer markers.	2 Marks	L1	CO3
	f)	What is Chargaff's rule in DNA base pairing?	2 Marks	L2	CO3
	g)	Name the limiting aminoacids present in carbohydrates.	2 Marks	L1	CO4
	h)	Define the biological value of protein.	2 Marks	L1	CO4
	i)	Add a note on steatorrhea.	2 Marks	L1	CO5
	j)	Name the contractile elements in the muscle tissue.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Classify carbohydrates based on their structure.	8 Marks	L4	CO1
	b)	Describe the role of glycosaminoglycans in the extra cellular matrix.	8 Marks	L2	CO1

(OR)

3.	a)	Explain the structure of glycogen.	8 Marks	L2	CO1
	b)	Discuss homopolysaccharides and their functions.	8 Marks	L2	CO1

MODULE-II

4.	a)	Describe the transamination reaction with one example.	8 Marks	L2	CO2
	b)	How is ammonia detoxified and excreted to prevent toxicity?	8 Marks	L3	CO2

(OR)

5.	a)	Explain the classification of proteins based on composition.	8 Marks	L2	CO2
	b)	Outline the properties of fatty acids and explain any two properties in detail.	8 Marks	L1	CO2

MODULE-III

6.	a)	Analyze the effect of substrate concentration on enzyme activity.	8 Marks	L4	CO3
	b)	Describe how temperature and pH influence enzyme activity.	8 Marks	L2	CO3

(OR)

7.	a)	Distinguish between the different types of RNA and their functions.	8 Marks	L2	CO3
	b)	Interpret the significance of measuring liver enzymes in diagnosing liver disease.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss the sources, chemical nature, and beneficial effects of dietary fiber.	8 Marks	L2	CO4
	b)	Mention the types of protein energy malnutrition and explain any one type in detail.	8 Marks	L2	CO4

(OR)

9.	a)	Discuss the nutritional importance of carbohydrates.	8 Marks	L2	CO4
	b)	Explain the protein recommendations for children by age.	8 Marks	L2	CO4

MODULE-V

10.	a)	Describe the defects of absorption of carbohydrates.	8 Marks	L2	CO5
	b)	Explain the role of glutathione in protein synthesis.	8 Marks	L2	CO5

(OR)

11.	a)	Explain absorption of lipids by bergstrom theory.	8 Marks	L2	CO5
	b)	Describe about sliding filament theory.	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T & B.Sc (Allied Sciences) I Semester (MBU-22) Regular Examinations, May – 2026

TELUGU

[Anaesthesia & Operation Theatre Technology, Emergency Medical and Critical Care Technology, Medical Lab Technology, Respiratory Therapy, Cardio Vascular Technology, Optometry, Dialysis Technology, Radiology & Imaging Technology, Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	ఈ రాత్రికి నేను పాడలేను అని పలికినది ఎవరు?	2 Marks	L3	CO1
	b)	రాక్షస గురువు ఎవరు?	2 Marks	L1	CO2
	c)	భారతంలో ఆది, సభాపర్వాలను రచించనది ఎవరు?	2 Marks	L1	CO1
	d)	పూర్ణమ్మను ఎవరికిచ్చి పెళ్లి జరిపించారు?	2 Marks	L1	CO2
	e)	ముత్యాల సరాలు రచించిన కవి ఎవరు?	2 Marks	L3	CO2
	f)	మధ్యాహ్నము విగ్రహ వాక్యం వ్రాయండి?	2 Marks	L3	CO1
	g)	మురికి కాలువ ప్రక్కన కవికి ఏమి కనపడినది?	2 Marks	L2	CO1
	h)	శకుంతల తల్లి పేరు ఏమి?	2 Marks	L1	CO1
	i)	యనాదేశ సంధికి ఒక ఉదాహరణ?	2 Marks	L3	CO1
	j)	పోతన ఎవరి ప్రేరణతో భాగవతం రచించాడు?	2 Marks	L3	CO2

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	బలి చక్రవర్తి వామనుని గురించి సభలో ఏమని పలికాడు?	8 Marks	L2	CO1
	b)	పూర్ణమ్మ సమాజానికి ఏమని సందేశమిచ్చింది?	8 Marks	L3	CO1
		(OR)			
3.	a)	ఇది ఏ నాగరికతకు ఫలశృతి? ఏ బుద్ధ దేవుని జన్మభూమికి గర్వ స్మృతి? సందర్భాలను వివరించండి?	8 Marks	L1	CO1
	b)	ముదుసలి మొగుడికి ముడివేసిరి! పసుపు రాసిరి బంగరు మేనికి! సందర్భాలను వివరించండి?	8 Marks	L4	CO1

MODULE-II

4.	a)	"వలవదు బుద్ధిమంతులు నవప్రియు లైనధరాధినాథులన్" గణ విభజన చేసి ఏ పద్య పాదమో తెలిపి లక్షణాలను వివరించండి?	8 Marks	L4	CO2
	b)	మత్తేభం పద్య లక్షణాలను వివరించండి?	8 Marks	L2	CO2
		(OR)			
5.	a)	శకుంతలోపాఖ్యానం పాఠ్యబాగ సారాంశాన్ని వివరించండి?	8 Marks	L2	CO2
	b)	పుత్రుని యొక్క గొప్పతనం గురించి నన్నయ ఎలా వివరించాడు?	8 Marks	L2	CO2

MODULE-III

6.	a)	వామనావతారం పాఠ్యబాగ సారాంశాన్ని వివరించండి?	10 Marks	L3	CO3
	b)	గురజాడ రచించిన పాఠ్యభాగ సందేశం ఏమిటి?	6 Marks	L2	CO3
		(OR)			
7.	a)	"నావిని నారదుండు నరనాథున కిట్లను నీ కుమారుడా" గణ విభజన చేసి ఏ పద్య పాదమో తెలిపి లక్షణాలను వివరించండి??	10 Marks	L3	CO3
	b)	ఉపమా, ఉత్ప్రేక్ష అలంకారాలను వివరించండి?	6 Marks	L2	CO3

MODULE-IV

8.	a)	నా యెద మోడైన దుస్థితి, సిగ్గుతో రెండుగా చీలిన వెదురు బొంగును సందర్భాలను వివరించండి?	8 Marks	L2	CO4
	b)	సిగ్గులేని ముఖాన్ని చూపించలేను! ఈ కలలు కాగితపు పేలికలై రాలినవి! సందర్భాలను వివరించండి?	8 Marks	L2	CO4
		(OR)			
9.	a)	అమ్మను, అయ్యను కానండీ! నాపేరొకసారి తలవండి! సందర్భాలను వివరించండి?	8 Marks	L2	CO4
	b)	ఆర్తగీతం పాఠ్యభాగ సారాంశాన్ని వివరించండి?	8 Marks	L2	CO4

MODULE-V

10.	a)	నిరయం బైన నిబంధమైన ధరణీ నిర్మూలనం బైన దుర్మరణం బైన గులాంతమైన నిజము రానిమ్ము కానిమ్ము పో హరుడైన హరియైన నీరజభవుం డభ్యాగతుం డైన నౌ దిరుగ న్నేరదు నాదు జిహ్వ వినుమా ధీవర్య! వేయేటికిన్.	8 Marks	L3	CO5
	b)	కులము రాజ్యము తేజము నిలుపు మీ కుబ్జుండు విశ్వంభరుం డలతిం బోడు త్రివిక్రమన్ఘరణవాడై నిండు బ్రహ్మాండము గలడే మాన్ప నొకండు నా పలుకు లాకరింపు కర్ణంబుల వలదీ దానము గీనము బనుపుమా వర్ణి వదాన్యోత్తమా!	8 Marks	L3	CO5
		(OR)			
11.	a)	విమలయశోనిధీ పురుష వృత్త మెఱుంగుచు నుండు జూవె వే దములును బంచభూతములు ధర్మువు సంధ్యలు నంతరాత్మయున్ యముడును జంద్రసూర్యులు నహంబును రాత్రియు నన్మహాపదా ర్థము లివి యుండగా నరుడు దక్కొన నేర్చునె తన్ను మ్రుచ్చిలన్	8 Marks	L3	CO5
	b)	తలపగ నాడు వల్కినవి ధం, బెడ దప్పగ వీడెనొక్కొ చూడ్కులు విరసంబు లై కరము క్రూరము లైననిమిత్త మేమియో కలయగ బల్కరించి రుప కారులు నై రని నమ్మి యుండగా వలవదు బుద్ధిమంతులు నవప్రియు లైనధరాధినాథులన్	8 Marks	L3	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T & B.Sc (Allied Sciences) I Semester (MBU-22) Regular Examinations, May – 2026

SANSKRIT

[Anaesthesia & Operation Theatre Technology, Emergency Medical and Critical Care Technology, Medical Lab Technology, Respiratory Therapy, Cardio Vascular Technology, Optometry, Dialysis Technology, Radiology & Imaging Technology, Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	रामायणस्य कर्ता क:	2 Marks	L2	CO1
	b)	श्रीरामः किद्रुषं भरतं ददर्श	2 Marks	L1	CO1
	c)	महाभारतस्य कर्ता क:	2 Marks	L3	CO2
	d)	सीतायाः पतिः कः ?	2 Marks	L1	CO2
	e)	रामःकति वर्षाणि वनवासं गतवान्	2 Marks	L3	CO3
	f)	यक्ष: कं प्रश्नम् पृच्छति	2 Marks	L1	CO3
	g)	चंपुरमयानस्य कर्ता क:	2 Marks	L2	CO4
	h)	मोहापनोदः कर्ता क:	2 Marks	L3	CO4
	i)	पूर्वं कस्य नाम राज आसीत्	2 Marks	L2	CO5
	j)	मानवः कति दिनेषु घाप पुण्यफलम् अनुभवति ?	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	आर्यपादुकाभिषेकः पाठ्यभागस्य साराशं लिखत ?	8 Marks	L2	CO1
	b)	रामभरतयोः सम्भाषणम् उपस्थापयत ?	8 Marks	L3	CO1
		(OR)			
3.	a)	यक्षप्रश्नेषु वर्णितान् लौकिकधर्मान् वर्णयत?	8 Marks	L1	CO1
	b)	यक्षयुधिष्ठिरप्रश्नोत्तराणि विवृणुत ?	8 Marks	L3	CO1

MODULE-II

4.	a)	गङ्गावतरणम् पाठ्यभागस्य साराशं लिखत ?	8 Marks	L1	CO2
	b)	गङ्गावतरणम् पाठ्यभागे उक्त विषयान् समुपस्थापयत ?	8 Marks	L3	CO2
		(OR)			
5.	a)	मोहापनोदः पाठ्यभागस्य साराशं लिखत ?	8 Marks	L3	CO2
	b)	गुरुपत्नी कथं सुनन्दयाः मोहापनोदं कृतवती लिखत ?	8 Marks	L1	CO2

MODULE-III

6.	a)	अत्युत्कटैः पापपुण्यैः इहैव फलमश्नुते विशदयत ?	8 Marks	L2	CO3
	b)	शृगालः कथं मारितः लिखत ?	8 Marks	L3	CO3

(OR)

7.	a)	वीरवरस्य त्यागभुद्धिं लिखत ?	8 Marks	L3	CO3
	b)	शूद्रकवीरवर कथा पाठ्यभागस्य साराशं लिखत ?	8 Marks	L1	CO3

MODULE-IV

8.	a)	अक" देव शाब्दरूपुंल्लिङ्गम्:	8 Marks	L3	CO4
	b)	इक" कवि शाब्दरूपुंल्लिङ्गम्:	8 Marks	L3	CO4

(OR)

9.	a)	आक" रमा शब्दःस्त्रीलिङ्गम्:	8 Marks	L3	CO4
	b)	उक" गुरु शाब्दरूपुंल्लिङ्गम्:	8 Marks	L1	CO4

MODULE-V

10.	a)	पाणिनि कविपरिचयं लिखत.	8 Marks	L1	CO5
	b)	कौटिल्य कविपरिचयं लिखत.	8 Marks	L3	CO5

(OR)

11.	a)	आदिशङ्कराचार्य कविपरिचयं लिखत.	8 Marks	L3	CO5
	b)	भरतमुनि कविपरिचयं लिखत.	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T & B.Sc (Allied Sciences). I Semester (MBU-22) Regular Examinations, May – 2026

PROFESSIONAL ENGLISH

[Anaesthesia & Operation Theatre Technology, Emergency Medical and Critical Care Technology, Medical Lab Technology, Respiratory Therapy, Cardio Vascular Technology, Optometry, Dialysis Technology, Radiology & Imaging Technology, Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Write the meaning of the word "Scrub" as used in the poem *Be the Best of Whatever You Are*.	2 Marks	L1	CO1
	b)	What was the primary quality of the bus conductor that struck the author in *On Saying Please*?	2 Marks	L2	CO1
	c)	What does the speaker mean by "my roots will set off to seek another land" the poem *If You Forget Me*?	2 Marks	L2	CO4
	d)	What is the significance of the "Gokul Chat" in the context of the story *After the Sunset*?	2 Marks	L2	CO4
	e)	What is the "peril" that Bertrand Russell refers to in the title?	2 Marks	L2	CO3
	f)	Fill in the blanks with appropriate words to form tongue twisters: A proper cup of coffee from a proper _____ coffee pot.	2 Marks	L3	CO2
	g)	Fill in the blanks with appropriate articles: i) He is _____ best student in the class. ii) She has _____ European friend.	2 Marks	L2	CO4
	h)	Find the error in the sentences: i) Rajan is a cleverest boy in the class. ii) Does you see it?	2 Marks	L1	CO3
	i)	Write the phonetic transcriptions of the following words: i) Book ii) Sun	2 Marks	L2	CO5
	j)	Write the past and past participle of the following base verbs: i) Drive ii) Grow	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	What does the phrase "be the best of whatever you are" mean to you personally?	8 Marks	L2	CO1
	b)	You are the class representative of your section. Write a letter to the Head of the Department requesting permission to organize a blood donation camp on 12 August on International Youth Day.	8 Marks	L3	CO1

(OR)

3.	a)	Apply the poem's lesson to modern career choices.	8 Marks	L3	CO5
	b)	Write a letter to the Municipal Corporation complaining about irregular garbage collection in your locality. Include the date, subject, and a request for action.	8 Marks	L3	CO1

MODULE-II

4.	a)	Critically examine the bus conductor's character as a contrast to the lift-man. What virtues does the conductor represent, and how does he influence the narrator's mood?	8 Marks	L2	CO3
	b)	Why is pronunciation important in reading? List out the important measures to be followed to read a passage in English effectively.	8 Marks	L3	CO2

(OR)

5.	a)	Analyze the significance of the lift-man's behavior in the opening anecdote. How does Gardiner use this incident to introduce the central theme of the essay?	8 Marks	L4	CO3
	b)	Build a conversation between two friends regarding higher education plans.	8 Marks	L4	CO4

MODULE-III

6.	a)	What lesson does the poem teach about self-respect in a romantic relationship?	8 Marks	L2	CO3
	b)	Describe how the speaker views the reciprocal nature of love in the final stanza.	8 Marks	L1	CO3

(OR)

7.	a)	Evaluate the speaker's tone—is it a threat, a warning, or a promise of reciprocity?	8 Marks	L5	CO3
	b)	Summarize the central message regarding the fragility and strength of the speaker's love.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss the role of the police and authority figures during the aftermath of the tragedy.	8 Marks	L2	CO4
	b)	Discuss how the activities of terrorists disrupt the regular lives of common people.	8 Marks	L2	CO4

(OR)

9.	a)	Analyse the theme of social class and its relation to the value of human life in the story.	8 Marks	L4	CO4
	b)	Summarize the author's message regarding the vulnerability of "ordinary citizens" in a violent society.	8 Marks	L2	CO4

MODULE-V

10.	a)	Describe the "wisdom" Russell advocates for to ensure the survival of the human race.	8 Marks	L1	CO5
	b)	What are prepositions? Mention the uses of prepositions.	8 Marks	L1	CO5

(OR)

11.	a)	Discuss Bertrand Russell's opinion about the supreme importance of humanity compared to the futility of war.	8 Marks	L2	CO5
	b)	Evaluate the moral responsibility of individuals versus authorities in preventing "Man's Peril.	8 Marks	L4	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. IV Semester (MBU-22) Regular Examinations, April – 2026

MULTI VARIABLE CALCULUS

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Write the necessary conditions for $f(x, y)$ to have a maximum or minimum at the point (a, b).	2 Marks	L1	CO1
	b)	Compute $\frac{\partial f}{\partial x} + \frac{\partial f}{\partial y} + \frac{\partial f}{\partial z}$ at the point $(1,1,1)$ if $f(x, y, z) = xy + xz$.	2 Marks	L1	CO1
	c)	Evaluate $\int_{y=0}^{2} \int_{x=0}^{3} (x + y)\,dy\,dx$.	2 Marks	L1	CO2
	d)	Identify the limits to cover the region R bounded by $y = x,\ y^2 = x$.	2 Marks	L1	CO2
	e)	Evaluate $\int_0^1 \int_0^1 \int_0^1 (x + y + z)\,dx\,dy\,dz$	2 Marks	L1	CO2
	f)	Evaluate $\int_{-1}^{1} \int_{-2}^{2} \int_{-3}^{3} xyz\,dx\,dy\,dz$	2 Marks	L1	CO2
	g)	Define directional derivative.	2 Marks	L1	CO3
	h)	If $\bar{r} = x\bar{i} + y\bar{j} + z\bar{k}$ then find $curl\,\bar{r}$.	2 Marks	L1	CO3
	i)	Define closed curve.	2 Marks	L1	CO4
	j)	State Gauss Divergence theorem.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	If $U = log\left(x^3 + y^3 + z^3 - 3xyz\right)$, show that $\left(\frac{\partial}{\partial x} + \frac{\partial}{\partial y} + \frac{\partial}{\partial z}\right)^2 U = \frac{-9}{(x + y + z)^2}$	8 Marks	L2	CO1
	b)	Determine the minimum value of $x^2 + y^2 + z^2$ given that $xyz = a^3$.	8 Marks	L3	CO1

(OR)

3.	Discuss the maxima and minima for the function $f(x, y) = x^4 + y^4 - 2x^2 - 2y^2 + 4xy$.	16 Marks	L2	CO1

MODULE-II

4.	a)	Evaluate $\int_0^5 \int_0^{x^2} x\left(x^2 + y^2\right) dx\, dy.$	6 Marks	L5	CO2
	b)	Evaluate $\iint x^2 dx\, dy$ over the region bounded by hyperbola $xy = 4, y = 0, x = 1, x = 4.$	10 Marks	L5	CO2

(OR)

5.	Evaluate the integral by changing the order of integration $\int_0^1 \int_1^{2-x} xy\, dy dx.$	16 Marks	L5	CO2

MODULE-III

6	Evaluate $\iiint_V xyz\, dx\, dy\, dz$ where V is the domain bounded by the coordinate planes and the plane $x + y + z = 1.$	16 Marks	L5	CO2

(OR)

7.	Evaluate $\iiint \left(x^2 + y^2 + z^2\right) dx\, dy\, dz$ taken over the volume enclosed by the sphere $x^2 + y^2 + z^2 = 1$, by transforming into spherical polar coordinates.	16 Marks	L1	CO2

MODULE-IV

8.	a)	Determine the directional derivative of $f = x^2 yz + 4xz^2$ in the direction of vector $2\bar{i} - \bar{j} - 2\bar{k}$ at the point (1,-2,-1).	8 Marks	L3	CO3
	b)	Find the angle between the normals to the surface $x^2 - yz$ at the point (1,1,1) and (2,4,1).	8 Marks	L1	CO3

(OR)

9.	a)	Show that $div\left(\frac{\bar{r}}{r}\right) = \frac{2}{r}$, where $\bar{r} = x\bar{i} + y\bar{j} + z\bar{k}$.	8 Marks	L2	CO3
	b)	Show that $curl(r^n \bar{r}) = 0.$	8 Marks	L2	CO3

MODULE-V

10.	Evaluate $\int_S \bar{F}.\bar{n}\, ds$, where $\bar{F} = 18z\bar{i} - 12\bar{j} + 3y\bar{k}$ and S is the part of the surface of the plane $2x + 3y + 6z = 12$ located in the first octant.	16 Marks	L5	CO4

(OR)

11.	Verify Stoke's theorem for $\bar{F} = -y^3\bar{i} + x^3\bar{j}$, where S is the circular disc $x^2 + y^2 \le 1, z = 0.$	16 Marks	L2	CO4

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Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. IV Semester (MBU-22) Regular Examinations, April – 2026

INTEGRAL TRANFORMS

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define periodic function.	2 Marks	L1	CO1
	b)	Find the Fourier coefficient a_0 for the function $f(x) = \sin x$ in the interval $(-\pi, \pi)$.	2 Marks	L1	CO1
	c)	Write Fourier sine integral.	2 Marks	L1	CO2
	d)	State Fourier integral Theorem.	2 Marks	L1	CO2
	e)	Define Fourier sine transform.	2 Marks	L1	CO2
	f)	State convolution theorem for Fourier Transforms.	2 Marks	L1	CO2
	g)	Define Laplace transform.	2 Marks	L1	CO3
	h)	Find the Laplace transform of $\sin(wt + \alpha)$.	2 Marks	L1	CO3
	i)	Find the inverse Laplace transform of $\frac{1}{4s^2 + 16}$.	2 Marks	L1	CO4
	j)	Determine $L^{-1}\left[\frac{1}{(s+3)(s+5)}\right]$.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Find the Fourier series to represent $f(x) = x^2 - 2$ in the interval $(-2, 2)$.	8 Marks	L2	CO1
	b)	Find the half range cosine series $f(x) = \sin x$ in $0 < x < \pi$.	8 Marks	L1	CO1

(OR)

3.	Express $f(x)$ as a Fourier series in $(-\pi, \pi)$, where $f(x) = \begin{cases} 0, -\pi < x < 0 \\ \cos x, 0 < x < \pi \end{cases}$.	16 Marks	L2	CO1

MODULE-II

4.	Applying Fourier integral theorem, Show that $e^{-ax} - e^{-bx} = \frac{2(b^2 - a^2)}{\pi}\int_0^\infty \frac{\lambda \sin \lambda x}{(\lambda^2 + a^2)(\lambda^2 + b^2)} d\lambda$.	16 Marks	L5	CO2

(OR)

5. Find the Fourier sine integral of $f(x) = \begin{cases} x^2, 0 < x < a \\ 0 \quad x > a \end{cases}$ 16 Marks L1 CO2

MODULE-III

6. a) Find the Fourier cosine transform of $f(x) = e^{-ax}, a > 0$ and hence deduce the integral $\int_0^\infty \frac{\cos px}{a^2 + p^2} dp$. 8 Marks L1 CO2

b) Find Fourier sine transform for the function $e^{-|x|}$, and hence deduce the integral $\int_0^\infty \frac{x \sin mx}{1 + x^2} dx.$. 8 Marks L1 CO2

(OR)

7. Find the Fourier transform of $f(x) = \begin{cases} a - |x|, |x| < a \\ 0 \quad |x| > a > 0 \end{cases}$ and hence find the value of the integral $\int_0^\infty \left(\frac{\sin t}{t}\right)^2 dt$. 16 Marks L3 CO2

MODULE-IV

8. a) Find the Laplace transform of $g(t)$, where $g(t) = \begin{cases} \sin\left(t - \frac{3\pi}{4}\right), \text{ if } t > \frac{3\pi}{4} \\ 0, \quad \text{ if } t < \frac{3\pi}{4} \end{cases}$. 8 Marks L1 CO3

b) Determine Laplace transform of $t^2 e^{2t}$ by using transformation of derivatives. 8 Marks L3 CO3

(OR)

9. a) State and prove Laplace transform of integrals. 8 Marks L2 CO3

b) By using Laplace transform, evaluate $\int_0^\infty \frac{e^{-t} \sin^2 t}{t} dt$. 8 Marks L2 CO3

MODULE-V

10. a) Find the inverse Laplace transform of $\log\left(\frac{s+1}{s+2}\right)$. 8 Marks L3 CO4

b) By using Convolution theorem, find $L^{-1}\left[\frac{s}{(s^2 + a^2)(s^2 + b^2)}\right]$. 8 Marks L1 CO4

(OR)

11. Solve the differential equation $\frac{d^2x}{dt^2} + 2\frac{dx}{dt} + 2x = 5\sin t$, given that $x(0) = 0, x'(0) = 0$ using Laplace transforms. 16 Marks L3 CO4

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T I Semester (MBU-22) Regular Examinations, May – 2026

ANATOMY - I

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is a nutrient artery?	2 Marks	L2	CO1
	b)	Name the carpal bones.	2 Marks	L1	CO1
	c)	Write a brief note on median cubital vein and its clinical importance.	2 Marks	L3	CO2
	d)	Name the branches of axillary artery.	2 Marks	L1	CO2
	e)	What is femoral canal?	2 Marks	L3	CO3
	f)	Name the tarsal bones in foot.	2 Marks	L1	CO3
	g)	Write a brief note on pleural effusion.	2 Marks	L2	CO4
	h)	Define bronchopulmonary segment of the lung.	2 Marks	L1	CO4
	i)	What is centromere and write its importance?	2 Marks	L2	CO5
	j)	List out abnormal sites of implantation.	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Define cartilage, and describe types of cartilage with examples.	8 Marks	L2	CO1
	b)	Compare the features of skeletal muscle and smooth muscle.	8 Marks	L3	CO1
		(OR)			
3.	a)	Explain different types of movements possible in upper limb.	8 Marks	L1	CO1
	b)	Write in detail about blood supply of a long bone with a neat labelled diagram.	8 Marks	L3	CO1

MODULE-II

4.	a)	Illustrate anatomy of mammary gland under the following headings: i) Location & Extent ii) Structure iii) Blood supply & Nerve supply iv) Applied anatomy.	8 Marks	L3	CO2
	b)	What are intermuscular spaces? Explain boundaries and contents of intermuscular spaces.	8 Marks	L2	CO2
		(OR)			
5.	a)	Explain features of the humerus bone with its muscle attachments.	8 Marks	L1	CO2
	b)	What is cubital fossa? Explain boundaries and contents of cubital fossa.	8 Marks	L2	CO2

MODULE-III

6.	a)	Describe hip joint under the following headings: i) Type & Variety ii) Articular surfaces, Ligaments & Relations iii) Blood supply & Nerve supply iv) iv) Applied anatomy.	8 Marks	L2	CO3
	b)	Explain saphenous nerve under the following headings: i) Origin ii) Course & Relations iii) Branches iv) Applied anatomy.	8 Marks	L3	CO3

(OR)

7.	a)	What are hamstring muscles? Describe origin, insertion, nerve supply, action and applied aspects of hamstring muscles.	8 Marks	L3	CO3
	b)	Describe boundaries of popliteal fossa and list out its contents.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Describe conducting system of the heart and add a note on its clinical anatomy.	8 Marks	L3	CO4
	b)	What is aorta? Explain parts of aorta, branches of aorta & its relations.	8 Marks	L2	CO4

(OR)

9.	a)	Write a note on blood supply of heart with a diagram.	8 Marks	L2	CO4
	b)	Explain structures passing through hilum of right lung and left lung.	8 Marks	L1	CO4

MODULE-V

10.	a)	Define connective tissue, and mention it's types with examples.	8 Marks	L1	CO5
	b)	Illustrate the microscopic structure of a bone T.S. & L.S.	8 Marks	L3	CO5

(OR)

11.	a)	Explain the histological features of a skeletal muscle.	8 Marks	L2	CO5
	b)	Define fertilization. Write the factors that affect fertilization.	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T I Semester (MBU-22) Regular Examinations, May – 2026

PHYSIOLOGY - I

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Mention the uses of cell membrane.	2 Marks	L2	CO1
	b)	Add a note on negative feedback mechanism.	2 Marks	L1	CO1
	c)	What are steps involved in collection & storage of blood?	2 Marks	L3	CO2
	d)	Mention the causes of Megaloblastic anemia.	2 Marks	L1	CO2
	e)	Add a note on length-tension relationship.	2 Marks	L3	CO3
	f)	Draw the graphical representation of Action potential.	2 Marks	L1	CO3
	g)	What is the role of Renin in regulating blood pressure?	2 Marks	L2	CO4
	h)	What are the factors that affect the Heart rate?	2 Marks	L3	CO4
	i)	What is hypercapnia?	2 Marks	L2	CO5
	j)	Add a note High altitude sickness.	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Write the differences between prokaryotic and eukaryotic ell..	8 Marks	L2	CO1
	b)	Explain Homeostasis.	8 Marks	L3	CO1
		(OR)			
3.	a)	Describe the structure of cell membrane and its functions.	8 Marks	L1	CO1
	b)	Write a note on the structure and function of cell organelles. i) Nucleus ii) Lysosomes	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain platelet plug formation.	8 Marks	L1	CO2
	b)	Add a note on different types of anemias.	8 Marks	L3	CO2
		(OR)			
5.	a)	Define Jaundice and add a note on different types of jaundice.	8 Marks	L3	CO2
	b)	Explain different types of immunity.	8 Marks	L1	CO2

MODULE-III

6.	a)	Define tetanus. Explain the types of tetanus.	8 Marks	L2	CO3
	b)	What is electromyogram? Explain the uses of electromyogram and disorders of skeletal muscle.	8 Marks	L3	CO3
		(OR)			
7.	a)	Explain the length - tension relationship of a muscle.	8 Marks	L3	CO3
	b)	Write the differences between skeletal and cardiac muscles.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Explain fetal circulation.	8 Marks	L3	CO4
	b)	Add a note on cardiac arrhythmias.	8 Marks	L3	CO4
		(OR)			
9.	a)	Explain cerebral circulation.	8 Marks	L3	CO4
	b)	Add a note on cardiac catheterization.	8 Marks	L1	CO4

MODULE-V

10.	a)	Explain different types of regulation of respiration.	8 Marks	L1	CO5
	b)	Add a note on hypoxia and it's types.	8 Marks	L3	CO5
		(OR)			
11.	a)	Add a note on pneumonia and emphysema.	8 Marks	L3	CO5
	b)	Explain decompression sickness.	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. II Semester (MBU-25) Regular Examinations, May – 2026

INTRODUCTION TO BIOINFORMATICS

[Bioinformatics]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define Bioinformatics.	2 Marks	L1	CO1
	b)	Recall Protein Sequence databases.	2 Marks	L1	CO1
	c)	Name Nucleic acid databases.	2 Marks	L1	CO2
	d)	What is Secondary database?	2 Marks	L1	CO2
	e)	What is flat file?	2 Marks	L1	CO3
	f)	List the different types of files.	2 Marks	L1	CO3
	g)	What is BLOSUM?	2 Marks	L1	CO4
	h)	Name the Multiple sequence alignment methods.	2 Marks	L1	CO4
	i)	What is PyMol?	2 Marks	L1	CO5
	j)	Recall the sequence visualization tools.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain how bioinformatics is related to Molecular biology.	8 Marks	L2	CO1
	b)	Summarize about Chimera and Ligand explorer.	8 Marks	L2	CO1
		(OR)			
3.	a)	Discuss the applications of Bioinformatics.	8 Marks	L6	CO1
	b)	Justify the interdisciplinary nature of Bioinformatics.	8 Marks	L2	CO1

MODULE-II

4.	a)	Classify the Biological databases.	8 Marks	L2	CO2
	b)	Outline specialized genome databases.	8 Marks	L2	CO2
		(OR)			
5.	a)	Summarize the Human genome database.	8 Marks	L2	CO2
	b)	Identify and explain at least one structure database.	8 Marks	L3	CO2

MODULE-III

6.	a)	Outline different types of files used in the Biological databases.	8 Marks	L2	CO3
	b)	Show the different lines in FASTA format.	8 Marks	L2	CO3
		(OR)			
7.	a)	Organize the elements in the PDB file.	8 Marks	L3	CO3
	b)	Explain SwissProt file format.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Outline Dynamic programming methods.	8 Marks	L2	CO4
	b)	Compare between Global and Local alignment with examples.	8 Marks	L2	CO4

(OR)

9.	a)	Illustrate the Phylogenetic tree and its importance.	8 Marks	L2	CO4
	b)	Identify and elaborate the matrices used for Sequence alignment.	8 Marks	L3	CO4

MODULE-V

10.	a)	Analyze the importance of Comprehensive bioinformatics packages.	8 Marks	L4	CO5
	b)	Select the Structure visualization tools and explain.	8 Marks	L3	CO5

(OR)

11.	a)	Compare PyMol and RasMol.	8 Marks	L2	CO5
	b)	Explain any of the sequence visualization tools.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. II Semester (MBU-25) Regular Examinations, May – 2026

BIOPHYSICAL TECHNIQUES

[Biotechnology, Bioinformatics]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Why is pH important in biological systems?	2 Marks	L1	CO1
	b)	What is a pH meter?	2 Marks	L1	CO1
	c)	What is RPM? How is RPM different from RCF?	2 Marks	L1	CO2
	d)	What is preparative centrifugation? Give one example of its use.	2 Marks	L1	CO2
	e)	How is the molecular weight of a protein determined using gel filtration chromatography?	2 Marks	L1	CO3
	f)	What is ion-exchange chromatography? Give one example of an ion exchanger.	2 Marks	L1	CO3
	g)	What is isoelectric focusing (IEF)? Define isoelectric point (pI).	2 Marks	L1	CO4
	h)	What is immunoelectrophoresis? Mention its principle.	2 Marks	L1	CO4
	i)	What is a Jablonski diagram? What does it explain?	2 Marks	L1	CO5
	j)	Define Stokes' shift. Why is it important in fluorimetry?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	What is TDS in water? Show the table of TDS level chart for drinking water.	8 Marks	L1	CO1
	b)	Explain the importance of Henderson-Hasselbalch equation.	8 Marks	L2	CO1

(OR)

3.	a)	What are the limits of Electrical conductance in drinking water?	8 Marks	L1	CO1
	b)	Draw a neat labeled diagram of Clark Oxygen Electrode.	8 Marks	L2	CO1

MODULE-II

4.	a)	Illustrate ultra centrifuge. Add a note on the optical system used in ultra centrifuges.	8 Marks	L2	CO2
	b)	Explain about the sub cellular fractionation using sucrose as a medium for density gradient centrifugation.	8 Marks	L2	CO2

(OR)

5.	a)	Differentiate between isopycnic and rate zonal centrifugation.	8 Marks	L5	CO2
	b)	What is Svedberg unit? How is Svedberg unit useful in the study of macromolecules?	8 Marks	L1	CO2

MODULE-III

6.	a)	Describe the method of radial development of paper chromatography.	8 Marks	L2	CO3
	b)	How do you identify an amino acid in the given mixture by carrying out paper chromatography?	8 Marks	L1	CO3

(OR)

7.	a)	Explain the principle and applications of affinity chromatography.	8 Marks	L2	CO3
	b)	What are ligands? How is ligand specificity useful in protein purification?	8 Marks	L1	CO3

MODULE-IV

8.	a)	Describe the principle and applications of chromatofocusing.	8 Marks	L2	CO4
	b)	Give a brief account of types and properties of carrier ampholytes used in Isoelectric focusing.	8 Marks	L2	CO4

(OR)

9.	a)	Explain the principle and applications of capillary electrophoresis.	8 Marks	L2	CO4
	b)	What are the two methods of sample loading in capillary electrophoresis?	8 Marks	L1	CO4

MODULE-V

10.	a)	Explain the principle of radioactive measurements using a GM counter.	8 Marks	L2	CO5
	b)	Give important applications of GM counters.	8 Marks	L2	CO5

(OR)

11.	a)	What are fluors? Give a brief account of fluors in scintillography.	8 Marks	L1	CO5
	b)	What are types of scintillation counters used in radioactivity measurement?	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. II Semester (MBU-25) Regular Examinations, May – 2026

BASIC ENZYMOLOGY

[Biotechnology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Apoenzyme.	2 Marks	L1	CO1
	b)	Define Coenzyme.	2 Marks	L1	CO1
	c)	Write equation of Michaelis menten for uni substrate reactions.	2 Marks	L1	CO2
	d)	Write the significance of Km.	2 Marks	L2	CO2
	e)	Write definition to feed back inhibition.	2 Marks	L1	CO3
	f)	Define substrate inhibition.	2 Marks	L1	CO3
	g)	Define Ribozyme.	2 Marks	L1	CO4
	h)	Give examples of Abzymes.	2 Marks	L1	CO4
	i)	Give examples of oligomeric enzymes.	2 Marks	L1	CO5
	j)	Draw Hills plot for Hemoglobin.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain about active site in detail.	8 Marks	L2	CO1
	b)	What is Transition state? Explain transition state theory in detail.	8 Marks	L2	CO1

(OR)

3.	a)	Explain about absolute and relative substrate specificity in detail.	8 Marks	L2	CO1
	b)	Explain Holoenzyme and Apoenzyme with examples.	8 Marks	L2	CO1

MODULE-II

4.	a)	Derive the michaelismenten equation and add a note on significance of Km and Vmax in the equation.	8 Marks	L1	CO2
	b)	Explain the Line weaver Burk equation and draw the lineweaver plots in the presence and absence of inhibitors.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the Haldane plots and eadiehofstee plots for reversible inhibition.	8 Marks	L2	CO2
	b)	Explain the significance and relation of Km and Vmax.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the mechanism of allosteric inhibition and add a note on allosteric enzymes.	10 Marks	L2	CO3
	b)	Explain the Irreversible inhibition with one example.	6 Marks	L2	CO3

(OR)

7.	a)	Explain Competitive inhibition and Non competitive inhibition in detail.	10 Marks	L2	CO3
	b)	Explain the substrate inhibition and draw the Line weaver burk plot for uncompetitive inhibition.	6 Marks	L2	CO3

MODULE-IV

8.	a)	Explain the Reaction mechanism of TPP in detail.	8 Marks	L2	CO4
	b)	Explain about the reactions catalysed by carboxy peptidase in detail.	8 Marks	L2	CO4

(OR)

9.	a)	Explain the mechanism of reaction catalysed by tetrahydrofolate in detail.	10 Marks	L2	CO4
	b)	Explain the mechanism of FAD/FMN in an enzyme catalysed reaction in detail.	6 Marks	L2	CO4

MODULE-V

10.	a)	Explain the enzyme regulation through covalent modification taking Glycogen phosphorylase as an example.	8 Marks	L2	CO5
	b)	Explain about serine proteases in detail.	8 Marks	L2	CO5

(OR)

11.	a)	Explain about zymogen activation in detail.	8 Marks	L2	CO5
	b)	Explain in detail about significance of sigmoidal behavior in allosteric kinetics.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. II Semester (MBU-25) Regular Examinations, May – 2026

BASIC ORGANIC CHEMISTRY

[Bioinformatics, Biotechnology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Identify the difference between homolytic and heterolytic cleavage.	2 Marks	L1	CO1
	b)	Define inductive effect.	2 Marks	L1	CO1
	c)	Identify the preparation of ethane from methyl iodide using a coupling reaction.	2 Marks	L1	CO2
	d)	Identify the termination steps in the bromination of propane.	2 Marks	L1	CO2
	e)	Name two general methods for the preparation of alkenes.	2 Marks	L1	CO3
	f)	Define Markownikoff's rule.	2 Marks	L1	CO3
	g)	State why benzene is more stable than cyclohexatriene.	2 Marks	L1	CO4
	h)	State Huckel's rule.	2 Marks	L1	CO4
	i)	Define a chiral molecule.	2 Marks	L1	CO5
	j)	What is a meso compound?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Define hybridization and explain the hybridization of carbon in ethane, ethene, and ethyne.	7 Marks	L2	CO1
	b)	Discuss the concept of sigma (σ) and pi (π) bonds with examples.	9 Marks	L3	CO1

(OR)

3.	a)	Explain the resonance with suitable examples.	8 Marks	L2	CO1
	b)	Explain the factors affecting the stability of carbocations.	8 Marks	L3	CO1

MODULE-II

4.	a)	Discuss the Kolbe electrolysis method for alkane synthesis. What are the products obtained?	8 Marks	L2	CO2
	b)	Explain the mechanism of free radical chlorination of methane and compare it with the SN1 mechanism.	8 Marks	L3	CO2

(OR)

5.	a)	Describe the conformations of cyclohexane (chair, boat, twist-boat) and their relative energies.	8 Marks	L2	CO2
	b)	Describe the Freund's method for the preparation of cycloalkanes.	8 Marks	L3	CO2

MODULE-III

6.	a)	Compare and contrast the physical properties of alkenes with alkanes and alkynes, explaining the reasons for the observed differences.	8 Marks	L3	CO3
	b)	Explain the mechanism of the addition of hydrogen halides (HX) to alkenes, including Markovnikov's rule.	8 Marks	L3	CO3

(OR)

7.	a)	Explain the mechanism of the Wittig reaction for alkene synthesis.	8 Marks	L3	CO3
	b)	Discuss the mechanism of 1,2- and 1,4-additions of alkenes.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Design a synthetic route to synthesize acetophenone from benzene.	8 Marks	L3	CO4
	b)	Describe the mechanism of Friedel-Crafts alkylation of benzene.	8 Marks	L3	CO4

(OR)

9.	a)	Describe the molecular orbital theory (MOT) of benzene.	8 Marks	L3	CO4
	b)	State and explain the characteristics of aromatic compounds.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain the E,Z configuration system for assigning configurations to alkenes.	8 Marks	L3	CO5
	b)	Explain the optical isomerism of amino acid, Alanine.	8 Marks	L3	CO5

(OR)

11.	a)	Explain optical isomerism in glyceraldehyde with the help of Fischer projections.	8 Marks	L3	CO5
	b)	Explain the optical isomerism in 2,3-dibromopentane. Draw all possible stereoisomers.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. II Semester (MBU-25) Regular Examinations, May – 2026

CELL BIOLOGY AND INTRODUCTION TO CANCER BIOLOGY

[Biotechnology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Briefly describe the process of nuclear import.	2 Marks	L2	CO1
	b)	What is the function of the Golgi apparatus?	2 Marks	L1	CO1
	c)	What role do chaperone proteins play in the ER?	2 Marks	L1	CO2
	d)	What is glycosylation, and where does it occur?	2 Marks	L1	CO2
	e)	What is the function of flagella?	2 Marks	L1	CO3
	f)	How do motor proteins interact with microtubules?	2 Marks	L1	CO3
	g)	What is the function of cGMP in cell signaling?	2 Marks	L1	CO4
	h)	How do calcium ions contribute to signal transduction?	2 Marks	L1	CO4
	i)	What is the role of tumor suppressor genes in the cell cycle?	2 Marks	L1	CO5
	j)	How does the p53 protein contribute to apoptosis?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe the structure and function of chloroplasts in photosynthesis.	8 Marks	L2	CO1
	b)	Discuss the lysosome's role in intracellular digestion and waste management.	8 Marks	L2	CO1

(OR)

3.	a)	Explain the structure and functions of the cytoskeleton in maintaining cell shape and facilitating movement.	9 Marks	L2	CO1
	b)	Compare and contrast the roles of microtubules, microfilaments, and intermediate filaments.	7 Marks	L2	CO1

MODULE-II

4.	a)	Describe the steps involved in vesicle formation and transport between the ER and Golgi.	9 Marks	L2	CO2
	b)	Explain the role of vesicle tethering and fusion in the SNARE hypothesis.	7 Marks	L2	CO2

(OR)

5.	a)	Discuss the roles of different types of SNARE proteins in vesicular transport.	8 Marks	L2	CO2
	b)	Explain the role of chaperone proteins in assisting protein folding in the ER.	8 Marks	L2	CO2

MODULE-III

6.	a)	Describe the role of motor proteins in microtubule-based transport.	7 Marks	L2	CO3
	b)	Explain the involvement of microfilaments in cell shape and motility.	9 Marks	L2	CO3

(OR)

7.	a)	Discuss the role of intermediate filaments in maintaining cell integrity.	8 Marks	L5	CO3
	b)	Explain how cytoskeletal elements coordinate during cell migration.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss the role of integrin signaling in cell adhesion and migration.	7 Marks	L2	CO4
	b)	Explain the Hedgehog signaling pathway and its role in developmental processes.	9 Marks	L2	CO4

(OR)

9.	a)	Describe the Wnt signaling pathway and its involvement in cell fate determination.	8 Marks	L2	CO4
	b)	Discuss the cross-talk between different signaling pathways in cellular processes.	8 Marks	L2	CO4

MODULE-V

10.	a)	Describe the functions of oncogene products and their impact on cell proliferation.	8 Marks	L2	CO5
	b)	Discuss the role of tumor suppressor genes in preventing cancer.	8 Marks	L2	CO5

(OR)

11.	a)	Explain the function of tumor suppressor gene products and their role in cell cycle regulation.	7 Marks	L2	CO5
	b)	Describe how mutations in oncogenes and tumor suppressor genes contribute to cancer.	9 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. II Semester (MBU-25) Regular Examinations, May – 2026

HETERO CYCLIC CHEMISTRY

[Organic Chemistry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List the common heteroatoms present in heterocyclic rings.	2 Marks	L1	CO1
	b)	List the prefixes used to indicate the presence of different heteroatoms in the Hantzsch-Widman system.	2 Marks	L1	CO1
	c)	State the reason of protonation of nitrogen in pyrrole leads to loss of aromaticity.	2 Marks	L1	CO2
	d)	Separate the thieno[3,2-c]pyrrole into individual component heterocyclic rings.	2 Marks	L1	CO2
	e)	Identify a key characteristic property of thiiranes that distinguishes them from oxiranes and aziridines.	2 Marks	L1	CO3
	f)	List the product(s) formed when an aziridine reacts with a strong acid.	2 Marks	L1	CO3
	g)	Identify the position in thiophene which is most susceptible to electrophilic aromatic substitution, and why?	2 Marks	L1	CO4
	h)	Write a reaction for the electrophilic bromination of pyrrole.	2 Marks	L1	CO4
	i)	Name the starting materials used in the Fischer indole synthesis.	2 Marks	L1	CO5
	j)	State the effect of electron donating groups on the reactivity of isoquinoline towards electrophiles.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the nomenclature for monocyclic heterocycles. Provide the prefixes and suffixes used for different ring sizes and heteroatoms.	7 Marks	L2	CO1
	b)	Compare the nomenclature of fused and bridged heterocyclic systems. Highlight the key differences in their naming conventions.	9 Marks	L2	CO1

(OR)

3.	a)	Discuss the applications of heterocyclic compounds.	8 Marks	L2	CO1
	b)	Illustrate the different functional groups in the organic chemistry.	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain the molecular orbital theory for the structure of pyrrole.	8 Marks	L2	CO2
	b)	Define tautomerism and explain with examples in heterocyclic aromatic compounds.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the concept of aromaticity in heterocyclic compounds.	8 Marks	L2	CO2
	b)	Discuss the resonating forms of furan and identify the favorable positions for electrophilic substitution.	8 Marks	L3	CO2

MODULE-III

6.	a)	Describe the synthesis of aziridines from epoxides and amines. Provide one example of a ring-opening reaction of aziridines under acidic conditions.	8 Marks	L2	CO3
	b)	Explain the epoxidation of alkenes using peroxyacids. Illustrate the stereochemistry involved in this reaction.	8 Marks	L2	CO3

(OR)

7.	a)	Explain the desulfurization of thiiranes using metal reagents. Give a specific example.	8 Marks	L2	CO3
	b)	Explain the oxidation of thietanes. What are the products formed and list their applications.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Describe the Paal-Knorr synthesis of pyrrole. Outline one electrophilic substitution reaction of pyrrole and explain why it occurs preferentially at the 2-position.	8 Marks	L2	CO4
	b)	Explain the nitration reaction mechanism of pyridine.	8 Marks	L2	CO4

(OR)

9.	a)	Explain why pyridine is more basic than pyrrole. Illustrate the difference in their basicity using resonance structures and orbital diagrams.	8 Marks	L2	CO4
	b)	Describe what happens when pyrrole is treated with strong acids. Explain the formation of the observed product and its implications.	8 Marks	L2	CO4

MODULE-V

10.	a)	Describe the Fischer indole synthesis, outline the reagents and mechanism involved.	8 Marks	L2	CO5
	b)	Explain why electrophilic substitution in indole preferentially occurs at the C-3 position. Provide a suitable example.	8 Marks	L2	CO5

(OR)

11.	a)	Compare the basicity of indole with pyrrole and explain the difference in terms of electron delocalization.	8 Marks	L2	CO5
	b)	Give two examples of reactions of indole with electrophiles other than those involved in direct substitution, and explain the products.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. II Semester (MBU-25) Regular Examinations, May – 2026

MEDICINAL CHEMISTRY

[Organic Chemistry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is the mechanism of action of penicillins?	2 Marks	L1	CO1
	b)	State two clinical applications of cephalosporins.	2 Marks	L1	CO1
	c)	Name two uses of paracetamol.	2 Marks	L1	CO2
	d)	What is the clinical application of ibuprofen?	2 Marks	L1	CO2
	e)	Write two side effects of Quinine.	2 Marks	L1	CO3
	f)	What is the primary use of Amodiaquine?	2 Marks	L1	CO3
	g)	Differentiate between basal and bolus insulin.	2 Marks	L1	CO4
	h)	List any two side effects of insulin therapy.	2 Marks	L1	CO4
	i)	What is directly observed therapy (DOT) in tuberculosis treatment?	2 Marks	L1	CO5
	j)	Write the full form of MDR-TB and XDR-TB.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Write a note on the synthesis and therapeutic uses of tetracyclines.	8 Marks	L1	CO1
	b)	Discuss the current trends in antibiotic therapy and their implications for drug resistance.	8 Marks	L2	CO1

(OR)

3.		Describe the synthesis and clinical applications of cephalosporins.	16 Marks	L2	CO1

MODULE-II

4.	a)	Compare and contrast the analgesics and anti-inflammatory drugs with examples.	8 Marks	L2	CO2
	b)	Discuss the mechanism of action of aspirin, ibuprofen, and naproxen.	8 Marks	L2	CO2

(OR)

5.		Explain the introduction to analgesics, antipyretics, and anti-inflammatory drugs with suitable examples.	16 Marks	L2	CO2

MODULE-III

6.		Analyze the differences between blood schizonticides and tissue schizonticides, with examples.	16 Marks	L3	CO3

(OR)

7.	a)	Describe the synthesis, properties, and adverse effects of Quinine.	8 Marks	L2	CO3
	b)	Discuss the mechanism of action of antimalarial drugs targeting the erythrocytic stage.	8 Marks	L2	CO3

MODULE-IV

8.		Describe the synthesis, mechanism of action, and therapeutic uses of sulfonylureas.	16 Marks	L2	CO4
		(OR)			
9.		Explain the complications associated with diabetes and their management strategies.	16 Marks	L2	CO4

MODULE-V

10.		Describe the mechanism of action of Rifampin and Isoniazid.	16 Marks	L2	CO5
		(OR)			
11.	a)	Explain the combination therapy approach in tuberculosis and its significance.	8 Marks	L2	CO5
	b)	Explain the classification of tuberculosis drugs with examples.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. II Semester (MBU-25) Regular Examinations, May – 2026

MICROBIAL GENETICS AND RDNA TECHNOLOGY

[Biotechnology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is DNA?	2 Marks	L1	CO1
	b)	Define DNA replication.	2 Marks	L1	CO1
	c)	Draw structure of antigen.	2 Marks	L1	CO2
	d)	Define Mutation.	2 Marks	L1	CO2
	e)	What is Plasmid Replication?	2 Marks	L1	CO3
	f)	What is the basic principle of Gene Regulation?	2 Marks	L1	CO3
	g)	Write GST-tag purification.	2 Marks	L1	CO4
	h)	What is DNA Ligase?	2 Marks	L1	CO4
	i)	What is Bt Cotton?	2 Marks	L1	CO5
	j)	What is Gene Therapy in human diseases?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss the discovery and mechanism of Bacterial Conjugation.	8 Marks	L2	CO1
	b)	Describe the procedure and significance of transformation of Escherichia coli (XL1-Blue strain) with plasmid DNA such as pUC19 Plasmid.	8 Marks	L2	CO1

(OR)

3.	a)	Discuss the importance of transformation, conjugation, and transduction in bacterial evolution and genetic engineering.	8 Marks	L2	CO1
	b)	Discuss the physical and chemical properties of DNA and RNA.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the mechanism of mutation caused by Chemical Mutagens.	8 Marks	L2	CO2
	b)	Describe the molecular basis of mutations and how DNA alterations affect gene expression.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the structure and applications of Ti Plasmid in genetic engineering.	8 Marks	L2	CO2
	b)	Differentiate between Composite Transposons and Non-Composite Transposons.	8 Marks	L2	CO2

MODULE-III

6.	a)	Describe the structure and application of the His Tag in recombinant protein purification.	10 Marks	L2	CO3
	b)	Explain the principle and uses of the GST Tag in protein purification.	6 Marks	L2	CO3
		(OR)			
7.	a)	Discuss the applications of recombinant protein expression in biotechnology and medicine.	10 Marks	L2	CO3
	b)	Explain the principle and steps involved in Protein Purification.	6 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss the biological significance of gene conversion in genetic recombination and evolution.	8 Marks	L2	CO4
	b)	Define and explain the concept of a cDNA Library.	8 Marks	L2	CO4
		(OR)			
9.	a)	Explain the advantages and limitations of bacteriophage lambda vectors in molecular cloning.	10 Marks	L2	CO4
	b)	Explain the essential features required for an efficient cloning vector.	6 Marks	L2	CO4

MODULE-V

10.	a)	Explain the concept and production of Recombinant Vaccines.	8 Marks	L2	CO5
	b)	Explain the role of recombinant DNA technology in the development of modern vaccines.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain the concept and applications of Gene Therapy in human diseases	8 Marks	L2	CO5
	b)	Explain the production and therapeutic applications of Human Growth Hormone through recombinant DNA technology.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. II Semester (MBU-25) Regular Examinations, May – 2026

BIOPROCESS TECHNOLOGY

[Biotechnology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define upstream processing.	2 Marks	L1	CO1
	b)	What is downstream processing?	2 Marks	L1	CO1
	c)	What is anaerobic fermentation?	2 Marks	L1	CO2
	d)	List two examples of microbial biomass products.	2 Marks	L1	CO2
	e)	What are batch cultures?	2 Marks	L1	CO3
	f)	Define microbial growth kinetics.	2 Marks	L1	CO3
	g)	Define oxygen transfer rate.	2 Marks	L1	CO4
	h)	What is the significance of gas-liquid interface in oxygen transfer?	2 Marks	L1	CO4
	i)	What is growth-associated product formation?	2 Marks	L1	CO5
	j)	What is a secondary metabolite?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss the challenges and solutions in scaling up bioprocess operations.	10 Marks	L2	CO1
	b)	Describe the significance of process monitoring and control in an integrated bioprocess.	6 Marks	L2	CO1

(OR)

3.	a)	Explain the applications of bioprocess technology in the pharmaceutical industry.	8 Marks	L2	CO1
	b)	Discuss the importance of strain improvement in bioprocessing.	8 Marks	L2	CO1

MODULE-II

4.	a)	Discuss the key considerations in designing a fermenter for industrial applications	10 Marks	L2	CO2
	b)	Explain the advantages and challenges of using solid-state fermentation for enzyme production.	6 Marks	L2	CO2

(OR)

5.	a)	Describe the process flow for the production of primary and secondary metabolites.	8 Marks	L2	CO2
	b)	Outline the factors influencing the efficiency of submerged fermentation.	8 Marks	L2	CO2

MODULE-III

6.	a)	Discuss the role of medium composition in determining fermentation efficiency.	10 Marks	L2	CO3
	b)	Describe the factors influencing microbial growth parameters in fermentation processes.	6 Marks	L2	CO3

(OR)

7.	a)	Explain the phases of microbial growth in batch cultures with diagrams.	8 Marks	L2	CO3
	b)	Discuss the direct and indirect methods for the quantitative analysis of microbial growth.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss the kinetics of oxygen transfer and its role in bioreactor design.	10 Marks	L2	CO4
	b)	Explain the concept of critical oxygen concentration and its significance in bioprocessing.	6 Marks	L2	CO4

(OR)

9.	a)	Describe the impact of oxygen transfer efficiency on the productivity of bioprocesses	8 Marks	L2	CO4
	b)	Discuss the importance of bubble dynamics in oxygen transfer processes.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain how substrate concentration affects microbial growth kinetics.	10 Marks	L2	CO5
	b)	Discuss the kinetics of secondary metabolite production in batch cultures.	6 Marks	L2	CO5

(OR)

11.	a)	Explain the mathematical representation of the Monod model and its parameters.	8 Marks	L2	CO5
	b)	Discuss the role of environmental factors in influencing microbial growth phases.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. II Semester (MBU-25) Regular Examinations, May – 2026

BIOINFORMATICS AND ITS APPLICATIONS

[Biotechnology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	List emerging areas in proteomics.	2 Marks	L1	CO1
	b)	Expand REBASE.	2 Marks	L1	CO1
	c)	What is Contig?	2 Marks	L1	CO2
	d)	Define ORF.	2 Marks	L1	CO2
	e)	Recall SnRPS.	2 Marks	L1	CO3
	f)	List RNA structure prediction tools.	2 Marks	L1	CO3
	g)	Recall protein sequence analysis tools.	2 Marks	L1	CO4
	h)	Expand ExPASy.	2 Marks	L1	CO4
	i)	What is Local sequence alignment?	2 Marks	L1	CO5
	j)	Recall PAM matrix.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss the interdisciplinary nature of Bioinformatics.	8 Marks	L2	CO1
	b)	Summarize the applications of Bioinformatics.	8 Marks	L2	CO1
		(OR)			
3.	a)	Outline the Primary structure databases.	8 Marks	L2	CO1
	b)	Explain the DNA databases.	8 Marks	L2	CO1

MODULE-II

4.	a)	Outline ORF analysis.	8 Marks	L2	CO2
	b)	Identify RNA transcription signals and other sequence patterns.	8 Marks	L1	CO2
		(OR)			
5.	a)	Summarize shotgun sequencing method.	8 Marks	L2	CO2
	b)	Outline EST analysis.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain classification of RNA based on their function.	8 Marks	L2	CO3
	b)	Illustrate the clover leaf model of tRNA structure.	8 Marks	L2	CO3
		(OR)			
7.	a)	Explain the RNA prediction methods.	8 Marks	L2	CO3
	b)	Illustrate the structure of Sn RNA and its functions.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain different secondary structural elements of proteins.	8 Marks	L2	CO4
	b)	Outline protein families.	8 Marks	L2	CO4
		(OR)			
9.	a)	Outline Abinitio modeling of protein structure.	8 Marks	L2	CO4
	b)	Summarize the steps in homology modeling.	8 Marks	L2	CO4

MODULE-V

10.	a)	Describe Heuristic methods.	8 Marks	L2	CO5
	b)	Explain the Pair wise sequence alignment methods.	8 Marks	L2	CO5
		(OR)			
11.	a)	Compare BLOSUM and PAM matrices.	8 Marks	L2	CO5
	b)	Illustrate dot matrix and applications.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. II Semester (MBU-25) Regular Examinations, May – 2026

IMMUNOLOGY AND IMMUNOTECHNOLOGY

[Biotechnology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is immunity?	2 Marks	L1	CO1
	b)	Write the importance of hematopoiesis.	2 Marks	L1	CO1
	c)	Draw structure of antigen.	2 Marks	L1	CO2
	d)	What is MHC?	2 Marks	L1	CO2
	e)	What are B-lymphocytes?	2 Marks	L1	CO3
	f)	Define receptors.	2 Marks	L1	CO3
	g)	Write the importance of AIDS vaccine	2 Marks	L1	CO4
	h)	What is immunization?	2 Marks	L1	CO4
	i)	What is Precipitation?	2 Marks	L1	CO5
	j)	What is monoclonal antibody?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the overview and functions of the immune system.	8 Marks	L2	CO1
	b)	Describe the mechanisms of Innate Immunity and Adaptive Immunity.	8 Marks	L2	CO1

(OR)

3.	a)	Describe the differences between Innate Immunity and Adaptive Immunity.	8 Marks	L2	CO1
	b)	Explain the role of Hematopoietic Growth Factors in the regulation of blood cell production.	8 Marks	L2	CO1

MODULE-II

4.	a)	Define an Antigen. Explain the structural features of antigens.	8 Marks	L2	CO2
	b)	Discuss the different types of antigens with suitable examples and explain their immunological significance.	8 Marks	L2	CO2

(OR)

5.	a)	Describe the structure of an Antibody. Explain the functions of the different regions of the antibody molecule.	8 Marks	L2	CO2
	b)	Classify the different types of Immunoglobulins. Explain the structure and biological functions of IgG, IgM, IgA, IgE, and IgD.	8 Marks	L2	CO2

MODULE-III

6.	a)	Describe the biology and development of T Lymphocytes and explain their role in cell-mediated immunity.	10 Marks	L2	CO3
	b)	Discuss the biology, maturation, and functions of B Lymphocytes in humoral immune response.	6 Marks	L2	CO3

(OR)

7.	a)	Explain the structure and function of Membrane Immunoglobulin and its role in antigen recognition.	10 Marks	L2	CO3
	b)	Describe the molecules associated with T-cell membranes such as T Cell Receptor and co-receptors involved in antigen recognition.	6 Marks	L2	CO3

MODULE-IV

8.	a)	Define a vaccine and explain its role in preventing infectious diseases.	8 Marks	L2	CO4
	b)	Classify the different types of vaccines and describe their principles with suitable examples.	8 Marks	L2	CO4

(OR)

9.	a)	Differentiate between active immunization and passive immunization with examples and applications.	10 Marks	L2	CO4
	b)	Explain the mechanism of immune response generated after vaccination.	6 Marks	L2	CO4

MODULE-V

10.	a)	Illustrate the principle and stages of Antigen–Antibody Reaction and its importance in diagnostic immunology	8 Marks	L2	CO5
	b)	Describe the principle, types, and applications of Precipitation Reaction in antigen–antibody interactions.	8 Marks	L2	CO5

(OR)

11.	a)	Explain the principle and procedure of Immunoelectrophoresis and discuss its diagnostic applications.	8 Marks	L2	CO5
	b)	Describe the mechanism and applications of Hemagglutination in immunological testing.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. II Semester (MBU-25) Regular Examinations, May – 2026

ORGANIC REACTION MECHANISM

[Organic Chemistry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define rearrangement reaction.	2 Marks	L1	CO1
	b)	Name any two rearrangements involving electron deficient carbon.	2 Marks	L1	CO1
	c)	Write any one application of chromium trioxide.	2 Marks	L1	CO2
	d)	Give any two examples of oxidizing reagent used for conversion of alcohols to carbonyls.	2 Marks	L1	CO2
	e)	What is Clemmensen reduction?	2 Marks	L1	CO3
	f)	Define reduction. Discuss the concept of reduction in terms of oxidation number.	2 Marks	L1	CO3
	g)	Give an example of dehydrating agent and write its structure.	2 Marks	L1	CO4
	h)	Write the resonance forms of diazomethane.	2 Marks	L1	CO4
	i)	Recall the Simmons-Smith reagent. Write the reaction using Simmons-Smith reagent.	2 Marks	L1	CO5
	j)	What is Gilman's reagent? Give an example.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

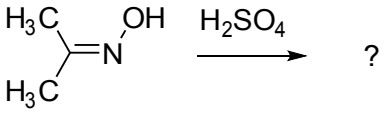
5 X 16 = 80 Marks

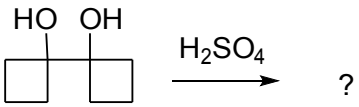
MODULE-I

2.	a)	Describe the mechanism of Favorski Rearrangement with suitable examples.	8 Marks	L2	CO1
	b)	Discuss the mechanism and applications of Neber Rearrangement with suitable examples.	8 Marks	L2	CO1

(OR)

3. Identify the product and name of the rearrangement. Write the mechanism involved. 16 Marks L3 CO1

i) 

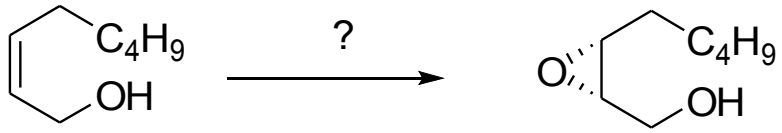
ii) 

MODULE-II

4.	What is Baeyer Villiger oxidation? Explain its mechanism and applications with suitable examples.	16 Marks	L2	CO2

(OR)

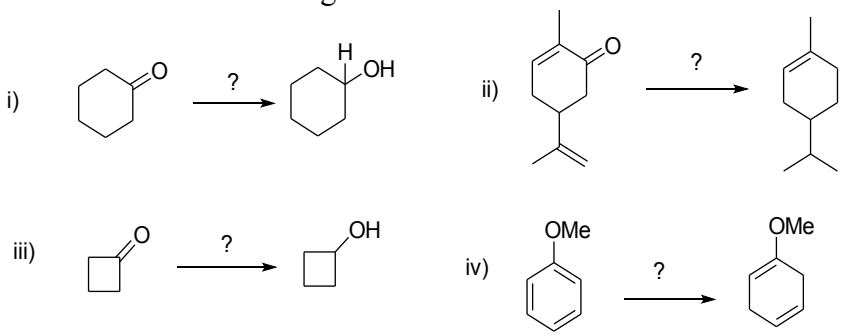
5. a) Identify how the following conversions is carried out and write the mechanism — 8 Marks — L3 — CO2



b) Explain the Oppenauer oxidation with suitable examples. — 8 Marks — L2 — CO2

MODULE-III

6. a) Predict how the following conversions are carried out? — 8 Marks — L3 — CO3



b) Explain the mechanism of Birch reduction by giving suitable examples. — 8 Marks — L2 — CO3

(OR)

7. Summarize the various reduction reactions of $LiAlH_4$. — 16 Marks — L2 — CO3

MODULE-IV

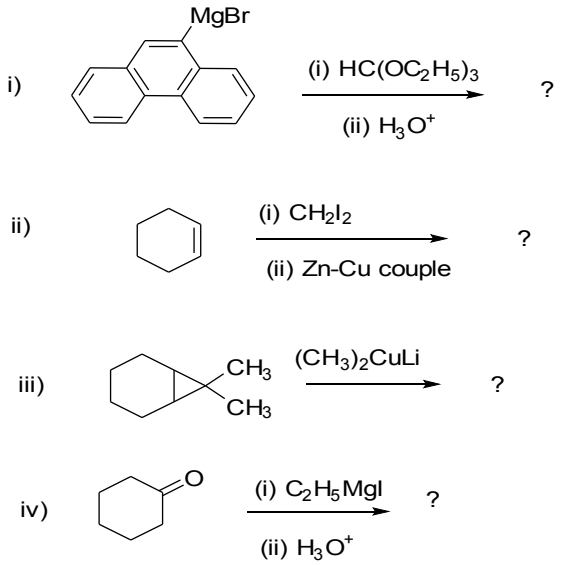
8. Write the structure and explain the various reactions of DDQ. — 16 Marks — L2 — CO4

(OR)

9. Write the structure of *N*-Bromo succinimide. Explain the mechanism of various reactions involving *N*-Bromo succinimide. — 16 Marks — L2 — CO4

MODULE-V

10. a) Identify the products of the following and complete the reactions. — 8 Marks — L3 — CO5



b) Discuss the hydroformylation reaction with suitable examples — 8 Marks — L2 — CO5

(OR)

11. Explain the preparation and chemical reactions of Grignard's reagent. — 16 Marks — L2 — CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. II Semester (MBU-25) Regular Examinations, May – 2026

INORGANIC CHEMISTRY-II

[Organic Chemistry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define metal ions in biological systems.	2 Marks	L1	CO1
	b)	Mention the role of metal ions in photosynthesis.	2 Marks	L1	CO1
	c)	Define term symbols in atomic spectroscopy.	2 Marks	L1	CO2
	d)	What are free ion terms? Provide one example.	2 Marks	L1	CO2
	e)	Define stepwise formation constant in metal-ligand equilibria.	2 Marks	L1	CO3
	f)	What is an overall formation constant?	2 Marks	L1	CO3
	g)	Define homogeneous catalysis with an example.	2 Marks	L1	CO4
	h)	What are metal ion-catalyzed reactions?	2 Marks	L1	CO4
	i)	Define nanomaterials.	2 Marks	L1	CO5
	j)	Classify nanomaterials based on dimensions.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss the significance of metal ions in biological systems.	8 Marks	L2	CO1
	b)	Explain the role of metal ions in photosynthesis and their impact on the process.	8 Marks	L2	CO1

(OR)

3.		Describe the mechanism of nitrogen fixation and the involvement of metal ions.	16 Marks	L2	CO1

MODULE-II

4.	a)	Discuss term symbols and their significance in spectroscopy.	8 Marks	L2	CO2
	b)	Explain free ion terms and energy levels with examples.	8 Marks	L2	CO2

(OR)

5.		Differentiate between electronic configurations, terms, states, and microstates, with suitable illustrations.	16 Marks	L3	CO2

MODULE-III

6.		Explain stepwise and overall formation constants and their interrelation with suitable examples.	16 Marks	L2	CO3

(OR)

7.	a)	Discuss the trends in successive formation constants and their significance in metal-ligand equilibria.	8 Marks	L2	CO3
	b)	Analyze the factors affecting the stability of metal complexes, considering both metal ion and ligand properties.	8 Marks	L3	CO3

MODULE-IV

8.		Explain the concept of homogeneous catalysis and its significance in chemical processes.	16 Marks	L2	CO4
		(OR)			
9.	a)	Discuss metal ion-catalyzed reactions with examples, emphasizing their importance.	8 Marks	L2	CO4
	b)	Elaborate on the mechanism of redox processes involving ligands with suitable examples.	8 Marks	L2	CO4

MODULE-V

10.		Explain the classification of nanomaterials based on dimensions with examples.	16 Marks	L2	CO5
		(OR)			
11.		Discuss the synthesis methods for gold nanoparticles and their biomedical applications.	16 Marks	L2	CO5

CODE No.: 25BS202018 MBU-25

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. II Semester (MBU-25) Regular Examinations, May – 2026

PHYSICAL CHEMISTRY-II

[Organic Chemistry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Write the electrode reaction occurring in a Calomel electrode.	2 Marks	L1	CO1
	b)	Define EMF of a cell.	2 Marks	L1	CO1
	c)	Define lattice point.	2 Marks	L1	CO2
	d)	How many Bravais lattices are present in three dimensions?	2 Marks	L1	CO2
	e)	Define partially miscible liquids.	2 Marks	L1	CO3
	f)	What is Critical Solution Temperature?	2 Marks	L1	CO3
	g)	What is meant by partially miscible liquids in ternary systems?	2 Marks	L1	CO4
	h)	How does temperature influence ternary phase diagrams?	2 Marks	L1	CO4
	i)	Write the empirical expression of Freundlich adsorption isotherm.	2 Marks	L1	CO5
	j)	What is meant by adsorption isotherm?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	Derive the Nernst equation for an electrochemical cell and explain its significance in determining electrode potentials.	16 Marks	L2	CO1
	(OR)			
3.	Discuss the different types of reference electrodes. Explain the structure and working of the Standard Hydrogen Electrode and Calomel electrode.	16 Marks	L2	CO1

MODULE-II

4.	Discuss the seven crystal systems and fourteen Bravais lattices. Explain their characteristics with suitable diagrams.	16 Marks	L2	CO2
	(OR)			
5.	Discuss stoichiometric defects in crystals. Explain Schottky defect and Frenkel defect with suitable examples.	16 Marks	L2	CO2

MODULE-III

6.	Explain the concept of phase diagrams. Discuss the importance of phase diagrams in understanding phase equilibria.	16 Marks	L2	CO3
	(OR)			
7.	Explain azeotropic mixtures and their classification. Discuss minimum boiling and maximum boiling azeotropes.	16 Marks	L2	CO3

MODULE-IV

8.	Discuss the influence of impurities on ternary phase diagrams and their practical significance.	16 Marks	L2	CO4

(OR)

9.	Explain ternary azeotropic mixtures and their importance in separation techniques.	16 Marks	L2	CO4

MODULE-V

10.	Explain the estimation of specific surface area using BET equation and discuss its importance in material characterization.	16 Marks	L2	CO5

(OR)

11.	Explain Gibbs adsorption isotherm. Derive the Gibbs adsorption equation and discuss its applications in surface chemistry.	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. II Semester (MBU-25) Regular Examinations, May – 2026

BASICS OF VIRTUALIZATION AND CLOUD TECHNOLOGY

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define hardware virtualization.	2 Marks	L2	CO1
	b)	What is software virtualization?	2 Marks	L1	CO1
	c)	List any two benefits of server virtualization.	2 Marks	L1	CO2
	d)	What is a Type-1 hypervisor?	2 Marks	L1	CO2
	e)	What are the stages of the Infrastructure Optimization Model?	2 Marks	L1	CO3
	f)	List any two benefits of client virtualization.	2 Marks	L2	CO3
	g)	Mention any two roots of cloud computing.	2 Marks	L2	CO3
	h)	List any two essential characteristics of cloud computing.	2 Marks	L1	CO4
	i)	What is utility computing?	2 Marks	L1	CO4
	j)	Define security benefits of cloud computing.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain fast deployment in virtualization and its advantages.	8 Marks	L3	CO1
	b)	Describe the limitations of virtualization with suitable examples.	8 Marks	L2	CO1

(OR)

3.	a)	Discuss storage virtualization and its impact on data management.	8 Marks	L2	CO1
	b)	Explain data virtualization and its importance in cloud systems.	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain virtual machine basics and their working principles.	8 Marks	L2	CO2
	b)	Discuss the components and lifecycle of a virtual machine.	8 Marks	L2	CO2

(OR)

5.	a)	Discuss the working of server virtualization using hypervisors.	8 Marks	L2	CO2
	b)	Explain how hypervisors improve resource utilization in servers.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the major benefits of virtualization in enterprise environments.	8 Marks	L2	CO3
	b)	Describe how organizations can achieve the benefits of datacenter virtualization.	8 Marks	L2	CO3

(OR)

7.	a)	Discuss scalability and flexibility achieved through Microsoft virtualization solutions.	8 Marks	L2	CO3
	b)	Explain virtualization-enabled infrastructure optimization in detail.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain on-demand self-service and its significance in cloud environments.	8 Marks	L2	CO3
	b)	Describe broad network access and its advantages.	8 Marks	L2	CO3
		(OR)			
9.	a)	Explain how cloud computing supports business agility and flexibility.	8 Marks	L2	CO4
	b)	Discuss cost efficiency in cloud computing compared to traditional IT systems.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain various cloud computing scenarios with examples.	8 Marks	L2	CO4
	b)	Discuss the major benefits of cloud computing in detail.	8 Marks	L3	CO4
		(OR)			
11.	a)	Explain data protection and privacy issues in cloud computing.	8 Marks	L2	CO4
	b)	Discuss regulatory and compliance issues in cloud computing.	8 Marks	L2	CO4

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. II Semester (MBU-25) Regular Examinations, May – 2026

DATA STRUCTURES

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define a data structure.	2 Marks	L1	CO1
	b)	State the difference between linear and non-linear data structures.	2 Marks	L1	CO1
	c)	List any two basic operations of a stack.	2 Marks	L1	CO2
	d)	What is meant by stack overflow?	2 Marks	L1	CO2
	e)	Define a binary search tree.	2 Marks	L1	CO3
	f)	State one advantage of binary search trees.	2 Marks	L1	CO3
	g)	What is bubble sort?	2 Marks	L1	CO4
	h)	Define insertion sort.	2 Marks	L1	CO4
	i)	What is meant by open addressing?	2 Marks	L1	CO5
	j)	Define hashing.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain data structures and classify them into linear and non-linear data structures with examples.	8 Marks	L2	CO1
	b)	Describe the concept of algorithms and explain their role in problem solving.	8 Marks	L3	CO1

(OR)

3.	a)	Illustrate Big O notation and explain its importance in analyzing algorithm efficiency.	8 Marks	L2	CO1
	b)	Explain the structure of a linked list and its advantages over arrays.	8 Marks	L3	CO1

MODULE-II

4.	a)	Demonstrate delimiter matching using stack with an example.	8 Marks	L3	CO2
	b)	Discuss the role of stack in parsing arithmetic expressions.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the concept of queues and describe their fundamental operations.	8 Marks	L2	CO2
	b)	Describe the implementation of queue using arrays.	8 Marks	L2	CO2

MODULE-III

6.	a)	Describe the structure and properties of AVL trees.	8 Marks	L2	CO3
	b)	Illustrate insertion and rotation operations in AVL trees.	8 Marks	L3	CO3

(OR)

7.	a)	Explain the concept of Red-Black trees and their properties.	8 Marks	L2	CO3
	b)	Demonstrate node insertion and rotations in Red-Black trees and analyze their efficiency.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Discuss the concept of shell sort and explain why it is preferred over simple sorting techniques.	8 Marks	L2	CO4
	b)	Demonstrate the step-by-step partitioning process involved in quick sort.	8 Marks	L3	CO4

(OR)

9.	a)	Explain the procedure of linear search with a suitable illustration.	8 Marks	L4	CO4
	b)	Analyze the working of bubble sort and evaluate its performance.	8 Marks	L2	CO4

MODULE-V

10.	a)	Describe the open addressing technique used for collision resolution in hashing.	8 Marks	L2	CO5
	b)	Discuss the fundamental concepts of graphs with suitable examples.	8 Marks	L2	CO5

(OR)

11.	a)	Demonstrate the working of the Depth-First Search (DFS) algorithm using an example.	8 Marks	L3	CO5
	b)	Outline and explain the major operations performed on graphs.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. II Semester (MBU-25) Regular Examinations, May – 2026

OBJECT ORIENTED PROGRAMMING THROUGH C++

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Object-Oriented Programming (OOP).	2 Marks	L1	CO1
	b)	What is meant by an inline function?	2 Marks	L1	CO1
	c)	Define a class in C++.	2 Marks	L1	CO2
	d)	Define reference in C++.	2 Marks	L2	CO2
	e)	Define function overloading.	2 Marks	L1	CO3
	f)	Distinguish between function overloading and operator overloading.	2 Marks	L2	CO3
	g)	Define inheritance in C++.	2 Marks	L1	CO4
	h)	State the advantage of virtual functions.	2 Marks	L2	CO4
	i)	What is a file in C++?	2 Marks	L1	CO5
	j)	What is a custom exception?	2 Marks	L1	CO6

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the need for Object-Oriented Programming with suitable examples.	8 Marks	L2	CO1
	b)	Compare procedural programming and object-oriented programming in detail.	8 Marks	L2	CO1

(OR)

3.	a)	Explain arrays in C++ with syntax and examples.	8 Marks	L3	CO1
	b)	Discuss strings in C++ and explain commonly used string functions.	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain classes and objects in C++ with a suitable example.	8 Marks	L2	CO2
	b)	Discuss the concept of friend functions with example programs.	8 Marks	L3	CO2

(OR)

5.	a)	Explain memory access using pointers to objects with examples.	8 Marks	L3	CO2
	b)	Write a detailed note on object-oriented features implemented using classes and objects.	8 Marks	L2	CO2

MODULE-III

6.	a)	Compare member function overloading and friend function overloading of operators.	8 Marks	L2	CO3
	b)	Explain overloading of new and delete operators with examples.	8 Marks	L2	CO3

(OR)

7.	a)	Write a program to overload arithmetic operators for a class.	8 Marks	L3	CO3
	b)	Explain overloading of special operators ([], (), ->, =) with examples.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain inheritance and its advantages in object-oriented programming.	8 Marks	L2	CO4
	b)	Discuss base class access control and its impact on derived classes.	8 Marks	L3	CO4
		(OR)			
9.	a)	Explain object-oriented design using inheritance and virtual functions.	8 Marks	L3	CO4
	b)	Write a detailed note on inheritance and virtual functions in C++.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain the need for exception handling in C++.	8 Marks	L3	CO5
	b)	Describe the exception handling mechanism using try, catch, and throw.	8 Marks	L3	CO5
		(OR)			
11.	a)	Explain simple exception handling with examples.	8 Marks	L2	CO6
	b)	Discuss handling multiple exceptions in C++.	8 Marks	L2	CO6

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. II Semester (MBU-25) Regular Examinations, May – 2026

FUNDAMENTALS OF DATA SCIENCE

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Distinguish between Data and Knowledge.	2 Marks	L2	CO1
	b)	Define Data Science.	2 Marks	L2	CO1
	c)	What is semi-structured data? Give one example?	2 Marks	L2	CO2
	d)	What is unstructured data?	2 Marks	L2	CO2
	e)	What is data reduction?	2 Marks	L2	CO3
	f)	What is data transformation?	2 Marks	L2	CO3
	g)	What are the types of Big Data?	2 Marks	L2	CO4
	h)	What is Map Reduce?	2 Marks	L2	CO4
	i)	What are dimensions in Tableau?	2 Marks	L2	CO5
	j)	What are measures in Tableau?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe the tools and skills required for a Data Scientist.	8 Marks	L2	CO1
	b)	Explain the need and objectives of Data Science in detail.	8 Marks	L4	CO1

(OR)

3.	a)	Explain Data Science and discuss its tasks and objectives in detail.	8 Marks	L2	CO1
	b)	Describe the Data Science process with a neat diagram.	8 Marks	L4	CO1

MODULE-II

4.	a)	Explain row-oriented and column-oriented data storage formats with examples.	8 Marks	L2	CO2
	b)	Describe common data storage formats used in big data environments.	8 Marks	L4	CO2

(OR)

5.	a)	Explain how data attributes influence the choice of data storage formats.	8 Marks	L2	CO2
	b)	Compare structured and semi-structured data storage formats in detail.	8 Marks	L4	CO2

MODULE-III

6.	a)	Explain data integration with examples.	8 Marks	L2	CO3
	b)	Explain the machine learning paradigm.	8 Marks	L4	CO3

(OR)

7.	a)	Describe the steps involved in evaluating a classifier.	8 Marks	L2	CO3
	b)	Explain the concept of model generalization.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Explain Big Data analytics platforms.	8 Marks	L2	CO4
	b)	Explain the Data Discovery phase.	8 Marks	L4	CO4
		(OR)			
9.	a)	Explain Big Data analysis techniques.	8 Marks	L2	CO4
	b)	Describe MapReduce architecture with neat diagram.	8 Marks	L4	CO4

MODULE-V

10.	a)	Explain the importance of dashboards in Tableau.	8 Marks	L2	CO5
	b)	Explain the need for Data Science in real-world applications.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain descriptive statistics used in data visualization.	8 Marks	L2	CO5
	b)	Discuss basic charts available in Tableau.	8 Marks	L4	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. II Semester (MBU-25) Regular Examinations, May – 2026

ORDINARY DIFFERENTIAL EQUATIONS

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Form the differential equation for: $y = A\cos nx + B\sin nx$ where A, B are arbitrary constants.	2 Marks	L6	CO1
	b)	Find the integrating factor for the differential equation: $x\left(\frac{dy}{dx}\right) + y = 2\log x$.	2 Marks	L1	CO1
	c)	Solve the differential equation: $p^2 + p = 0$.	2 Marks	L3	CO2
	d)	Solve the differential equation: $p = \log(px - y)$.	2 Marks	L4	CO2
	e)	Find the general solution of $(D^3 - 3D^2 + 2D)y = 0$.	2 Marks	L1	CO3
	f)	Find the particular integral of $(D^3 + 3D + 2)y = e^x$.	2 Marks	L1	CO3
	g)	Find the particular integral of: $(D - 2)^3 y = xe^{2x}$.	2 Marks	L2	CO4
	h)	Find the particular integral of $(D^2 - 3D + 2)y = e^{2x}\sin x$.	2 Marks	L2	CO4
	i)	Find the complementary function of: $(x^2D^2 - 3xD + 5)y = \sin(\log x)$.	2 Marks	L2	CO5
	j)	Find the complementary function of: $\{(3x+2)^2D^2 + 5(3x+2)D - 3\}y = x^2 + x + 1$.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Solve: $\left(y\left(1+\frac{1}{x}\right) + \cos y\right)dx + (x + \log x - x\sin y)dy = 0$.	8 Marks	L2	CO1
	b)	Find the orthogonal trajectories of cardioids: $r = a(1 - \cos\theta)$; where 'a' being a parameter.	8 Marks	L5	CO1

(OR)

3.	a)	Solve: $\frac{dy}{dx} = \frac{(x + 2y - 3)}{(2x + y - 3)}$.	8 Marks	L3	CO1
	b)	Solve: $x\left(\frac{dy}{dx}\right) + y = y^2\log x$.	8 Marks	L4	CO1

MODULE-II

4.	a)	Solve: $yp^2 - 2xp + y = 0$.	8 Marks	L4	CO2
	b)	Solve $(px - y)(py + x) = h^2 p$, using the transformations: $x^2 = u, y^2 = v$.	8 Marks	L3	CO2

(OR)

5.	a)	Solve the differential equation: $y = 2px + \tan^{-1}(xp^2)$.	8 Marks	L4	CO2
	b)	Solve the differential equation: $p^2 + 2py\cot x = y^2$.	8 Marks	L3	CO2

MODULE-III

6.	a)	Solve the differential equation $\frac{d^2y}{dx^2} + \frac{dy}{dx} + y = (1 - e^x)^2$.	8 Marks	L3	CO3
	b)	Solve: $(D^4 + 2D^3 - 3D^2)y = 3e^{2x} + 4\sin x$.	8 Marks	L3	CO3

(OR)

7.	a)	Solve: $\frac{d^4y}{dx^4} + y = 0$.	8 Marks	L2	CO3
	b)	Solve the differential equation: $(D - 2)^2 y = 8(e^{2x} + \sin 2x)$.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Using the method of variation of parameters, solve $(D^2 - 2D + 1)y = e^x \log x$.	8 Marks	L3	CO4
	b)	Solve the differential equation $\frac{d^2y}{dx^2} - 5\frac{dy}{dx} + 6y = e^x \sin x$.	8 Marks	L3	CO4

(OR)

9.	a)	Solve the differential equation $(D^2 + 2D + 1)y = e^x \cdot x^3$.	8 Marks	L3	CO4
	b)	Solve: $(D^2 - 4D + 4)y = x^2 + e^x + sin\,2x$.	8 Marks	L3	CO4

MODULE-V

10.	a)	Solve the Cauchy's linear homogeneous equation $(x^3D^3 + 2x^2D^2 + 2)y = 10\left(x + \frac{1}{x}\right)$.	8 Marks	L3	CO5
	b)	Find the general solution for the differential equation: $(x^2D^2 - xD + 2)y = x\log x$.	8 Marks	L4	CO5

(OR)

11.	a)	Solve the differential equation $(x^2D^2 - 2xD - 4)y = x^4$.	8 Marks	L3	CO5
	b)	Find the general solution for the differential equation: $(x^2D^2 - xD + 3)y = x^2 \log x$.	8 Marks	L4	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. II Semester (MBU-25) Regular Examinations, May – 2026

MACHINE LEARNING

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is meant by Human Learning?	2 Marks	L1	CO1
	b)	What are the main types of Machine Learning?	2 Marks	L1	CO1
	c)	State Bayes' theorem.	2 Marks	L1	CO2
	d)	Mention any two advantages of Bayesian learning.	2 Marks	L1	CO2
	e)	What is Simple Linear Regression?	2 Marks	L1	CO3
	f)	What is meant by inductive bias in decision tree learning?	2 Marks	L2	CO3
	g)	List any two types of clustering techniques.	2 Marks	L1	CO4
	h)	What is hierarchical clustering?	2 Marks	L1	CO4
	i)	Define overfitting in neural networks.	2 Marks	L1	CO5
	j)	What are multilayer neural networks?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain Human Learning and discuss the different types of human learning.	8 Marks	L2	CO1
	b)	Describe the types of Machine Learning with suitable examples.	8 Marks	L3	CO1

(OR)

3.	a)	Describe the types of data used in Machine Learning with examples.	8 Marks	L3	CO1
	b)	Explain how to explore the structure of data before model building.	8 Marks	L4	CO1

MODULE-II

4.	a)	Describe the steps involved in selecting and training a Machine Learning model.	8 Marks	L3	CO2
	b)	Explain feature transformation techniques with examples.	8 Marks	L3	CO2

(OR)

5.	a)	What is feature engineering? Why is it important in Machine Learning?	8 Marks	L5	CO2
	b)	How is a Machine Learning model selected and trained?	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain Multiple Linear Regression and its assumptions.	8 Marks	L4	CO3
	b)	Describe Polynomial Regression and Logistic Regression with suitable examples.	8 Marks	L3	CO3

(OR)

7.	a)	What are the major problems and issues in decision tree learning?	8 Marks	L4	CO3
	b)	Introduce Regression analysis and explain its importance.	8 Marks	L5	CO3

MODULE-IV

8.	a)	Describe the K-Medoids clustering algorithm with steps and example.	8 Marks	L3	CO4
	b)	Explain partitioning clustering methods in detail.	8 Marks	L4	CO4

(OR)

9.	a)	Explain the advantages and limitations of hierarchical clustering.	8 Marks	L4	CO4
	b)	Explain the types of clustering techniques with examples.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain the concepts of convergence and local minima in neural network training	8 Marks	L4	CO5
	b)	Discuss the representational power of feed-forward neural networks	8 Marks	L4	CO5

(OR)

11.	a)	How are Artificial Neural Networks represented? Explain with a neat diagram.	8 Marks	L2	CO5
	b)	Explain the Perceptron model, its working, and limitations.	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. II Semester (MBU-25) Regular Examinations, May – 2026

DISCRETE MATHEMATICS

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Write the following statement in symbolic form "If it is raining then I get wet".	2 Marks	L1	CO1
	b)	Write the maxterms for the two variables p and q.	2 Marks	L1	CO1
	c)	Write the truth table for OR operation.	2 Marks	L1	CO2
	d)	Name any one method used for minimization.	2 Marks	L1	CO2
	e)	Explain the Euclidean algorithm and use it to find the GCD of 252 and 198.	2 Marks	L1	CO3
	f)	Find the LCM of $\frac{3}{2}, \frac{81}{16}$ *and* $\frac{9}{8}$.	2 Marks	L1	CO3
	g)	Find the sequence for the generating function $f(x) = e^{2x} + x^3$.	2 Marks	L1	CO4
	h)	Define generating function and give example.	2 Marks	L1	CO4
	i)	Determine the number of edges in a graph with 6 vertices, 2 of degree 4 and 4 of degree 2.	2 Marks	L1	CO5
	j)	Explain graph isomorphism.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Find the truth values of the following, given that p is true and q is false : i) $(\neg p) \wedge q$ ii) $(\neg p) \rightarrow (\neg q)$.	8 Marks	L3	CO1
	b)	Construct the truth table for $((p \vee q) \wedge (\neg p \wedge (\neg q \vee \neg r))) \vee ((\neg p \wedge q) \vee (\neg p \wedge \neg r))$	8 Marks	L3	CO1

(OR)

3.	a)	Find the PDNF for $p \vee (\neg p \wedge q)$ i) By using truth table ii) Without using truth table.	8 Marks	L3	CO1
	b)	Define connectives and write an example for each connectives.	8 Marks	L2	CO1

MODULE-II

4.	a)	Define Lattice. Show that the POSET $(D_{36}, /)$ is a lattice.	8 Marks	L2	CO2
	b)	Explain the types of relation with an examples.	8 Marks	L2	CO2

(OR)

5.	a)	Find the minimal and maximal elements of the posets given below	8 Marks	L3	CO2

i) $\{(2,4,5,10,12,20,25)\}$

ii) $\{(2,3,6,12,24,36)\}$

	b)	Show that the relation "greater than or equal to" is a partial ordering on the set of integers.	8 Marks	L3	CO2

MODULE-III

6.	a)	Show that $G = \{a + b\sqrt{2} : a, b \in Q\}$ form an Abelian group with respect to addition.	8 Marks	L3	CO3
	b)	Find the GCD of 615 and 1080 and find u and v such that $\gcd(615,1080) = 615u + 1080v$.	8 Marks	L2	CO3

(OR)

7.	a)	Let a and b be any two integers, $b > 0$ then there exist unique integers q and r such that $a = bq + r, 0 \le r < b$.	8 Marks	L3	CO3
	b)	Find GCD(858,728,325) using Euclidean algorithm.	8 Marks	L2	CO3

MODULE-IV

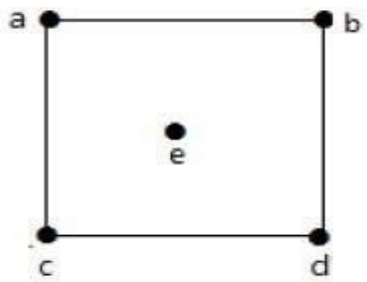
8.	a)	Use the generating function to solve the recurrence relation $a_n - 9a_{n-1} + 20a_{n-2} = 0$, $a_0 = -3$ and $a_1 = -10$	8 Marks	L2	CO4
	b)	Solve the recurrence relation $a_n = a_{n-1}$, $n \ge 1$ where $a_0 = 2$ by substitution method.	8 Marks	L2	CO4

(OR)

9.	a)	Find the generating function for the following sequences $1^3, 2^3, 3^3, ...$	8 Marks	L3	CO4
	b)	Find the coefficient of x^{25} in $(x^2 + x^3 + x^4 + x^5 + x^6)^7$.	8 Marks	L2	CO4

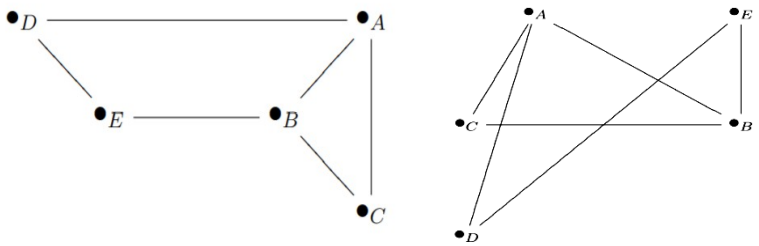
MODULE-V

10.	a)	Define Graph Isomorphism. Give one suitable example of graph isomorphism.	8 Marks	L3	CO5
	b)	Find the degree of each vertex of the below Graph.	8 Marks	L2	CO5



(OR)

11.	a)	Determine whether the following graphs are isomorphic.	8 Marks	L3	CO5



	b)	Explain Kruskal's algorithm for finding minimal spanning tree.	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. II Semester (MBU-25) Regular Examinations, May – 2026

DATA WAREHOUSING AND DATA MINING

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is meant by classification of Data Mining systems?	2 Marks	L1	CO1
	b)	State the importance of Data Mining.	2 Marks	L1	CO1
	c)	What is Data Warehouse Modeling?	2 Marks	L1	CO2
	d)	What is meant by Data Warehouse Design?	2 Marks	L1	CO2
	e)	What is Constraint-Based Frequent Pattern Mining?	2 Marks	L1	CO3
	f)	What is meant by correlation in Data Mining?	2 Marks	L1	CO3
	g)	Define Lazy Learners.	2 Marks	L1	CO4
	h)	What is meant by Pattern-Based Classification?	2 Marks	L1	CO4
	i)	Define Cluster Analysis.	2 Marks	L1	CO5
	j)	What is meant by clustering structures?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the different kinds of data used in Data Mining.	8 Marks	L2	CO1
	b)	Discuss different kinds of patterns discovered in Data Mining.	8 Marks	L2	CO1

(OR)

3.	a)	Explain how a Data Mining system is integrated with a database or data warehouse system.	8 Marks	L3	CO1
	b)	Describe the Data Mining task primitives and their role in data mining queries.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain how multidimensional databases support data analysis and exploration.	8 Marks	L2	CO2
	b)	Analyze the role of Data Cube technology in multidimensional data analysis.	8 Marks	L4	CO2

(OR)

5.	a)	Discuss the process of exploration and discovery in multidimensional databases.	8 Marks	L3	CO2
	b)	Explain the advantages of Data Warehousing in large-scale data analysis.	8 Marks	L2	CO2

MODULE-III

6.	a)	Analyze the relationship between frequent patterns, associations, and correlations.	8 Marks	L4	CO3
	b)	Explain how pattern evaluation helps in identifying useful patterns in data mining.	8 Marks	L3	CO3

(OR)

7.	a)	Discuss the importance of scalable mining methods for large databases.	8 Marks	L2	CO3
	b)	Explain the working principle of Bayesian Belief Networks in classification.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Analyze the role of Neural Networks in solving classification problems**.**	8 Marks	L4	CO4
	b)	Discuss the importance of handling different kinds of cases in classification tasks**.**	8 Marks	L3	CO4

(OR)

9.	a)	Explain the working mechanism of Bayesian Belief Networks in classification problems**.**	8 Marks	L2	CO4
	b)	Compare Lazy Learners and Pattern-Based Classification methods in data mining.	8 Marks	L4	CO4

MODULE-V

10.	a)	Explain the basic concepts of Cluster Analysis in Data Mining.	8 Marks	L2	CO5
	b)	Describe different clustering structures and their significance in cluster analysis.	8 Marks	L2	CO5

(OR)

11.	a)	Discuss the major clustering approaches used in Data Mining.	8 Marks	L2	CO5
	b)	Explain the Partitioning Methods used in clustering algorithms.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. II Semester (MBU-25) Regular Examinations, May – 2026

INTERNET OF THINGS

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is SDN in IoT networking?	2 Marks	L1	CO1
	b)	Give two examples of domain-specific IoT applications.	2 Marks	L2	CO1
	c)	What is RFID technology used for in IoT?	2 Marks	L1	CO2
	d)	Define internet connectivity in IoT systems.	2 Marks	L2	CO2
	e)	Name two AWS IoT services.	2 Marks	L1	CO3
	f)	What is the difference between microprocessor and microcontroller?	2 Marks	L2	CO3
	g)	Give two examples of domain model specifications in IoT.	2 Marks	L2	CO4
	h)	Define information model specification.	2 Marks	L1	CO4
	i)	List two secure message communication protocols used in IoT.	2 Marks	L2	CO5
	j)	What are security requirements in IoT?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the role of Software Defined Networking (SDN) in IoT networks.	8 Marks	L1	CO1
	b)	What is Network Function Virtualization (NFV) in IoT? Explain its benefits and applications.	8 Marks	L2	CO1

(OR)

3.	a)	Discuss IoT applications in home automation. Provide at least two use cases.	8 Marks	L2	CO1
	b)	Explain how IoT supports smart cities. Discuss two examples in detail.	8 Marks	L1	CO1

MODULE-II

4.	a)	Compare and contrast sensors and actuators in IoT with examples.	8 Marks	L2	CO2
	b)	Explain how RFID technology works with sensor networks in IoT.	8 Marks	L3	CO2

(OR)

5.	a)	Compare contention-based MAC protocols (CSMA/CA) and schedule-based MAC protocols (TDMA) in IoT.	8 Marks	L3	CO2
	b)	Explain the working and applications of MQTT and CoAP protocols in IoT.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the importance of microcontrollers and microprocessors in IoT prototyping.	8 Marks	L3	CO3
	b)	Write notes on open-source embedded platforms and their significance in rapid IoT development.	8 Marks	L2	CO3
		(OR)			
7.	a)	Explain how IoT devices stay always connected to the Internet/Cloud.	8 Marks	L2	CO3
	b)	Discuss the role of gateways in providing internet/cloud connectivity for IoT devices.	8 Marks	L3	CO3
		MODULE-IV			
8.	a)	What is an operational view specification? Discuss its role in ensuring smooth IoT system functioning.	8 Marks	L3	CO4
	b)	Explain the process of device and component integration in IoT system design.	8 Marks	L2	CO4
		(OR)			
9.	a)	Discuss the challenges faced in device integration during IoT application development.	8 Marks	L2	CO4
	b)	Explain the steps involved in IoT application development starting from design to deployment.	8 Marks	L3	CO4
		MODULE-V			
10.	a)	Explain the role of data analytics in IoT with suitable examples.	8 Marks	L3	CO5
	b)	Discuss the architecture and working of Apache Hadoop in IoT data processing.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain the challenges of implementing lightweight security protocols in resource-constrained IoT devices.	8 Marks	L2	CO5
	b)	Discuss a case study highlighting IoT security threats and the countermeasures taken to resolve them.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. II Semester (MBU-25) Regular Examinations, May – 2026

CRYPTOGRAPHY AND NETWORK SECURITY

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is meant by ethical hacking?	2 Marks	L1	CO1
	b)	What is a mono alphabetic cipher?	2 Marks	L1	CO1
	c)	What is Triple DES (3DES)?	2 Marks	L1	CO2
	d)	What is Cipher Block Chaining (CBC) mode?	2 Marks	L1	CO2
	e)	What is SHA-512?	2 Marks	L1	CO3
	f)	Define Message Authentication Code (MAC).	2 Marks	L1	CO3
	g)	What is password-based authentication?	2 Marks	L1	CO4
	h)	What is Public Key Infrastructure (PKI)?	2 Marks	L2	CO4
	i)	What is Pretty Good Privacy (PGP)?	2 Marks	L1	CO5
	j)	What is DNSSEC?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.		Explain substitution techniques in detail. Discuss mono alphabetic and poly alphabetic ciphers with examples and compare their strengths and weaknesses.	16 Marks	L4	CO1

(OR)

3.	a)	Explain the difference between mono alphabetic ciphers and poly alphabetic ciphers.	8 Marks	L2	CO1
	b)	Discuss the security trends in modern information systems.	8 Marks	L2	CO1

MODULE-II

4.		Compare DES and AES in terms of structure, security, and performance.	16 Marks	L4	CO2

(OR)

5.	a)	Explain in detail the AES algorithm and its transformation functions.	8 Marks	L2	CO2
	b)	Discuss various block cipher modes of operation and their applications.	8 Marks	L2	CO2

MODULE-III

6.		Describe and analyze Diffie-Hellman key exchange and ElGamal cryptographic system. Compare their security and applications.	16 Marks	L2	CO3

(OR)

7.	a)	Discuss different types of simple hash functions.	8 Marks	L1	CO3
	b)	Explain the security requirements of Message Authentication Codes.	8 Marks	L2	CO3

MODULE-IV

8.		Explain Entity Authentication in detail. Discuss Biometrics, Passwords, distribution of public keys, X.509 certificates and PKI architecture.	16 Marks	L2	CO4

(OR)

9.	a)	Describe remote user authentication mechanisms and threats.	8 Marks	L1	CO4
	b)	Explain Personal Identity Verification (PIV) and its components.	8 Marks	L1	CO4

MODULE-V

10.	a)	Describe S/MIME message processing and security services.	8 Marks	L1	CO5
	b)	Explain Pretty Good Privacy (PGP) with encryption and authentication process.	8 Marks	L2	CO5

(OR)

11.	a)	Discuss DNSSEC architecture and its security features.	8 Marks	L2	CO5
	b)	Explain IPSec architecture including AH and ESP protocols.	8 Marks	L1	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. II Semester (MBU-25) Regular Examinations, May – 2026

DATABASE MANAGEMENT SYSTEMS

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What are the types of Database Languages in DBMS?	2 Marks	L1	CO1
	b)	Differentiate between an entity and an attribute With Examples.	2 Marks	L1	CO1
	c)	Explain the difference between a primary key and a foreign key.	2 Marks	L1	CO2
	d)	What is the difference between table and view?	2 Marks	L1	CO2
	e)	Explain integrity constraints in SQL.	2 Marks	L1	CO3
	f)	Describe triggers in SQL and their uses.	2 Marks	L1	CO3
	g)	What is a candidate key?	2 Marks	L1	CO4
	h)	Define First Normal Form (1NF).	2 Marks	L2	CO4
	i)	Define isolation property.	2 Marks	L1	CO5
	j)	What is durability?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the roles and responsibilities of a Database Administrator (DBA).	8 Marks	L2	CO1
	b)	What is the primary purpose of a database system? Explain how a DBMS helps in storing, organizing, and retrieving data efficiently.	8 Marks	L2	CO1

(OR)

3.	What are the basic components of an ER diagram? Explain the role of entities, attributes, and relationships in an ER diagram, and provide an example for each.	16 Marks	L2	CO1

MODULE-II

4.	a)	Explain the process of logical database design. What are the key steps involved? Illustrate your answer with an example.	8 Marks	L2	CO2
	b)	Explain how an Entity-Relationship (ER) diagram is mapped to the relational model. Illustrate this with an example.	8 Marks	L1	CO2

(OR)

5.	Explain the fundamental operators of relational algebra and demonstrate how they can be used to query relational databases.	16 Marks	L2	CO2

MODULE-III

6.		Explain database triggers in PL/SQL, their types, and applications.	16 Marks	L2	CO3

(OR)

7.	a)	Explain triggers and active databases with examples.	8 Marks	L2	CO3
	b)	Explain PL/SQL block structure and data types.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Explain join dependencies and Fifth Normal Form (5NF).	8 Marks	L1	CO4
	b)	Describe lossless join decomposition and its significance in normalization.	8 Marks	L2	CO4

(OR)

9.		Discuss functional dependencies in detail and explain their role in the process of normalization.	16 Marks	L1	CO4

MODULE-V

10.	a)	Explain deadlock handling methods in DBMS**.**	8 Marks	L1	CO5
	b)	Describe multiple granularity locking**.**	8 Marks	L2	CO5

(OR)

11.		Explain transaction management in DBMS and discuss the ACID properties of transactions.	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. II Semester (MBU-25) Regular Examinations, May – 2026

SOFTWARE ENGINEERING

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define software engineering.	2 Marks	L1	CO1
	b)	What is Dynamic System Development Method (DSDM)?	2 Marks	L1	CO1
	c)	Define requirements engineering.	2 Marks	L1	CO2
	d)	What is requirements modeling for web applications?	2 Marks	L2	CO2
	e)	Define software design.	2 Marks	L1	CO3
	f)	Define maintainability metric.	2 Marks	L1	CO3
	g)	What is basis path testing?	2 Marks	L1	CO4
	h)	What is debugging?	2 Marks	L1	CO4
	i)	Define COCOMO model.	2 Marks	L1	CO5
	j)	Define risk identification.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the nature and characteristics of software in detail.	8 Marks	L2	CO1
	b)	Describe the software engineering layers with a neat diagram.	8 Marks	L2	CO1

(OR)

3.	a)	Explain the concept of Agile development and agility.	8 Marks	L3	CO1
	b)	Discuss the Agile process framework in software engineering.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the concept of requirements engineering and its importance.	8 Marks	L2	CO2
	b)	Describe the requirements engineering process with a diagram.	8 Marks	L2	CO2

(OR)

5.	a)	Compare requirements specification and requirements modeling.	8 Marks	L4	CO2
	b)	Explain common challenges in requirements engineering.	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain the concept of design engineering in software development.	8 Marks	L2	CO3
	b)	Describe UML and its importance in software design.	8 Marks	L2	CO3

(OR)

7.	a)	Explain measurement techniques used in software engineering.	8 Marks	L2	CO3
	b)	Describe the relationship between software metrics and quality improvement.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain the fundamentals of software testing.	8 Marks	L2	CO4
	b)	Discuss the objectives and principles of software testing.	8 Marks	L3	CO4

(OR)

9.	a)	Compare reverse engineering and forward engineering.	8 Marks	L4	CO4
	b)	Explain the software implementation techniques used in development.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain the concept of software project management.	8 Marks	L2	CO5
	b)	Describe the software project planning process.	8 Marks	L2	CO5

(OR)

11.	a)	Discuss the advantages of CASE tools in project management.	8 Marks	L3	CO5
	b)	Explain the relationship between project estimation, scheduling, and risk management.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. II Semester (MBU-25) Regular Examinations, May – 2026

PYTHON PROGRAMMING

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define variables in Python.	2 Marks	L1	CO1
	b)	What are literals? Mention any two types.	2 Marks	L1	CO1
	c)	Define a nested if statement.	2 Marks	L1	CO2
	d)	What is a loop**?**	2 Marks	L1	CO2
	e)	What are set operations?	2 Marks	L1	CO3
	f)	What is the use of dictionary methods?	2 Marks	L1	CO3
	g)	What is meant by file handling?	2 Marks	L1	CO4
	h)	Write a Python program to read a file line by line.	2 Marks	L1	CO4
	i)	Define Object-Oriented Programming (OOP).	2 Marks	L1	CO5
	j)	What is a class in Python?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain fundamental data types in Python with suitable examples.	8 Marks	L3	CO1
	b)	Describe expressions in Python and explain how they are evaluated.	8 Marks	L1	CO1

(OR)

3.	a)	Explain type conversion in Python with examples of implicit and explicit conversion.	8 Marks	L3	CO1
	b)	Discuss input and output operations in Python**,** explaining the use of input() and print() functions.	8 Marks	L1	CO1

MODULE-II

4.	a)	Differentiate between while loop and for loop with examples.	8 Marks	L3	CO2
	b)	Write a detailed note on loop control statements in Python.	8 Marks	L2	CO2

(OR)

5.	a)	Write a Python program to check whether a given number is positive with explanation.	8 Marks	L1	CO2
	b)	Apply appropriate looping constructs in Python to solve repetitive tasks and explain how iteration improves program efficiency.	8 Marks	L5	CO2

MODULE-III

6.	a)	Explain string initialization and string operations in Python.	8 Marks	L3	CO3
	b)	Write a detailed note on sequences and collections in Python.	8 Marks	L1	CO3

(OR)

7.	a)	Discuss various string handling methods available in Python.	8 Marks	L3	CO3
	b)	Explain string formatting techniques with examples.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Explain how functions are defined and invoked in Python and illustrate their role in program modularity with suitable examples.	8 Marks	L3	CO4
	b)	Write a Python program to search a word in a given string using regular expressions.	8 Marks	L1	CO4

(OR)

9.	a)	Examine the different categories of arguments used in Python functions and demonstrate their usage with appropriate examples.	8 Marks	L3	CO4
	b)	Analyze the concept of generators in Python and explain how they differ from normal functions with suitable examples.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain the basic concepts of Object-Oriented Programming in detail.	8 Marks	L2	CO5
	b)	Describe classes and objects in Python with suitable examples.	8 Marks	L2	CO5

(OR)

11.	a)	Explain inheritance and its types with examples.	8 Marks	L2	CO5
	b)	Discuss polymorphism and explain method overriding in Python.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. II Semester (MBU-22) Regular Examinations, May – 2026

CRIMINALISTICS

[Forensic Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Difference between Abduction and Kidnapping.	2 Marks	L1	CO1
	b)	What are the types of sketching methods?	2 Marks	L1	CO1
	c)	Explain the dual role of crime scene logs in the investigative process.	2 Marks	L1	CO2
	d)	Explain the initial actions that first responders should take upon arriving at a crime scene.	2 Marks	L2	CO2
	e)	Define Hazardous Evidence.	2 Marks	L1	CO3
	f)	Differentiate between physical and trace evidence found at a crime scene. Provide examples of each type and explain their significance in forensic investigations.	2 Marks	L1	CO3
	g)	What is fracture analysis?	2 Marks	L2	CO4
	h)	Write the applications of FTIR.	2 Marks	L1	CO4
	i)	Write about Collection of soil evidence.	2 Marks	L1	CO5
	j)	Define druggist folder.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Provide specific scenarios where spiral and zonal method would be most applicable and explain how these methods contribute to the systematic retrieval of evidence.	6 Marks	L1	CO1
	b)	Analyze the importance of maintaining a meticulous and standardized approach in documentation for chain of custody purposes and the presentation of evidence in court.	10 Marks	L4	CO1

(OR)

3.	a)	Explore the role of forensic technologies in investigating both outdoor and indoor crimes.	6 Marks	L1	CO1
	b)	Explain various types of sketching methods in detail.	10 Marks	L1	CO1

MODULE-II

4.	a)	How police personnel and forensic scientist related?	6 Marks	L1	CO2
	b)	Examine the challenges faced by first responders in securing and isolating a crime scene. Provide solutions and strategies to overcome these challenges, emphasizing the importance of preserving evidence.	10 Marks	L4	CO2

(OR)

5.	a)	Discuss the elements of crime in detail.	8 Marks	L1	CO2

	b)	Discuss the role of documentation in the Crime Scene Management.	8 Marks	L1	CO2

MODULE-III

6.	a)	Explain any two collection methods.	6 Marks	L1	CO3
	b)	Explain the common methods used to preserve biological evidences such as blood or saliva?	10 Marks	L1	CO3

(OR)

7.	a)	Give examples of Hazardous evidence in detail.	6 Marks	L1	CO3
	b)	Explain the importance of maintaining a detailed chain of custody in crime scene investigations.	10 Marks	L1	CO3

MODULE-IV

8.	a)	Explain the working Principle of UV-Visible spectroscopy.	6 Marks	L1	CO4
	b)	Discuss the specific applications of FTIR spectroscopy in the analysis of paint evidence.	10 Marks	L2	CO4

(OR)

9.	a)	Explain the collection and packaging of glass evidences.	6 Marks	L1	CO4
	b)	Explain Bayes Theorem in analysis and applications.	10 Marks	L1	CO4

MODULE-V

10.	a)	Can soil be utilized as primary evidence? Justify?	6 Marks	L1	CO5
	b)	Explain the proper procedures for collecting fiber evidence at a crime scene. Include considerations for packaging, labeling, and preserving the integrity of the samples.	10 Marks	L1	CO5

(OR)

11.	a)	Discover the locations where soil evidence can be found.	6 Marks	L1	CO5
	b)	Explain any 2 case study related to tool marks.	10 Marks	L5	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. II Semester (MBU-22) Regular Examinations, May – 2026

CRIMINAL LAW

[Forensic Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	State the punishment under Section 124A IPC.	2 Marks	L1	CO1
	b)	What is the object of Section 376 IPC?	2 Marks	L1	CO1
	c)	Define Dacoity.	2 Marks	L1	CO2
	d)	What is the object of Section 320 IPC?	2 Marks	L1	CO2
	e)	What is meant by Bail?	2 Marks	L1	CO3
	f)	Define Arrest.	2 Marks	L1	CO3
	g)	What is meant by "Fact"?	2 Marks	L1	CO4
	h)	What is meant by Judicial Proceedings?	2 Marks	L1	CO4
	i)	Define Speedy Trial.	2 Marks	L1	CO5
	j)	What is Judicial Activism?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss General Exceptions from Sections 82, 84, 94 IPC in detail.	6 Marks	L2	CO1
	b)	Elaborate offences against Offences affecting the Human Body.	10 Marks	L3	CO1

(OR)

3.	a)	Explain Section Section 463 to 489 (E) and discuss its essential ingredients.	6 Marks	L2	CO1
	b)	Explain Abetment and its types.	10 Marks	L2	CO1

MODULE-II

4.	a)	Explain Sections 299–304 with case laws.	6 Marks	L5	CO2
	b)	Discuss crimes against women from Sections 375 – 376DB IPC in detail.	10 Marks	L3	CO2

(OR)

5.	a)	Explain Rape under IPC with amendments.	6 Marks	L2	CO2
	b)	Discuss crimes against properties from Sections 375 – 376DB IPC in detail.	10 Marks	L3	CO2

MODULE-III

6.	a)	Explain the concept of warrant of arrest.	6 Marks	L2	CO3
	b)	Explain the rights of an arrested person under CrPC.	10 Marks	L2	CO3

(OR)

7.	a)	Explain cross-examination and its importance.	6 Marks	L2	CO3
	b)	Explain the powers and jurisdiction of criminal courts in India.	10 Marks	L2	CO3

MODULE-IV

8.	a)	Distinguish between Admission and Confession.	6 Marks	L2	CO4
	b)	Discuss the evidentiary value of forensic science in criminal justice.	10 Marks	L2	CO4
		(OR)			
9.	a)	Explain Burden of Proof.	6 Marks	L2	CO4
	b)	Explain Dying Declaration and its admissibility with legal principles.	10 Marks	L2	CO4

MODULE-V

10.	a)	Explain the objectives of the Juvenile Justice Act.	6 Marks	L3	CO5
	b)	Explain the Protection of Women from Domestic Violence Act, 2005.	10 Marks	L3	CO5
		(OR)			
11.	a)	Explain salient features of the NDPS Act.	6 Marks	L2	CO5
	b)	Explain the concept of Speedy Trial as a fundamental right.	10 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. II Semester (MBU-22) Regular Examinations, May – 2026

FORENSIC BIOLOGY

[Forensic Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List two examples of biological evidence commonly found at a crime scene.	2 Marks	L1	CO1
	b)	Why is it important to collect biological evidence promptly?	2 Marks	L2	CO1
	c)	How can the cortex of hair contribute to forensic investigations?	2 Marks	L2	CO2
	d)	Explain the role of the cuticle in distinguishing between human and animal hair.	2 Marks	L2	CO2
	e)	How can forensic experts identify different types of leaves found at a crime scene?	2 Marks	L3	CO3
	f)	What is the role of pollen analysis in forensic science?	2 Marks	L2	CO3
	g)	Name two protected species of animals and two protected species of plants.	2 Marks	L1	CO4
	h)	How can forensic scientists identify wildlife species from skin or fur samples?	2 Marks	L3	CO4
	i)	How do forensic entomologists collect entomological evidence at a crime scene?	2 Marks	L3	CO5
	j)	Describe a method used to preserve entomological evidence for later analysis.	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss the process of preserving biological evidence, including packaging and storage methods.	8 Marks	L3	CO1
	b)	Explain the role of refrigeration in the preservation of different types of biological evidence.	8 Marks	L4	CO1

(OR)

3.	a)	Explain the significance of DNA analysis in forensic investigations using biological evidence.	8 Marks	L2	CO1
	b)	Discuss the limitations of DNA evidence in criminal cases.	8 Marks	L5	CO1

MODULE-II

4.	a)	Describe the biochemical composition of hair and its relevance in forensic science.	8 Marks	L2	CO2
	b)	Discuss the impact of environmental factors on the biochemistry of hair and its forensic implications.	8 Marks	L4	CO2

(OR)

5.	a)	Explain the process of collecting hair evidence at a crime scene.	8 Marks	L3	CO2

	b)	Discuss the challenges involved in preserving and analyzing hair evidence.	8 Marks	L4	CO2

MODULE-III

6.	a)	How can forensic scientists distinguish between different types of pollen found at a crime scene?	8 Marks	L3	CO3
	b)	Discuss the role of pollen identification in determining the geographical origin and timing of a crime.	8 Marks	L4	CO3

(OR)

7.	a)	What is the forensic significance of analyzing plant juices?	8 Marks	L2	CO3
	b)	Describe the methods used to collect and analyze plant juices in forensic investigations.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Discuss the methods used to identify and analyze wildlife teeth and horns in forensic investigations.	8 Marks	L3	CO4
	b)	Explain how these analyses can help in understanding the ecological impact of wildlife crime.	8 Marks	L4	CO4

(OR)

9.	a)	What are pug marks, and how are they used in wildlife forensics?	8 Marks	L2	CO4
	b)	Describe the techniques used to analyze and compare pug marks for identifying animal species.	8 Marks	L3	CO4

MODULE-V

10.	a)	What is insect succession and how is it used in forensic entomology?	8 Marks	L2	CO5
	b)	Discuss how forensic entomologists interpret insect succession patterns to aid in death investigations.	8 Marks	L4	CO5

(OR)

11.	a)	Describe the process of analyzing insect larvae to estimate the time of death.	8 Marks	L3	CO5
	b)	Explain the challenges associated with using larval age in time of death estimations.	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. II Semester (MBU-22) Regular Examinations, May – 2026

CRIME AND SOCIETY

[Forensic Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define criminal profiling.	2 Marks	L1	CO1
	b)	What is meant by criminal behaviour?	2 Marks	L1	CO1
	c)	How do formal and informal sanctions act as social control mechanisms?	2 Marks	L1	CO2
	d)	Why is victimology important in understanding crime?	2 Marks	L1	CO2
	e)	State any two characteristics of social change.	2 Marks	L1	CO3
	f)	How are drugs linked to criminal activities?	2 Marks	L1	CO3
	g)	What is meant by delinquent behaviour?	2 Marks	L1	CO4
	h)	Who are children in conflict with law?	2 Marks	L1	CO4
	i)	Who are the first point of contact in the Criminal Justice System?	2 Marks	L1	CO5
	j)	Define community policing.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Write a brief note on Garofalo's definition of crime.	6 Marks	L1	CO1
	b)	Explain criminal profiling, its approaches, and its importance in criminal investigation.	10 Marks	L2	CO1

(OR)

3.	a)	Explain the concept of investigative strategy.	6 Marks	L2	CO1
	b)	Explain labelling theory and its impact on criminal behaviour.	10 Marks	L2	CO1

MODULE-II

4.	a)	Explain the types of hate crimes and their impact.	6 Marks	L2	CO2
	b)	Discuss workplace violence, its types, and prevention strategies.	10 Marks	L2	CO2

(OR)

5.	a)	Explain the types of workplace violence.	6 Marks	L2	CO2
	b)	Discuss the scope and importance of victimology in the criminal justice system.	10 Marks	L2	CO2

MODULE-III

6.	a)	Discuss the effects of urbanization and industrialization on crime.	6 Marks	L2	CO3
	b)	Discuss the rational choice theory and routine activities theory in relation to situational crime prevention.	10 Marks	L2	CO3

(OR)

7.	a)	Explain the concept of situational crime prevention.	6 Marks	L2	CO3
	b)	Explain social change and critically examine its relationship with crime.	10 Marks	L2	CO3

MODULE-IV

8.	a)	Explain counseling and rehabilitation of juvenile delinquents.	6 Marks	L2	CO4
	b)	Discuss the factors responsible for juvenile delinquency.	10 Marks	L2	CO4
		(OR)			
9.	a)	Discuss the types of juvenile delinquency.	6 Marks	L2	CO4
	b)	Discuss the role and functions of the Child Welfare Committee (CWC) under the Juvenile Justice Act.	10 Marks	L2	CO4

MODULE-V

10.	a)	Discuss the role of prisons in correction and rehabilitation.	6 Marks	L2	CO5
	b)	Examine the challenges involved in policing a heterogeneous society.	10 Marks	L2	CO5
		(OR)			
11.	a)	Explain the procedure of filing criminal charges in India.	6 Marks	L2	CO5
	b)	Discuss community policing and policing in a heterogeneous society.	10 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com IV Semester (MBU-22) Regular Examinations, April – 2026

CORPORATE ACCOUNTING

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Write about valuation of shares.	2 Marks	L1	CO1
	b)	What is net assets method?	2 Marks	L1	CO1
	c)	What is loss?	2 Marks	L1	CO2
	d)	Write about loss prior to incorporation.	2 Marks	L1	CO2
	e)	List out the methods of amalgamation.	2 Marks	L1	CO3
	f)	Write about external reconstruction.	2 Marks	L1	CO3
	g)	List out the capital reduction processor.	2 Marks	L1	CO4
	h)	Write about reducing share capital.	2 Marks	L1	CO4
	i)	List out the modes of winding up of a company.	2 Marks	L1	CO5
	j)	Write about final statement of liquidator.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2. Distinguish between net assets method and market value of share. 16 Marks L2 CO1

(OR)

3. On 31st march 2020 Kavitha ltd balance sheet disclosed as followscompute the value under Net assets method and Yield method. 16 Marks L2 CO1

Liabilities	Rs	Assets	Rs
Issued capital at Rs.10 each	5,00,000	Fixed assets	6,50,000
Profit and loss account	30,000	Current assets	2,00,000
reserve	1,00,000	Good will	60,000
5% debentures	1,50,000		
Current liabilities	1,30,000		
	9,10,000		9,10,000

MODULE-II

4. Subhash ltd. was incorporated on 1st July 2022 and received its certificate of commencement of business on 1st august 2022. the company bought the business of M/s small &co with effect from 1st march 2022. from the following figures relating to the year ending February 2023 find out the profits available for dividends. i) Sales for the year were Rs.6,00,000 out of which sales upto 1st July were Rs.2,50,000 ii) Gross profit for the year was Rs.1,80,000© the expenses debited to the profit and loss account were. 16 Marks L4 CO2

Particulars	Rs	Particulars	Rs
Rent	9,000	Advertising	18,000
Salaries	15,000	stationery and printing	3,600
Directors fees	4,800	commission on sales	6,000
Interest on debentures	5,000	Bad debts (Rs.500 relate to created prior to incorporation)	1500
Audit fees	1,500		
Discount on sales	3,600		
Depreciation	24,000		

(OR)

5. Ankitha ltd was incorporated on 1st July 2022 and received its certificate of commencement of business on 1st august 2022. The company bought the business of M/s small &co with effect from 1st march 2022. from the following figures relating to the year ending February 2023 find out the profits available from dividends. i) Sales for the year were Rs.6,00,000 out of which sales up to 1st July were Rs.2,50,000 ii) Gross profit for the year was Rs.1,80,000© the expenses debited to the profit and loss account were. — 16 Marks — L4 — CO2

Particulars	Rs	Particulars	Rs
Rent	9,000	Advertising	18,000
Salaries	15,000	stationery and printing	3,600
Directors' fees	4,800	commission on sales	6,000
Interest on debentures	5,000	Bad debts (Rs.500 relate to created prior to incorporation)	1500
Audit fees	1,500		
Discount on sales	3,600		
Depreciation	24,000	interest on vendor on purchase consideration up to 1st sep 2022	3000
General expenses	4,800		

MODULE-III

6. Explain various types of amalgamation. — 16 Marks — L2 — CO3

(OR)

7. Explain the differences between pooling of interest method and purchase method. — 16 Marks — L2 — CO3

MODULE-IV

8. Explain the various provisions of capital reduction as given in the companies act 2013. — 16 Marks — L2 — CO4

(OR)

9. Explain the procedure for reducing share capital. — 16 Marks — L2 — CO4

MODULE-V

10. Explain preferential creditors as given under companies act. — 16 Marks — L2 — CO5

(OR)

11. How the liquidator's remuneration was calculated? — 16 Marks — L2 — CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com IV Semester (MBU-22) Regular Examinations, April – 2026

MANAGEMENT ACCOUNTING

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Management Accounting.	2 Marks	L1	CO1
	b)	State the meaning of Management Accounting.	2 Marks	L1	CO1
	c)	What is Ratio Analysis?	2 Marks	L1	CO2
	d)	What are Profitability Ratios?	2 Marks	L1	CO2
	e)	What is meant by Working Capital?	2 Marks	L1	CO3
	f)	Explain the concept of Working Capital.	2 Marks	L1	CO3
	g)	What is a Cash Flow Statement?	2 Marks	L1	CO4
	h)	Explain the meaning of Cash Flow Statement.	2 Marks	L1	CO4
	i)	What is a Budget?	2 Marks	L1	CO5
	j)	Explain the meaning of Budget.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Define Management Accounting and explain its meaning in detail.	8 Marks	L1	CO1
	b)	Discuss the nature and scope of Management Accounting.	8 Marks	L1	CO1

(OR)

3.	a)	Explain the significance of Management Accounting in modern business organizations.	8 Marks	L2	CO1
	b)	Describe the objectives of Management Accounting and how they support managerial functions.	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain the meaning of Ratio Analysis and discuss its objectives.	8 Marks	L2	CO2
	b)	A company has Net Sales Rs10,00,000, Gross Profit Rs 2,50,000, and Net Profit Rs 1,20,000. Calculate Gross Profit Ratio and Net Profit Ratio.	8 Marks	L3	CO2

(OR)

5.	a)	From the following data: Current Assets Rs 4,00,000, Current Liabilities Rs 2,00,000, Inventory Rs 80,000. Compute Current Ratio and Quick Ratio.	8 Marks	L3	CO2
	b)	Distinguish between Liquidity Ratios and Solvency Ratios.	8 Marks	L3	CO2

MODULE-III

6.	a)	Discuss Gross Working Capital and Net Working Capital.	8 Marks	L1	CO3
	b)	Define Funds Flow Statement and explain its objectives.	8 Marks	L1	CO3

(OR)

7.	a)	Critically examine the usefulness of Funds Flow Statement for management.	8 Marks	L4	CO3
	b)	Net Profit Rs 1,50,000; Depreciation Rs 30,000; Goodwill Written Off Rs 20,000; Preliminary Expenses Written Off Rs 10,000; Gain on Sale of Land Rs 40,000. Find Funds from Operations.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain the meaning and objectives of a Cash Flow Statement.	8 Marks	L2	CO4
	b)	Discuss the uses and importance of Cash Flow Statement.	8 Marks	L1	CO4
		(OR)			
9.	a)	Compare Cash Flow Statement and Funds Flow Statement on the basis of concept, scope, and usefulness.	8 Marks	L3	CO4
	b)	Discuss the limitations of Cash Flow Statement.	8 Marks	L1	CO4

MODULE-V

10.	a)	Prepare a Fixed Budget for production of 10,000 units given: i) Direct Material Rs 20 per unit ii) Direct Labour Rs 15 per unit iii) Variable Overheads Rs 10 per unit iv) Fixed Overheads Rs 50,000 v) Selling Price Rs 60 per unit	8 Marks	L3	CO5
	b)	Explain the preparation of a Fixed Budget with a suitable example.	8 Marks	L2	CO5
		(OR)			
11.	a)	Prepare a Fixed Budget for sales of 5,000 units with the following data: Sales Price Rs 100 per unit Variable Cost Rs 60 per unit Fixed Cost Rs 1,20,000	8 Marks	L3	CO5
	b)	Prepare a Flexible Budget at 50%, 70%, and 90% capacity given: i) Fixed Overheads Rs 1,00,000 ii) Variable Overheads Rs 20 per unit iii) Semi-variable Overheads Rs 50,000 (with 60% fixed and 40% variable) Capacity = 10,000 units	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com IV Semester (MBU-22) Regular Examinations, April – 2026

COMPUTERIZED ACCOUNTING WITH TALLY
(Computer Applications)

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	List the accounting concepts.	2 Marks	L1	CO1
	b)	List the accounting software.	2 Marks	L1	CO1
	c)	Narrate the versions of Tally.	2 Marks	L1	CO2
	d)	How to create stock items in Tally ERP 9.0?	2 Marks	L1	CO2
	e)	What is the procedure for configuration in Tally ERP9.0?	2 Marks	L1	CO3
	f)	What is the procedure for printing inventory reports?	2 Marks	L1	CO3
	g)	How to create TDS Ledgers in Tally?	2 Marks	L1	CO4
	h)	How to enter TDS on an advance payment in Tally?	2 Marks	L1	CO4
	i)	How to enable Payroll statutory features?	2 Marks	L1	CO5
	j)	How to create a payroll voucher in Tally?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Define computerized Accounting. Explain its advantages and disadvantages.	16 Marks	L2	CO1
	(OR)			
3.	Discuss the features of computerized accounting systems in detail.	16 Marks	L2	CO1

MODULE-II

4.	Elaborate on the importance of ledger creation and its role in maintaining accurate accounting records.	16 Marks	L3	CO2
	(OR)			
5.	Explain the concept of vouchers in computerized accounting and their significance.	16 Marks	L2	CO2

MODULE-III

6.	Discuss the inventory configuration options in Tally and their role in effective stock control.	16 Marks	L2	CO3
	(OR)			
7.	Explain the steps involved in the creation and display of Stock Groups, Stock Categories, and Stock Items in Tally.	16 Marks	L2	CO3

MODULE-IV

8.	Explain the procedure for enabling TDS features in Tally.	16 Marks	L2	CO4
	(OR)			
9.	Elaborate the treatment of advance payments and balance payments of tax under TDS.	16 Marks	L3	CO4

MODULE-V

10.	Explain the creation of Pay Head ledgers and their classification in payroll accounting.	16 Marks	L2	CO5
	(OR)			
11.	Elaborate the procedure for enabling Payroll features in Tally.	16 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA IV Semester (MBU-22) Regular Examinations, April – 2026

BANKING AND INSURANCE

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is mean by Banking?	2 Marks	L1	CO1
	b)	Name the key tools of the RBI's monetary policy.	2 Marks	L1	CO1
	c)	Write a short note on NPA'S.	2 Marks	L1	CO2
	d)	Define Loans.	2 Marks	L1	CO2
	e)	What does the B2G (Business-to-Government) model entail?	2 Marks	L1	CO3
	f)	Define E- Banking.	2 Marks	L1	CO3
	g)	State the Types of Life Insurance Policies.	2 Marks	L1	CO4
	h)	Distinction between risk and uncertainty in the context of insurance.	2 Marks	L1	CO4
	i)	Define Motor Vehicle Insurance.	2 Marks	L1	CO5
	j)	List the key functions of insurance companies	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Explain the role of the Reserve Bank of India in maintaining monetary stability and promoting financial inclusion.	16 Marks	L2	CO1

(OR)

3.	What is the role and importance of banking in the development of an economy?	16 Marks	L2	CO1

MODULE-II

4.	Explain the Procedure for Opening and Closing a Bank Account.	16 Marks	L2	CO2

(OR)

5.	Describe the different types of loans and advances provided by banks, with relevant examples.	16 Marks	L2	CO2

MODULE-III

6.	How do credit cards work in the electronic payment ecosystem? Discuss their advantages and security features.	16 Marks	L2	CO3

(OR)

7.	What is Online Banking? Explain the various online banking services available to customers.	16 Marks	L2	CO3

MODULE-IV

8.	What is the principle of indemnity in insurance? Why is it important?	16 Marks	L2	CO4
	(OR)			
9.	What are the key elements of an insurance policy?	16 Marks	L2	CO4

MODULE-V

10.	What is the role of the Insurance Regulatory and Development Authority (IRDA) in India?	16 Marks	L2	CO5
	(OR)			
11.	Explain the various types of insurance policies available in India.	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA IV Semester (MBU-22) Regular Examinations, April – 2026

ENTREPRENEURSHIP DEVELOPMENT

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Mention the functions of entrepreneurship.	2 Marks	L1	CO1
	b)	Mention any two qualities of a successful entrepreneur.	2 Marks	L1	CO1
	c)	State any two functions of the National Small Industries Corporation (NSIC).	2 Marks	L1	CO2
	d)	What is the role of Industrial Credit and Investment Corporation of India (ICICI) in industrial development?	2 Marks	L1	CO2
	e)	What is meant by technology and industrial accommodation?	2 Marks	L1	CO3
	f)	What is a business incubator?	2 Marks	L1	CO3
	g)	What is a project report?	2 Marks	L1	CO4
	h)	Define planning in business management.	2 Marks	L1	CO4
	i)	State two measures that can help in the development of women entrepreneurship.	2 Marks	L1	CO5
	j)	Name two government schemes supporting women entrepreneurship.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Discuss the various dimensions of entrepreneurship and explain their influence on entrepreneurial development.	16 Marks	L2	CO1

(OR)

3.	Compare different types of entrepreneurs. Explain innovative, imitative, Fabian, and drone entrepreneurs with suitable illustrations.	16 Marks	L3	CO1

MODULE-II

4.	Explain the functions and services of Small Industries Service Institutions (SISIs) and their importance in providing technical and managerial support to entrepreneurs.	16 Marks	L2	CO2

(OR)

5.	Discuss the role, objectives, and functions of the Small Industries Development Organization (SIDO) in promoting and developing small-scale industries in India.	16 Marks	L2	CO2

MODULE-III

6.	Explain the role of private equity funds in entrepreneurial finance. Discuss their investment approach, advantages, and impact on business growth	16 Marks	L2	CO3

	(OR)			
7.	Explain the concept of business incubators. Discuss their functions and role in supporting start-ups and new ventures.	16 Marks	L2	CO3
	MODULE-IV			
8.	Explain the steps involved in the preparation of a project report for a new business venture.	16 Marks	L2	CO4
	(OR)			
9.	Describe the contents of a business plan. Explain the importance of each component in detail.	16 Marks	L3	CO4
	MODULE-V			
10.	Explain the financial and marketing problems faced by women entrepreneurs and suggest suitable remedial measures.	16 Marks	L2	CO5
	(OR)			
11.	Discuss the measures needed for the development of women entrepreneurship in India.	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA IV Semester (MBU-22) Regular Examinations, April – 2026

INTRODUCTION TO FINANCIAL TECHNOLOGY

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Write the uses of financial analytics.	2 Marks	L1	CO1
	b)	What is Data Analysis?	2 Marks	L1	CO1
	c)	Define Multiple linear regression.	2 Marks	L2	CO2
	d)	Tell about Multinominal regression.	2 Marks	L2	CO2
	e)	Write Uses of Digital Finance.	2 Marks	L2	CO3
	f)	What are various applications in Fintech?	2 Marks	L1	CO3
	g)	What is RegTech Ecosystem?	2 Marks	L2	CO4
	h)	Write the benefits of AI in Finance.	2 Marks	L1	CO4
	i)	Define Data in Financial Services.	2 Marks	L1	CO5
	j)	What is Risk of Breach?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Demonstrate difference between Business intelligence and Business analytics.	8 Marks	L2	CO1
	b)	Write a short note on recent trends in financial analytics.	8 Marks	L1	CO1

(OR)

3.	a)	Tell about Business intelligence and how it will useful in Data Analysis.	8 Marks	L2	CO1
	b)	Analyze the challenges and opportunities associated with implementing a data-driven business model.	8 Marks	L2	CO1

MODULE-II

4.	a)	Discuss the importance of data preparation in predictive analysis.	8 Marks	L2	CO2
	b)	Demonstrate Regression Analysis Model and explain its types.	8 Marks	L2	CO2

(OR)

5.	a)	Summarize the concept of Logistic Regression Analysis with suitable examples.	8 Marks	L3	CO2
	b)	Tell about various Applications in Predictive analytics.	8 Marks	L3	CO2

MODULE-III

6.	a)	Discuss the evolution of mobile payments and their implications for financial inclusion and economic development.	8 Marks	L3	CO3
	b)	Discuss the key components of digital finance.	8 Marks	L1	CO3

(OR)

7.	a)	Explain the concept of cryptocurrencies and their impact on the financial prospective.	8 Marks	L2	CO3
	b)	Analyze the impact of crowdfunding on traditional financing methods.	8 Marks	L3	CO3

MODULE-IV

8.	a)	What are various Applications in Blockchain Technology?	8 Marks	L3	CO4
	b)	Explain the functions of two major regulatory bodies in the finance.	8 Marks	L1	CO4

(OR)

9.	a)	Define what a regulatory sandbox is and outline its primary objectives.	8 Marks	L2	CO4
	b)	Discuss the potential benefits and risks of using AI algorithms in financial markets.	8 Marks	L2	CO4

MODULE-V

10.		Compare and contrast machine learning and traditional statistical models in credit risk assessment.	16 Marks	L3	CO5

(OR)

11.	a)	Discuss the key principles of GDPR and explain how they guide the processing of personal data.	8 Marks	L2	CO5
	b)	Explain the concept of predictive analytics in financial services.	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA IV Semester (MBU-22) Regular Examinations, April – 2026

BUSINESS LAW

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is the legality of object consideration?	2 Marks	L1	CO1
	b)	How does the contract get discharged by performance?	2 Marks	L1	CO1
	c)	State essentials of the doctrine of caveat emptor.	2 Marks	L1	CO1
	d)	Who is unpaid seller explain?	2 Marks	L1	CO1
	e)	Why is partnership necessary?	2 Marks	L1	CO1
	f)	Who is a Dormant Partner?	2 Marks	L1	CO1
	g)	State the contents of the Prospectus. (Any four)	2 Marks	L1	CO1
	h)	Explain effect of incorporation.	2 Marks	L1	CO1
	i)	Explain briefly National Commission.	2 Marks	L1	CO1
	j)	Distinguish between Environment and Environmental Law.	2 Marks	L1	CO1

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	What is meant by Free Consent? Explain the factors affecting Free Consent.	8 Marks	L2	CO1
	b)	Differentiate bailment and agency with examples.	8 Marks	L2	CO1
		(OR)			
3.	a)	What are the essential features of Contract of guarantee? Explain with an example.	8 Marks	L2	CO1
	b)	Explain about the duties of the principal towards his agent.	8 Marks	L2	CO1

MODULE-II

4.	a)	Who prepares an airway bill? What is the minimum liability of a carrier by air?	8 Marks	L2	CO2
	b)	State the respective Rights, Duties and Liabilities of Common carriers and Private carriers.	8 Marks	L2	CO2
		(OR)			
5.	a)	What is the conditions and types of conditions? Differentiate between condition and warranty.	8 Marks	L2	CO2
	b)	Explain the transfer of property doctrine of caveat emptor with an example.	8 Marks	L2	CO2

MODULE-III

6.	a)	The sharing of profits is only a prima facie evidence of partnership". Comment.	8 Marks	L2	CO3
	b)	Discuss in brief various modes of dissolution of firm under Indian Partnership Act, 1932.	8 Marks	L2	CO3
		(OR)			
7.	a)	Distinguish Partnership from i) Joint Hindu family business. ii) Joint Stock Company. iii) Co-ownership.	8 Marks	L2	CO3
	b)	Can a minor be admitted to a partnership? If so what are the rules governing his/her rights and liabilities during minority?	8 Marks	L2	CO3

MODULE-IV

8.	a)	Mention different kinds of Companies. Explain about any four companies.	8 Marks	L2	CO4
	b)	Write short notes: i) Conversion of a public company into a private company. ii) Small company.	8 Marks	L2	CO4
		(OR)			
9.	a)	Describe the documentary requirements for incorporation of a joint stock company.	8 Marks	L2	CO4
	b)	Distinguish a Company from Ordinary Partnership Firm.	8 Marks	L2	CO4

MODULE-V

10.	a)	How do you file a complaint regarding a defect in any goods and what is the procedure of hearing?	8 Marks	L2	CO5
	b)	Enumerate the general environmental regulations in force in India and discuss their subject-matters.	8 Marks	L2	CO5
		(OR)			
11.	a)	Give a summarized view of the Consumer Protection Act 1986.	8 Marks	L2	CO5
	b)	Describe the legislations in force that seek to provide protection to wildlife and forests.	8 Marks	L2	CO5

CODE No.: 22MG101034 MBU-22

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA IV Semester (MBU-22) Regular Examinations, April – 2026

STRATEGIC MANAGEMENT

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define Strategic Management.	2 Marks	L1	CO1
	b)	State any two external factors shaping strategy.	2 Marks	L1	CO1
	c)	Define market life cycle.	2 Marks	L1	CO2
	d)	What is experience curve?	2 Marks	L1	CO2
	e)	Define retrenchment strategy.	2 Marks	L1	CO3
	f)	What is combination strategy?	2 Marks	L1	CO3
	g)	Define strategic leadership.	2 Marks	L1	CO4
	h)	What is planning system?	2 Marks	L1	CO4
	i)	Define strategic audit.	2 Marks	L1	CO5
	j)	What is feedback in strategic management?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Discuss the role of objectives and policies in strategic management.	16 Marks	L2	CO1
	(OR)			
3.	Explain the concept of core competence with suitable examples	16 Marks	L2	CO1

MODULE-II

4.	Discuss BCG Matrix and its strategic implications.	16 Marks	L2	CO2
	(OR)			
5.	Explain organizational learning and its role in strategic management.	16 Marks	L2	CO2

MODULE-III

6.	Describe functional level strategies and their importance.	16 Marks	L3	CO3
	(OR)			
7.	Describe combination strategy and its relevance.	16 Marks	L3	CO3

MODULE-IV

8.	Describe vertical and horizontal integration strategies.	16 Marks	L3	CO4
	(OR)			
9.	Explain the importance of resource allocation in strategy implementation.	16 Marks	L2	CO4

MODULE-V

10.	Describe benchmarking as a tool for performance evaluation.	16 Marks	L3	CO5
	(OR)			
11.	Explain strategic surveillance and strategic audit.	16 Marks	L2	CO5

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BBA IV Semester (MBU-22) Regular Examinations, April – 2026

CONSUMER BEHAVIOUR

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Name two examples of low involvement products.	2 Marks	L1	CO1
	b)	What is problem recognition in the buying process?	2 Marks	L1	CO1
	c)	Who are reference groups?	2 Marks	L1	CO2
	d)	What is meant by aspirational reference group?	2 Marks	L1	CO2
	e)	What is meant by feedback in consumer behaviour models?	2 Marks	L1	CO3
	f)	What is the EKB Model of consumer behaviour?	2 Marks	L1	CO3
	g)	What is meant by social proof?	2 Marks	L1	CO4
	h)	Define personalized advertising.	2 Marks	L1	CO4
	i)	What is consumer acculturation?	2 Marks	L1	CO5
	j)	What is meant by global market segmentation?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	Explain industrial buying behaviour and discuss the stages involved in the industrial buying process.	16 Marks	L2	CO1

(OR)

3.	Differentiate between consumer buying behaviour and industrial buying behaviour with examples.	16 Marks	L2	CO1

MODULE-II

4.	Explain socio-cultural influences on consumer behaviour with suitable examples.	16 Marks	L2	CO2

(OR)

5.	Explain the concept of opinion leadership and explain how marketers can use opinion leaders effectively.	16 Marks	L2	CO2

MODULE-III

6.	Explain the EKB Model of consumer behaviour, describing each stage of the decision-making process.	16 Marks	L2	CO3

(OR)

7.	Illustrates the role of information input and information processing in the EKB Model.	16 Marks	L2	CO3

MODULE-IV

8.	Explain how personalized advertising influences consumer decision-making.	16 Marks	L2	CO4
	(OR)			
9.	Illustrates the importance of transparency and ethics in marketing communication.	16 Marks	L2	CO4

MODULE-V

10.	Explain the difference between standardization and adaptation strategies in global marketing.	16 Marks	L2	CO5
	(OR)			
11.	Illustrates the role of culture, values, and lifestyle in shaping global consumer behaviour.	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

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BBA IV Semester (MBU-22) Regular Examinations, April – 2026

PERFORMANCE MANAGEMENT

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Enlist the features of Performance Management.	2 Marks	L2	CO1
	b)	Define Performance Appraisal.	2 Marks	L1	CO1
	c)	Define Mentoring.	2 Marks	L1	CO2
	d)	Enlist the four Counseling objectives.	2 Marks	L2	CO2
	e)	Define MBO.	2 Marks	L1	CO3
	f)	List the advantages of Ranking Method.	2 Marks	L1	CO3
	g)	Define Performance Management Skills.	2 Marks	L1	CO4
	h)	What are the functions of the Performance Assessment System?	2 Marks	L1	CO4
	i)	What is People Analytics?	2 Marks	L1	CO5
	j)	What are the objectives of Reskilling and Upskilling?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Illustrate the purpose and Significance of Performance Management System.	8 Marks	L2	CO1
	b)	What is Performance Planning? Explain the objectives of Performance Planning.	8 Marks	L2	CO1

(OR)

3.		Explain the Process of Performance Management.	16 Marks	L3	CO1

MODULE-II

4.		What are the responsibilities of a mentor and mentee and briefly explain the role and advantages of mentoring.	16 Marks	L3	CO2

(OR)

5.		State the process of Effective Counseling in Performance Management.	16 Marks	L3	CO2

MODULE-III

6.		How does the graphic rating scale method work, and what are its advantages and disadvantages?	16 Marks	L2	CO3

(OR)

7.	a)	What is Human Resource Accounting? Explain the features and importance of HRA.	8 Marks	L2	CO3
	b)	Explain the features and applications of the balanced scorecard.	8 Marks	L3	CO3

MODULE-IV

8.	Explain the objectives and importance of Performance Management Skills.	16 Marks	L3	CO4
	(OR)			
9.	What are the different methods of employee assessment commonly used in performance management?	16 Marks	L2	CO4

MODULE-V

10.	How can organizations ensure that annual reviews contribute to employee development rather than being merely evaluative?	16 Marks	L2	CO5
	(OR)			
11.	How can HR professionals measure and assess employee well-being within the organization?	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA IV Semester (MBU-22) Regular Examinations, April – 2026

STRATEGIC MANAGEMENT

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is meant by strategy?	2 Marks	L1	CO1
	b)	State one objective of strategic management.	2 Marks	L1	CO1
	c)	Define Porter's Five Forces Model.	2 Marks	L1	CO2
	d)	What is BCG Matrix?	2 Marks	L1	CO2
	e)	Define business-level strategy.	2 Marks	L1	CO3
	f)	What is functional-level strategy?	2 Marks	L1	CO3
	g)	Define defensive strategy.	2 Marks	L1	CO4
	h)	What is vertical integration?	2 Marks	L1	CO4
	i)	Define benchmarking.	2 Marks	L1	CO5
	j)	What is operational control?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain how companies craft strategies for competitive advantage.	8 Marks	L2	CO1
	b)	Discuss the role of strategic vision in guiding organizational direction.	8 Marks	L1	CO1

(OR)

3.	Explain the concept of Strategic Management in detail. How does it differ from traditional management practices, and why is it considered essential for modern organizations operating in dynamic environments?	16 Marks	L2	CO1

MODULE-II

4.	a)	Explain SWOT analysis with advantages and limitations.	8 Marks	L2	CO2
	b)	Discuss the TOWS Matrix and its role in strategy formulation.	8 Marks	L1	CO2

(OR)

5.	Explain Porter's Five Forces Model in detail. How can organizations use this framework to assess industry attractiveness and formulate competitive strategies? Illustrate with examples from a chosen industry.	16 Marks	L2	CO2

MODULE-III

6.	Explain the formulation of strategy at the corporate level. How do corporate-level strategies influence diversification, resource allocation, and overall organizational direction?	16 Marks	L2	CO3

(OR)

7.	Critically evaluate the Stability Strategy as a strategic alternative. Under what circumstances is stability preferred, and what are its advantages and limitations?	16 Marks	L3	CO3

MODULE-IV

8.	a)	Discuss the importance of tailoring strategy to industry situations.	8 Marks	L1	CO4
	b)	Explain the role of leadership in strategy implementation.	8 Marks	L2	CO4
		(OR)			
9.	a)	Explain organizational alignment in strategy execution.	8 Marks	L2	CO4
	b)	Discuss the importance of operational strategies in implementation.	8 Marks	L1	CO4

MODULE-V

10.	Discuss the role of the strategist in establishing and maintaining strategic controls. How do strategists balance monitoring, evaluation, and adaptation in dynamic business environments?	16 Marks	L1	CO5
	(OR)			
11.	Examine the importance of strategic information systems in supporting strategic control. How do these systems facilitate decision-making, monitoring, and feedback processes?	16 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA IV Semester (MBU-22) Regular Examinations, April – 2026

INTERNATIONAL FINANCIAL MANAGEMENT

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is Disequilibrium?	2 Marks	L1	CO1
	b)	Define Balance of Payments.	2 Marks	L1	CO1
	c)	Define SWIFT.	2 Marks	L1	CO2
	d)	What is indirect quotation?	2 Marks	L1	CO2
	e)	What is meant by forward premium and forward discount?	2 Marks	L1	CO3
	f)	What is the role of inflation differentials in PPP?	2 Marks	L1	CO3
	g)	Define back-to-back loans.	2 Marks	L1	CO4
	h)	What is hedging?	2 Marks	L1	CO4
	i)	Define Yankee bond.	2 Marks	L1	CO5
	j)	What is euro note?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Critically evaluate the operations and performance of International Monetary Fund in recent years.	16 Marks	L5	CO1
	(OR)			
3.	Explain the origin, objectives and functions of International Monetary Fund.	16 Marks	L2	CO1

MODULE-II

4.	Define quotation. Explain direct and indirect quotations with appropriate example.	16Marks	L2	CO2
	(OR)			
5.	What is arbitrage? How local and triangular arbitrage eliminates foreign exchange risk?	16Marks	L3	CO2

MODULE-III

6.	Explain the Purchasing Power Parity theory and examine its relevance in international trade.	16Marks	L2	CO3
	(OR)			
7.	Distinguish between absolute and relative PPP and illustrate with suitable examples.	16Marks	L2	CO3

MODULE-IV

8.	Explain the methods by which translation exposure can be measured.	16Marks	L2	CO4
	(OR)			
9.	How are currency forward contracts different from currency future contracts?	16Marks	L2	CO4

MODULE-V

10.	What is foreign bond? Discuss the features and types of foreign bonds.	16 Marks	L2	CO5
	(OR)			
11.	Illustrate the characteristics of American Depository Receipts.	16 Marks	L3	CO5

CODE No.: 22MG201029 MBU-22

Reg. No. | | | | | | | | | | | | |

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SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA IV Semester (MBU-22) Regular Examinations, April – 2026

FINANCIAL DERIVATIVES

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	List out the types of derivatives.	2 Marks	L1	CO1
	b)	Who are the participants in derivative markets?	2 Marks	L1	CO1
	c)	What is the mode of settlement in futures?	2 Marks	L1	CO2
	d)	Write about forwards contract.	2 Marks	L1	CO2
	e)	Define put option.	2 Marks	L1	CO3
	f)	Name the valuation of pricing.	2 Marks	L1	CO3
	g)	Write about strip.	2 Marks	L1	CO4
	h)	Name the call parity.	2 Marks	L1	CO4
	i)	What is mechanics of interest rate swaps?	2 Marks	L1	CO5
	j)	What is MIBOR?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Briefly explain different types market participants in derivatives market.	16 Marks	L2	CO1
	(OR)			
3.	Explain the trading process in derivatives market.	16 Marks	L2	CO1

MODULE-II

4.	Write about the Meaning, characteristics, pricing and Pay-offs of forward contract.	16 Marks	L2	CO2
	(OR)			
5.	Summarize futures contract. What are the features of futures contract?	16 Marks	L2	CO2

MODULE-III

6.	What is options contract? Explain its features.	16 Marks	L2	CO3
	(OR)			
7.	Write about various types' market participants in options markets.	16 Marks	L2	CO3

MODULE-IV

8.	Summarize Strangle Strategy. How and when is it created? Explain.	16 Marks	L2	CO4
	(OR)			
9.	What is straddle Strategy? Explain with suitable example.	16 Marks	L2	CO4

MODULE-V

10.	Distinguish between forward rate agreement and interest rate futures.	16 Marks	L2	CO5
	(OR)			
11.	Discuss the various types of swaps and their features.	16 Marks	L2	CO5

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SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA IV Semester (MBU-22) Regular Examinations, April – 2026

INTERNATIONAL HUMAN RESOURCE MANAGEMENT

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List any three objectives of IHRM.	2 Marks	L1	CO1
	b)	What is meant by global leadership?	2 Marks	L1	CO1
	c)	List any three methods of global staffing.	2 Marks	L2	CO2
	d)	State the importance of job specification in IHRM.	2 Marks	L2	CO2
	e)	State the importance of global selection.	2 Marks	L1	CO3
	f)	List any three methods of career planning.	2 Marks	L1	CO3
	g)	What is meant by the fundamentals of training?	2 Marks	L1	CO4
	h)	List any three methods of incentives.	2 Marks	L2	CO4
	i)	What is meant by women grievance cell?	2 Marks	L1	CO5
	j)	List any three methods of administration.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	Illustrate the role of HR Manager in business organizations with examples.	16 Marks	L2	CO1
	(OR)			
3.	Mention the significance of IHRM and how it interconnected to other departments. Explain.	16 Marks	L2	CO1

MODULE-II

4.	Illustrates the process involved in e-Recruitment. How does it differ from traditional recruitment?	16 Marks	L1	CO2
	(OR)			
5.	What are the challenges faced by recruitment manager to attract the potential candidates in present business environment? Explain.	16 Marks	L2	CO2

MODULE-III

6.	Explain in detail the various employees training programs followed in MNC's.	16 Marks	L2	CO3
	(OR)			
7.	Illustrates the external factors affecting recruitment in industries.	16 Marks	L2	CO3

MODULE-IV

8.	Infer various compensation strategies followed in other countries.	16 Marks	L2	CO4
	(OR)			
9.	What are the factors influences compensation management? Explain.	16 Marks	L2	CO4

MODULE-V

10.	Illustrates the benefits of a global compensation system.	16 Marks	L2	CO5
	(OR)			

11.	What are various causes of employee compensation? Explain.	16 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA IV Semester (MBU-22) Regular Examinations, April – 2026

ORGANIZATIONAL CHANGE AND DEVELOPMENT

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What are the causes of organizational resistance to change?	2 Marks	L1	CO1
	b)	State the economic causes of resistance to change by the individuals.	2 Marks	L1	CO1
	c)	What is the difference between the Kotter model and ADKAR model?	2 Marks	L1	CO2
	d)	Why Your Organization Should use Lewin's Change Theory?	2 Marks	L1	CO2
	e)	Mention the characteristics of OD.	2 Marks	L1	CO3
	f)	What is systems theory?	2 Marks	L1	CO3
	g)	What are the different types of Team Building Intervention?	2 Marks	L1	CO4
	h)	What is a problem-solving team building intervention method?	2 Marks	L1	CO4
	i)	What is Microcosm?	2 Marks	L1	CO5
	j)	What is a consultant model?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the various types and forms of change. How to manage different resistance to change?	8 Marks	L2	CO1
	b)	Change is highly important to the success of an organization, but many people have the tendency, overtly or covertly to resist it." How do you think resistance to change can be overcome?	8 Marks	L2	CO1

(OR)

3.	a)	Why are organizational changes often resisted by individuals and groups within the organization? How can such resistance be prevented or overcome?	8 Marks	L2	CO1
	b)	Discuss the different forces of change.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the McKinsey 7S model. How to apply the McKinsey 7S model with an example.	8 Marks	L2	CO2
	b)	How to implement change with Kotter's 8-step change model?	8 Marks	L2	CO2

(OR)

5.	a)	List the five stages of grief and give an example of behaviors that may be observed during each stage.	8 Marks	L2	CO2
	b)	What is the ADKAR Model and How To Use It (With Benefits)?	8 Marks	L2	CO2

MODULE-III

6.	a)	"The future of OD is bright, but only if the field continues to evolve." Discuss the statement.	8 Marks	L2	CO3
	b)	Define Organizational Development and explain its characteristics.	8 Marks	L2	CO3
		(OR)			
7.	a)	Explain goals and values of OD and also Identify the key factors in cultural change.	8 Marks	L2	CO3
	b)	Clarify the meaning of action research with the help of a model.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain Group and Team OD intervention.	8 Marks	L2	CO4
	b)	Explain Structural Interventions and their relevance to Organizational Development.	8 Marks	L2	CO4
		(OR)			
9.	a)	Explain Inter Group Interventions.	8 Marks	L2	CO4
	b)	Discuss the Obstacles in OD development.	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss the future of O.D.	8 Marks	L2	CO5
	b)	Explain the Mechanistic and organic systems and the contingency approach.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain the Issues in consultant–client relationships.	8 Marks	L2	CO5
	b)	Describe the conditions for failure and success in O.D.	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA IV Semester (MBU-22) Regular Examinations, April – 2026

INTEGRATED MARKETING COMMUNICATION

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List out the steps involved in the marketing communication process.	2 Marks	L2	CO1
	b)	What is encoding?	2 Marks	L1	CO1
	c)	List out any two unethical aspects of advertising.	2 Marks	L1	CO2
	d)	What is an advertising agency?	2 Marks	L1	CO2
	e)	What is media scheduling?	2 Marks	L1	CO3
	f)	What is celebrity endorsement?	2 Marks	L1	CO3
	g)	What is coupon?	2 Marks	L1	CO4
	h)	What is online sales promotion?	2 Marks	L2	CO4
	i)	Name any two disadvantages of public relation.	2 Marks	L2	CO5
	j)	List any two advantages of public relation.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	Explain Advertising as a mass communication. What is its role in marketing communication?	16 Marks	L2	CO1
	(OR)			
3.	What are the various Integrated Marketing Communication tools and how is each one of them important for the overall Marketing Communication function?	16 Marks	L2	CO1

MODULE-II

4.	What are the legal implications of Advertising? Explain.	16 Marks	L2	CO2
	(OR)			
5.	Classify the types of Advertisement Agency and explain in detail.	16 Marks	L2	CO2

MODULE-III

6.	How would you classify advertising copy? Explain.	16 Marks	L2	CO3
	(OR)			
7.	Explain the different types of advertisement.	16 Marks	L2	CO3

MODULE-IV

8.	How will you do sales promotion campaign? Explain with an example.	16 Marks	L2	CO4
	(OR)			
9.	What is online sales promotion? Explain its advantages and disadvantages.	16 Marks	L2	CO4

MODULE-V

10.	How will you measure the effectiveness of public relation? Explain.	16 Marks	L2	CO5
	(OR)			
11.	Explain the process of public relation and explain its importance.	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA IV Semester (MBU-22) Regular Examinations, April – 2026

PRODUCT AND BRAND MANAGEMENT

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	List out the factors influencing in design of a product.	2 Marks	L1	CO1
	b)	Mention any two responsibilities of a product manager.	2 Marks	L1	CO1
	c)	What is meant by packaging?	2 Marks	L1	CO2
	d)	State the types of product positioning errors.	2 Marks	L1	CO2
	e)	List any two essentials of a good brand.	2 Marks	L1	CO3
	f)	Mention any two reasons for brand decline.	2 Marks	L1	CO3
	g)	What is meant by customer-based brand equity?	2 Marks	L1	CO4
	h)	State any two causes of brand failure.	2 Marks	L1	CO4
	i)	What is meant by retail branding?	2 Marks	L1	CO5
	j)	Mention any two innovative methods in insurance branding.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Describe the classification of products and explain consumer and industrial products in detail.	16 Marks	L2	CO1

(OR)

3.	Examine the challenges faced by a product manager in a competitive market environment.	16 Marks	L4	CO1

MODULE-II

4.	Describe the process of new product development in detail with suitable examples.	16 Marks	L2	CO2

(OR)

5.	Explain the functions of packaging and labeling and their impact on consumer buying behavior.	16 Marks	L3	CO2

MODULE-III

6.	Describe the different types of brands and their relevance in marketing strategy.	16 Marks	L2	CO3

(OR)

7.	Discuss the concept of brand revitalization and the need for reviving mature or declining brands.	16 Marks	L3	CO3

MODULE-IV

8.	Describe the advantages of brand equity to both marketers and consumers with relevant examples.	16 Marks	L4	CO4

(OR)

9.	Explain the reasons for new brand failures in competitive markets.	16 Marks	L4	CO4

MODULE-V

10.	Discuss the role of branding in the retail sector. Explain how store image and private labels influence consumers.	16 Marks	L2	CO5
	(OR)			
11.	Brand differentiation in banking services is becoming increasingly difficult. Critically analyze this statement.	16 Marks	L5	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com IV Semester (MBU-22) Regular Examinations, April – 2026

RELATIONAL DATABASE MANAGEMENT SYSTEMS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	List any two applications of database systems.	2 Marks	L1	CO1
	b)	What is meant by schema?	2 Marks	L1	CO1
	c)	Define tuple and attribute.	2 Marks	L1	CO2
	d)	What is a primary key?	2 Marks	L1	CO2
	e)	What are aggregate functions?	2 Marks	L1	CO3
	f)	What is NULL value?	2 Marks	L1	CO3
	g)	What is access control?	2 Marks	L1	CO4
	h)	Define backup.	2 Marks	L1	CO4
	i)	What is transaction?	2 Marks	L1	CO5
	j)	Define concurrency control.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Describe the three levels of data abstraction with a neat diagram.	16 Marks	L2	CO1
	(OR)			
3.	Explain ER diagrams and their components.	16 Marks	L2	CO1

MODULE-II

4.	Discuss integrity constraints in the relational model.	16 Marks	L2	CO2
	(OR)			
5.	Explain views and their advantages.	16 Marks	L2	CO2

MODULE-III

6.	Discuss nested queries with suitable examples.	16 Marks	L2	CO3
	(OR)			
7.	Discuss procedures and functions in PL/SQL.	16 Marks	L2	CO3

MODULE-IV

8.	Discuss user management and access control mechanisms.	16 Marks	L2	CO4
	(OR)			
9.	Explain auditing and logging in databases.	16 Marks	L2	CO4

MODULE-V

10.	Discuss views and materialized views in detail.	16 Marks	L2	CO5
	(OR)			
11.	Explain cloud databases and their advantages.	16 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com IV Semester (MBU-22) Regular Examinations, April – 2026

PYTHON PROGRAMMING

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is an identifier? Write the rules for Identifiers.	2 Marks	L2	CO1
	b)	Develop a python program to find the area of a rectangle.	2 Marks	L3	CO1
	c)	What is 'if-else' statement in Python, write its syntax? Give an example.	2 Marks	L1	CO2
	d)	What is the continue statement, and how does it differ from break?	2 Marks	L1	CO2
	e)	What is a list comprehension? Provide an example.	2 Marks	L1	CO3
	f)	What is the use of f-string in string formatting?	2 Marks	L1	CO3
	g)	How do keyword arguments differ from positional arguments?	2 Marks	L1	CO4
	h)	How do you read and write data from and to a file in Python?	2 Marks	L1	CO4
	i)	How do you define a class in Python?	2 Marks	L1	CO5
	j)	What is polymorphism, and how is it implemented in Python?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain various types of Literals used in Python with examples.	8 Marks	L2	CO1
	b)	Construct a python program to illustrate the use of member ship and identity operators used in python.	8 Marks	L2	CO1

(OR)

3.	a)	What is Type Conversion? Explain the types of type conversion in Python with example.	8 Marks	L2	CO1
	b)	Develop a python program to find biggest of three numbers using logical "and".	8 Marks	L3	CO1

MODULE-II

4.	a)	Describe the working mechanism of a **for** loop. Provide examples that demonstrate how the loop functions.	8 Marks	L2	CO2
	b)	Develop a Python program to find whether the given number is palindrome or not using while loop.	8 Marks	L3	CO2

(OR)

5.	a)	Explain nested if statement in Python with syntax and flowchart.	8 Marks	L2	CO2
	b)	Write a Python program that checks whether a given year is a leap year using nested if statements.	8 Marks	L3	CO2

MODULE-III

6.	a)	What is the concept of nested tuples, and how can they be used to represent complex data structures?	8 Marks	L2	CO3
	b)	Write a Python script to print the second element of the second tuple from the given Tuple ((1, 2), (3, 4), (5, 6)).	8 Marks	L3	CO3

(OR)

7.	a)	Discuss the key operations on dictionaries in Python, including insertion, deletion, and searching. Provide examples for each.	8 Marks	L2	CO3
	b)	Write a Python script to perform Union and Intersection operations on Sets.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Discuss the need for functions in programming. How do functions enhance code reusability and modularity?	8 Marks	L2	CO4
	b)	Construct a Python program to implement a function that takes a list of numbers and returns a new list containing only the even numbers, using a lambda function.	8 Marks	L3	CO4

(OR)

9.	a)	Explain the different types of files that can be handled in Python.	8 Marks	L2	CO4
	b)	Construct a python script to read all the strings from the text file and display them.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain the principles of Object-Oriented Programming (OOP) with examples.	8 Marks	L2	CO5
	b)	Explain various types of Inheritance in Python with examples.	8 Marks	L2	CO5

(OR)

11.	a)	Define Constructor. Explain various types of constructors used in Python.	8 Marks	L2	CO5
	b)	Construct a Python script to illustrate the use of Parameterized Constructor.	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. II Semester (MBU-25) Regular Examinations, May – 2026

FOOD AND NUTRITION

[Biotechnology, Bioinformatics]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is the definition of food?	2 Marks	L1	CO1
	b)	Define nutrition.	2 Marks	L1	CO1
	c)	Explain how gender can be a factor affecting the Thermic Effect of Food.	2 Marks	L2	CO2
	d)	Define Basal Metabolic Rate (BMR).	2 Marks	L1	CO2
	e)	Define nutrients and provide examples of macronutrients and micronutrients.	2 Marks	L1	CO3
	f)	Differentiate between essential and non-essential nutrients. Give examples of each.	2 Marks	L4	CO3
	g)	What is the nutritional value of proteins in a diet?	2 Marks	L1	CO4
	h)	Why are proteins considered essential macronutrients for human health?	2 Marks	L1	CO4
	i)	What is the primary function of vitamin A in the body?	2 Marks	L1	CO5
	j)	What role does vitamin D play in the body?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Define food and nutrition. Explain different functions of food.	8 Marks	L1	CO1
	b)	Explore the role of genetics in determining individual nutritional requirements. How do genetic variations influence nutrient metabolism and the concept of personalized nutrition?	8 Marks	L3	CO1

(OR)

3.	a)	Write a brief account on basic five food groups.	9 Marks	L1	CO1
	b)	Analyze the role of food in cultural identity and social bonding. How do cultural practices and food rituals contribute to the social aspects of eating?	7 Marks	L4	CO1

MODULE-II

4.	a)	What are the different ways to determine the energy content of food?	6 Marks	L1	CO2
	b)	Examine the hormonal factors that influence the Thermic Effect of Food. How do hormones such as insulin, glucagon, and cortisol contribute to the regulation of postprandial energy expenditure?	10 Marks	L4	CO2

(OR)

5.	a)	Write a brief account on RQ.	8 Marks	L1	CO2
	b)	Define the Thermic Effect of Food (TEF) and elaborate on its components. How do the macronutrient composition and energy density of a meal influence TEF?	8 Marks	L1	CO2

MODULE-III

6.	a)	How do digestion and absorption of carbohydrates take place in the human body?	9 Marks	L1	CO3
	b)	Discuss the importance of macronutrients and micronutrients in the diet. Provide examples of each and explain their roles in maintaining health.	7 Marks	L2	CO3

(OR)

7.	a)	What are the sources and RDA of carbohydrates?	10 Marks	L1	CO3
	b)	Examine the concept of bioavailability in nutrient absorption. How does bioavailability vary among different nutrients, and what factors influence it?	6 Marks	L4	CO3

MODULE-IV

8.	a)	Discuss the nutritional value of proteins, considering their role in providing energy, amino acids, and supporting various physiological functions in the body.	8 Marks	L2	CO4
	b)	Explain diverse functions of the proteins in human body.	8 Marks	L2	CO4

(OR)

9.	a)	Examine the diverse functions of proteins in detail, including structural roles, enzymatic activities, immune function, and their significance in maintaining overall health.	10 Marks	L4	CO4
	b)	Elaborate on the process of protein digestion in the stomach and small intestine. How are complex proteins broken down into absorbable amino acids, and how are these absorbed into the bloodstream?	6 Marks	L2	CO4

MODULE-V

10.	a)	Name food sources rich in thiamine. What are the recommended daily intakes for vitamin B1?	8 Marks	L4	CO5
	b)	What are the recommended daily intakes for vitamin B1?	8 Marks	L1	CO5

(OR)

11.	a)	Discuss the dual role of vitamin A in both vision and immune function. How do retinoids and carotenoids contribute to these functions?	9 Marks	L4	CO5
	b)	Elaborate on the role of vitamin D in calcium metabolism and bone health. How does vitamin D synthesis in the skin contribute to maintaining adequate levels?	7 Marks	L5	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) Regular Examinations, April – 2026

POWER SYSTEM ANALYSIS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define PU system? List the applications of PU systems.	2 Marks	L1	CO1
	b)	The per-unit impedance of an alternator corresponding to base values 13.2 kV and 50 MVA is 0.1 pu. What is the p.u. value of the impedance for base values 13.8 kV and 100 MVA	2 Marks	L2	CO1
	c)	Write the significance of acceleration factor in load flow studies.	2 Marks	L1	CO2
	d)	Specify the quantities to determine at slack bus and generator bus.	2 Marks	L1	CO2
	e)	Discuss the importance of symmetrical fault analysis using Z-bus matrix.	2 Marks	L1	CO3
	f)	Write the equation for short circuit MVA.	2 Marks	L1	CO3
	g)	Define a single line-to-ground fault with example.	2 Marks	L1	CO4
	h)	Write the symmetrical components of currents in terms of phase currents.	2 Marks	L1	CO4
	i)	Define transient stability. Write the condition of stability in equal area criterion.	2 Marks	L1	CO5
	j)	List the methods to improve power system stability.	2 Marks	L1	CO5

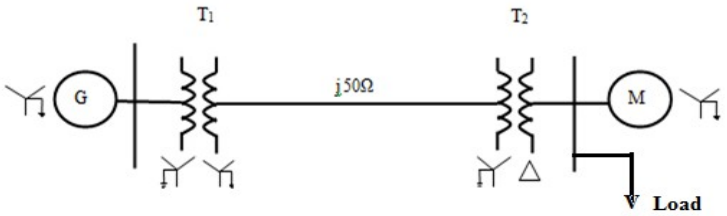
PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

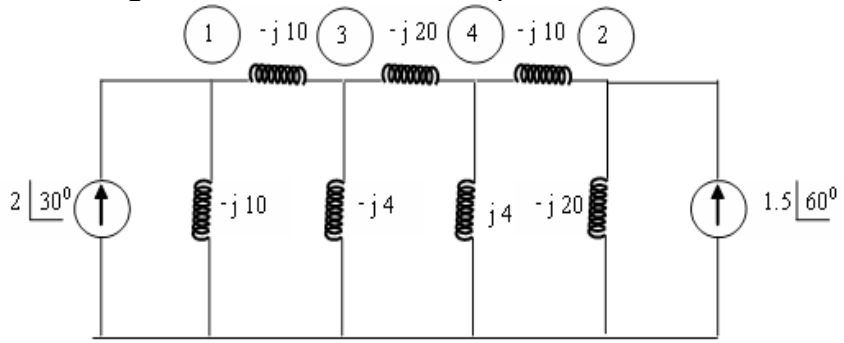
2.	a)	Define per unit system? Write its significance in power system.	4 Marks	L2	CO1
	b)	Draw the per unit reactance diagram for the power systems shown in figure. Neglecting resistance, use a base of 100 MVA, 220 kV in 50 Ohms line.	12Marks	L3	CO1



The ratings of the network components are:
G: 40 MVA, 25 kV, X'' = 20%;
M: 50 MVA, 11 kV, X'' = 30%;
T1:40 MVA, 33 Y / 220 Y kV, X = 15%;
T2: 30 MVA, 11 Δ /220Y kV, X = 15%,
Load: 11 kV, 50MW + j68 MVAR.

(OR)

3.	a)	Prove that when there is no mutual coupling the diagonal and off-diagonal elements of the bus admittance matrix can be computed as follows. $$Y_{ij} = \sum_{i=j} y_{ij} \text{ and } Y_{ij} = Y_{ji}$$	8 Marks	L3	CO1
	b)	Form Ybus by direct inspection method for the given power system shown in Figure with reactance value in p.u.	8 Marks	L3	CO1



MODULE-II

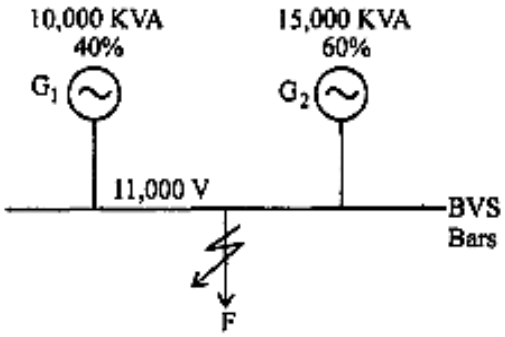
4.	a)	Define acceleration factor. Write is its significance in GS-method for power flow studies.	6 Marks	L1	CO2
	b)	In a 2-Bus power system with Bus-1 as slack bus, V_1= 1.0∠0° p.u ,P_2=1 and Q_2= 0.5 p.u. with Z_{12}= 0.012+j0.16 p.u. Using GS-method, determine V_2 after second iteration. Also find the line flows and line losses?	10 Marks	L3	CO2

(OR)

5.	a)	Develop the load flow equations suitable for N-R method in polar co-ordinates.	8 Marks	L3	CO2
	b)	With flow chart, analyze the computational procedure for load flow solution using decoupled method and also derive the necessary equations.	8 Marks	L4	CO2

MODULE-III

6.	a)	Derive the equation to calculate symmetrical fault of power system using Z-bus matrix.	8 Marks	L3	CO3
	b)	Consider the system shown in Figure. The percentage reactance of each alternator is expressed on its own capacity determine the short circuit current that will flow into a dead three phase short circuit at F.	8 Marks	L3	CO3



(OR)

7.	a)	Why do we use reactors in the power system? Discuss the different types of reactors used in power systems.	8 Marks	L1	CO3
	b)	A three phase fault with a fault impedance of 0.16 p.u. occurs at bus 3 , for which Z_{BUS} is given by :	8Marks	L3	CO3

$$Zbus = \begin{bmatrix} 0.016j & 0.08j & 0.12j \\ 0.08j & 0.24j & 0.16j \\ 0.12j & 0.16j & 0.34j \end{bmatrix}$$

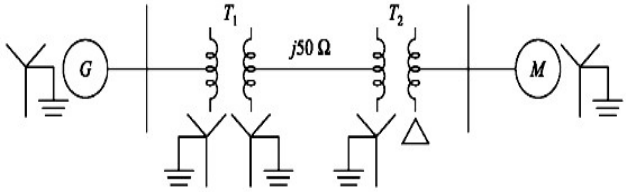
Compute the fault current, the bus voltages and the line currents during the fault. Assume pre-fault bus voltages 1.0 per unit.

MODULE-IV

8.	a)	Develop the zero sequence reactance diagram of a transformer when the primary and secondary windings are connected as, grounded Y/Delta, ungrounded Y/ Delta and in Delta/Delta connections.	8 Marks	L3	CO4
	b)	Discuss the importance of symmetrical components. How will you convert a phase quantity into symmetrical components and vice versa?	8 Marks	L2	CO4

(OR)

9.	a)	Derive the necessary equation to determine the fault current for Double line to ground fault with fault impedance. Sketch the connection diagram of the sequence network for LLG fault.	8 Marks	L3	CO4
	b)	Develop the positive, negative and zero sequence networks for the power system network shown in figure.	8 Marks	L3	CO4

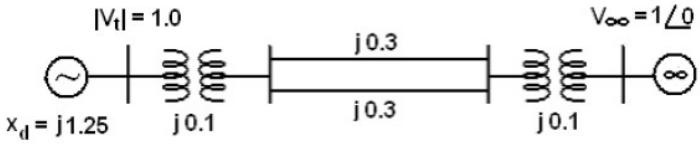


MODULE-V

10.	a)	Illustrate the transient stability by using equal area criterion.	8 Marks	L2	CO5
	b)	A 200 MVA, 2 pole, 50 Hz alternator has a moment of inertia of 50,000 Kg-m2. What is the energy stored in the rotor at the rated speed? Find the value of H and determine the corresponding angular momentum.	8 Marks	L3	CO5

(OR)

11.	a)	Define clearing angle and also explain its effect upon the stability. Obtain an expression for the same.	8 Marks	L2	CO5
	b)	A generator supplies 1.0PU. power to an infinite bus as shown in figure. The terminal voltage and infinite bus voltage are 1.0 PU. All the reactance's are on a common base.	8 Marks	L3	CO5



Determine steady state stability limit when both lines are in and when one line is switched off.

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) Regular Examinations, April – 2026

CLOUD COMPUTING

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What are the main goals of cloud computing?	2 Marks	L1	CO1
	b)	Define elasticity in cloud computing.	2 Marks	L2	CO1
	c)	What are the key features of the Cloud Cube model?	2 Marks	L2	CO2
	d)	Explain SaaS with a simple example.	2 Marks	L1	CO2
	e)	What are the key characteristics of Software as a Service (SaaS)?	2 Marks	L3	CO3
	f)	What is meant by IDaaS interoperability?	2 Marks	L3	CO3
	g)	What is Platform as a Service (PaaS)?	2 Marks	L3	CO4
	h)	Name any two services offered by Google Web Services for PaaS.	2 Marks	L2	CO4
	i)	Define Amazon Machine Images (AMI's).	2 Marks	L3	CO5
	j)	What are the key features of Amazon S3?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe the goals and benefits of cloud computing and explain it's characteristics.	8 Marks	L2	CO1
	b)	Describe VMware and its significance in virtualization and give real World Applications of VMware.	8 Marks	L2	CO1

(OR)

3.	a)	Discuss the use cases and benefits of Hybrid cloud deployment and Explain the Community cloud model with suitable examples.	8 Marks	L5	CO1
	b)	Discuss the advantages and disadvantages of virtualization and explain any two types of virtualization with example.	8 Marks	L4	CO1

MODULE-II

4.	a)	Compare and contrast the four cloud deployment models: Public, Private, Hybrid, and Community, with examples.	8 Marks	L4	CO2
	b)	What are communication protocols in cloud computing? Explain their importance with examples.	8 Marks	L3	CO2

(OR)

5.	a)	Provide a detailed explanation of the key components of cloud architecture, including infrastructure, platforms, and applications.	8 Marks	L5	CO2
	b)	Discuss the evolution of cloud computing and its impact on modern IT infrastructure and business models.	8 Marks	L4	CO2

MODULE-III

6.	a)	Provide a detailed analysis of Salesforce.com as a CRM SaaS platform.	8 Marks	L4	CO3
	b)	Explain system metrics and their significance in monitoring cloud performance.	8 Marks	L3	CO3

(OR)

7.	a)	Discuss the concept of networked identity and its implementation in IDaaS.	8 Marks	L3	CO3
	b)	Describe the process of defining a baseline in capacity planning and What is load testing, and why is it important?	8 Marks	L2	CO3

MODULE-IV

8.	a)	How does the Google Toolkit support application development in Google Web Services?	8 Marks	L3	CO4
	b)	Explain the significance of the Wolf framework and its unique features in PaaS.	8 Marks	L3	CO4

(OR)

9.	a)	Discuss the impact of Windows Azure on enterprise application development using PaaS.	8 Marks	L2	CO4
	b)	Describe the process of defining baseline measurements in capacity planning.	8 Marks	L2	CO4

MODULE-V

10.	a)	Analyze the functionalities and use cases of Amazon Elastic Block Store (EBS).	8 Marks	L5	CO5
	b)	Describe the functionality and advantages of Amazon Relational Database Service (RDS).	8 Marks	L4	CO5

(OR)

11.	a)	Define Amazon EBS? & list factors of choosing AWS database.	8 Marks	L3	CO5
	b)	Explain Amazon Storage service S3 with an example	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) Regular Examinations, April – 2026

CLOUD COMPUTING

[Computer Science and Engineering (Artificial Intelligence and Machine Learning), Computer Science and Engineering (Data Science), Information Technology, Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Cloud Computing according to NIST.	2 Marks	L1	CO1
	b)	Mention any two cloud characteristics.	2 Marks	L1	CO1
	c)	What is server virtualization?	2 Marks	L1	CO1
	d)	What is multitenancy?	2 Marks	L1	CO1
	e)	Define Private Cloud.	2 Marks	L1	CO2
	f)	What is Platform as a Service (PaaS)?	2 Marks	L2	CO2
	g)	What is CRM SaaS?	2 Marks	L1	CO3
	h)	What is cloud interoperability?	2 Marks	L1	CO3
	i)	Define Amazon Cloud Front.	2 Marks	L1	CO5
	j)	What is Amazon RDS?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the evolution and origin of Cloud Computing.	8 Marks	L2	CO1
	b)	Discuss advantages of Cloud Computing over traditional computing.	8 Marks	L2	CO1
		(OR)			
3.	a)	Explain types of virtualization technologies.	8 Marks	L3	CO1
	b)	Compare Xen, VMware, and Hyper-V.	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain cloud computing architecture.	8 Marks	L2	CO2
	b)	Describe cloud deployment models.	8 Marks	L2	CO2
		(OR)			
5.	a)	Explain cloud computing stack.	8 Marks	L2	CO2
	b)	Compare Jolicloud OS and Chromium OS.	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain SaaS application architecture.	8 Marks	L2	CO3
	b)	Discuss advantages and limitations of SaaS.	8 Marks	L2	CO3
		(OR)			
7.	a)	Explain IDaaS architecture and security issues.	8 Marks	L3	CO3
	b)	Discuss cloud service integration challenges.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain capacity planning metrics in cloud environments.	8 Marks	L3	CO4
	b)	Discuss storage capacity planning techniques.	8 Marks	L3	CO4
		(OR)			
9.	a)	Explain elastic scaling in cloud computing.	8 Marks	L3	CO4
	b)	Discuss load balancing techniques in the cloud.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain EC2 instance lifecycle.	8 Marks	L2	CO5
	b)	Discuss EC2 security mechanisms.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain Amazon S3 architecture.	8 Marks	L2	CO5
	b)	Compare Cloud Front and S3.	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) Regular Examinations, April – 2026

OPERATIONS RESEARCH

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Operations Research	2 Marks	L1	CO1
	b)	What is linear programming?	2 Marks	L1	CO1
	c)	Define an assignment Problem.	2 Marks	L1	CO2
	d)	What is optimality test in transportation problem?	2 Marks	L1	CO2
	e)	Define Game Theory.	2 Marks	L1	CO3
	f)	What is a zero-sum game in Game Theory?	2 Marks	L1	CO3
	g)	What is a Minimal Spanning Tree (MST)?	2 Marks	L2	CO4
	h)	Define the Shortest Path Problem in the context of network flow model.	2 Marks	L3	CO4
	i)	What is the Infinite Queue Length Model in queuing theory?	2 Marks	L1	CO5
	j)	Define Exponential service time.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss the steps involved in solving LPP Using Graphical method?	8 Marks	L1	CO1
	b)	Write the applications of Operations Research	8 Marks	L1	CO1

(OR)

3. Solve LP problem by Big-M method — 16 Marks, L3, CO1

$$Min z = 2x_1 + x_2$$

Subjected to

$$3x_1 + x_2 = 3$$
$$4x_1 + 3x_2 \geq 6$$
$$x_1 + 2x_2 \leq 4$$
$$x_1, x_2 \ and \ x_3 \leq 0$$

MODULE-II

4. Find the optimal solution to the following transportation problem — 16 Marks, L3, CO2

Destination						
Origin		P	Q	R	S	Supply
	A	21	16	25	13	11
	B	17	18	14	23	13
	C	32	17	18	41	19
	demand	6	10	12	15	43

(OR)

5. Solve the assignment problem using Hungarian method — 16 Marks, L3, CO2

	Machines			
Jobs	A	B	C	D
1	5	7	11	16
2	8	5	9	6
3	4	7	10	7
4	10	4	8	3

MODULE-III

6. a) Explain various costs involved in inventory control. 6 Marks L1 CO3

b) A supplier is required to deliver 20000 tons of raw materials in one year to a large manufacturing organization. The supplier maintains his go-down to store the material received from various resources. He finds that cost of inventory holding is 30 paisa per ton per month. His cost for ordering the material is Rs. 400. One of the conditions of the supplier contract from the manufacturing organization is that the contract will be terminated in the event of supply not being maintained as a schedule. Determine : i) in what lot size is the supplier should produce the material for minimum total associated cost of inventory? ii) At what time interval should he procure the material? It may be assumed that replacement of inventory is instantaneous. 10 Marks L2 CO3

(OR)

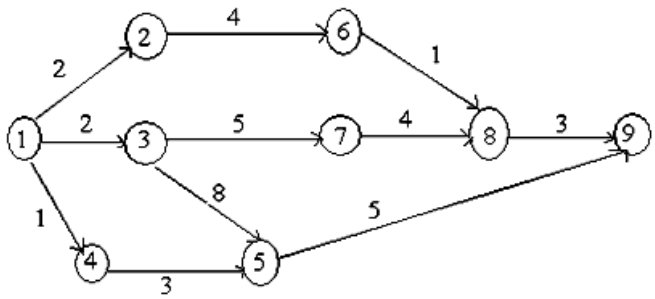
7. a) Explain the theory of dominance in the solution of rectangular games. 6 Marks L1 CO3

b) Solve the game whose payoff matrix is given below: 10 Marks L3 CO3

		Player B				
		B1	B2	B3	B4	B5
Player A	A1	-2	5	-3	6	7
	A2	4	6	8	-1	-6
	A3	8	2	3	5	4
	A4	15	14	18	12	20

MODULE-IV

8. Find the critical path and calculate the slack time for the following network 16 Marks L3 CO4



(OR)

9. Construct a PERT network and find the critical path for following 16 Marks L3 CO4

Activity	Most optimistic time	Most pessimistic time	Most likely time
(1-2)	1	5	1.5
(2-3)	1	3	2
(2-4)	1	5	3
(3-5)	3	5	4
(4-5)	2	4	3
(4-6)	3	7	5
(5-7)	4	6	5
(6-7)	6	8	7

(7-8)	2	6	4
(7-9)	5	8	6
(8-10)	1	3	2
(9-10)	3	7	5

MODULE-V

10. An oil company is constructing a service station on a high way. Traffic analysis indicated that customers' arrivals over most of the day would approximate a poisson distribution with a mean of 40 automobiles per hour, with that service time distribution approximating the negative exponential. If 5 pumps are installed. 16 Marks L3 CO5

i) What is the probability that an arrival would have to wait in line

ii) Find out the average waiting time, average time spent in the system and the average number of automobiles in the system.

(OR)

11. A dentist schedules all her patients for 30 minutes appointments. Some of the patients take more or less than 30 minutes depending on the type of dental work to be done. The following summary shows the various categories of work, their probabilities and time needed to complete the work. 16 Marks L3 CO5

Category	Time required (Minutes)	Probability of category
Filling	45	0.4
Crown	60	0.15
Cleaning	15	0.15
Extraction	45	0.1
Checkup	15	0.2

Simulate the dentist's clinic for four hours and determine the average waiting time for the patients as well as the idleness of the doctor. Assume that all the patients show up at the clinic at exactly their scheduled arrival times, starting at 8 A.M. Use the following random numbers for handling the above problem: 40, 82, 11, 34, 25, 66, 17, 79.

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) Regular Examinations, April – 2026

DESIGN OF TRANSMISSION SYSTEMS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Name the various flexible power transmission drives.	2 Marks	L1	CO1
	b)	Choose a belt drive suitable to transmit power above 100KW at short distances.	2 Marks	L3	CO1
	c)	State the law of gearing.	2 Marks	L1	CO2
	d)	Interpret the significance of i) pressure angle and ii) diametral pitch in gear performance.	2 Marks	L2	CO2
	e)	Identify a real-world machine where bevel gears are used and justify their selection.	2 Marks	L3	CO3
	f)	Differentiate between the spiral bevel gears and hypoid gears.	2 Marks	L1	CO3
	g)	Recommend which gear type is more appropriate for automotive rear axles and justify your choice.	2 Marks	L3	CO4
	h)	Specify the four types of gear box.	2 Marks	L1	CO4
	i)	What is the function of the piston in an I.C engine?	2 Marks	L1	CO5
	j)	Evaluate the advantages and limitations of aluminum alloy pistons compared to cast iron in high-performance engines.	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	Design a suitable drive to transmit 20 kW from a motor pulley of 100 mm diameter running at 1440 rpm to a compressor shaft running at 450 rpm. The centre distance between the shafts is 1.2 m. The load factor may be taken as 1.2.	16 Marks	L3	CO1

(OR)

3.	Select a wire rope to lift 10 kN of debris from a mine shaft 600 m deep. The weight of the bucket is 2.5 kN. The maximum velocity of 20 m/s is attained in 5 seconds.	16 Marks	L3	CO1

MODULE-II

4.	A 37.5 kW power is transmitted at 450 rpm to a shaft running at approximately 112 rpm through a spur gear drive. The load is steady and continuous. Design the gear drive and check the design. Assume the following materials: Pinion-heat treated cast steel; Gear-High grade cast iron.	16 Marks	L3	CO2

(OR)

5.	A pair of helical gears with 30° helix angle is used to transmit 15 kW at	16 Marks	L2	CO2

10 000 r.p.m. of the pinion. The velocity ratio is 4 : 1. Both the gears are to be made of hardened steel of static strength 100 N/mm2. The gears are 20° stub and the pinion is to have 24 teeth. The face width may be taken as 14 times the module. Find the module and face width from the standpoint of strength and check the gears for wear.

MODULE-III

6.	Design a pair of bevel gears to transmit 10 kW at 1440 rpm of th pinion. The velocity ratio should be about 4. Material for gear is 1 5 N i 2 C r 1M o 1 5 Steel. The tooth profiles of the gears are of 20 º composite form.	16 Marks	L3	CO3
	(OR)			
7.	Design a cast iron bevel gear drive for a pillar drilling machine to transmit 1875 Watts at 800 rpm to a spindle at 400 rpm. The gear is to work for 40 hrs /week for 3 years. Pressure angle is 20º.	16 Marks	L3	CO3

MODULE-IV

8.	Design a 16 speed gear box for the following data. Minimum speed: 100 rpm, step ratio is 1.25. The input is from a 5 kW, 1000rpm motor. Draw the speed diagram, kinematic diagram and indicate the number of teeth on each gear.	16 Marks	L3	CO4
	(OR)			
9.	A six speed gear box is required to provide output speeds in the range of 125 to 400 rpm with a step ratio of 1.25 and transmit a power of 5 kW at 710 rpm. Draw the speed diagram and kinematics diagram. Determine the number of teeth module and face width of all gears, assuming suitable materials for the gears. Determine the length of the gear box along the axis of the gear shaft.	16 Marks	L3	CO4

MODULE-V

10.	A four stroke diesel engine has the following specifications :Brake power = 15 kW ; Speed = 1500 r.p.m. ; Indicated mean effective pressure = 0.45 N / mm ^{2} ;Mechanical efficiency = 70 %.Determine: 1. bore and length of the cylinder; 2. thickness of the cylinder head ; and 3. size of studs for the cylinder head.	16 Marks	L3	CO5
	(OR)			
11.	Design a cast iron piston for a single acting four stroke engine for the following data: Cylinder bore = 120 mm ; Stroke = 155 mm ; Maximum gas pressure = 7 N/mm2 ; Indicated mean effective pressure = 0.75 N/mm2 ; Mechanical efficiency = 85% ; Fuel consumption = 0.15 kg per brake power per hour ; Higher calorific value of fuel = 42 × 103 kJ/kg ; Speed = 2400 r.p.m. Any other data required for the design may be assumed.	16 Marks	L4	CO5

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SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) Regular Examinations, April – 2026

COMPUTER AIDED DESIGN AND MANUFACTURING

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Computer-Aided Design (CAD).	2 Marks	L1	CO1
	b)	Mention two types of manufacturing systems used in CIM.	2 Marks	L1	CO1
	c)	What is Raster Scan Graphics?	2 Marks	L1	CO2
	d)	List any two 2D transformations.	2 Marks	L1	CO2
	e)	Define part programming in CNC.	2 Marks	L1	CO3
	f)	State the importance of work holding devices in CNC.	2 Marks	L1	CO3
	g)	What is the purpose of RFID in manufacturing?	2 Marks	L1	CO4
	h)	Mention any two benefits of CAPP.	2 Marks	L1	CO4
	i)	State the laws of robotics.	2 Marks	L1	CO5
	j)	Name two types of automation systems.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the design process in Computer-Aided Design (CAD).	8 Marks	L2	CO1
	b)	Discuss the classification and importance of CAD standards.	8 Marks	L3	CO1

(OR)

3.	a)	Explain the benefits of adopting CIM in industrial manufacturing.	8 Marks	L2	CO1
	b)	Discuss the importance of the product life cycle in CAD and CAM applications.	8 Marks	L3	CO1

MODULE-II

4.	a)	Describe the steps in Bresenham's Line Algorithm.	8 Marks	L3	CO2
	b)	Discuss 2D and 3D transformations with suitable examples.	8 Marks	L3	CO2

(OR)

5.	a)	Explain the importance of geometric modeling in CAD.	8 Marks	L2	CO2
	b)	Compare parametric and non-parametric representations with examples.	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain the structure and components of CNC machine tools.	8 Marks	L2	CO3
	b)	Write a detailed note on CNC tooling and automatic tool changers.	8 Marks	L2	CO3

(OR)

7.	a)	Elaborate on the importance and applications of canned cycles.	8 Marks	L2	CO3
	b)	Describe the role and types of work holding devices in CNC.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain the concept and benefits of Group Technology in manufacturing.	8 Marks	L2	CO4
	b)	Describe the process of Retrieval and Generative CAPP systems.	8 Marks	L3	CO4
		(OR)			
9.	a)	Compare contact and non-contact inspection methods in quality control.	8 Marks	L3	CO4
	b)	Describe the various methods used for inspection and testing in quality control.	8 Marks	L3	CO4

MODULE-V

10.	a)	Discuss the types and elements of automation systems.	8 Marks	L3	CO5
	b)	Explain the different part transfer methods used in automation.	8 Marks	L2	CO5
		(OR)			
11.	a)	Describe the classification and working of robotic end effectors.	8 Marks	L3	CO5
	b)	Explain the flow lines and mechanisms used in automated systems.	8 Marks	L2	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) Regular Examinations, April – 2026

HEAT TRANSFER

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	State Fourier's Law of conduction.	2 Marks	L1	CO1
	b)	Define Thermal Conductivity.	2 Marks	L1	CO1
	c)	Define fins (or) extended surfaces.	2 Marks	L1	CO2
	d)	State the applications of fins.	2 Marks	L2	CO2
	e)	Define convection.	2 Marks	L1	CO3
	f)	Define thermal boundary layer.	2 Marks	L1	CO3
	g)	What is heat exchanger?	2 Marks	L1	CO4
	h)	What are the types of heat exchangers?	2 Marks	L1	CO4
	i)	Define emissive power [E] and monochromatic emissive power. [$E_{b\lambda}$]	2 Marks	L2	CO5
	j)	What is meant by absorptivity, reflectivity and transmissivity?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the different modes of Heat Transfer with suitable examples	8 Marks	L2	CO1
	b)	A Plane wall is 150mm thick and its wall area is 4.5m^2. If its conductivity is 9.35 W/m^{0}C and surface temperatures are steady at 150^{0}C and 45^{0}C, determine i) Heat flow across the plane wall ii) Temperature gradient in the flow direction	8 Marks	L3	CO1
		(OR)			
3.		Derive the general heat conduction equation in Cartesian coordinates	16 Marks	L3	CO1

MODULE-II

4.	a)	List out various types of fins and its applications	8 Marks	L4	CO2
	b)	Define and write equation for Efficiency and Effectiveness of Fin.	8 Marks	L3	CO2
		(OR)			
5.		A bar of square cross section connects two metallic structures. One structure is maintained at a temperature 200° C and the other is maintained at 50° C. The bar, 20 mm × 20 mm, is 100 mm long and is made of mild steel (k = 0.06 kW/m . K). The surroundings are at 20° C and the heat transfer coefficient between the bar and the surroundings is 0.01 kW/m^2 . K. Derive an expression for the temperature distribution along the bar and hence calculate the total heat flow rate from the bar to the surroundings.	16 Marks	L3	CO2

MODULE-III

6.	a)	Explain the development of boundary layer over a cylinder.	6 Marks	L2	CO3
	b)	Air at 20°C and atmospheric pressure flows at a velocity of 4.5 m/s past a flat plate with a sharp leading edge. The entire plate surface is maintained at a temperature of 60°C. Assuming that the transition occurs at a critical Reynolds number of $5x10^5$, find the distance from the leading edge at which the boundary layer changes from laminar to turbulent. At the location, calculate the followings: i) thickness of hydrodynamic boundary layer ii) thickness of thermal boundary layer	10 Marks	L3	CO3

(OR)

7.	a)	Develop a relationship between Nusselt, Prandtl and Reynolds Numbers in forced convection using dimensional analysis	8 Marks	L2	CO3
	b)	Estimate the heat transfer from a 40 W incandescent bulb at 127°C to 27°C quiescent air. Approximate the bulb as a 50mm diameter sphere. What percentage of the power is lost by free convection?	8 Marks	L3	CO3

MODULE-IV

8.	a)	A 4cm outer diameter, 1 m long tube is to be used to condense steam at atmospheric pressure. The water flows inside the tube maintaining the wall surface at 60^0C. Estimate the mass of condensate for the tube in horizontal position.	8 Marks	L3	CO4
	b)	In a counter flow double pipe heat exchanger with Water (Cp=4186) enters at 15°C, flowing at the rate of 1300kg/h. It is heated by oil (Cp=2000J/ kg K) flowing at the rate of 550kg/h from the inlet temperature of 94 °C. For an area of $1m^2$ and an overall heat transfer co-efficient of 1075 w/m^2K, determine the total heat transfer and the out let temperatures of water and oil.	8 Marks	L3	CO4

(OR)

9.	a)	Water at atmospheric pressure is to be boiled in polished copper pan. The diameter of the pan is 350 mm and is kept at 115^0C. Calculate: i) power of the burner, ii) rate of evaporation in kg/h and iii) critical heat flux	8 Marks	L3	CO4
	b)	Oil with a specific heat of 2 KJ/ kg K is cooled from 110^0C to 70^0C by a flow of water flow in a counter flow heat exchanger. Water flows at the rate of 2 kg/sec and is heated from 35^0C to 65^0C. The overall heat transfer coefficient is estimated to be 0.37 KW/ m2K. Determine the exit temperatures of oil and water, if the water flow rate drops to 1.5 kg / sec at the same oil flow rate.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain the terms absorptivity, reflectivity and transmissivity.	8 Marks	L2	CO5
	b)	The net radiation from the surfaces of two parallel plates maintained at temperatures, T1 and T2 is to be reduced by79 times. Calculate the number screens to placed between the two surfaces to achieve this reduction in heat exchange, assuming the emissivity of the screens as 0.05 and that of the surfaces as 0.8.	8 Marks	L2	CO5

(OR)

11.	a)	Define the following: i) Irradiation ii) Radiosity iii) radiation shape factor.	8 Marks	L2	CO5
	b)	Two parallel black plates 0.5m × 1.0m are separated by 0.5m distance. One plate is at 1100^0C and the other at 600^0C. Compute the net radiant heat exchange between the two plates.	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com & B.B.A II Semester (MBU-25) Regular Examinations, May – 2026

ENVIRONMENTAL SCIENCE
(Computer Applications, Management)

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is deforestation?	2 Marks	L1	CO1
	b)	Define food resources.	2 Marks	L1	CO1
	c)	Who are producers?	2 Marks	L1	CO2
	d)	What is an ecological pyramid?	2 Marks	L1	CO2
	e)	What is water pollution?	2 Marks	L1	CO3
	f)	What is solid waste management?	2 Marks	L1	CO3
	g)	Define ozone layer depletion.	2 Marks	L1	CO4
	h)	What are green technologies?	2 Marks	L1	CO4
	i)	What is family welfare program?	2 Marks	L1	CO5
	j)	What is women empowerment?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Discuss causes, effects and remedies of deforestation with a case study.	16 Marks	L2	CO1
	(OR)			
3.	Describe the role of individuals in conservation of natural resources.	16 Marks	L3	CO1

MODULE-II

4.	Define ecosystem and explain its structure and functions.	16 Marks	L2	CO2
	(OR)			
5.	Explain biodiversity hotspots of India.	16 Marks	L2	CO2

MODULE-III

6.	Explain causes, effects and control measures of air pollution.	16 Marks	L2	CO3
	(OR)			
7.	Discuss thermal and nuclear pollution.	16 Marks	L2	CO3

MODULE-IV

8.	Discuss global warming causes and control measures.	16 Marks	L2	CO4
	(OR)			
9.	Explain nuclear accidents with case studies.	16 Marks	L2	CO4

MODULE-V

10.	Explain population characteristics and variation among nations.	16 Marks	L2	CO5
	(OR)			
11.	Explain role of IT in environment and health.	16 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com II Semester (MBU-25) Regular Examinations, May – 2026

PRINCIPLES OF BANKING AND INSURANCE

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Evolution of banking in India.	2 Marks	L1	CO1
	b)	Write the functions of commercial banks.	2 Marks	L1	CO1
	c)	What is mean by Sound lending?	2 Marks	L1	CO2
	d)	Write management of NPAs.	2 Marks	L1	CO2
	e)	Expand EFT.	2 Marks	L1	CO3
	f)	Define Debit Cards.	2 Marks	L1	CO3
	g)	Write a Short note on IRDA.	2 Marks	L1	CO4
	h)	State any five Advantages of Life Insurance.	2 Marks	L1	CO4
	i)	Define Fire Insurance.	2 Marks	L1	CO5
	j)	List the key functions of insurance companies.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Explain the structure of commercial banks in India with a neat diagram.	16 Marks	L2	CO1
	(OR)			
3.	Describe the functions of commercial banks and explain their role in economic development.	16 Marks	L2	CO1

MODULE-II

4.	Explain the concept and classification of Non-Performing Assets (NPAs).	16 Marks	L2	CO2
	(OR)			
5.	Discuss secured and unsecured advances with examples.	16 Marks	L2	CO2

MODULE-III

6.	Explain Electronic Funds Transfer (EFT) and Electronic Clearing Service (ECS).	16 Marks	L2	CO3
	(OR)			
7.	Describe the working of ATM and Internet Banking.	16 Marks	L2	CO3

MODULE-IV

8.	Explain the types of life insurance policies.	16 Marks	L2	CO4
	(OR)			
9.	Describe the regulatory mechanism of IRDA and its functions.	16 Marks	L2	CO4

MODULE-V

10.	Explain the meaning and importance of general insurance.	16 Marks	L2	CO5
	(OR)			
11.	Discuss Motor vehicle insurance and Health insurance.	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

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B.Com II Semester (MBU-25) Regular Examinations, May – 2026

FINANCIAL ACCOUNTING

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Mark

1.	a)	What is overriding commission?	2 Marks	L1	CO
	b)	List the parties involved in consignment.	2 Marks	L1	CO
	c)	What is Joint Venture Account?	2 Marks	L1	CO2
	d)	State any two objectives of joint venture.	2 Marks	L1	CO2
	e)	State any two examples of reserves.	2 Marks	L1	CO
	f)	What is Provision?	2 Marks	L1	CO3
	g)	Define Partnership firm.	2 Marks	L1	CO4
	h)	What do you mean by retirement of a partner?	2 Marks	L1	CO4
	i)	What is partnership dissolution.	2 Marks	L1	CO5
	j)	Give any two types of partners.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Mark

MODULE-I

2. Gupta of Madras consigned 120 Units @ 750/- each to Rakesh of Bangalore. Gupta spent transportation and insurance expenses amounting to Rs. 6,400/-. Rakesh sent Rs. 18,000/- as advance payment against the consignment. Gupta received an account sales from Rakesh containing the following information: 16 Marks L4 CO

Warehouse expenses Rs. 2,200/- and Transportation expenses Rs. 1,200/-.

ii) Commission charge at 10% on Gross sales.

iii) Gross sales of Rs. 1,20,000/-.

Gupta received a bank remittance for the balance due from Rakesh. Prepare necessary ledger accounts in the books of both parties.

(OR)

3. Mumbai Indian Consigned to the Kolkata agent Kolkata Riders Rs. 10,000/- worth of goods drawing a bill of exchange on Kolkata Riders for the amount. They pay freight and insurance Rs, 650/-. Mumbai Indian received an account sales from Kolkata riders containing the following information: 16 Marks L4 CO

Particulars	**Rs.**	**Rs.**
200 bales of goods sold at		14,000/-
Less: Consignee Expenses:		
i) Delivery charges	5,00	
ii) Godown Rent	70	
iii) Insurance	80	
iv) Sundry Expenses	18	
v) Commission	700	1368
		12632
Bill of Exchange		10,000/-
Balance		2,632,/-

Enter the particulars in the ledger of the consignor and complete the

transactions showing the final profit or loss of the consignment. Show the consignor account in the books of consignee.

MODULE-II

4. Distinguish between the partnership venture and Joint venture. 16 Marks L3 CO2

(OR)

5. Gopal and Bhaskar to start a joint venture business of Assembling unit to share profits and losses equally. Gopal provides the raw material at mutually agreed value of Rs. 1,30,000/-. He spent expenses amounted to Rs. 8,400/-. Bhaskar spent further expenses cartage and storage Rs. 9,600/- and receives cash for sales amounting to Rs. 1,00,000/-. He also takes overheads to the value of Rs. 13,000/- for his personal use. At the end Gopal takes over the balance of stock for his personal use Rs14,000/-. you are requiring to prepare joint venture and co-venturers accounts. 16 Marks L4 CO2

MODULE-III

6. Define Reserve. Classify the different types of Reserves. 16 Marks L2 CO3

(OR)

7. On 01.01.2014, B Sen had the following balances: Sundry Debtors 1,20,000 and Provision for Doubtful Debts Rs. 6,000. 16 Marks L4 CO3

During the year ending 31.12.2014, B Sen sold goods on credit amounting to Rs 15,00,000. During the year customers returned goods of Rs. 5,000, while the firm collected in cash from debtors 12,00,000, allowed discounts of Rs 2,000 and received acceptance (B/R) amounting to Rs 2,00,000. The firm could not collect Rs 5,000 from Debtors and had to write off the amount. It was decided to maintain provision for doubtful debts @ 5% on Debtors as on 31.12.2014. You are required to show Sundry Debtors and Provision for Doubtful Debts Accounts.

MODULE-IV

8. A, B and C is a firm sharing profit and losses in the ratios of 2:2:1. Their balance sheet as on 31st march 2024 is as below: 16 Marks L4 CO4

Liabilities	Rs.	Assets	Rs.
Creditors	12,850	Land & Buildings	25,000
Outstanding	1,500	Furniture	6,500
liabilities	6,500	Stock of good	11,750
General Reserve		Sundry debtors	5,500
Capital :	12,000	Cash in hand	140
A	12,000	Cash at bank	960
B	5,000		
C	**49,850**		**49,850**

The partners have agreed to take D as a partner with effect from 1st April 2024 on the following terms:

i) D Shall bring Rs.5,000 towards his capital.
ii) The value of stock should be increased by Rs 2,500.
iii) The furniture depreciated by 10%.
iv) Provision for bad and doubtful debts should be provided at 10% of the debtors.
v) The value of land and buildings should be enhanced by 20%.
vi) The value of the goodwill be fixed at Rs. 15,000.
vii) General reserve will be transferred to the partners' capital a/cs.
viii) The new profit-sharing ratio shall be A:5/5, B:5/15, C:3/15 and D:2/15.

The outstanding liabilities include Rs. 1,000 due to E which has been paid by A. Necessary entries were not made in the books.

(OR)

9. Amal, Bimal and Kamal were partners sharing profit and losses in the ratio of 3:2:1. Their balance sheet on 31st December was as follows: 16 Marks L4 CO4

Liabilitities	Rs.	Assets	Rs.
Creditors	20,500	Cash at bank	3,500
Reserve	15,000	Sundry debtors	30,000
Profit and loss a/c	12,000	Stock	25,000
Capital :		Plant and Machinery	40,000
Amal	45,000	Buildings	50,000
Bimal	35,000	Furniture	4,000
Kamal	25,000		
	1,52,500		**1,52,500**

Kamal retires on that date subject to the following conditions:

i) Goodwill of the firm is to be valued at Rs. 36,000/-
ii) Building is to be appreciated by 20%.
iii) Plant & Furniture are to be depreciated by 10% and 15% respectively.
iv) Provision is to be made for doubtful debts at 5%.
v) Amal and Bimal are to bring in cash, if necessary, in their profit-sharing ratio to pay off Kamal's dues on retirement and leave a sum of Rs. 10,000 as working capital.

Prepare revaluation account, partners' capital accounts and the new balance sheet.

MODULE-V

10. X, Y and Z are partners sharing profits and losses as to 2:2:1. Balance sheet on 31st Dec., 2023 is as follows: 16 Marks L4 CO5

Liabilities	Rs.	Assets		Rs.
Creditors	4,000	Cash		4,000
Capital :		Sundry debtors	1,300	
X	10,000	Less: Pro. For bad debts	300	2,000
X	4,000	Stock		4,000
Z	2,000	Furniture		10,000
	20,000			20,000

They decide to go out of business. Following are the amounts realized: Furniture Rs.9,000, stock Rs.4,520, debtors Rs.1,800, creditors paid completely Rs.38,00, Expenses realization Rs.120 and close the accounts

(OR)

11. Padma, Kumudha and Vidhya are partners sharing profits and losses in the ratio of 2:1:1respectively. Balance sheet as on 31st December 2023 is as follows: 16 Marks L4 CO5

Liabilities	Rs.	Assets	Rs.
Creditors	35,000	Sundry Assets	1,00,000
Capital :			
Padma	25,000		
Kumudha	25,000		
Vidhya	15,000		
	100,000		**100,000**

On the above date, the firm was dissolved and the following were the terms agreed:

Assets realized Rs. 1,07,000, creditors were paid Rs.28,000, Realization expenses amounted to Rs. 2,000. Prepare realization account, capital, and bank accounts.

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com II Semester (MBU-25) Regular Examinations, May – 2026

BUSINESS LAW

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is discharge of contract?	2 Marks	L1	CO1
	b)	What is a contract of indemnity?	2 Marks	L1	CO1
	c)	What is auction sale?	2 Marks	L1	CO2
	d)	Who is an unpaid seller	2 Marks	L1	CO2
	e)	What is a partnership deed?	2 Marks	L1	CO3
	f)	Mention one content of a partnership deed.	2 Marks	L1	CO3
	g)	Who is a promoter?	2 Marks	L1	CO4
	h)	What is incorporation of a company?	2 Marks	L1	CO4
	i)	What is a defect in goods?	2 Marks	L1	CO5
	j)	What is Environment Protection Act, 1986?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Who are minors and persons of unsound mind? Discuss their capacity to contract.	8 Marks	L1	CO1
	b)	Explain the meaning of free consent and its importance in a contract.	8 Marks	L1	CO1
		(OR)			
3.	a)	What do you mean by breach of contract? What are its consequences?	8 Marks	L1	CO1
	b)	Explain the contract of indemnity and its essential elements.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the legal effects of sale and agreement to sell.	8 Marks	L1	CO2
	b)	What are “conditions” in a contract of sale? Explain with examples.	8 Marks	L1	CO2
		(OR)			
5.	a)	What is meant by carriage of goods? Explain its importance.	8 Marks	L1	CO2
	b)	Explain carriage of goods by land and duties of carrier.	8 Marks	L2	CO2

MODULE-III

6.	a)	Discuss different modes of dissolution of a partnership firm.	8 Marks	L1	CO3
	b)	Explain dissolution by agreement and compulsory dissolution.	8 Marks	L2	CO3
		(OR)			
7.	a)	What are the effects of non-registration of a partnership firm?	8 Marks	L1	CO3
	b)	Explain the meaning of dissolution of partnership.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Distinguish between prospectus and statement in lieu of prospectus.	8 Marks	L3	CO4
	b)	What are shares? Explain different types of shares.	8 Marks	L1	CO4
		(OR)			
9.	a)	Distinguish between shares and debentures.	8 Marks	L3	CO4
	b)	Explain the borrowing powers of a company.	8 Marks	L2	CO4
		MODULE-V			
10.	a)	Explain the three-tier consumer dispute redressal machinery.	8 Marks	L2	CO5
	b)	Explain the meaning of defect in goods and deficiency in services.	8 Marks	L2	CO5
		(OR)			
11.	a)	Discuss the penalties for violation of the Environment Protection Act.	8 Marks	L1	CO5
	b)	Explain the importance of the Environment Protection Act in environmental protection.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com II Semester (MBU-25) Regular Examinations, May – 2026

DATA ANALYSIS USING SPREAD SHEET
(Computer Applications)

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	How does the MIN() function operate in Excel?	2 Marks	L1	CO1
	b)	What is the purpose of the MAX() function in Excel?	2 Marks	L1	CO1
	c)	What does "grouping" data in a PivotTable mean?	2 Marks	L1	CO2
	d)	How do you modify calculations in a PivotTable?	2 Marks	L1	CO2
	e)	How can you nest functions in Excel? Provide an example.	2 Marks	L1	CO3
	f)	What is the COUNTIF() function used for in Excel?	2 Marks	L1	CO3
	g)	What is the purpose of using the INDEX() function in Excel?	2 Marks	L1	CO4
	h)	How does the MATCH() function work in Excel?	2 Marks	L1	CO4
	i)	What is the formula to calculate Net Present Value (NPV) in Excel?	2 Marks	L1	CO5
	j)	Explain the Internal Rate of Return (IRR) concept in financial analysis.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe the different types of sorting options available in Excel and how each can be used.	8 Marks	L2	CO1
	b)	How do you use AutoFilter to filter data in Excel? Explain with an example.	8 Marks	L2	CO1

(OR)

3.	a)	What is the process for removing duplicates from an Excel list? Explain the importance of this feature.	8 Marks	L1	CO1
	b)	Describe how Excel's Data Validation feature can be used to ensure accurate data entry.	8 Marks	L2	CO1

MODULE-II

4.	a)	What is the Slicer Tool in Excel, and how does it improve the efficiency of filtering data in PivotTables?	8 Marks	L1	CO2
	b)	Explain how to format a PivotTable to enhance readability and presentation of the data.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the steps to create a basic PivotTable in Excel and discuss its advantages for summarizing large datasets.	8 Marks	L1	CO2
	b)	Describe how you can group data in a PivotTable. Provide examples of how grouping can be used for dates, numbers, and text.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain how to use the IF() function in Excel, with examples for different logical tests.	8 Marks	L2	CO3
	b)	Discuss how nesting functions in Excel can enhance the complexity of formulas. Provide examples.	8 Marks	L2	CO3

(OR)

7.	a)	How do you consolidate data from multiple worksheets into a summary worksheet in Excel? Provide examples.	8 Marks	L2	CO3
	b)	What are Name Ranges, and how do they improve the organization of formulas in Excel?	8 Marks	L2	CO3

MODULE-IV

8.	a)	How does the MATCH() function work? Provide examples of how to use it to find a value in a list.	8 Marks	L2	CO4
	b)	Discuss how the LEFT(), RIGHT(), and MID() functions are used to extract specific characters from a text string.	8 Marks	L2	CO4

(OR)

9.	a)	Compare and contrast VLOOKUP() and HLOOKUP() functions. When would you use each of them.	8 Marks	L2	CO4
	b)	Explain how the VLOOKUP() function works and provide an example of its use in finding a value from a table.	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss how Net Present Value (NPV) is calculated in Excel, and explain its importance in capital budgeting decisions.	8 Marks	L3	CO5
	b)	Describe how the Internal Rate of Return (IRR) is used to assess investment opportunities. Include how to calculate IRR using Excel.	8 Marks	L3	CO5

(OR)

11.	a)	How can the INTRATE() function be used to determine the interest rate on an investment or loan in Excel?	8 Marks	L1	CO5
	b)	Describe how to calculate the Future Value (FV) of an investment using the FV() function in Excel.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA II Semester (MBU-25) Regular Examinations, May – 2026

MANAGEMENT CONCEPTS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is POSDCORB?	2 Marks	L1	CO1
	b)	Name any two classical management theories.	2 Marks	L1	CO1
	c)	State the steps in the decision-making process.	2 Marks	L1	CO2
	d)	What is a programmed decision?	2 Marks	L1	CO2
	e)	Define authority.	2 Marks	L1	CO3
	f)	What is delegation?	2 Marks	L1	CO3
	g)	What is span of control?	2 Marks	L1	CO4
	h)	What is motivation?	2 Marks	L1	CO4
	i)	Define organizational development	2 Marks	L1	CO5
	j)	What is corporate social responsibility?	2 Marks	L1	CO5

MODULE-I

2.	a)	Discuss the importance of management in modern organizations.	8 Marks	L2	CO1
	b)	Explain scope and objectives of management.	8 Marks	L2	CO1
		(OR)			
3.	a)	Discuss the principles of management proposed by Henri Fayol.	8 Marks	L2	CO1
	b)	Explain classical and behavioral management theories.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain strategic and operational planning.	8 Marks	L2	CO2
	b)	Compare long-term and short-term planning.	8 Marks	L2	CO2
		(OR)			
5.	a)	Describe planning tools and techniques.	8 Marks	L2	CO2
	b)	Explain steps in decision making with examples.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain line and staff relationships.	8 Marks	L2	CO3
	b)	Discuss advantages and limitations of line and staff organization.	8 Marks	L2	CO3
		(OR)			
7.	a)	Explain organizing as a process.	8 Marks	L2	CO3
	b)	Discuss authority–responsibility relationship.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain types of control.	8 Marks	L1	CO4
	b)	Analyze span of control.	8 Marks	L2	CO4
		(OR)			
9.	a)	Explain coordination and its need.	8 Marks	L2	CO4
	b)	Discuss types and techniques of coordination.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain organizational development.	8 Marks	L2	CO5
	b)	Discuss OD interventions.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain corporate social responsibility (CSR).	8 Marks	L1	CO5
	b)	Discuss benefits of CSR.	8 Marks	L2	CO5

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Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA II Semester (MBU-25) Regular Examinations, May – 2026

FINANCIAL MANAGEMENT

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is profit maximization?	2 Marks	L1	CO1
	b)	What is mean by time value of money?	2 Marks	L1	CO1
	c)	Define operating leverage.	2 Marks	L1	CO2
	d)	Write a formula for combined leverage.	2 Marks	L1	CO2
	e)	What do you mean by capital budgeting?	2 Marks	L1	CO3
	f)	What is ARR?	2 Marks	L1	CO3
	g)	What is inventory management?	2 Marks	L1	CO4
	h)	Define working capital.	2 Marks	L1	CO4
	i)	What is meant by dividend policy?	2 Marks	L1	CO5
	j)	Define interim dividend.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2. Differentiate between Profit and Wealth maximization. 16 Marks L2 CO1

(OR)

3. Explain the functions of Financial Management. 16 Marks L2 CO1

MODULE-II

4. Define of cost of capital. Discuss about specific cost of capital. 16 Marks L2 CO2

(OR)

5. ABC Ltd. company issues a new 12% debentures of Rs. 500 face value. The debenture is expected to be sold at 10% discount and issued at premium at 10%. It will also involve flotation costs of 5%. The company's tax rate is 50%. What would be the cost of debt? 16 Marks L3 CO2

MODULE-III

6. From the following information calculate the net present value of the two projects and suggest which of the two projects should be accepted assuming a discount rate of 10%. 16 Marks L4 CO3

Particulars	**Project X**	**Project Y**
Initial Investment	20,000	30,000
Estimated life	5 years	5 years
Scrap value	1,000	2,000

The profits before depreciation and after taxes are as follows:

Particulars	1 year	2 years	3 year	4 year	5 year
Project X	5,000	10,000	10,000	3,000	2,000
Project Y	20,000	10,000	5,000	3,000	2,000

(OR)

7. Calculate earning per share using below data. 16 Marks L4 CO3

A company requires Rs.20,00,000 for expansion. It is considering two financial plans:

- **Plan A**: 100% Equity shares of Rs.10 each
- **Plan B**: 50% Equity shares of Rs.10 each and 50% Debt @ 12%

Expected EBIT = Rs.6,00,000

Tax rate = 30%, Calculate EPS under both plans and advise the best plan.

MODULE-IV

8. A Company is considering investment in a project that costs Rs.2,00,000. The project has an expected life of 5 years and zero salvage value. The company uses straight-line method of depreciation. The company's tax rate is 40%. 16 Marks L4 CO4

The estimated earnings before depreciation and tax from the project are as follows:

Year	earnings before depreciation and tax	PV factor at 10%
1	70,000	0.909
2	80,000	0.826
3	1,20,000	0.751
4	90,000	0.683
5	60,000	0.621

You are required to calculate the net present value at 10% and advise the company.

(OR)

9. A company is considering a project requiring an initial investment of Rs.1,00,000.The expected cash inflows are: 16 Marks L2 CO4

Year	Cash Inflow (Rs.)
1	30,000
2	40,000
3	50,000
4	20,000

Cost of Capital = 10%, Calculate the Net Present Value (NPV) and PI.

MODULE-V

10. The following information is available in respect of return on investment, the cost of capital (ko) and earning per share (E) of XYZ ltd. 16 Marks L2 CO5

R = 10 per cent, E= Rs. 40/-

Determine the value of its shares using Gordan's Model, assuming the following:

	D/p ratio (1-b)	retention ratio)(b)	cost of equity (ke) %
A	20	80	20
B	40	60	18
C	60	40	16
D	80	20	14

(OR)

11. Explain the determinants of dividend policy. 16 Marks L4 CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA II Semester (MBU-25) Regular Examinations, May – 2026

PRODUCTION AND OPERATIONS MANAGEMENT

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is Operations Strategy?	2 Marks	L1	CO1
	b)	Define productivity.	2 Marks	L1	CO1
	c)	Define plant layout. State any two objectives of a good plant layout.	2 Marks	L1	CO2
	d)	What is plant maintenance? Why is it important in production management?	2 Marks	L1	CO2
	e)	What is meant by capacity timing strategy?	2 Marks	L1	CO3
	f)	What is lead capacity strategy?	2 Marks	L1	CO3
	g)	What is JIT? State one benefit of JIT.	2 Marks	L1	CO4
	h)	What is inventory control? State one objective.	2 Marks	L1	CO4
	i)	What is PERT? State one feature of PERT.	2 Marks	L1	CO5
	j)	Mention one difference between CPM and PERT.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Explain the concept of Operations Management. Discuss its nature, scope, and importance in detail.	16 Marks	L2	CO1
	(OR)			
3.	Explain the concept of productivity. Discuss different types of productivity measures and their importance.	16 Marks	L2	CO1

MODULE-II

4.	Define plant layout. Explain the objectives and principles of a good plant layout with a neat diagram.	16 Marks	L2	CO2
	(OR)			
5.	Explain the concept of replacement policy. Discuss the factors affecting replacement decisions	16 Marks	L2	CO2

MODULE-III

6.	Discuss the steps involved in planning long-term capacity in an organization	16 Marks	L2	CO3
	(OR)			
7.	Explain the importance of capacity planning. Discuss the consequences of poor capacity planning.	16 Marks	L2	CO3

MODULE-IV

8.	Explain the Kanban system. Discuss its features, advantages, and limitations	16 Marks	L2	CO4
	(OR)			
9.	Explain the concept of Just-in-Time (JIT). Discuss its objectives, advantages, and limitations.	16 Marks	L2	CO4

MODULE-V

10.	Compare CPM and PERT. Explain their similarities and differences.	16 Marks	L3	CO5
	(OR)			
11.	Describe the steps involved in constructing a project network diagram and identifying the critical path.	16 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA II Semester (MBU-25) Regular Examinations, May – 2026

ORGANISATIONAL BEHAVIOUR

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is meant by organizational goals?	2 Marks	L1	CO1
	b)	Define perception in organizational behavior.	2 Marks	L1	CO1
	c)	What is reinforcement in learning?	2 Marks	L1	CO2
	d)	What is the difference between positive and negative reinforcement?	2 Marks	L1	CO2
	e)	List any four traits of an effective leader.	2 Marks	L1	CO3
	f)	Mention three types of leadership styles.	2 Marks	L1	CO3
	g)	What are the key principles of effective negotiation?	2 Marks	L1	CO4
	h)	What is meant by team building?	2 Marks	L1	CO4
	i)	What are the two main types of communication barriers?	2 Marks	L1	CO5
	j)	Define organizational change.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Explain the perspectives of human behavior.	16 Marks	L2	CO1
	(OR)			
3	Explain the importance and advantages of Organizational Behavior.	16 Marks	L2	CO1

MODULE-II

4	Discuss different types of reinforcement and their impact on learning.	16 Marks	L2	CO2
	(OR)			
5	Explain the role of reinforcement in shaping employee behavior.	16 Marks	L2	CO2

MODULE-III

6	Explain the various leadership skills required for successful management.	16 Marks	L2	CO3
	(OR)			
7	Define a group and explain the stages of group formation.	16 Marks	L2	CO3

MODULE-IV

8	Describe the importance of team building in managing organizational conflict.	16 Marks	L2	CO4
	(OR)			
9	Explain the various methods of conflict resolution in groups.	16 Marks	L2	CO4

MODULE-V

10	What is Organizational Development (OD)? Explain its objectives and significance.	16 Marks	L2	CO5
	(OR)			
11	Describe the various OD interventions used in organizations.	16 Marks	L2	CO5

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Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA II Semester (MBU-25) Regular Examinations, May – 2026

BASICS OF COMPUTERS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Write any two advantages of computers.	2 Marks	L1	CO1
	b)	Mention any two limitations of computers	2 Marks	L1	CO1
	c)	What is paragraph formatting?	2 Marks	L1	CO2
	d)	What is a bulleted list?	2 Marks	L1	CO2
	e)	Define cell and cell address	2 Marks	L1	CO3
	f)	What is auto-fill?	2 Marks	L1	CO3
	g)	What is a record?	2 Marks	L1	CO4
	h)	What is a primary key?	2 Marks	L1	CO4
	i)	What is an email account?	2 Marks	L1	CO5
	j)	What is a web browser?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Discuss the advantages and limitations of computers	16 Marks	L2	CO1
	(OR)			
3.	What is an operating system? Explain the functions of an operating system.	16 Marks	L2	CO1

MODULE-II

4.	Explain the steps to create, save, open and close a document.	16 Marks	L2	CO2
	(OR)			
5.	Explain page formatting options in MS Word.	16 Marks	L2	CO2

MODULE-III

6.	Explain how to create and build a worksheet.	16 Marks	L2	CO3
	(OR)			
7.	Explain steps to create a chart in Excel	16 Marks	L2	CO3

MODULE-IV

8.	Describe steps to create a database in MS Access.	16 Marks	L3	CO4
	(OR)			
9.	Explain forms and steps to create auto forms.	16 Marks	L2	CO4

MODULE-V

10.	Explain applications of Internet in business.	16 Marks	L2	CO5
	(OR)			
11.	Explain advantages and disadvantages of Internet	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA II Semester (MBU-25) Regular Examinations, May – 2026

LEGAL ASPECTS OF BUSINESS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is performance of contract?	2 Marks	L1	CO1
	b)	What is a Negotiable Instrument?	2 Marks	L1	CO1
	c)	What is a warranty in a contract of sale?	2 Marks	L1	CO2
	d)	Mention one right of an unpaid seller.	2 Marks	L1	CO2
	e)	What is the nature of a partnership?	2 Marks	L1	CO3
	f)	What is meant by "mutual agency" in partnership?	2 Marks	L1	CO3
	g)	What is incorporation of a company?	2 Marks	L1	CO4
	h)	What is Memorandum of Association?	2 Marks	L1	CO4
	i)	What is a defect in goods?	2 Marks	L1	CO5
	j)	What is environmental pollution?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the meaning of consideration and its essential features.	8 Marks	L2	CO1
	b)	What is lawful consideration? Explain with examples.	8 Marks	L1	CO1
		(OR)			
3.	a)	Discuss the types of Negotiable Instruments under the Act.	8 Marks	L1	CO1
	b)	Distinguish between cheque, bill of exchange and promissory note.	8 Marks	L3	CO1

MODULE-II

4.	a)	Distinguish between conditions and warranties.	8 Marks	L3	CO2
	b)	Explain the meaning of transfer of property in goods.	8 Marks	L2	CO2
		(OR)			
5.	a)	Explain the rules relating to auction sales.	8 Marks	L2	CO2
	b)	Who is an unpaid seller?	8 Marks	L1	CO2

MODULE-III

6.	a)	Explain the rights of partners in a partnership firm.	8 Marks	L2	CO3
	b)	Explain the liabilities of partners in a partnership firm.	8 Marks	L2	CO3
		(OR)			
7.	a)	Discuss the nature of partnership.	8 Marks	L1	CO3
	b)	Explain the true test of partnership.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Distinguish between Memorandum and Articles of Association.	8 Marks	L3	CO4
	b)	What is a prospectus? Explain its importance.	8 Marks	L1	CO4
		(OR)			
9.	a)	Explain different types of companies.	8 Marks	L2	CO4
	b)	What is promotion of a company? Explain the role of promoters.	8 Marks	L1	CO4

MODULE-V

10.	a)	Explain the rights of consumers under the Consumer Protection Act.	8 Marks	L2	CO5
	b)	Explain the duties of consumers.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain the powers of inspection, entry and sampling under the Act.	8 Marks	L2	CO5
	b)	Critically explain the achievements and limitations of the Environment Protection Act, 1986.	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA II Semester (MBU-25) Regular Examinations, May – 2026

FINANCIAL MANAGEMENT

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define financial management.	2 Marks	L1	CO1
	b)	What is business finance?	2 Marks	L1	CO1
	c)	Define Financial leverage.	2 Marks	L1	CO2
	d)	What is EBIT?	2 Marks	L1	CO2
	e)	Define capital budgeting.	2 Marks	L1	CO3
	f)	What is IRR?	2 Marks	L1	CO3
	g)	Define working capital.	2 Marks	L1	CO4
	h)	What is inventory?	2 Marks	L1	CO4
	i)	Define dividend.	2 Marks	L1	CO5
	j)	What is dividend payout ratio?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss the Scope of Financial Management.	8 Marks	L2	CO1
	b)	Nature of Financial management,	8 Marks	L2	CO1

(OR)

3.	Explain about the Objectives of Financial Management	16 Marks	L2	CO1

MODULE-II

4. The following is the capital structure of a company. — 16 Marks, L4, CO2

Source of capital	Book value Rs.	Market value Rs,
Equity shares @100/-	8,00,000	16,00,000
9% preference shares @100/-	2,00,000	2,40,000
11% Debentures	6,00,000	6,60,000
Retained earnings	4,00,000	-

The current market price of the company's equity share is Rs. 200/-. For the last year the company had paid equity dividend at 25 per cent and its dividend is likely to grow 5 per cent every year. The corporate tax Is 3 per cent and shareholders personal income tax is 20 per cent.
You are required to calculate:
Cost of capital for each source of capital.
Weighted average cost of capital on the basis of book value weights.
Weighted average cost of capital on the basis of market value weights.

(OR)

5. A Simplified income statement of Zenith ltd. is given below. Calculate degree of operating leverage, degree of financial leverage and degree of combined leverage. Income statement of Zenith ltd. for the year ended 31st March 2019. — 16 Marks, L4, CO2

Particulars	Rs.
Sales	10,50,000
Variable cost	7,67,000
Fixed cost	75,000
EBIT	2,08,000
Interest	1,10,000
Taxes (30%)	29,400
Net income	68,600

MODULE-III

6. What is capital budgeting? Explain the techniques of capital budgeting. 16 Marks L2 CO3

(OR)

7. X Ltd. is producing articles mostly by manual labour and is considering to replace it by a new article. There are two alternative models M and N of the new machine. Prepare a statement of profitability showing the pay-back period from the following information. 16 Marks L4 CO3

Particulars	Machine M	Machine N
Estimated life of the machine	4 years	5 years
Cost of machine	90,000	1,80,000
Estimated savings in scrap	5,000	8,000
Estimated savings in direct wages	60,000	80,000
Additional cost of maintenance	8,000	10,000
Additional cost of supervision	12,000	18,000

MODULE-IV

8. A company is expecting to have Rs.32,000/- cash in hand on 1.4.2021 and it requests you to prepare cash budget for the three months. April to June 2021. The following information is supplied to you: 16 Marks L4 CO4

Month	sales (Rs)	purchases (Rs.)	Wages (Rs.)	Expenses (Rs.)
Feb	70,000	44,000	6,000	5,000
March	80,000	56,000	9,000	6,000
April	96,000	60,000	9,000	7,000
May	1,00,000	68,000	11,000	9,000
June	1,20,000	62,000	14,000	9,000

Other information:

i) The period of credit allowed by suppliers is two months.
ii) 25% of sales is for cash and the period of credit allowed to customers for credit sales is one month.
iii) Delay in payment of wages and expenses one month.

Income tax of Rs. 28,000 is to be paid in June 2021.

(OR)

9. Critically examine the factors determining the working capital requirements. 16 Marks L3 CO4

MODULE-V

10. Explain the determinants of dividend policy. 16 Marks L2 CO5

(OR)

11. ABC Ltd belongs to a risk class for which the appropriate capitalisation rate is 10%. It currently has an outstanding 5,000 shares selling at Rs. 100 each. The firm is contemplating the declaration of dividend of Rs. 6 per share at the end of the current financial year. The company expects to have a net income of Rs.50,000 and has a proposal for making new investments of Rs. 1,00,000. Show that under the MM hypothesis, the payment of dividend does not affect the value of the firm. 16 Marks L4 CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA II Semester (MBU-25) Regular Examinations, May – 2026

HUMAN RESOURCE MANAGEMENT

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define HR trend	2 Marks	L1	CO1
	b)	What is job forecasting?	2 Marks	L1	CO1
	c)	What is e-recruitment?	2 Marks	L1	CO2
	d)	Define selection.	2 Marks	L1	CO2
	e)	Define training.	2 Marks	L1	CO3
	f)	What is employee development?	2 Marks	L1	CO3
	g)	What are fringe benefits?	2 Marks	L1	CO4
	h)	State any two incentive plans.	2 Marks	L1	CO4
	i)	What is grievance handling?	2 Marks	L1	CO5
	j)	State any two causes of indiscipline.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Describe challenges faced by HR managers in modern organizations.	16 Marks	L2	CO1
	(OR)			
3.	Discuss Human Resource Planning: objectives and process.	16 Marks	L2	CO1

MODULE-II

4.	Explain Hackman and Oldham's Job Characteristics Model.	16 Marks	L2	CO2
	(OR)			
5.	Explain Job Analysis and its process.	16 Marks	L2	CO2

MODULE-III

6.	Explain employee commitment and its importance.	16 Marks	L2	CO3
	(OR)			
7.	Differentiate training and development.	16 Marks	L3	CO3

MODULE-IV

8.	Explain components of remuneration	16 Marks	L2	CO4
	(OR)			
9.	Explain purposes of performance appraisal.	16 Marks	L2	CO4

MODULE-V

10.	Explain misconduct and its forms.	16 Marks	L2	CO5
	(OR)			
11.	Explain labour laws: importance and objectives.	16 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA II Semester (MBU-25) Regular Examinations, May – 2026

MARKETING MANAGEMENT

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is marketing orientation, and how does it differ from product orientation?	2 Marks	L1	CO1
	b)	Explain the concept of customer needs and how it forms the foundation of marketing.	2 Marks	L1	CO1
	c)	What is product differentiation, and why is it important in marketing?	2 Marks	L1	CO2
	d)	What is the relationship between a product line and a product mix?	2 Marks	L1	CO2
	e)	What is meant by "psychological pricing"?	2 Marks	L1	CO3
	f)	Why might a company initiate a price change?	2 Marks	L1	CO3
	g)	Name two elements of the promotional mix used in IMC.	2 Marks	L1	CO4
	h)	What is the primary goal of designing an integrated marketing communications strategy?	2 Marks	L1	CO4
	i)	Define a holistic marketing organization.	2 Marks	L1	CO5
	j)	How does a holistic marketing approach contribute to organizational success?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Explain the core concepts of marketing, such as needs, wants, and demands, market offerings, value and satisfaction, exchanges and relationships, and markets. Provide examples for each.	16 Marks	L2	CO1

(OR)

3.	Outline the key tasks of marketing management. How does a marketing manager integrate these tasks to achieve organizational goals?	16 Marks	L2	CO1

MODULE-II

4.	Analyze the relationship between product lines, product mixes, and brands. How do companies manage their product and brand portfolios to maximize profitability?	16 Marks	L3	CO2

(OR)

5.	Discuss the significance of packaging, labeling, warranties, and guarantees in enhancing customer satisfaction and brand loyalty. Provide real-world examples to support your answer.	16 Marks	L2	CO2

MODULE-III

6.	Discuss factors lead companies to initiate price changes? Discuss the risks and challenges involved in increasing or decreasing prices with relevant examples.	16 Marks	L2	CO3
	(OR)			
7.	How should companies respond to competitors' price changes? Discuss the strategic options available and their potential impact on market positioning.	16 Marks	L2	CO3

MODULE-IV

8.	Define Integrated Marketing Communications (IMC). Explain the steps involved in designing an effective IMC strategy with examples.	16 Marks	L1	CO4
	(OR)			
9.	Discuss the challenges faced by marketers in managing integrated marketing communications across multiple channels. Provide strategies to overcome these challenges.	16 Marks	L2	CO4

MODULE-V

10.	Discuss the role of market research in the successful introduction of new products. How can market research inform product development, pricing, and promotional strategies?	16 Marks	L2	CO5
	(OR)			
11.	Define a holistic marketing organization. Discuss the key components of holistic marketing and how they contribute to long-term business success.	16 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA II Semester (MBU-25) Regular Examinations, May – 2026

PRODUCTION AND OPERATIONS MANAGEMENT

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What are the key objectives of method study?	2 Marks	L1	CO1
	b)	Mention two key challenges faced in production management.	2 Marks	L1	CO1
	c)	What is the difference between preventive and breakdown maintenance?	2 Marks	L1	CO2
	d)	What is the main objective of a good plant layout?	2 Marks	L1	CO2
	e)	State Quality Control.	2 Marks	L1	CO3
	f)	Define Line Balancing.	2 Marks	L1	CO3
	g)	Define the term "buffer stock" in inventory management.	2 Marks	L1	CO4
	h)	What is the significance of the FIFO (First In, First Out) method in inventory management?	2 Marks	L1	CO4
	i)	Mention two factors that affect project cost and scheduling.	2 Marks	L1	CO5
	j)	Define "normal time" and "crash time" in project scheduling.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	What is Productivity? How Service industry is using the techniques of productivity for improve productivity?	8 Marks	L2	CO1
	b)	Assuming that the total observed time for an operation of assembling an electric switch is 1.00 minutes. If the rating is 120 %, find a normal time. If an allowance of 10 % is allowed for the operation, determine the standard time.	8 Marks	L2	CO1

(OR)

3.	a)	The input and output data for the industry are given in the below table. Find out various productivity measures like total, multifactor, and partial measures.	8 Marks	L2	CO1

Output	Value	Input	Value
Finished units	10000	Human	3000
Work in Progress	2500	Material	153
Dividends	1000	Capital	10000
		Energy	540
		Other expenses	1500

	b)	Explain the factors affecting productivity	8 Marks	L2	CO1

MODULE-II

4. How does a good plant layout help to improve productivity? Explain with examples. 16 Marks L2 CO2

(OR)

5. Explain the different types of Plant Layout. 16 Marks L2 CO2

MODULE-III

6. Explain various methods and factors of scheduling. 16 Marks L2 CO3

(OR)

7. Differentiate job shop and continuous production methods with examples. 16 Marks L2 CO3

MODULE-IV

8. Calculate the EOQ from the following data 16 Marks L2 CO4
   i) Consumption during the year 600 units
   ii) Ordering cost Rs12/- per order
   iii) Carrying cost 20%
   iv) Price per unit Rs 20/-

(OR)

9. Explain the objectives of Material Management and Store management. 16 Marks L2 CO4

MODULE-V

10. What is Project Management? Explain the procedure of CPM and PERT techniques in project management. 16 Marks L2 CO5

(OR)

11. Given the following information 16 Marks L2 CO5

Activity	1-2	1-3	1-4	2-5	3-6	3-7	4-7	5-8	6-8	7-9	8-9
Time (in hrs)	5	6	3	5	7	10	4	2	5	6	4

Construct the network diagram and find the Critical Path.

Reg. No. | | | | | | | | | | | |

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SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA II Semester (MBU-25) Regular Examinations, May – 2026

OPERATIONS RESEARCH

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	State any two practical applications of Operations Research.	2 Marks	L1	CO1
	b)	Define slack variables and surplus variables in Linear Programming.	2 Marks	L1	CO1
	c)	What is degeneracy in transportation?	2 Marks	L1	CO2
	d)	Explain the concept of the optimality test in a transportation model.	2 Marks	L1	CO2
	e)	What is an assignment Problem?	2 Marks	L1	CO3
	f)	What is an unbalanced assignment model?	2 Marks	L1	CO3
	g)	Define 'saddle point' in a game.	2 Marks	L1	CO4
	h)	What is 'payoff matrix' in Game Theory?	2 Marks	L1	CO4
	i)	Mention the Minimal Spanning Tree (MST) significance in network design.	2 Marks	L1	CO5
	j)	Define the Critical Path Method in project management.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2. Use simplex method to solve the following LP problem — 16 Marks, L3, CO1

$MaxZ = 3x_1 + 2x_2 + 5x_3$

Subjected to $x_1 + x_2 + x_3 \le 430$

$x_1 + 2x_2 \le 420$

$x_1, x_2 \text{ and } x_3 \ge 0$

(OR)

3. Solve the following Liner Programming Problem (LPP) by using the Simplex Method. — 16 Marks, L3, CO1

Maximize

$Z = 5x + 3y$

Subject to

$2x + y \le 8$

$x + 2y \le 8$

$x \ge 0, y \ge 0$

MODULE-II

4. Find an initial basic feasible solution to the following transportation problem using Least cost cell method — 16 Marks — L3 — CO2

	1	2	3	Supply
1	2	7	4	5
2	3	3	1	8
3	5	4	7	7
4	1	6	2	14
Demand	2	14	18	

(OR)

5. Explain the steps involve in Northwest corner cell method to find the initial basic feasible solution for a transportation problem — 16 Marks — L2 — CO2

MODULE-III

6. Discuss the steps of Hungarian method to solve the assignment problem. — 16 Marks — L2 — CO3

(OR)

7. What is assignment? Explain its importance in decision making. — 16 Marks — L4 — CO3

MODULE-IV

8. Discuss the steps involving in game with pure strategies — 16 Marks — L2 — CO4

(OR)

9. Find the optimum strategies of the players in the following game — 16 Marks — L3 — CO4

		Player B		
		1	2	3
Player A	A	10	5	20
	B	65	50	40
	C	55	25	30

MODULE-V

10. Find the Critical Path and duration of the project — 16 Marks — L3 — CO5

Activity	1-2	1-3	1-4	2-5	3-5	4-6	5-6
Duration	6	2	4	3	4	3	6

(OR)

11. What is a project? Explain rules for drawing a network — 16 Marks — L1 — CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) Regular Examinations, April – 2026

CRYPTOGRAPHY AND NETWORK SECURITY

[Information Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Compare Substitution and Transposition techniques.	2 Marks	L4	CO1
	b)	Define computer security.	2 Marks	L1	CO1
	c)	State advantages and Disadvantages of Cipher Block Chaining.	2 Marks	L2	CO1
	d)	Define Triple Encryption.	2 Marks	L1	CO1
	e)	Define Hash Function.	2 Marks	L1	CO2
	f)	Define Digital Signature.	2 Marks	L1	CO2
	g)	Define replay attacks.	2 Marks	L1	CO3
	h)	State authenticators..	2 Marks	L1	CO3
	i)	State the need of Change Cipher Spec Protocol.	2 Marks	L2	CO4
	j)	Illustrate the need of a padding field in ESP.	2 Marks	L2	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Generate Cipher text for the plain text "there is no crime to detect" using the Mono-alphabetic ciphering technique with key "cipher".	8 Marks	L4	CO1
	b)	Explain the working of poly alphabetic cipher with an example.	8 Marks	L2	CO1

(OR)

3.	a)	Apply the Vigenère cipher to encrypt the plaintext "NETWORKSECURITY" with the keyword "CIPHER".	8 Marks	L4	CO1
	b)	List the security services and describe the role of each service in network communication.	8 Marks	L2	CO1

MODULE-II

4.	a)	Write about the MixColumns Transformation in AES cipher.	8 Marks	L1	CO1
	b)	State the purpose of the S-boxes in DES.	8 Marks	L2	CO1

(OR)

5.	a)	Write about Substitute Bytes Transformation in AES cipher	8 Marks	L1	CO1
	b)	Illustrate the process of Encryption and Decryption in Cipher Block Chaining Mode.	8 Marks	L2	CO1

MODULE-III

6.	a)	Consider a Diffie-Hellman Scheme with a common prime q=11 and a primitive root α=2 i) If user A has public key YA=9, What is A's private key XA? ii) If user B has public key YB=3, What is the shared secret key K?	8 Marks	L4	CO1
	b)	List and explain the approaches to attack the RSA algorithm	8 Marks	L1	CO1

(OR)

7.	a)	In a public-key system using RSA, you intercept the cipher text C = 10 sent to a user whose public key is e = 5, n = 35.What is the plaintext M?	8 Marks	L4	CO1
	b)	Analyze the purpose of HMAC in network security and how it is generated? Explain with a neat sketch	8 Marks	L4	CO2

MODULE-IV

8.	a)	Illustrate the procedure for distribution of public keys using Public-key certificates	8 Marks	L2	CO3
	b)	Illustrate the concept of 'certificate chain' for verification of digital signature on X.509 certificate.	8 Marks	L2	CO3

(OR)

9.	a)	With a neat Sketch, explain the key terms in NIST 800-63 Digital Identity Model	8 Marks	L2	CO3
	b)	Illustrate the procedure for Obtaining a User's Certificate in X.509	8 Marks	L2	CO3

MODULE-V

10.	a)	Discuss various steps involved in the TLS Record Protocol transmission	8 Marks	L2	CO4
	b)	Write the steps how an enveloped data MIME entity is prepared.	8 Marks	L2	CO4

(OR)

11.	a)	Describe the TLS Handshake Protocol in detail	8 Marks	L1	CO4
	b)	Explain about ESP format in IP security.	8 Marks	L1	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) Regular Examinations, April – 2026

ARTIFICIAL NEURAL NETWORKS

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What happens if you choose a polynomial degree that is too high for curve fitting?	2 Marks	L1	CO1
	b)	How does model complexity affect overfitting and underfitting?	2 Marks	L2	CO1
	c)	What is Fisher's linear discriminant used for in classification?	2 Marks	L1	CO2
	d)	Why is learning rate decay used in gradient-based optimization?	2 Marks	L2	CO2
	e)	What is the main purpose of back-propagation in training MLP's?	2 Marks	L1	CO3
	f)	What is the primary drawback of using sigmoid functions in deep networks?	2 Marks	L1	CO3
	g)	What is a posterior probability, and how is it estimated in machine learning?	2 Marks	L1	CO4
	h)	Why is the sum-of-squares error function less commonly used for classification tasks?	2 Marks	L2	CO4
	i)	How does regularization help mitigate overfitting?	2 Marks	L2	CO5
	j)	Explain the decomposition of prediction error into bias and variance components.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Compare and contrast classification and regression tasks with examples.	8 Marks	L4	CO1
	b)	Discuss different techniques for data pre-processing and their importance in building effective machine learning models.	8 Marks	L2	CO1

(OR)

3.	a)	Explain feature extraction methods and how they help reduce dimensionality.	8 Marks	L2	CO1
	b)	Describe the curse of dimensionality and its impact on machine learning models. Provide examples.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the role of linear discriminant functions in classification and describe how they define decision boundaries.	8 Marks	L2	CO2
	b)	Discuss linear separability with examples. What happens when data is not linearly separable?	8 Marks	L2	CO2

(OR)

5.	a)	Illustrate generalized linear discriminants and their applications in machine learning.	8 Marks	L4	CO2
	b)	Derive the least-squares solution for linear regression and discuss its applications in classification.	8 Marks	L4	CO2

MODULE-III

6.	a)	Explain how a feed-forward network maps inputs to outputs. Provide examples of architectures.	8 Marks	L2	CO3
	b)	Describe the purpose and functioning of threshold units in neural networks. Provide a mathematical representation.	8 Marks	L2	CO3

(OR)

7.	a)	Discuss the properties of sigmoid functions and their impact on the learning process in MLPs.	8 Marks	L2	CO3
	b)	Explain weight-space symmetry in MLPs. Why can it make training neural networks challenging?	8 Marks	L2	CO3

MODULE-IV

8.	a)	Derive the formula for the sum-of-squares error and explain how it is used in regression tasks.	8 Marks	L4	CO3
	b)	Explain the Minkowski error function and its role in generalizing different loss functions (e.g., L1 and L2).	8 Marks	L2	CO3

(OR)

9.	a)	Discuss the concept of input-dependent variance and how it affects the performance of machine learning models.	8 Marks	L2	CO3
	b)	Explain the importance of modeling conditional distributions in supervised learning. Provide examples.	8 Marks	L2	CO3

MODULE-V

10.	a)	Discuss the bias-variance trade-off in machine learning. Provide examples of high-bias and high-variance models.	8 Marks	L2	CO5
	b)	Explain L1 and L2 regularization techniques. How do they impact model complexity?	8 Marks	L2	CO5

(OR)

11.	a)	Discuss the role of regularization in reducing overfitting. Provide examples of how it is applied in linear regression and neural networks.	8 Marks	L2	CO5
	b)	Describe how introducing noise into the training data or during the training process improves generalization. Provide examples.	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) Regular Examinations, April – 2026

CYBER SECURITY ESSENTIALS

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is CIA Triad.	2 Marks	L1	CO1
	b)	Distinguish between a "Packet Filtering" firewall and an "Application Level" firewall.	2 Marks	L2	CO1
	c)	Name the primary goal of click fraud in online advertising	2 Marks	L1	CO2
	d)	Identify the main difference between standard Fast Flux and Advanced Fast Flux	2 Marks	L2	CO2
	e)	Describe how integer overflow vulnerabilities can affect program execution	2 Marks	L1	CO3
	f)	Differentiate race condition vulnerabilities from other software flaws.	2 Marks	L2	CO3
	g)	Write the purpose of persistent software techniques in long-term attacks.	2 Marks	L2	CO4
	h)	Explain common attacks against privileged user accounts.	2 Marks	L1	CO4
	i)	Differentiate the role of honey pots from traditional security mechanisms.	2 Marks	L2	CO5
	j)	Describe the capabilities of memory forensics in detecting malicious activities.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Compare different Firewall architectures, specifically Proxy Firewalls (Application-level) versus Circuit-level Gateways	8 Marks	L4	CO1
	b)	Summarize the operational mechanics of Symmetric Encryption.	8 Marks	L2	CO1

(OR)

3.	a)	Demonstrate how a Public Key cryptographic system is used to secure a website via HTTPS.	8 Marks	L2	CO1
	b)	Interpret the function of Stateful Packet Inspection (SPI) in modern firewalls. Explain how tracking the "state" of a connection provides superior security compared to simple static packet filtering	8 Marks	L3	CO1

MODULE-II

4.	a)	Demonstrate with a neat diagram how an attacker uses DNS Tunneling to bypass network security	8 Marks	L3	CO2
	b)	Summarize the operational mechanics of Botnets. Describe the lifecycle of a botnet from initial infection to the execution of a DDoS attack.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the operational differences between Phishing, Smishing, and Vishing.	8 Marks	L2	CO2
	b)	Apply the use of Mobile Malicious Code to the propagation of Rogue Antivirus. Construct a step-by-step scenario where a mobile user is redirected to a malicious site.	8 Marks	L3	CO2

MODULE-III

6.	a)	Compare various web exploit tools based on their capabilities, strengths, and limitations.	8 Marks	L4	CO3
	b)	Summarize the working of SQL injection attacks in database-driven applications.	8 Marks	L2	CO3

(OR)

7.	a)	Describe integer overflow vulnerabilities and their impact on program security.	8 Marks	L2	CO3
	b)	Apply defensive techniques to reduce the risk of brute force and dictionary attacks.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain the characteristics of worms and viruses and how they differ in propagation.	8 Marks	L2	CO4
	b)	Show how privilege escalation can occur through the exploitation of system vulnerabilities.	8 Marks	L3	CO4

(OR)

9.	a)	Describe the functionality of rootkits and spyware in compromised systems.	8 Marks	L2	CO4
	b)	Analyze how malware combines obfuscation and persistence techniques to remain undetected.	8 Marks	L4	CO4

MODULE-V

10.	a)	Illustrate the architecture of memory analysis frameworks used in forensic analysis.	8 Marks	L2	CO5
	b)	Apply the use of automated malicious code analysis systems in threat detection.	8 Marks	L3	CO5

(OR)

11.	a)	Describe the capabilities of memory forensics in uncovering malicious activity.	8 Marks	L2	CO5
	b)	Differentiate between signature-based and anomaly-based intrusion detection techniques.	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) Regular Examinations, April – 2026

BLOCK CHAIN TECHNOLOGIES

[Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is a distributed system?	2 Marks	L2	CO1
	b)	Define Blockchain.	2 Marks	L1	CO1
	c)	Define Bitcoin.	2 Marks	L2	CO2
	d)	What is the Genesis Block?	2 Marks	L2	CO2
	e)	Define a smart contract.	2 Marks	L1	CO3
	f)	Who introduced the concept of smart contracts?	2 Marks	L2	CO3
	g)	What is Hyperledger?	2 Marks	L1	CO4
	h)	List any two projects under the Hyperledger umbrella.	2 Marks	L2	CO4
	i)	What is an enterprise-grade Blockchain?	2 Marks	L3	CO5
	j)	Define scalability in the context of Blockchain.	2 Marks	L4	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the history and evolution of Blockchain technology.	8 Marks	L2	CO1
	b)	Describe the generic elements of Blockchain architecture with a neat diagram.	8 Marks	L4	CO1

(OR)

3.	a)	Explain the evolution of Blockchain technology from its origin to modern use.	8 Marks	L2	CO1
	b)	Discuss the different types of Blockchains and their advantages.	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain the definition and key characteristics of Bitcoin as a digital currency.	8 Marks	L2	CO2
	b)	Describe the life cycle of a Bitcoin transaction with a neat diagram.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the structure of a Bitcoin block and how mining works.	8 Marks	L2	CO2
	b)	Describe the function of the Genesis Block in the Bitcoin network.	8 Marks	L4	CO2

MODULE-III

6.	a)	Explain the history and definition of smart contracts.	8 Marks	L2	CO3
	b)	Discuss the concept of Ricardian contracts and their relevance to Blockchain.	8 Marks	L3	CO3

(OR)

7.	a)	Explain smart contract templates with suitable examples.	8 Marks	L4	CO3
	b)	What are oracles and smart oracles? Explain their roles in connecting Blockchain to real-world data.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain the objectives and structure of the Hyperledger project.	8 Marks	L2	CO4
	b)	Discuss the role of the Linux Foundation in developing Hyperledger projects.	8 Marks	L4	CO4

(OR)

9.	a)	Describe the architecture and components of Hyperledger Fabric.	8 Marks	L1	CO4
	b)	Explain the transaction flow in Hyperledger Fabric with a neat diagram.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain the architecture and key features of enterprise-grade Blockchain systems.	8 Marks	L2	CO5
	b)	Discuss various design considerations for enterprise Blockchain deployment.	8 Marks	L3	CO5

(OR)

11.	a)	Describe real-world scalability challenges and their possible solutions in Blockchain networks.	8 Marks	L1	CO5
	b)	Analyze Layer-1 and Layer-2 scalability solutions with examples.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) Regular Examinations, April – 2026

BLOCK CHAIN TECHNOLOGIES

[Computer Science and Engineering (Data Science)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is the CAP theorem in relation to Block chain?	2 Marks	L2	CO1
	b)	Mention one limitation of Block chain technology.	2 Marks	L2	CO1
	c)	What is a Bitcoin transaction ID?	2 Marks	L2	CO2
	d)	Mention one function of a Bitcoin wallet.	2 Marks	L1	CO2
	e)	What is a smart oracle?	2 Marks	L2	CO3
	f)	What is the function of precompiled contracts in Ethereum?	2 Marks	L3	CO3
	g)	What is Corda?	2 Marks	L4	CO4
	h)	Define an alternative blockchain.	2 Marks	L3	CO4
	i)	Define Web3.	2 Marks	L4	CO5
	j)	What is a token economy?	2 Marks	L4	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss the benefits and limitations of Block chain technology.	8 Marks	L4	CO1
	b)	Explain how Block chain ensures transparency and immutability.	8 Marks	L2	CO1

(OR)

3.	a)	What is a decentralized ecosystem? Explain full ecosystem decentralization with an example.	8 Marks	L1	CO1
	b)	Describe the role of smart contracts and DAOs in decentralized systems.	8 Marks	L4	CO1

MODULE-II

4.	a)	Describe the working of mining and proof-of-work in the Bitcoin ecosystem.	8 Marks	L2	CO2
	b)	Explain the significance of cryptographic keys in Bitcoin transactions.	8 Marks	L3	CO2

(OR)

5.	a)	Describe the structure and working of a Bitcoin block header.	8 Marks	L3	CO2
	b)	Discuss how Bitcoin payments and investments are made.	8 Marks	L3	CO2

MODULE-III

6.	a)	Compare CPU mining and GPU mining in Ethereum.	8 Marks	L3	CO3
	b)	Describe Ethereum clients and wallets with suitable examples.	8 Marks	L4	CO3

(OR)

7.	a)	Describe the process of deploying smart contracts on a Blockchain platform.	8 Marks	L2	CO3
	b)	Compare traditional contracts with smart contracts in terms of automation and trust.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain the decentralized storage mechanism in Storj and Maidsafe.	8 Marks	L4	CO4
	b)	Describe the structure and features of BigChainDB.	8 Marks	L1	CO4
		(OR)			
9.	a)	Describe the architecture and components of Hyperledger Fabric.	8 Marks	L1	CO4
	b)	Explain the transaction flow in Hyperledger Fabric with a neat diagram.	8 Marks	L3	CO4

MODULE-V

10.	a)	Compare proof-of-work and proof-of-stake consensus mechanisms in terms of sustainability.	8 Marks	L2	CO5
	b)	Explain Blockchain security challenges in production systems and their mitigation strategies.	8 Marks	L5	CO5
		(OR)			
11.	a)	Discuss various design considerations for enterprise Blockchain deployment.	8 Marks	L3	CO5
	b)	Describe real-world scalability challenges and their possible solutions in Blockchain networks.	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) Regular Examinations, April – 2026

CRYPTOGRAPHY AND NETWORK SECURITY

[Computer Science and Engineering (Data Science), Computer Science and Information Technology, Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	State active and passive attack	2 Marks	L1	CO1
	b)	Define integrity and non-repudiation.	2 Marks	L2	CO1
	c)	Compare stream cipher with block cipher	2 Marks	L4	CO1
	d)	List the design parameters of Feistel cipher network	2 Marks	L2	CO1
	e)	Distinguish between message integrity and message authentication.	2 Marks	L4	CO2
	f)	List the attacks to which MAC is vulnerable	2 Marks	L2	CO2
	g)	List the requirements of Kerberos	2 Marks	L1	CO3
	h)	Define PKI	2 Marks	L1	CO3
	i)	State Radix-64 text encoding	2 Marks	L1	CO4
	j)	Analyze how is replay attack prevented by IPSec	2 Marks	L4	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Determine the security services required to counter various types of Active and Passive attacks.	8 Marks	L2	CO1
	b)	Analyze the relation between security mechanisms and attacks.	8 Marks	L4	CO1

(OR)

3.	a)	Differentiate Poly and Mono Alphabetic cipher techniques with example.	8 Marks	L4	CO1
	b)	Explain the operations, requirements, components of Network security model.	8 Marks	L1	CO1

MODULE-II

4.	a)	Give the structure of AES. Explain how Encryption/Decryption is done in AES.	8 Marks	L2	CO1
	b)	Define Output Feedback (OFB) and list its advantages and disadvantages	8 Marks	L1	CO1

(OR)

5.	a)	Illustrate how expansion permutation function work in DES	8 Marks	L2	CO1
	b)	How do you convert a block cipher into a stream cipher by using the Cipher Feedback (CFB) mode? Explain.	8 Marks	L2	CO1

MODULE-III

6.	a)	Explain the compression of Secure Hash Algorithm	8 Marks	L1	CO2
	b)	Illustrate the requirements of hash functions	8 Marks	L2	CO2

(OR)

7.	a)	Give the structure of HMAC. List out the design objectives of HMAC.	8 Marks	L2	CO2
	b)	Explain the benefits/advantages of HMAC over other hash based schemes.	8 Marks	L1	CO2

MODULE-IV

8.	a)	Explain the authentication procedures defined by X.509 certificate.	8 Marks	L1	CO3
	b)	Explain the process of Symmetric Key Distribution using Symmetric Encryption	8 Marks	L2	CO3

(OR)

9.	a)	List and Explain the main features of Kerberos Version 5	8 Marks	L2	CO3
	b)	Illustrate the procedure for distribution of public keys using Public announcement and Publicly available directory Schemes	8 Marks	L2	CO3

MODULE-V

10.	a)	Explain the content types provided in S/MIME.	8 Marks	L1	CO4
	b)	Write a short notes on DNSSEC	8 Marks	L1	CO4

(OR)

11.	a)	Justify the need of compression after generating signatures and before message encryption in PGP	8 Marks	L4	CO4
	b)	Describe the architecture of IPSec	8 Marks	L1	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) Regular Examinations, April – 2026

ETHICAL HACKING

[Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define sound operations in the context of ethical hacking.	2 Marks	L1	CO1
	b)	Differentiate between computer security and network security.	2 Marks	L2	CO1
	c)	Why are previous penetration test results valuable?	2 Marks	L1	CO2
	d)	Explain multi-phased attacks in penetration testing.	2 Marks	L2	CO2
	e)	List two tools commonly used for internet reconnaissance.	2 Marks	L1	CO3
	f)	How does combining social engineering and physical security testing enhance penetration testing effectiveness?	2 Marks	L3	CO3
	g)	How do threads and groups help in organizing penetration testing efforts?	2 Marks	L2	CO4
	h)	What is wardialing, and how does it work?	2 Marks	L1	CO5
	i)	What is the role of incident management in penetration testing?	2 Marks	L2	CO5
	j)	List two strategies commonly used in defense planning.	2 Marks	L2	CO6

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss how risk analysis contributes to the process of ethical hacking and security planning.	8 Marks	L2	CO1
	b)	Differentiate between ethical hackers and malicious hackers, emphasizing their approaches and goals.	8 Marks	L3	CO2

(OR)

3.	a)	Explain the Security Architecture in detail.	8 Marks	L3	CO3
	b)	Discuss the steps involved in implementing an information security program.	8 Marks	L4	CO4

MODULE-II

4.	a)	What is an engagement planner, and how does it facilitate a successful penetration test?	8 Marks	L2	CO2
	b)	Compare inherent limitations and imposed limitations in the context of ethical hacking.	8 Marks	L3	CO3

(OR)

5.	a)	Explain the role of previous test results in shaping future penetration testing strategies.	8 Marks	L3	CO4
	b)	Explain the significance of identifying attack types and source points in penetration testing.	8 Marks	L4	CO5

MODULE-III

6.	a)	Discuss the different types of social engineering attacks and their impact on an organization.	8 Marks	L2	CO2
	b)	What is social engineering, and why is it an effective method for gaining unauthorized access?	8 Marks	L3	CO6

(OR)

7.	a)	Discuss the tools and techniques used during the technical preparation phase of ethical hacking.	8 Marks	L3	CO3
	b)	How does proper documentation help in managing an ethical hacking engagement?	8 Marks	L2	CO6

MODULE-IV

8.	a)	Discuss common enumeration techniques and their importance in ethical hacking.	8 Marks	L2	CO4
	b)	How do threads and groups play a role in managing large-scale penetration testing tasks?	8 Marks	L3	CO6

(OR)

9.	a)	What is evasion in ethical hacking, and how does it help bypass security measures?	8 Marks	L3	CO5
	b)	What are password crackers, and how are they utilized during ethical hacking?	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss the challenges of creating a penetration testing document that is accessible to both technical and non-technical stakeholders.	8 Marks	L3	CO6
	b)	What is the purpose of a deliverable in the context of ethical hacking, and why is it important?	8 Marks	L2	CO3

(OR)

11.	a)	What changes to security policies might be recommended based on penetration test results?	8 Marks	L3	CO5
	b)	Explain the significance of having a well-structured document for reporting penetration testing results.	8 Marks	L2	CO2

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) Regular Examinations, April – 2026

STEEL STRUCTURES

[Civil Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Mention the advantages and disadvantages of bolted connection.	2 Marks	L1	CO1
	b)	Name the different types of butt welds with sketches.	2 Marks	L1	CO1
	c)	Explain the class of sections in steel as per code.	2 Marks	L1	CO2
	d)	Distinguish web buckling and web crippling.	2 Marks	L1	CO2
	e)	List the types of failures of a tension member	2 Marks	L1	CO3
	f)	Draw different shapes of members used as compression members.	2 Marks	L1	CO3
	g)	Write any three codal provisions to be followed in the design of lacing system as per IS: 800-2007	2 Marks	L2	CO4
	h)	What is a column base?	2 Marks	L2	CO4
	i)	State any four component parts of roof truss with neat sketch.	2 Marks	L2	CO5
	j)	What is a tubular truss?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.		Design a lap joint between the two plates of width 150 mm, if the thickness of one plate is 12 mm and the other is 10 mm. The joint has to transfer a working load of 100 kN. The plates are of Fe 410 grade. Use bearing type bolts.	16 Marks	L6	CO1

(OR)

3.	a)	Write neat sketches and explain about different types of welds.	8 Marks	L2	CO1
	b)	A 18 mm thick plate is joined to a 16 mm plate by 200 mm long butt weld. determine the strength of joint if i) A double V butt weld is used ii) A single V butt weld is used Assume that Fe410 grade plates and shop welds are used.	8 Marks	L4	CO1

MODULE-II

4.		A simply supported beam of span 5 m is subjected to a superimposed load of a concentrated load of 200 kN at mid span. Design the beam and check for deflection and shear. The beam is laterally supported throughout.	16 Marks	L6	CO2

(OR)

5.		Design a built-up beam using rolled I-section ISMB 350. The effective span of the beam is 5.5m, it carries a UDL of 40 kN/m for the whole span. The ends of the beam are framed to the column. Use fy= 250 MPa. Available thickness of plates: 12 mm and 14 mm.	16 Marks	L6	CO2

MODULE-III

6. A single unequal angle ISA 90 x 60 x 6mm is connected to a 10mm gusset plates at the ends with 5nos of 16mm bolts to transfer tension. Determine the design tensile strength of the angle
   i) If the gusset is connected to 90mm leg
   ii) If the gusset is connected to 60mm leg — 16 Marks — L4 — CO3

(OR)

7. A single angle section ISA 60 x 60 x 8 mm, 2.55 m long, is used as strut. The ends are welded to the gusset plates. Determine the design compressive strength and the service load that can be applied. — 16 Marks — L4 — CO3

MODULE-IV

8. Design a built-up column consisting of two channels placed back to back to carry an axial factored load of 1900 kN. Design bolted single lacing system also. Length of the column is 10 m and both the ends of the column are effectively restrained in direction and position — 16 Marks — L6 — CO4

(OR)

9. Design a gusseted base for a column ISHB 350 @72.4 kg/m with flange plates 450 mm × 20 mm carrying a factored axial force of 3000 kN. The column rests on M20 grade concrete pedestal. Design the bolted connection also. Assume Fe 410 grade steel and 4.6 grade bolts. — 16 Marks — L6 — CO4

MODULE-V

10. A roof truss shed is to be built in Visakhapatnam for an industry. The size of the shed is 24 m X 40 m. The height of the building is 12 m at the ends. Determine the design wind speed and design wind pressure. — 16 Marks — L4 — CO5

(OR)

11. a) State advantages & disadvantages of tubular sections in steel structure — 8 Marks — L2 — CO5

    b) A tie member in a roof truss is connected to the principal rafter at an angle of 900. Design the members and the connections for the following data. Use grade Yst=240 tubes — 8 Marks — L6 — CO5

S.No.	Member	Length	Force
1	Principal rafter panel	2.6 m	85 kN
2	Tie member	2.2 m	35 kN

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Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) Regular Examinations, April – 2026

GROUND IMPROVEMENT TECHNIQUES

[Civil Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define ground improvement. State two objectives.	2 Marks	L1	CO1
	b)	What are problematic soils? Give examples.	2 Marks	L1	CO1
	c)	Define drainage and dewatering.	2 Marks	L1	CO2
	d)	What is well pointing system?	2 Marks	L2	CO2
	e)	Define dynamic compaction.	2 Marks	L1	CO3
	f)	What are vertical drains?	2 Marks	L1	CO3
	g)	Define soil stabilization.	2 Marks	L2	CO4
	h)	List types of grouting.	2 Marks	L1	CO4
	i)	What are geo synthetics?	2 Marks	L2	CO5
	j)	Define reinforced earth wall.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain role and need of ground improvement techniques in foundation engineering.	8 Marks	L3	CO1
	b)	Discuss selection criteria for suitable ground improvement methods based on soil conditions.	8 Marks	L4	CO1

(OR)

3.	a)	Explain different methods of ground improvement with advantages and limitations.	8 Marks	L2	CO1
	b)	Discuss geotechnical problems associated with alluvial, laterite and black cotton soils.	8 Marks	L4	CO1

MODULE-II

4.	a)	Explain drainage techniques used in geotechnical engineering.	8 Marks	L4	CO2
	b)	Describe vacuum and electro-osmotic dewatering methods with applications.	8 Marks	L3	CO2

(OR)

5.	a)	Explain well point system for deep excavation with neat sketch.	8 Marks	L3	CO2
	b)	Discuss electro-kinetic dewatering and its advantages.	8 Marks	L4	CO2

MODULE-III

6.	a)	It was proposed to construct an embankment over a 12 m thick clay layer overlain a impermeable strata. Sand drain (Vertical drain) of dia. 0.36 m are installed in clay layer in a square pattern with a spacing of 3.2 m c/c. The clay has Cv = 3.5 m^2/year, Cr = 7 m^2/year and m_v = 0.21 m^2/MN. Determine the settlement of clay layer in 6 months commencing from middle of construction projects. The mean effective vertical pressure is 90kPa.	16 Marks	L4	CO3

(OR)

7.	a)	What is meant by a 60% dynamite charge? Why is 60% dynamite preferred over high-strength explosives for ground improvement? A site is improved using ballasting with 60% dynamite. The weight of explosive used is 80 kg. Determine the radius of influence of compaction. Take C= 0.0122C	8 Marks	L3	CO3
	b)	Prefabricated vertical drains were installed in the clay mass in a triangular pattern with a spacing of 2 m. The drain size was 100 mm in width and 4 mm in thickness. Consider the horizontal water flow only and perfect drain condition. Estimate the time to achieve 90% consolidation. Assume C_h= 2.25 m^2/year.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain mechanical and lime stabilization techniques.	8 Marks	L3	CO4
	b)	Describe chemical stabilization and fly ash stabilization methods.	8 Marks	L2	CO4

(OR)

9.	a)	Explain grouting methods and types of grouts.	8 Marks	L2	CO4
	b)	Discuss shotcreting and guniting technology with applications.	8 Marks	L4	CO4

MODULE-V

10.	Consider a geo textile reinforced soil retaining wall with the following details: Height of the retaining wall, H = 8 m For the granular backfill total unit weight = 18 kN/M^3 Angle of internal friction, $\phi = 33^\circ$ Allowable tensile strength of geotextile reinforcement = 40 kN/m F.O.S against geotextile rupture = 1.5 F.O.S against geotextile pullout = 1.5 Calculate the spacing and length of geotextile layers and the lap length at depth Z = 2 m, 4 m, and 8 m.	16 Marks	L4	CO5

(OR)

11.	With diagram explain soil nailing? What are the different types of soil nails used in construction? What are the different applications of soil nails and its limitation?	16 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) Regular Examinations, April – 2026

GEOSPATIAL TECHNOLOGIES

[Civil Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define photogrammetry and state its fundamental principle.	2 Marks	L1	CO1
	b)	Classify aerial photographs based on stereoscopic vision and explain the basis of classification.	2 Marks	L1	CO1
	c)	What is meant by the space segment of the Global Positioning System?	2 Marks	L1	CO2
	d)	What are GPS observations?	2 Marks	L1	CO2
	e)	What is non-spatial (attribute) data? Give one suitable example	2 Marks	L1	CO3
	f)	Distinguish between raster data and vector data with respect to their data structure.	2 Marks	L2	CO3
	g)	What is meant by attribute data storage in GIS?	2 Marks	L1	CO4
	h)	Define Digital Elevation Model (DEM).	2 Marks	L1	CO4
	i)	What is meant by drought monitoring? Explain its role in disaster management.	2 Marks	L2	CO5
	j)	Define drainage morphometry.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the principle of photogrammetry with suitable illustrations and real-world examples.	8 Marks	L2	CO1
	b)	Examine the role of perspective geometry in photogrammetric measurements and mapping, highlighting its influence on image formation and accuracy.	8 Marks	L4	CO1

(OR)

3.	a)	Explain the procedure for preparation of a controlled photographic mosaic.	8 Marks	L2	CO1
	b)	Explain parallax and its measurement in aerial photographs.	8 Marks	L3	CO1

MODULE-II

4.	a)	Discuss the applications of GPS in surveying, navigation, and engineering projects with suitable examples.	8 Marks	L3	CO2
	b)	Define the elements of remote sensing and explain each element in detail.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the various GPS observations used for position determination and analyze their role in accuracy.	8 Marks	L4	CO2
	b)	Discuss the applications of GPS in surveying, navigation, and engineering projects with suitable examples.	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain the concept and historical evolution of the Geographic Information System (GIS), highlighting the major stages in its development from manual mapping to modern digital systems.	8 Marks	L2	CO3
	b)	Describe the importance of GIS in modern decision-making processes, explaining how it supports planning, management, and policy formulation in different sectors.	8 Marks	L3	CO3
		(OR)			
7.	a)	Classify Geographic Information Systems based on data handling methods and application areas, clearly explaining the basis of each classification.	8 Marks	L2	CO3
	b)	Explain the advantages and limitations of different categories of GIS, and analyze how these factors influence their suitability for various applications.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Explain the different database models used in Geographic Information Systems and their suitability for spatial data handling.	8 Marks	L2	CO4
	b)	What are the different database models used in GIS?	8 Marks	L1	CO4
		(OR)			
9.	a)	Discuss the common issues related to attribute data handling in GIS and analyze their impact on spatial analysis results.	8 Marks	L4	CO4
	b)	Explain the data manipulation techniques used in GIS for editing, updating, and transforming spatial data.	8 Marks	L3	CO4

MODULE-V

10.	a)	Describe the role of spatial data in hydrological modeling and watershed analysis.	8 Marks	L2	CO5
	b)	Explain flood impact assessment and monitoring using GIS techniques and multi-temporal remote sensing data.	8 Marks	L3	CO5
		(OR)			
11.	a)	Why is flood impact assessment using GIS important for disaster management and mitigation planning?	8 Marks	L4	CO5
	b)	Describe drought assessment and monitoring techniques using remote sensing indices and spatial analysis.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) Regular Examinations, April – 2026

ADVANCED CONCRETE TECHNOLOGY

[Civil Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What are the primary components of Ordinary Portland Cement (OPC)?	2 Marks	L1	CO1
	b)	Define mineral admixtures.	2 Marks	L1	CO1
	c)	What is the nominal mix design of concrete?	2 Marks	L1	CO2
	d)	What is Ground Granulated Blast Furnace Slag (GGBS)?	2 Marks	L2	CO2
	e)	What is the meaning of high-performance concrete?	2 Marks	L1	CO3
	f)	What is the minimum grade of concrete as per IS 456: 2000?	2 Marks	L1	CO3
	g)	What causes frost damage in concrete?	2 Marks	L2	CO4
	h)	How does the corrosion of reinforcement affect concrete structures?	2 Marks	L1	CO4
	i)	What is the Non-Destructive Testing (NDT)?	2 Marks	L2	CO5
	j)	What is the Destructive Testing?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	What are the recent advancements in aggregate technology, and how do they enhance the performance of concrete?	16 Marks	L3	CO1

(OR)

3.	Illustrate the hydration process of Portland Cement, explaining the chemical reactions involved during different stages.	16 Marks	L2	CO1

MODULE-II

4.	Explain the IS method for mix proportioning in concrete.	16 Marks	L4	CO2

(OR)

5.	What is the Interfacial Transition Zone (ITZ) in concrete? Discuss its significance and how it affects the mechanical properties of concrete.	16 Marks	L3	CO2

MODULE-III

6.	Describe the role of bacterial concrete in self-healing processes and its potential impact on the durability of structures.	16 Marks	L3	CO3

(OR)

7.	Evaluate recycled aggregate concrete's mechanical and durability properties and its role in sustainable construction.	16 Marks	L3	CO3

MODULE-IV

8.	Discuss the primary factors affecting the durability of concrete.	16 Marks	L3	CO4

(OR)

9.	Describe the carbonation process in concrete. How does it lead to reinforcement corrosion?	16 Marks	L2	CO4

MODULE-V

10.	Discuss the electrical resistivity test for concrete and its importance in evaluating the durability of reinforced concrete structures.	16 Marks	L4	CO5
	(OR)			
11.	What is thermal imaging, and how can it be used to detect anomalies in concrete structures? Discuss its benefits and limitations in comparison to other NDT methods.	16 Marks	L3	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) Regular Examinations, April – 2026

INTERFACING WITH MICROCONTROLLERS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is the primary function of a CPU in a computer system	2 Marks	L1	CO1
	b)	Name the component of a computer system responsible for storing data permanently.	2 Marks	L1	CO1
	c)	List few features of 8051 microcontroller?	2 Marks	L1	CO2
	d)	What is the purpose of ALU ?	2 Marks	L1	CO2
	e)	What is the difference between Asynchronous and synchronous Mode	2 Marks	L1	CO3
	f)	Write a two examples of direct addressing mode	2 Marks	L1	CO3
	g)	What are the functions of timers and counters in the 8051 microcontroller?	2 Marks	L1	CO4
	h)	How does a timer operate in the 8051 microcontroller?	2 Marks	L4	CO4
	i)	What is the purpose of the 8255 Programmable Peripheral Interface?	2 Marks	L1	CO5
	j)	How do you interface an LED with the 8051 microcontroller?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Compare Microprocessors and Microcontrollers	8 Marks	L4	CO1
	b)	Discuss the concept of criteria for choosing a microcontroller	8 Marks	L3	CO1
		(OR)			
3.	a)	Sketch the block diagram of Computer system and explain each block in detail.	8 Marks	L2	CO1
	b)	Explain the role of CPU in a Computer system.	8 Marks	L2	CO1

MODULE-II

4.	a)	Sketch the Architecture of the 8051 and list out the features	10 Marks	L1	CO2
	b)	Explain the memory organization of 8051	6 Marks	L2	CO2
		(OR)			
5.	a)	List out the different bit addressable SFR's available in 8051	8 Marks	L1	CO2
	b)	Explain the timing diagram of 8051 microcontroller	8 Marks	L2	CO2

MODULE-III

6.		List the Branching instructions in 8051 and explain each with an example.	16 Marks	L2	CO3
		(OR)			
7.	a)	Write an ALP to find the largest of the given numbers.	8 Marks	L3	CO3
	b)	Write an ALP to multiply two 8 bit numbers	8 Marks	L3	CO3

MODULE-IV

8.	a)	Summarize modes of operation of Timers in 8051	8 Marks	L2	CO4
	b)	Develop a program to generate delay of 30 ms using timer 0 in mode 2.	8 Marks	L3	CO4

(OR)

9.	a)	Explain the interrupt Structure in 8051	8 Marks	L2	CO4
	b)	Sketch the registers Associated with Serial communication	8 Marks	L1	CO4

MODULE-V

10.	Illustrate interfacing diagram of ADC with 8051 Microcontroller	16 Marks	L2	CO5

(OR)

11.	Sketch the hardware details and program to interface stepper motor to 8051	16 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) Regular Examinations, April – 2026

ANTENNAS AND PROPAGATION

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define radiation intensity.	2 Marks	L1	CO1
	b)	Write the Friis transmission formula and mention its practical applications.	2 Marks	L1	CO1
	c)	What is the principle of pattern multiplication?	2 Marks	L1	CO2
	d)	Define a broadside array and an end-fire array, and state one key difference between them.	2 Marks	L1	CO2
	e)	Explain the difference between axial and normal modes in a monofilar helical antenna.	2 Marks	L2	CO2
	f)	What are the advantages and limitations of rectangular microstrip antennas?	2 Marks	L1	CO2
	g)	What is the concept of reciprocity in antenna theory?	2 Marks	L1	CO3
	h)	Differentiate near and far fields in antenna measurements.	2 Marks	L4	CO3
	i)	What is super refraction, and how does it affect wave propagation?	2 Marks	L1	CO4
	j)	Explain the concept of skip distance in sky wave propagation and its relation to the maximum usable frequency (MUF).	2 Marks	L2	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the following terms related to antenna i) Beam efficiency ii) Directivity. iii) Polarization. iv) Radiated power.	8 Marks	L2	CO1
	b)	Develop the relation between Directivity with Effective Aperture Area and Beam Area.	8 Marks	L3	CO1

(OR)

3.	a)	Discuss about the far fields of center-fed antennas with respect to different lengths?	8 Marks	L2	CO1
	b)	Explain the concept of radiation resistance and derive an expression for the radiation resistance of a small electric dipole antenna.	8 Marks	L2	CO1

MODULE-II

4.	a)	In a linear array of 4 isotropic elements spaced $\lambda/2$ apart and with equal currents fed in phase, develop the radiation pattern in polar coordinates.	10 Marks	L3	CO2
	b)	Discuss the characteristics, merits and demerits of a folded dipole.	6 Marks	L2	CO2

(OR)

5.	a)	Develop an expression for the array factor of a linear broadside array of 'n' elements.	8 Marks	L3	CO2
	b)	Design a 5-element Yagi-Uda array antenna to operate at 455MHz.	8 Marks	L3	CO2

MODULE-III

6.	a)	Sketch and explain the constructional features of a horn antenna.	8 Marks	L2	CO2
	b)	Compare the various feed methods involved in Micro strip Patch Antenna.	8 Marks	L4	CO2

(OR)

7.	a)	Develop the design considerations for monofilar helical antenna in axial mode.	8 Marks	L3	CO2
	b)	With neat diagram, explain the geometry of parabolic reflector.	8 Marks	L2	CO2

MODULE-IV

8.	a)	Explain the different gain measurement techniques of an antenna.	8 Marks	L2	CO3
	b)	Analyze the various sources of errors regarding antenna measurements.	8 Marks	L4	CO3

(OR)

9.	a)	Describe a method of measurement of radiation pattern with neat measurement setup	8 Marks	L2	CO3
	b)	What is polarization and describe polarization measurement by power measurement approach?	8 Marks	L1	CO3

MODULE-V

10.	a)	Explain the structural details of the ionosphere.	8 Marks	L2	CO4
	b)	Analyze the effects of D-layer in the sky wave propagation.	8 Marks	L4	CO4

(OR)

11.	a)	Derive the fundamental equation for free space propagation	8 Marks	L3	CO4
	b)	Explain the relation between MUF and skip distance in detail	8 Marks	L2	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) Regular Examinations, April – 2026

PROGRAMMABLE LOGIC CONTROLLERS

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define PLC.	2 Marks	L1	CO1
	b)	Compare the PLC and PC.	2 Marks	L1	CO1
	c)	Point out the applications of PLC.	2 Marks	L1	CO3
	d)	Draw the PLC ladder diagram for NAND gate.	2 Marks	L1	CO3
	e)	What is the use of MCR instruction?	2 Marks	L1	CO2
	f)	Point out the advantages of jump instruction.	2 Marks	L1	CO2
	g)	List basic math functions that can be performed on PLC's.	2 Marks	L1	CO3
	h)	Convert $(327)_{10}$ to octal.	2 Marks	L1	CO3
	i)	Sketch Token Ring Topology.	2 Marks	L1	CO4
	j)	Summarize PLC Comparison functions	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Draw a block diagram of a PLC showing the main functional items and how buses link them, explaining the functions of each block.	8 Marks	L2	CO1
	b)	State the characteristics of the Relay, Transistor and Triac types of PLC output terminals.	8 Marks	L2	CO1

(OR)

3.	a)	Describe the PLC CPU Power Supply with suitable sketches.	8 Marks	L2	CO1
	b)	Develop a ladder logic diagram for an alarm system. There are four hazard inputs to the alarm system that go on some operational malfunction occurs. The system operates as follows If one input is on, nothing happens If any two inputs are on, a red pilot light goes on If any three inputs are on, an alarm siren sounds If all four are on, the fire department is notified.	8 Marks	L3	CO1

MODULE-II

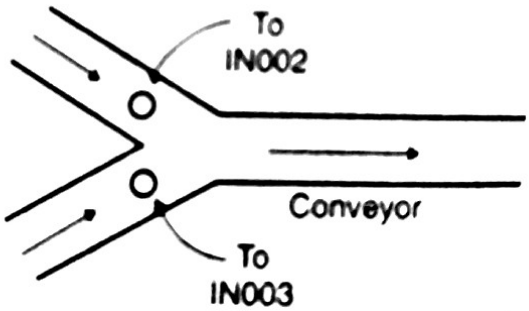
4.	a)	Create a ladder diagram for a motor control circuit that utilizes two push buttons.	8 Marks	L3	CO2
	b)	Explain the following i) AND gate and relay and PLC equivalents. ii) NOR gate and Relay and PLC equivalents.	8 Marks	L2	CO2

(OR)

5.	a)	Develop a ladder logic diagram for the following Boolean	8 Marks	L2	CO3

expression (61*62)+(63)+(64)+(65*66)=15.

	b)	Develop ladder logic for counting the net number of parts on a conveyor. The number of parts going on the conveyor is counted by one proximity device's count. The number leaving the conveyor is counted by a second proximity's device's count. The indicator will be ON when at least 6 of Part A and 8 of Part B have entered the conveyor.	8 Marks	L3	CO3



MODULE-III

6.		Explain the Jump with Non-Return with an application.	16 Marks	L2	CO4
		(OR)			
7.		Evaluate the significance of these comparison functions in the automation industry, focusing on process control applications.	16 Marks	L3	CO4

MODULE-IV

8.		Explain how Bit patterns in registers can be used in machine control?	16 Marks	L3	CO4
		(OR)			
9.		Discuss in detail shift register function and its applications.	16 Marks	L3	CO4

MODULE-V

10.	a)	Describe about open system interconnection model for network architecture in PLC.	8 Marks	L2	CO5
	b)	Explain the different levels of industrial control systems and illustrate how each level interacts with one another in a typical manufacturing environment	8 Marks	L2	CO5
		(OR)			
11.	a)	Discuss in detail about Networking of PLC.	8 Marks	L2	CO5
	b)	Generally, describe the PID function in PLC	8 Marks	L2	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) Regular Examinations, April – 2026

DIGITAL SIGNAL PROCESSING

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Compare Power Density spectrum and Energy Density spectrum.	2 Marks	L2	CO1
	b)	What is the mathematical equation for time-shifting property with initial conditions in Z-Transforms?	2 Marks	L1	CO1
	c)	Why FFT is called as in-place algorithm?	2 Marks	L2	CO2
	d)	List a few properties of DFT.	2 Marks	L1	CO2
	e)	Explain Warping effect.	2 Marks	L2	CO3
	f)	What is the denominator polynomial in the transfer function of Butterworth filter with order N=2?	2 Marks	L1	CO3
	g)	Why are FIR filters inherently stable?	2 Marks	L2	CO3
	h)	Explain the significance of windowing technique in the design of FIR Filters.	2 Marks	L1	CO3
	i)	Name the common structures used to realization of FIR filters.	2 Marks	L1	CO4
	j)	What are the digital elements in realization structures of IIR and FIR filters?	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2. Solve the difference equation — 16 Marks, L3, CO1

$$y(n) = x(n) + \frac{5}{6}y(n-1) - \frac{1}{6}y(n-2)$$

for the unit step input sequence. Assume that initial conditions y(-1) = y(-2) = 1 . Make use of Z- Transform.

(OR)

3.	a)	Develop the mathematical equation for power density spectrum.	6 Marks	L2	CO1
	b)	Determine the impulse response of the system using Z-Transform. $y(n) = (n) + \frac{5}{6}y(n-1) - \frac{1}{6}y(n-2)$.	10 Marks	L3	CO1

MODULE-II

4. a) A finite duration sequence is given as — 10 Marks, L3, CO2

$$x(n) = \begin{cases} 1 & 0 \le n \le 7 \\ 0 & otherwise \end{cases}$$

Determine DFT of the sequence using DIFFFT algorithm.

b) Make use of over-lap save method to find the output, y(n) of a — 6 Marks, L3, CO2

filter whose impulse response is h(n) = {1,1,1} and the input signal, x(n) = {3,-1,0,1,3,2,0,1,2,1}.

(OR)

5.	a)	Find the 8-point DFT of the sequence by applying DIT-FFT radix 2 algorithm for x(n) = {1,2,3,4,4,3,2,1 }.	10 Marks	L3	CO2
	b)	Explain twiddle factor. Prove the properties of twiddle factors with example.	6 Marks	L2	CO2

MODULE-III

6.	a)	Find the transfer function of an analog butter worth filter that has -8dB pass band attenuation at a frequency of 35rad/sec and atleast -16dB stop band attenuation at a frequency of 49rad/sec.	12 Marks	L4	CO3
	b)	Find the denominator polynomial of Butterworth transfer function for order 3.	4 Marks	L2	CO3

(OR)

7.		Develop a the transfer function of Digital Cheby shev Type-I Low pass filter using bilinear transformation with the specifications α_p=1 dB ripple in the pass band $0 \le \omega \le 0.2\pi$ α_s=15 dB ripple in the stop band $0.3\pi \le \omega \le \pi$	16 Marks	L4	CO3

MODULE-IV

8.	a)	Find the filter coefficients h(n) using frequency sampling method for N=7 $H_d(e^{jw}) = \begin{cases} e^{-j(N-1)\omega/2} & 0 \le \omega \le \pi/2 \\ 0 & \pi/2 \le \lvert\omega\rvert \le \pi \end{cases}$	12 Marks	L4	CO3
	b)	Summarize the window functions used in the design of FIR filters.	4 Marks	L2	CO3

(OR)

9.		Develop FIR high pass filter with the frequency response for N=11 using Barlett window. $H_d(e^{jw}) = \begin{cases} 1 & \pi/4 \le \omega \le \pi \\ 0 & \lvert\omega\rvert < \pi/4 \end{cases}$	16 Marks	L4	CO3

MODULE-V

10.		Realize of LTI system given below using the Cascade and parallel form structures $H(z) = \dfrac{\left(1+\frac{3}{2}z^{-1}+\frac{1}{2}z^{-2}\right)\left(1-\frac{3}{2}z^{-1}+z^{-2}\right)}{\left(1+z^{-1}+\frac{1}{4}z^{-2}\right)\left(1+\frac{1}{4}z^{-1}+\frac{1}{2}z^{-2}\right)}$.	16 Marks	L3	CO4

(OR)

11.	a)	Show direct form, transposed form, and lattice structures in the realization of FIR filters. Discuss the advantages and disadvantages of each structure.	10 Marks	L2	CO4
	b)	Make use of direct form structure and realize the FIR filter with transfer function $H(z)=z^5+2z^4+0.5z^3+0.5z^2+2z+1$.	6 Marks	L3	CO4

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) Regular Examinations, April – 2026

MICROCONTROLLER AND INTERFACING

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is the primary function of a CPU in a computer system	2 Marks	L1	CO1
	b)	Name the component of a computer system responsible for storing data permanently.	2 Marks	L1	CO1
	c)	List few features of 8051 microcontroller?	2 Marks	L1	CO2
	d)	What is the purpose of ALU ?	2 Marks	L1	CO2
	e)	What is the difference between Asynchronous and synchronous Mode	2 Marks	L1	CO2
	f)	Write a two examples of direct addressing mode	2 Marks	L1	CO2
	g)	What are the functions of timers and counters in the 8051 microcontroller?	2 Marks	L1	CO3
	h)	How does a timer operate in the 8051 microcontroller?	2 Marks	L4	CO3
	i)	What is the purpose of the 8255 Programmable Peripheral Interface?	2 Marks	L1	CO4
	j)	How do you interface an LED with the 8051 microcontroller?	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Compare Microprocessors and Microcontrollers	8 Marks	L4	CO1
	b)	Discuss the concept of criteria for choosing a microcontroller	8 Marks	L2	CO1
		(OR)			
3.	a)	Sketch the block diagram of Computer system and explain each block in detail.	8 Marks	L3	CO1
	b)	Explain the role of CPU in a Computer system.	8 Marks	L2	CO1

MODULE-II

4.	a)	Sketch the Architecture of the 8051 and list out the features.	10 Marks	L3	CO2
	b)	Explain the memory organization of 8051.	6 Marks	L2	CO2
		(OR)			
5.	a)	List out the different bit addressable SFR's available in 8051	8 Marks	L1	CO2
	b)	Sketch and explain the timing diagram of 8051 microcontroller	8 Marks	L3	CO2

MODULE-III

6.		List the Branching instructions in 8051 and explain each with an example.	16 Marks	L1	CO2
		(OR)			
7.	a)	Develop an ALP to find the largest of the given numbers.	8 Marks	L3	CO3
	b)	Develop an ALP to multiply two 8 bit numbers	8 Marks	L3	CO3

MODULE-IV

8.	a)	Summarize modes of operation of Timers in 8051	8 Marks	L2	CO3
	b)	Develop a program to generate delay of 30 ms using timer 0 in mode 2.	8 Marks	L3	CO3

(OR)

9.	a)	Explain the interrupt Structure in 8051	8 Marks	L2	CO2
	b)	Sketch the registers Associated with Serial communication	8 Marks	L3	CO2

MODULE-V

10.	Illustrate interfacing diagram of ADC with 8051 Microcontroller	16 Marks	L3	CO4

(OR)

11.	Sketch the hardware details and program to interface stepper motor to 8051.	16 Marks	L3	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) Regular Examinations, April – 2026

POWER ELECTRONICS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	State any two advantages of power MOSFET.	2 Marks	L1	CO1
	b)	Define reverse recovery time of a diode.	2 Marks	L1	CO1
	c)	Define firing angle (α).	2 Marks	L1	CO2
	d)	Mention two applications of phase-controlled rectifier.	2 Marks	L1	CO2
	e)	Elaborate the effect of source inductance.	2 Marks	L2	CO3
	f)	Define natural commutation.	2 Marks	L1	CO3
	g)	What is a dual converter.	2 Marks	L1	CO4
	h)	What is a cycloconverter.	2 Marks	L1	CO4
	i)	State two advantages of PWM inverters.	2 Marks	L1	CO5
	j)	Mention two limitations of VSI.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Analyze the causes and effects of dv/dt and di/dt triggering in SCRs and justify the need for protection circuits.	8 Marks	L4	CO1
	b)	Explain the working principle of power MOSFET and compare it with BJT.	8 Marks	L2	CO1

(OR)

3.	a)	Explain the static I-V Characteristics of SCR with proper diagram.	8 Marks	L2	CO1
	b)	Draw and explain the switching characterizes of IGBT.	8 Marks	L2	CO1

MODULE-II

4.	a)	Describe a single-phase fully controlled bridge rectifier with R-L load and also draw the nature of output voltage and current.	8 Marks	L2	CO2
	b)	Explain the operation of a three-phase half-wave-controlled rectifier with R load.	8 Marks	L2	CO2

(OR)

5.	a)	Analyze the effect of source inductance on commutation overlap and output voltage of controlled rectifiers.	8 Marks	L4	CO2
	b)	A 1-phase 230 V, 1 KW heater is connected across 1-phase, 230 V, 50 Hz supply through a SCR. For firing angle of 45^0 and 90^0, calculate the power absorbed in the heater element.	8 Marks	L3	CO2

MODULE-III

6.	a)	A step-down chopper has a resistance load of R =15Ω and input voltage of 200V. When the chopper remains ON, its voltage drop is 2.5V. The chopper frequency is 1 KHz. If the duty cycle is 50%. Determine the RMS Output voltage and average output voltage of chopper.	8 Marks	L3	CO3
	b)	Describe class-C commutation operation with suitable waveforms.	8 Marks	L2	CO3

(OR)

7.	a)	Explain the working of a step-down chopper and derive the expression of average output voltage.	8 Marks	L2	CO3
	b)	A step-down chopper has input voltage 200 V and duty cycle 0.4. Calculate average and rms output voltage.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Describe AC voltage controller with R load and draw the output voltage and current waveforms.	8 Marks	L2	CO4
	b)	Explain the working of a single-phase cycloconverter with suitable waveforms.	8 Marks	L2	CO4

(OR)

9.	a)	A single-phase AC voltage controller operates from 230 V supply at firing angle 60°. Calculate RMS output voltage.	8 Marks	L3	CO4
	b)	A cycloconverter steps down frequency from 50 Hz to 10 Hz. Determine the frequency conversion ratio and justify it suitable waveforms.	8 Marks	L3	CO4

MODULE-V

10.	a)	Analyze the operation of a single-phase VSI and explain how output waveform quality is affected by switching technique.	8 Marks	L4	CO5
	b)	Explain single-pulse PWM technique with waveforms.	8 Marks	L2	CO5

(OR)

11.	a)	A single-phase inverter is supplied with 200 V DC. Calculate RMS output voltage for square-wave operation.	8 Marks	L3	CO5
	b)	A three-phase bridge inverter operates in 180° conduction mode with DC input 400 V. Determine line voltage RMS value.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) Regular Examinations, April – 2026

POWER SYSTEM OPERATION AND CONTROL

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is meant by a load curve?	2 Marks	L1	CO1
	b)	Define the economic dispatch problem in a power system.	2 Marks	L2	CO1
	c)	What is a hydroelectric power plant?	2 Marks	L1	CO2
	d)	How hydro power plants classified are based on their mode of operation?	2 Marks	L1	CO2
	e)	What is meant by unit commitment?	2 Marks	L1	CO3
	f)	Define spinning reserve in a power system.	2 Marks	L2	CO3
	g)	What is the objective of Load Frequency Control (LFC) in power Systems?	2 Marks	L1	CO4
	h)	Mention any two types of turbines used in LFC systems.	2 Marks	L2	CO4
	i)	Why must the system frequency be maintained constant in a power system?	2 Marks	L2	CO5
	j)	Define a control area in power system operation.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2. a) A power station has the following daily load cycle: 8 Marks L2 CO1

Time (hrs)	6-8	8-12	12-16	16-20	20-24	24-6
Load (MW)	20	40	60	20	50	20

Plot the load curve and load duration curve. Also calculate the energy generated per day.

b) The load in MW on a generating plant observed over a period of time is as follows 8 Marks L3 CO1

Month	Jan	Feb	Mar	Apr	May	Jun
Load(MW)	220	240	262	258	304	310
Month	Jul	Aug	Sep	Oct	Nov	Dec
Load(MW)	240	280	230	245	262	280

Estimate the load for the next January using the simple regression method.

(OR)

3. a) Derive the transmission loss formula for a system consisting of n–generating units supplying several loads interconnected through a transmission network. 10 Marks L4 CO1

b) Derive the co-ordination equations for the optimal scheduling of hydro-thermal interconnected power plants neglecting the transmission losses 6 Marks L4 CO1

MODULE-II

4. a) What is hydro scheduling? Describe the problem of long range hydro scheduling with necessary expressions. 8 Marks L3 CO2

b) A hydro and thermal plant supply a connected load of 100 MW for one week. The characteristics of the units are as follows: 8 Marks L2 CO2

$Q = 110 + 5.1P_{hy}^2 \; m^3 / Sec.$ and

$F(P_{th}) = 55 + 11.5 + P_{th} + 0.022P_{th}^2 \; Rs / MWh.$,

determine the scheduling

i) If the hydro plant energy is limited to 12000 MWh.

ii) The volume of water drawn is limited to 3.2 X 10^8 m^3.

(OR)

5. a) With relevant equations, obtain the algorithm for short term scheduling of hydropower plant using γ - λ iteration method. 8 Marks L2 CO2

b) Explain the classification of hydroelectric power plants with diagrams. 8 Marks L2 CO2

MODULE-III

6. a) Obtain the priority list of unit commitment problem using full load average production cost for the given data: 8 Marks L2 CO3

Unit No	Loading Limits		Fuel Cost Parameters			Fuel cost
	Min	Max	a_i	b_i	c_i	
1	100	400	0.006	7	600	1.1
2	50	300	0.01	8	400	1.2
3	150	500	0.008	6	500	1.0

Consider the fuel cost as $F_i = a_i P_{Gi}^2 + b_i P_{Gi} + c_i$ (Rs/h) and obtain the optimum unit commitment table for a load demand of 800 MW.

b) With the help of a flowchart explain the Priority list method of unit commitment. 8 Marks L2 CO3

(OR)

7. There are 3 thermal generating units which can be committed to take the system load of 800MW. The fuel cost data and generation operating limit data are given below. Obtain the unit commitment using dynamic programming method. 16 Marks L1 CO3

Units	Min(MW)	Max(MW)	a_i	b_i	c_i
1	100	400	0.006	7	600
2	50	300	0.01	8	400
3	150	500	0.008	6	500

MODULE-IV

8. a) Develop the mathematical model of a generator-load model with relevant assumptions. 8 Marks L2 CO4

b) Explain the importance of load frequency control problem in detail. 8 Marks L1 CO4

(OR)

9. a) Sketch the block diagram of IEEE type-1 excitation system and explain it with functional aspects. 8 Marks L2 CO4

b) With a neat sketch, develop the mathematical modeling of automatic Voltage Regulator (AVR). 8 Marks L3 CO4

MODULE-V

10.	a)	Develop the transfer function model of a controlled single area power system and derive the expression for static error following a step load disturbance.	8 Marks	L2	CO5
	b)	An isolated power system has the following data: Rating of the generator 100 MW, Inertia Constant 5 Sec, Nominal operating load 60 MW, speed regulation of the governor 2.5Hz/p.u. MW. If the load would increase 1% for 1% frequency increases. When the load is increased by 10 MW, find the static frequency change for uncontrolled case.	8 Marks	L3	CO5

(OR)

11.	Develop the transfer function model of an uncontrolled two area power system and derive the expression for static error following a step load disturbance.	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) Regular Examinations, April – 2026

SWITCHGEAR AND PROTECTION

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define recovery voltage in circuit breakers and write the relevant expression.	2 Marks	L1	CO1
	b)	State what is meant by restriking voltage in circuit breakers and mention its significance.	2 Marks	L1	CO1
	c)	Write the inverse definite minimum time (IDMT) characteristic of protective relays along with its standard equation.	2 Marks	L1	CO2
	d)	Explain the term plug setting in protective relays and specify its purpose.	2 Marks	L2	CO2
	e)	Identify the concept of internal fault protection of generator stator windings.	2 Marks	L1	CO3
	f)	List any two effects of overloading on a synchronous generator.	2 Marks	L1	CO3
	g)	Describe the function of a distance relay used in transmission line protection.	2 Marks	L2	CO4
	h)	Illustrate the principle of the R–X diagram employed in distance protection schemes.	2 Marks	L2	CO4
	i)	Discuss the effect of an ungrounded neutral on power system performance.	2 Marks	L2	CO5
	j)	Mention the purpose of solid grounding in electrical power systems.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Elaborate, with neat diagrams, the phenomena of arc initiation, arc maintenance, and arc extinction in circuit breakers.	8 Marks	L2	CO1
	b)	Analyze the concept of rate of rise of restriking voltage (RRRV) and justify its importance in circuit breaker performance.	8 Marks	L4	CO1

(OR)

3.	a)	Discuss the concept of restriking voltage and justify its importance in fault interruption.	10 Marks	L2	CO1
	b)	Outline the constructional features of a vacuum circuit breaker and state its advantages.	6 Marks	L2	CO1

MODULE-II

4.	a)	Derive the universal torque equation of electromagnetic relays and interpret its physical significance.	8 Marks	L3	CO2
	b)	Differentiate between electromagnetic relays and static relays with respect to operating characteristics and applications.	8 Marks	L4	CO2

(OR)

5.	a)	Examine the operating principle and performance characteristics of induction-type protective relays.	8 Marks	L4	CO2
	b)	Illustrate the construction of a differential relay and assess its advantages in power system protection.	8 Marks	L4	CO2

MODULE-III

6.	a)	Demonstrate the principle of differential protection applied to synchronous generators.	8 Marks	L3	CO3
	b)	Evaluate various rotor protection techniques employed in electrical generators.	8 Marks	L3	CO3

(OR)

7.	a)	Describe the operating principle of a reverse power relay and substantiate its application in generator protection.	8 Marks	L3	CO3
	b)	Investigate the effects of unbalanced loading in generators and the associated protection schemes.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Describe the causes of over voltages in power systems and the corresponding protective measures.	8 Marks	L4	CO4
	b)	Enumerate the operating principle and application of surge diverters and surge absorbers with neat diagrams.	8 Marks	L2	CO4

(OR)

9.	a)	Apply the concept of insulation coordination to power systems using suitable examples.	8 Marks	L3	CO4
	b)	Correlate basic impulse insulation level (BIIL) with the protection of power system equipment.	8 Marks	L4	CO4

MODULE-V

10.	a)	Compare solid grounding, resistance grounding, and reactance grounding techniques adopted in power systems.	8 Marks	L4	CO5
	b)	Assess the impact of single-line-to-ground faults in ungrounded power systems.	8 Marks	L4	CO5

(OR)

11.	a)	Describe the advantages and limitations of solid grounding in electrical power systems.	8 Marks	L4	CO5
	b)	Recommend suitable grounding practices and rationalize their role in effective fault protection.	8 Marks	L5	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) Regular Examinations, April – 2026

NATURE INSPIRED ALGORITHMS

[Computer Science and Engineering (Artificial Intelligence and Machine Learning)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Differentiate between local and global optimization.	2 Marks	L1	CO1
	b)	What is the Knapsack problem?	2 Marks	L1	CO1
	c)	What is bio-inspired computation?	2 Marks	L1	CO2
	d)	What is meant by a metaheuristic algorithm?	2 Marks	L1	CO2
	e)	State the No Free Lunch Theorem.	2 Marks	L1	CO3
	f)	State the main characteristics of ant colonies.	2 Marks	L1	CO3
	g)	What is elephant herding behavior?	2 Marks	L1	CO4
	h)	Define clan updating operator in Elephant Herding Optimization.	2 Marks	L1	CO4
	i)	Define clustering.	2 Marks	L1	CO5
	j)	What is a deep belief network?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Formulate a mathematical optimization model for a real-world problem.	8 Marks	L3	CO1
	b)	Explain the Traveling Salesman Problem and discuss solution approaches.	8 Marks	L3	CO1

(OR)

3.	a)	Explain the Knapsack problem and its applications.	8 Marks	L3	CO1
	b)	Solve a transportation problem using any suitable method.	8 Marks	L3	CO1

MODULE-II

4.	a)	Compare traditional optimization algorithms with nature inspired algorithms.	8 Marks	L2	CO2
	b)	Explain Ant Colony Optimization (ACO) algorithm.	8 Marks	L3	CO2

(OR)

5.	a)	Evaluate the role of nature inspired algorithms in solving complex optimization problems.	8 Marks	L4	CO2
	b)	Explain selection techniques used in Genetic Algorithms.	8 Marks	L3	CO2

MODULE-III

6.	a)	Discuss variants of Ant Colony Optimization algorithm.	8 Marks	L3	CO3
	b)	Explain swarm intelligence and its significance in optimization.	8 Marks	L2	CO3

(OR)

7.	a)	Analyze pheromone update rules in Ant Colony Optimization.	8 Marks	L4	CO3
	b)	Explain the natural behavior of cuckoo birds.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Describe the Firefly Algorithm with mathematical formulation.	8 Marks	L3	CO3
	b)	Explain the Bat Algorithm with flowchart	8 Marks	L3	CO3
		(OR)			
9.	a)	Explain elephant herding behavior in nature.	8 Marks	L2	CO3
	b)	Compare and Contrast Firefly Algorithm and Bat Algorithm.	8 Marks	L4	CO3

MODULE-V

10.	a)	Describe clustering techniques in data mining using optimization algorithms.	8 Marks	L3	CO4
	b)	Analyze optimizers used in machine learning models	8 Marks	L3	CO4
		(OR)			
11.	a)	Explain Support Vector Machines optimized using nature inspired algorithms.	8 Marks	L3	CO4
	b)	Evaluate future trends and research directions in nature inspired optimization.	8 Marks	L4	CO4

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA IV Semester (MBU-25) Regular Examinations, April – 2026

FUNDAMENTALS OF DATA SCIENCE

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List the Five Steps of Data Science	2 Marks	L1	CO1
	b)	Differentiate between Structured Versus Unstructured Data	2 Marks	L1	CO1
	c)	List some of descriptive statistics on Data Frame	2 Marks	L1	CO2
	d)	How you read an excel file and give an example	2 Marks	L1	CO2
	e)	List any three applications of String manipulation.	2 Marks	L1	CO3
	f)	Write about Vectorized string methods with purpose.	2 Marks	L1	CO3
	g)	Write a program to create Horizonal and vertical bar plot	2 Marks	L1	CO4
	h)	Write the role of Computing group summary statistics.	2 Marks	L1	CO4
	i)	Define resampling and any two methods used for this.	2 Marks	L1	CO5
	j)	Define down sampling and give an example.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Construct a Python code to perform slicing and indexing on multi-dimensional arrays using NumPy.	8 Marks	L3	CO1
	b)	Write python code to perform computations on multi-dimensional array using universal functions.	8 Marks	L1	CO1

(OR)

3.	a)	Describe about File input and output in Text Files with suitable examples.	8 Marks	L2	CO1
	b)	Explain different types of data with suitable examples.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the different data structures used in pandas with syntax and suitable examples.	8 Marks	L2	CO2
	b)	Perform the following data loading and storing operations: i) Read Text file using Pandas ii) Read excel by considering first row as data iii) Save Data Frame to Excel file with more than one sheet with sheet names. iv) Save a Data Frame as CSV file	8 Marks	L3	CO2

(OR)

5.	a)	Discuss Arithmetic methods with fill values on Data Frames using suitable syntax and examples.	8 Marks	L2	CO2
	b)	Illustrate the methods Unique Values, Value Counts, and Membership on Series data structure.	8 Marks	L2	CO2

MODULE-III

6.	a)	What is data transformation? Demonstrate Transforming Data Using a Function or Mapping	8 Marks	L2	CO3
	b)	Write a Python code to perform data transformation by modifying set of values using map and replace method.	8 Marks	L2	CO3

(OR)

7.	a)	Write a python program for performing data cleaning by creating a Data Frame and identifying missing data using NA(Not Available) handling methods, filter out missing data using dropna function, fill the missing data using fillna function and remove duplicates using duplicated and drop_duplicates functions	8 Marks	L3	CO3
	b)	Analyze the importance of using regular expression methods in Python with examples.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Illustrate the process of creating Line plot with suitable examples using colors, markers and line styles options.	8 Marks	L2	CO4
	b)	Write a Python program to illustrate plotting categorical scatter plots with Seaborn with title, xlabel, and ylabel.	8 Marks	L2	CO4

(OR)

9.	a)	Illustrate with example the process of creating density plot using seaborn.	8 Marks	L2	CO4
	b)	Discuss in detail the process of performing data visualization using seaborn.	8 Marks	L2	CO4

MODULE-V

10.	a)	State and explain the important features of a dataset, which will designate as Time Series.	8 Marks	L2	CO5
	b)	What is a Time Zone? Write Python code snippets to generate, localize and convert data ranges on time zones.	8 Marks	L2	CO5

(OR)

11.	a)	Illustrate relevant examples that define data types of date and time.	8 Marks	L2	CO5
	b)	Discuss the importance of indexes in time series data with respect to pandas.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA IV Semester (MBU-22) Regular Examinations, April – 2026

ARTIFICIAL INTELLIGENCE

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is an acronym of PEAS?	2 Marks	L1	CO1
	b)	Define Goal Based agents.	2 Marks	L1	CO1
	c)	Define search tree.	2 Marks	L1	CO2
	d)	List any two performance measures of search algorithms.	2 Marks	L1	CO2
	e)	Define Genetic algorithm.	2 Marks	L1	CO3
	f)	What is local beam search?	2 Marks	L1	CO3
	g)	What is uncertainty in knowledge representation?	2 Marks	L1	CO4
	h)	Define prediction.	2 Marks	L1	CO4
	i)	What is an acronym of SLAM?	2 Marks	L1	CO5
	j)	Define Montecarlo localization.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the state of the art in AI.	8 Marks	L2	CO1
	b)	Explain the structure of intelligent agents with a neat diagram.	8 Marks	L2	CO1
		(OR)			
3.	a)	Explain any four different types of agents with suitable examples.	8 Marks	L2	CO1
	b)	Explain the evolution of AI.	8 Marks	L2	CO1

MODULE-II

4.	a)	Describe the evaluation function used in A* search and explain its components.	8 Marks	L2	CO2
	b)	Explain heuristic functions and its role in informed search strategies.	8 Marks	L2	CO2
		(OR)			
5.	a)	Differentiate between tree search and graph search algorithms.	8 Marks	L2	CO2
	b)	Illustrate breadth-first search algorithm with example.	8 Marks	L4	CO2

MODULE-III

6.	a)	Explain the problems of local maxima, plateaus, and ridges in hill-climbing search.	8 Marks	L2	CO3
	b)	Summarize the structure of a basic genetic algorithm.	8 Marks	L2	CO3
		(OR)			
7.	a)	Explain simulated annealing and optimal decision-making in multiplayer games.	8 Marks	L2	CO3
	b)	Elaborate local beam search algorithm in detail.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain Bayesian network with suitable example.	8 Marks	L2	CO4
	b)	Summarize states and observations with example.	8 Marks	L2	CO4
		(OR)			
9.	a)	Explain transition models and sensor models in temporal reasoning.	8 Marks	L2	CO4
	b)	Discuss probabilistic reasoning over time with suitable examples.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain pipelining architecture in robots.	8 Marks	L2	CO5
	b)	Elaborate robotic application domains.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain the various sensors in robotic hardware.	8 Marks	L2	CO5
	b)	Summarize Machine learning in robot perception.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA IV Semester (MBU-25) Regular Examinations, April – 2026

DATA WAREHOUSING AND DATA MINING

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define the concept of a Multidimensional Data Model for a data warehouse.	2 Marks	L1	CO1
	b)	Define the role of Concept Hierarchies in a data warehouse.	2 Marks	L1	CO1
	c)	Define the process of Mining Frequent Patterns	2 Marks	L1	CO2
	d)	Define Data Transformation	2 Marks	L1	CO2
	e)	What is Classifier?	2 Marks	L1	CO3
	f)	List the advantage of Bayesian classification?	2 Marks	L1	CO3
	g)	Write short notes on density based outlier detection?	2 Marks	L1	CO4
	h)	List the weaknesses of k-means?	2 Marks	L1	CO4
	i)	Define multimedia data in the context of data mining.	2 Marks	L1	CO5
	j)	What is the primary objective of mining web data?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe 3-tier Architecture of Data Warehouse with a neat sketch.	8 Marks	L2	CO1
	b)	Discuss about multi dimensional data models?	8 Marks	L3	CO1

(OR)

3.	a)	Describe various OLAP operations performed on Multidimensional Data Model.	8 Marks	L2	CO1
	b)	Explain the Fact constellation schema with suitable example.	8 Marks	L2	CO1

MODULE-II

4.	a)	"Data preprocessing is necessary before data mining process". Justify your answer.	8 Marks	L2	CO2
	b)	Describe the process of data cleaning.	8 Marks	L2	CO2

(OR)

5.	a)	Explain about various Data Mining Functionalities.	8 Marks	L2	CO2
	b)	Write about the following normalization techniques with examples: i) Min-Max Normalization ii) Z-score Normalization.	8 Marks	L2	CO2

MODULE-III

6.	a)	Illustrate FP-growth algorithm with a suitable example.	8 Marks	L3	CO3
	b)	Write about Rule Based Classification.	8 Marks	L2	CO3

(OR)

7.	a)	Define information gain and Gain Ratio. Explain its importance in decision tree induction.	8 Marks	L2	CO3
	b)	How a Naive Bays classifier works? Explain with an example.	8 Marks	L2	CO3

MODULE-IV

8.	a)	What is the main objective of clustering? Give the categorization of clustering approaches.	8 Marks	L2	CO4
	b)	Compare k-means with k-medoids algorithms for clustering.	8 Marks	L2	CO4

(OR)

9.	a)	What are key issues in hierarchical clustering? Explain.	8 Marks	L2	CO4
	b)	Explain about the basic Agglomerative Hierarchical clustering algorithm.	8 Marks	L2	CO4

MODULE-V

10.	a)	Describe the process of mining sequence data.	8 Marks	L2	CO5
	b)	Discuss the various applications of data mining.	8 Marks	L3	CO5

(OR)

11.	a)	Explain the concept of mining complex data types.	8 Marks	L2	CO5
	b)	Explain the challenges involved in mining spatial data.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA IV Semester (MBU-22) Regular Examinations, April – 2026

UNIX SHELL PROGRAMMING

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is meant by UNIX architecture?	2 Marks	L1	CO1
	b)	What is the use of the man command?	2 Marks	L1	CO1
	c)	Write the use of cal command?	2 Marks	L1	CO2
	d)	What is the function of date command?	2 Marks	L1	CO2
	e)	What are file permissions?	2 Marks	L1	CO3
	f)	Write the use of chmod command.	2 Marks	L1	CO3
	g)	How do you enter insert mode in vi?	2 Marks	L1	CO4
	h)	Write command to save and quit in vi.	2 Marks	L1	CO4
	i)	What is meant by script variables?	2 Marks	L1	CO5
	j)	What are command line arguments in shell scripts?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss internal and external commands with suitable examples.	8 Marks	L3	CO1
	b)	Explain command structure and syntax in UNIX.	8 Marks	L2	CO1
		(OR)			
3.	a)	Compare UNIX with other operating systems in detail.	8 Marks	L3	CO1
	b)	Explain the advantages of UNIX in multi user environments.	8 Marks	L2	CO1

MODULE-II

4.	a)	Write detailed notes on PS command and process status reporting.	8 Marks	L2	CO2
	b)	Explain process states in UNIX with diagram.	8 Marks	L2	CO2
		(OR)			
5.	a)	Discuss zombie processes and how to handle them.	8 Marks	L3	CO2
	b)	Explain job control commands with examples.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain file permissions and protection mechanism.	8 Marks	L2	CO3
	b)	Discuss chmod command with examples.	8 Marks	L3	CO3
		(OR)			
7.	a)	Explain changing file ownership using chown and chgrp commands.	8 Marks	L2	CO3
	b)	Describe inode structure and its importance.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain editing operations like delete, copy and paste in vi.	8 Marks	L2	CO4
	b)	Discuss undo and redo operations in vi.	8 Marks	L2	CO4
		(OR)			
9.	a)	Explain repeating the last command in vi editor.	8 Marks	L2	CO4
	b)	Describe searching text in vi editor with examples.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain command line arguments in shell scripts.	8 Marks	L3	CO5
	b)	Discuss positional parameters with examples.	8 Marks	L3	CO5
		(OR)			
11.	a)	Explain command substitution and its applications.	8 Marks	L3	CO5
	b)	Describe expressions involving variables in shell scripting.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Regular Examinations, April – 2026

TRANSMISSION AND DISTRIBUTION

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is GMR in transmission lines?	2 Marks	L1	CO1
	b)	What is meant by bundled conductors? Mention one advantage	2 Marks	L2	CO2
	c)	State any two advantages of underground cables.	2 Marks	L1	CO1
	d)	What is meant by surge impedance of a transmission line?	2 Marks	L1	CO2
	e)	List two factors affecting corona.	2 Marks	L1	CO3
	f)	What is meant by propagation constant?	2 Marks	L1	CO2
	g)	What is a radial distribution system?	2 Marks	L1	CO4
	h)	Why is voltage drop important in AC distributors?	2 Marks	L2	CO4
	i)	Classify substations based on service requirement.	2 Marks	L2	CO5
	j)	What is a bus-bar in a substation?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Derive the expression for capacitance of a single-phase two-wire transmission line.	8 Marks	L2	CO1
	b)	A 3-phase transmission line has conductors placed at the corners of a triangle of sides 2 m, 3 m and 4 m. Diameter of each conductor is 1.2 cm. Calculate inductance per phase per km.	8 Marks	L3	CO1

(OR)

3.	a)	Explain grading of cables and its significance.	8 Marks	L2	CO1
	b)	A single-core cable operates at 66 kV. Conductor diameter = 2.5 cm; sheath diameter = 7 cm. Determine maximum and minimum dielectric stress.	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain the significance of ABCD constants in transmission line analysis.	8 Marks	L2	CO2
	b)	A 3-phase, 100 km line delivers 25 MW at 0.9 pf lagging and 110 kV. R = 0.2 Ω/km, X = 0.35 Ω/km. Using nominal-π method, determine sending end voltage.	8 Marks	L3	CO2

(OR)

5.	a)	Explain reflection and refraction of travelling waves.	8 Marks	L2	CO2
	b)	A surge of 60 kV travels in a line of 400 Ω and reaches a junction connected to a 200 Ω line. Find reflected and transmitted voltages.	8 Marks	L4	CO2

MODULE-III

6.	a)	Derive the expression for sag when supports are at equal height.	8 Marks	L2	CO3
	b)	A conductor of span 250 m weighs 0.8 kg/m. Allowable tension = 1600 kg. Find sag.	8 Marks	L4	CO3

(OR)

7.	a)	Explain corona phenomenon and methods to reduce corona loss.	8 Marks	L2	CO3
	b)	A 3-phase line has conductors of 3 cm diameter spaced 2.5 m apart. Air density factor = 0.9; surface factor = 0.85. Calculate disruptive critical voltage.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Compare radial and ring main distribution systems.	8 Marks	L2	CO4
	b)	A single-phase AC distributor 500 m long is fed from one end at 240 V. Loads: 70 A at 0.8 pf at 200 m; 60 A at 0.9 pf at 400 m. Resistance and reactance per km (go & return) = 0.08 Ω and 0.12 Ω. Calculate voltage at the far end.	8 Marks	L3	CO4

(OR)

9.	a)	Derive expression for maximum voltage drop in a DC distributor uniformly loaded.	8 Marks	L2	CO4
	b)	A 2-wire DC distributor 800 m long is loaded at 1.2 A/m. Resistance per conductor = 0.15 Ω/km. If fed from one end at 220 V, determine maximum voltage drop.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain different bus-bar arrangements in substations.	8 Marks	L2	CO5
	b)	Discuss the advantages and disadvantages of double bus-bar system.	8 Marks	L2	CO5

(OR)

11.	a)	Discuss factors affecting the location of substations.	8 Marks	L2	CO5
	b)	Explain the layout and main equipment of a large substation.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Regular Examinations, April – 2026

ELECTRICAL MACHINES-II

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define slip in a three-phase induction motor	2 Marks	L1	CO1
	b)	Mention the losses occurring in a three-phase induction motor.	2 Marks	L1	CO1
	c)	List the methods of starting a three-phase induction motor.	2 Marks	L1	CO2
	d)	Compare DOL starter and auto-transformer starter with respect to starting current.	2 Marks	L4	CO2
	e)	Define pitch factor and distribution factor of armature winding.	2 Marks	L1	CO3
	f)	List the effect of short-pitched winding on generated EMF.	2 Marks	L1	CO3
	g)	List the conditions required for parallel operation of alternators.	2 Marks	L1	CO4
	h)	Compute the synchronous speed of an 8-pole alternator connected to a 50 Hz supply.	2 Marks	L4	CO4
	i)	State the principle of operation of a synchronous motor.	2 Marks	L1	CO5
	j)	Mention the function of damper windings in synchronous motors.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe the power flow diagram of a three-phase induction motor and classify the various losses.	8 Marks	L2	CO1
	b)	A three-phase induction motor develops a torque of 150 Nm at a slip of 0.05. Determine the torque developed at a slip of 0.02, assuming linear operation near synchronous speed.	8 Marks	L4	CO1

(OR)

3.	a)	Analyze the effect of rotor resistance on starting torque and starting current of an induction motor.	8 Marks	L4	CO1
	b)	The input power to a three-phase induction motor is 20 kW. Total losses are 3 kW. Compute the output power and efficiency of the motor.	8 Marks	L3	CO1

MODULE-II

4.	a)	List the need for starters in three-phase induction motors and explain any one type of starters with neat diagrams.	8 Marks	L2	CO2
	b)	A three-phase induction motor draws a line current of 60 A when started using DOL starter. Compute the line current, when the motor is started using star–delta starter.	8 Marks	L3	CO2

(OR)

5.	a)	Describe the construction and operation of a star–delta starter with a neat circuit diagram.	8 Marks	L2	CO2
	b)	A 415 V, three-phase induction motor is started using an auto-transformer with a tapping of 70%. Calculate the starting line current and starting torque	8 Marks	L3	CO2

as a fraction of DOL values.

MODULE-III

6.	a)	Apply the EMF equation of an alternator to compute the generated EMF per phase for a three-phase synchronous generator, and demonstrate how changes in flux per pole, frequency, and winding factors affect the generated voltage.	8 Marks	L4	CO3
	b)	Analyze the short-circuit ratio (SCR) of a synchronous generator and examine its impact on voltage regulation, stability, and overload capacity.	8 Marks	L4	CO3

(OR)

7.	a)	Analyze the different methods of voltage regulation determination of an alternator (EMF method, MMF method) in terms of accuracy, assumptions, and suitability for practical performance prediction.	8 Marks	L4	CO3
	b)	Apply the principles of synchronous generator operation to determine the synchronous speed, frequency of generated EMF, and slot distribution for a three-phase alternator, and compute the generated EMF per phase using the EMF equation for a three-phase synchronous generator operates at a rated speed of 1500 rpm and has 4 poles, 36 stator slots, and a three-phase distributed winding. The machine has a flux per pole of 0.05 Wb, 120 turns per phase, a distribution factor of 0.96, and a pitch factor of 0.95.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Analyze the real power and reactive power sharing between alternators operating in parallel with relevant diagrams and equations.	8 Marks	L4	CO4
	b)	An alternator operating in parallel with an infinite bus has its excitation increased. Determine the effect on terminal voltage, reactive power, and armature current.	8 Marks	L3	CO4

(OR)

9.	a)	Describe the concept of infinite bus bars and state its significance in power system operation with neat diagrams	8 Marks	L2	CO4
	b)	Two three-phase alternators rated at 500 kVA and 1000 kVA operate in parallel and supply a total load of 1200 kVA at 0.8 lagging power factor to a common bus. Both alternators operate at 11 kV, 50 Hz**,** have similar voltage regulation characteristics**,** and share the load in proportion to their ratings**.** Assume steady-state operation and negligible losses**.** Determine the kVA load shared by each alternator, the real power (kW) supplied by each alternator,	8 Marks	L3	CO4

MODULE-V

10.	a)	Describe the constructional features and principle of operation of a three-phase synchronous motor with neat diagrams.	8 Marks	L2	CO5
	b)	A 6-pole, three-phase synchronous motor is supplied with 50 Hz AC and is star-connected. The motor has 36 stator slots, a coil span of 150° electrical, a flux per pole of 0.04 Wb, 12 turns per phase, and a distribution factor of 0.96. Assume sinusoidal flux distribution and steady-state operation. Determine the synchronous speed of the motor, the number of slots per pole and the pitch factor.	8 Marks	L3	CO5

(OR)

11.	a)	Illustrate why a synchronous motor is not self-starting and describe the role of damper windings with appropriate diagrams.	8 Marks	L4	CO5
	b)	A three-phase synchronous motor operates at a line voltage of 11 kV and draws a line current of 40 A at a 0.9 leading power factor under rated load conditions. The motor operates at 50 Hz, and the stator copper losses are 20 kW, while rotational losses are negligible. Determine the input power to the motor, the apparent power drawn by the motor and the reactive power supplied or absorbed by the motor.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Regular Examinations, April – 2026

CONTROL SYSTEMS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is meant by a closed-loop control system?	2 Marks	L1	CO1
	b)	Define the transfer function of a control system.	2 Marks	L1	CO1
	c)	Why is the time constant important in the time response of a system?	2 Marks	L1	CO2
	d)	How control systems classified are based on the value of damping ratio?	2 Marks	L2	CO2
	e)	What is steady-state error?	2 Marks	L1	CO2
	f)	What are the specifications in the frequency domain of a control system?	2 Marks	L1	CO3
	g)	Why is compensation required in a feedback control system?	2 Marks	L1	CO4
	h)	Sketch the electrical lag compensator circuit.	2 Marks	L1	CO4
	i)	State the properties of the state transition matrix.	2 Marks	L1	CO5
	j)	What is the composite matrix used to test controllability and observability of a system?	2 Marks	L1	CO5

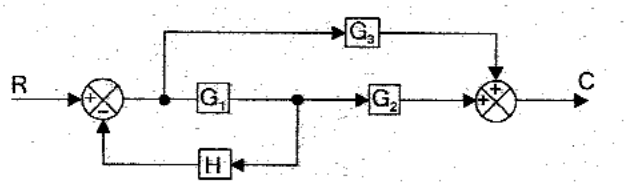
PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

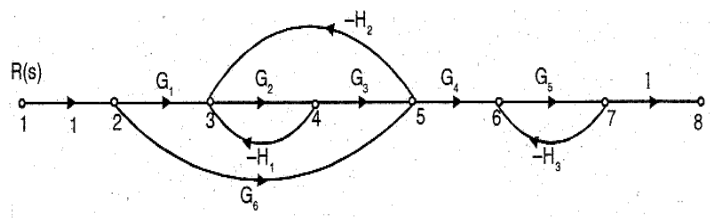
MODULE-I

2.	a)	With necessary equations derive the transfer function of a field-controlled DC servomotor	8 Marks	L2	CO1
	b)	Obtain the overall transfer function for the given block diagram based on rules.	8 Marks	L3	CO1



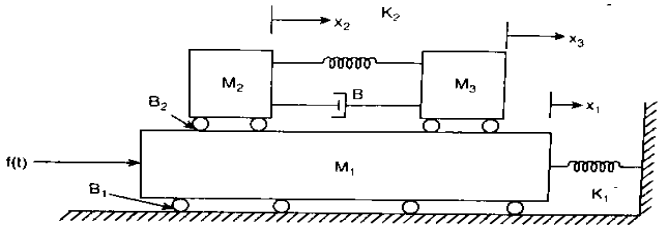
(OR)

3.	a)	Find the transfer function of the given signal flow graph using Mason's gain formula	8 Marks	L3	CO1



	b)	Write the differential equations for the given mechanical system to	8 Marks	L3	CO1

determine overall transfer function



MODULE-II

4.	a)	Determine the undamped natural frequency and damping ratio of the system response $c(t) = 1 + 0.2e^{-60t} - 1.2e^{-10t}$	8 Marks	L3	CO2
	b)	Determine the Rise time, peak time, Settling time and peak overshoot for ξ=0.5 ω_n=6 rad/sec for a typical second order system.	8 Marks	L3	CO2

(OR)

5.	a)	Derive the system response for a second order system with unit step input for an under damped case.	8 Marks	L3	CO2
	b)	Find the static error coefficients of the system forward path transfer function $G(s) = \dfrac{10}{S(0.1S+1)}$ and find the steady-state error for step input	8 Marks	L3	CO2

MODULE-III

6.	a)	Determine the stability of the system characterized by the polynomial $S^4+8S^3+18S^2+16S+5=0$ using Routh criterion.	8 Marks	L2	CO3
	b)	Explain various rules used to plot the root locus.	8 Marks	L3	CO3

(OR)

7.	a)	Explain the stability in terms of the location of the poles with relevant characteristics.	8 Marks	L2	CO3
	b)	Sketch the root locus for a system whose open-loop transfer function $G(s) = \dfrac{10}{S(S+1)}$	8 Marks	L3	CO3

MODULE-IV

8.	a)	Write the steps to design a lag compensator using bode plot in frequency domain.	8 Marks	L2	CO4
	b)	Realize the Lead and lag compensator with suitable electrical circuits.	8 Marks	L2	CO4

(OR)

9.	a)	Sketch the Bode plot and find GM and PM. for the open loop transfer function $G(s) = \dfrac{2}{S(S+1)(1+0.2S)}$.	8 Marks	L3	CO4
	b)	Discuss Nyquist stability criteria to determine stability.	8 Marks	L2	CO4

MODULE-V

10.	a)	Test the controllability and observability of the given state model, $\dot{X} = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -1 & -5 & -1 \end{bmatrix} X + \begin{bmatrix} 0 \\ 5 \\ -24 \end{bmatrix} u; \quad y = [1 \quad 0 \quad 0]x + [0]u$	8 Marks	L3	CO5
	b)	Derive the state model for the Armature controlled DC servomotor.	8 Marks	L3	CO5

(OR)

11.	a)	Discuss the controllability and observability.	8 Marks	L3	CO5
	b)	Derive the state model for a RLC series circuit, assume relevant parameters.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Regular Examinations, April – 2026

SOFTWARE ENGINEERING

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List out and define the different types of Software Myths.	2 Marks	L2	CO1
	b)	Sketch Software engineering layered technology.	2 Marks	L2	CO1
	c)	Define Requirement Engineering.	2 Marks	L2	CO2
	d)	Draw and describe the Flow Modelling notations.	2 Marks	L2	CO2
	e)	List out the relationships in UML with Notation.	2 Marks	L2	CO3
	f)	What is the role of design pattern?	2 Marks	L2	CO3
	g)	Define Alpha and Beta Testing.	2 Marks	L2	CO4
	h)	Write the purpose of verification and validation testing.	2 Marks	L2	CO4
	i)	Define Measures of Reliability and Availability with Formulae.	2 Marks	L2	CO5
	j)	Write the SQA Activities of Software.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe five activities of a generic process framework for Software Engineering.	8 Marks	L2	CO1
	b)	Illustrate and Explain Incremental Model.	8 Marks	L2	CO1

(OR)

3.	a)	Discuss the process of Extreme Programming (XP) in detail.	8 Marks	L2	CO1
	b)	State and explain the principles defined in Agile Process.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain in detail about four activities involved in Requirement Engineering Process.	8 Marks	L3	CO2
	b)	What is the use case technique of requirement elicitation? Describe its component.	8 Marks	L3	CO2

(OR)

5.	a)	Compare and contrast Functional and Non-Functional requirements with example.	8 Marks	L3	CO2
	b)	Discuss Flow-Oriented Modeling Concepts of Requirements modeling with Example.	8 Marks	L3	CO2

MODULE-III

6.	a)	Discuss various design concepts.	8 Marks	L4	CO3
	b)	Design a sequence diagram that models the data processing involved when a customer withdraws cash from the bank ATM machine.	8 Marks	L4	CO3

(OR)

7.	a)	Discuss in detail about Metrics in the process and project domains.	8 Marks	L4	CO3

	b)	Describe in detail about class-based modeling.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Compare between white-box testing and black-box testing.	8 Marks	L4	CO4
	b)	Explain the steps involved in Debugging Process with a neat sketch.	8 Marks	L4	CO4

(OR)

9.	a)	Discuss the analysis of two types of test strategies for object-oriented software.	8 Marks	L4	CO4
	b)	Explain Basis Path Testing with Example.	8 Marks	L4	CO4

MODULE-V

10.	a)	How Software Quality Assurance is useful to enhance quality? List out all the activities of it.	8 Marks	L3	CO5
	b)	Why do we use Defect Amplification Model?	8 Marks	L3	CO5

(OR)

11.	a)	Discuss the steps involved in Business process engineering model with a neat sketch.	8 Marks	L3	CO5
	b)	Explain the RMMM Plan and Risk Information Sheet with neat Diagram.	8 Marks	L3	CO5

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Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Regular Examinations, April – 2026

AI TECHNIQUES FOR RENEWABLE ENERGY SYSTEMS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define renewable energy	2 Marks	L1	CO1
	b)	List any two renewable energy sources	2 Marks	L1	CO1
	c)	Define Artificial Intelligence	2 Marks	L1	CO2
	d)	What is machine learning?	2 Marks	L1	CO2
	e)	What is predictive maintenance?	2 Marks	L2	CO3
	f)	Define energy demand forecasting.	2 Marks	L1	CO3
	g)	Define energy efficiency.	2 Marks	L2	CO4
	h)	What is energy optimization?	2 Marks	L1	CO4
	i)	What is Explainable AI (XAI)?	2 Marks	L2	CO5
	j)	Define federated learning.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	Explain various renewable energy sources with working principles	16 Marks	L3	CO1
	(OR)			
3.	Explain solar power generation systems with neat sketches	16 Marks	L3	CO1

MODULE-II

4.	Explain supervised, unsupervised and reinforcement learning with examples	16 Marks	L3	CO2
	(OR)			
5.	Explain structure and working of Artificial Neural Networks	16 Marks	L3	CO2

MODULE-III

6.	Explain predictive maintenance using AI	16 Marks	L3	CO3
	(OR)			
7.	Explain AI based solar power forecasting methods	16 Marks	L3	CO3

MODULE-IV

8.	Explain AI techniques used for energy efficiency and optimization	16 Marks	L3	CO4
	(OR)			
9.	Explain intelligent control systems for renewable energy integration	16 Marks	L3	CO4

MODULE-V

10.	Discuss emerging AI technologies in renewable energy systems	16 Marks	L3	CO5
	(OR)			
11.	Explain AI–IoT integration for renewable energy applications	16 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Regular Examinations, April – 2026

FLUID MECHANICS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	State Newton's law governing viscous flow in fluids.	2 Marks	L1	CO1
	b)	Explain how surface tension and capillarity influence fluid behavior.	2 Marks	L2	CO1
	c)	Write Euler's equation governing flow along a streamline.	2 Marks	L1	CO2
	d)	Explain the concepts of streamline and stream tube.	2 Marks	L2	CO2
	e)	Distinguish between major losses and minor losses in pipe flow.	2 Marks	L2	CO3
	f)	State the necessary conditions for pipes connected in parallel.	2 Marks	L1	CO3
	g)	Distinguish between pipe flow and open channel flow.	2 Marks	L2	CO4
	h)	State different expressions used to compute velocity in open channel flow.	2 Marks	L1	CO4
	i)	Explain how cavitation affects the performance and life of a pump.	2 Marks	L2	CO5
	j)	Identify the suitable pump type for high discharge and low head applications with justification.	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain Newton's law of Viscosity and differentiate dynamic viscosity from kinematic viscosity.	8 Marks	L2	CO1
	b)	Calculate the specific weight, density and specific gravity of one liter of a liquid which weighs 7 N.	8 Marks	L3	CO1

(OR)

3.	a)	Define single column manometers. How are they used for the measurement of pressure?	8 Marks	L2	CO1
	b)	What are the gauge pressure and absolute pressure at a point 3 m below the free surface of a liquid having a density of 1.53×10^3 kg/m³, if the atmospheric pressure is equivalent to 750 mm of mercury? The specific gravity of mercury is 13.6 and the density of water is 1000 kg/m³.	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain streamline, path line, and streak line in fluid flows.	8 Marks	L2	CO2
	b)	Derive the continuity equation for steady incompressible flow through a pipe.	8 Marks	L4	CO2

(OR)

5.		Derive Bernoulli's equation from Euler's equation stating all assumptions.	16 Marks	L4	CO2

MODULE-III

6.	a)	State Darcy–Weisbach and Chezy's equations and explain their applications in pipe flow.	8 Marks	L2	CO3
	b)	Describe laminar and turbulent boundary layers and compare their characteristics.	8 Marks	L3	CO3

(OR)

7.		In a pipe of diameter 350 mm and length 75 m, water is flowing at a velocity of 2.8 m/s. Find the head loss due to friction using: i) Darcy–Weisbach formula ii) Chezy's formula, for which C = 55 Assume the kinematic viscosity of water as 0.012 stoke.	16 Marks	L3	CO3

MODULE-IV

8.	a)	Explain the impact of jet on a stationary flat plate and derive the force expression.	8 Marks	L2	CO4
	b)	Describe velocity diagrams for jet impact on vanes and their significance.	8 Marks	L2	CO4

(OR)

9.	a)	Classify hydraulic turbines and explain any two with a neat sketch.	8 Marks	L2	CO4
	b)	Analyze performance characteristics of hydraulic turbines.	8 Marks	L3	CO4

MODULE-V

10.		Derive the expression for work done by a centrifugal pump with neat sketch.	16 Marks	L4	CO5

(OR)

11.		A single acting reciprocating pump running at 30 r.p.m delivers 0.012 m^3/s of water. The diameter of the piston is 25cm and the stroke length is 50cm. Determine: i) Theoretical discharge. ii) Coefficient of discharge. iii) Slip and % of slip.	16 Marks	L3	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Regular Examinations, April – 2026

DYNAMICS OF MACHINERY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What are differences between single plate and multi-plate clutch? Give two applications of each clutch	2 Marks	L1	CO1
	b)	How many design criteria's are there in cone clutch? Write the friction torque equation for each criterion.	2 Marks	L1	CO1
	c)	What is angle of heel?	2 Marks	L1	CO2
	d)	What are the applications of gyroscope? List the types of motion in each cases.	2 Marks	L1	CO2
	e)	Classify the various types of Governors?	2 Marks	L1	CO3
	f)	What is effort, hunting and power of a governor?	2 Marks	L1	CO3
	g)	State two satisfactory conditions which are to be satisfied in balancing of mass.	2 Marks	L1	CO4
	h)	What are primary and secondary unbalanced forces?	2 Marks	L1	CO4
	i)	What is resonance condition? Is it good to structural members? State reason	2 Marks	L1	CO5
	j)	Define vibration. Classify vibrations based on excitation.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe with a neat sketch a centrifugal clutch and deduce an equation for the total torque transmitted.	6 Marks	L2	CO1
	b)	A multi-disc clutch has three discs on the driving shaft and two on the driven shaft. The outside diameter of the contact surfaces is 240 mm and inside diameter 120 mm. Assuming uniform wear and coefficient of friction as 0.3, find the maximum axial intensity of pressure between the discs for transmitting 25 kW at 1575 r.p.m..	10 Marks	L3	CO1

(OR)

3.	A band and block brake, having 14 blocks each of which subtends an angle of 15° at the centre, is applied to a drum of 1 m effective diameter. The drum and flywheel mounted on the same shaft has a mass of 2000 kg and a combined radius of gyration of 500 mm. The two ends of the band are attached to pins on opposite sides of the brake lever at distances of 30 mm and 120 mm from the fulcrum. If a force of 200 N is applied at a distance of 750 mm from the fulcrum, find: i) maximum braking torque, ii) angular retardation of the drum, and iii) time taken by the system to come to rest from the rated speed of 360 r.p.m. The coefficient of friction between blocks and drum may be taken as 0.25.	16 Marks	L3	CO1

MODULE-II

4.	a)	Explain the application of gyroscopic principles to aircrafts.	6 Marks	L2	CO2
	b)	An aeroplane runs at 600 km / h. The rotor of the engine weighs 4000 N with radius of gyration of 1 metre. The speed of rotor is 3000 r.p.m. in anticlockwise direction when seen from rear side of the aeroplane. If the plane takes a loop upwards in a curve of 100 metres radius, find: i) gyroscopic couple developed; and ii) effect of reaction gyroscopic couple developed on the body of aeroplane.	10 Marks	L3	CO2

(OR)

5.	a)	What is the function of a flywheel? How does it differ from that of a governor?	6 Marks	L2	CO2
	b)	A punching press is required to punch 40 mm diameter holes in a plate of 15 mm thickness at the rate of 30 holes per minute. It requires 6 N-m of energy per mm^2 of sheared area. If the punching takes $1/10^{th}$of a second and the r.p.m. of the flywheel varies from 160 to 140, determine the mass of the flywheel having radius of gyration of 1 metre.	10 Marks	L3	CO2

MODULE-III

6.	a)	What are the differences between Porter and Proell Governors? Why the speed range of Proell governor is less than that of a similar Porter type?	8 Marks	L1	CO3
	b)	Porter governor has equal arms each 250mm long and pivoted on the axis of rotation. Each ball has a mass of 5Kg and the mass of the central load on the sleeve is 25Kg. The radius of rotation of the ball is 150mm when the governor begins to lift and 200mm when the governor is at maximum speed. Find the maximum and minimum speeds and range of speed of the governor.	8 Marks	L3	CO3

(OR)

7.	a)	With a neat sketch, explain the working of a Hartnell governor	8 Marks	L1	CO3
	b)	Calculate the minimum speed, maximum speed and range of speed of a Porter governor, which has equal arms each 250 mm long and pivoted on the axis of rotation. The mass of each ball is 6 kg and the central mass on the sleeve is 18 kg. The radius of rotation of ball is 150 mm when the governor begins to lift and 200 mm when the governor is at the maximum speed.	8 Marks	L3	CO3

MODULE-IV

8.	Four masses m1, m2, m3 and m4 having 100, 175, 200 and 25Kg are fixed to cranks of 20 cm radius and revolve in places 1,2,3 and 4. The angular position of the cranks in planes 2,3 and 4 with respect to the crank in plane 1 are 750 , 1350 and 2000 taken in the same sense. The distance of planes 2,3 and 4 from plane 1 are 60cm, 186cm and 240 cm respectively determine the position and magnitude of the balance mass at radius of 60cm in plane L and M located at middle of the plane 1 and 2 and the middle of the planes 3 and 4 respectively.	16 Marks	L3	CO4

(OR)

9.	Three masses P, Q and R with masses 12 kg, 11 kg and 18 kg respectively revolve in the same plane at radii 120 mm, 144 mm and 70 mm respectively. The angular position of Q and R are 600 and 1350 from P. Determine the position and magnitude of mass S at radius 152 mm to balance the system.	16 Marks	L3	CO4

MODULE-V

10.	Derive an expression for natural frequency of longitudinal and lateral vibration by considering the mass attached to stiffed bar.	16 Marks	L2	CO5
	(OR)			
11.	Determine: i) the critical damping co-efficient, ii) the damping factor, iii) the natural frequency of damped vibrations, iv) the logarithmic decrement and v) the ratio of two consecutive amplitudes of a vibrating system which consists of a mass of 25 kg, a spring of stiffness 15 kN/m and a damper. The damping provided is only 15% of the critical value.	16 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA IV Semester (MBU-25) Regular Examinations, April – 2026

INNOVATION, INCUBATION AND ENTREPRENEURSHIP

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define entrepreneurship.	2 Marks	L1	CO1
	b)	Explain entrepreneurial mindset.	2 Marks	L1	CO1
	c)	Explain product innovation.	2 Marks	L1	CO2
	d)	Stages of innovation process.	2 Marks	L1	CO2
	e)	Explain Industry 4.0.	2 Marks	L1	CO3
	f)	Role of AI in entrepreneurship.	2 Marks	L1	CO3
	g)	Startup economics.	2 Marks	L1	CO4
	h)	Market analysis.	2 Marks	L1	CO4
	i)	Business incubation.	2 Marks	L1	CO5
	j)	Business model innovation.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain concept and definition of entrepreneurship.	8 Marks	L2	CO1
	b)	Discuss why one should become an entrepreneur.	8 Marks	L3	CO1
		(OR)			
3.	a)	Explain entrepreneurial mindset.	8 Marks	L2	CO2
	b)	Explain value creation through entrepreneurship.	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain product innovation process.	8 Marks	L2	CO2
	b)	Explain engineering design process.	8 Marks	L3	CO2
		(OR)			
5.	a)	Explain frugal engineering.	8 Marks	L2	CO2
	b)	Discuss effective user interface design.	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain Industry 4.0.	8 Marks	L2	CO3
	b)	Discuss role of AI and IoT in entrepreneurship.	8 Marks	L3	CO3
		(OR)			
7.	a)	Explain cloud and SaaS.	8 Marks	L2	CO3
	b)	Explain AR and VR applications.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain startup economics.	8 Marks	L2	CO4
	b)	Discuss market analysis.	8 Marks	L3	CO4

(OR)

9.	a)	Explain feasibility analysis.	8 Marks	L2	CO4
	b)	Discuss customer targeting and positioning.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain business model innovation.	8 Marks	L2	CO5
	b)	Explain business process management.	8 Marks	L3	CO5

(OR)

11.	a)	Explain business model canvas.	8 Marks	L2	CO5
	b)	Explain bootstrapping.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Regular Examinations, April – 2026

NUMERICAL METHODS, PROBABILITY AND STATISTICS

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define algebraic equation?	2 Marks	L1	CO1
	b)	Write the formula of Newton Forward and Backward interpolation Formula.	2 Marks	L1	CO1
	c)	Explain the procedure of trapezoidal rule.	2 Marks	L2	CO2
	d)	List the assumptions of Numerical differentiation.	2 Marks	L1	CO2
	e)	Define Discrete Random variable.	2 Marks	L1	CO3
	f)	Define Binomial distribution.	2 Marks	L1	CO3
	g)	Write the formula for testing the single sample mean when the sample is large.	2 Marks	L1	CO4
	h)	Define Critical Region	2 Marks	L1	CO4
	i)	Write the applications of t – test.	2 Marks	L1	CO5
	j)	Write the applications of F – test.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Evaluate the square root of 68 by bisection method.	8 Marks	L4	CO1
	b)	Calculate $Sin\,58^o$, using suitable Newton's interpolation formula, when $Sin\,45^o = 0.7071, Sin\,50^o = 0.7660, Sin\,55^o = 0.8192$ and $Sin\,60^o = 0.8660$	8 Marks	L4	CO1

(OR)

3.	a)	Apply Newton Raphson method to Find the root of the equation $xe^x - 1 = 0$	8 Marks	L3	CO1
	b)	Interpret the value of 'y' when $x = 15$ from the following data by using suitable interpolation formula.	8 Marks	L3	CO1

x	2	4	7	11	16
y	10	22	40	72	96

MODULE-II

4.	a)	Evaluate $\int_0^5 \frac{1}{1+x^2}dx$ by using Trapezoidal Rule	8 Marks	L4	CO2
	b)	Apply Newton's Forward difference formula to estimate the first and second order derivatives from the following data at $x = 2$	8 Marks	L3	CO2

x	2	4	7	11	16
y	10	22	40	72	96

(OR)

5. a) Evaluate $\int_0^{\pi} x\sin x\,dx$ by using Simpson's $\frac{3}{8}$ Rule. 8 Marks L4 CO2

b) From the following data find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at 8 Marks L4 CO2

x	1	3	5	7	9
y	4	13	27	46	68

MODULE-III

6. a) Derive the mean and variance of Binomial distribution. 8 Marks L3 CO3

b) If X is a Normally distributed with mean 70 and standard deviation 16, Calculate i) $P(38 \le x \le 46)$ ii) $P(82 \le x \le 94)$. 8 Marks L4 CO3

(OR)

7. a) A discrete random variable X has the mean 5 and variance 2. If it is assumed that the distribution is Binomial, find the probabilities that $5 \le x \le 7$ and $4 \le x \le 6$. 8 Marks L3 CO3

b) A random variable X has the following probability distribution. 8 Marks L3 CO3

X	1	2	3	4	5	6	7	8
P(X)	K	2K	3K	4K	5K	6K	7K	8K

Find the value of i) K ii) Mean iii) variance.

MODULE-IV

8. a) A sample of 900 members with mean and standard deviations are 3.4 and 2.61 respectively. Is the sample drawn from a population whose mean is 3.25? 8 Marks L4 CO4

b) In a city, a sample of 1000 people, 540 are vegetarians and the rest are non-vegetarians. Can we say that both habits of eating (vegetarian and non-vegetarian) are equally popular in the city at 5% level of significance 8 Marks L4 CO4

(OR)

9. a) Random samples of 500 men and 600 women were asked whether they would like to have a Flyover near their residence. 200 men and 360 women were in favor of the proposal. Test whether the proportions of men and women in favor of proposal are the same. Use 5% level of significance. 8 Marks L4 CO4

b) Explain the procedure of testing of hypothesis. 8 Marks L2 CO4

MODULE-V

10. a) Explain Paired t-test 8 Marks L2 CO5

b) Two horses A and B were tested according to the time (in seconds) taken to run a particular Track, the following results are obtained. 8 Marks L4 CO5

Horse-A	28	30	32	33	33	29	34
Horse-B	29	30	30	24	27	29	

Test whether the two horses have the same running capacity. (use 5% LOS).

(OR)

11. a) Explain Chi –Square test for Independence of attributes. 8 Marks L2 CO5

b) A machine is designed to produce insulating washers for electrical devices of an average thickness of $0.025\,cm$. A random sample of 10 washers was found to have an average thickness of $0.024\,cm$ with a standard deviation of $0.002\,cm$. Test the significance of the deviation. 8 Marks L4 CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Regular Examinations, April – 2026

NUMERICAL METHODS, PROBABILITY AND STATISTICS

[Computer Science and Engineering (Data Science), Computer Science and Engineering (Cyber Security), Information Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define transcendental and algebraic equation with one example each.	2 Marks	L1	CO1
	b)	Write the Bisection method formula for finding a root of an equation.	2 Marks	L1	CO1
	c)	Write Newton's forward difference formula for the first derivative.	2 Marks	L1	CO2
	d)	State the trapezoidal rule for numerical integration.	2 Marks	L2	CO2
	e)	Define a random variable with an example.	2 Marks	L1	CO3
	f)	What is a probability density function (PDF)?	2 Marks	L1	CO3
	g)	State the large sample Z-test formula for a single mean.	2 Marks	L1	CO4
	h)	Write in brief about the level of significance	2 Marks	L1	CO4
	i)	Define type I and type II errors in hypothesis testing	2 Marks	L1	CO5
	j)	Write the formula for chi-square statistic in a goodness-of-fit test.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2. a) Perform six iterations of Bisection method to find a real root of $f(x) = x^3 + x^2 + x + 7 = 0$. 8 Marks L3 CO1

b) Construct the backward difference table for the data and find $f(1.2)$ 8 Marks L3 CO1

x	-1	0	1	2
$y = f(x)$	-8	3	1	12

(OR)

3. a) The following data represents the function $f(x) = \cos(x+1)$ 8 Marks L3 CO1

x	0.0	0.2	0.4	0.6
$y = f(x)$	0.5403	0.3624	0.1700	– 0.0292

Estimate the value of $f(0.1)$ and Compare with the exact value.

b) Construct a second degree polynomial passes through the points (0,1) (1,3) and (3,55) by using Lagrange's interpolation formula. Hence, find the value at 1.5. 8 Marks L2 CO1

MODULE-II

4. a) Find first and second order derivatives at $x = 0.5$ using Newton's forward formula from the following table. 8 Marks L2 CO2

x	0	1	2	3	4	5	6
y	0	1	16	81	256	625	1296

b) Evaluate $\int_0^6 \frac{dx}{1+x}$ by using s 8 Marks L4 CO2

i) Simpson's 1/3rd rule
ii) Simpson's 3/8th rule

(OR)

5. a) Using Newton's Forward interpolation formula compute the value of $sin 52^0$ given $sin 45^0 = 0.7071$, $sin 50^0 = 0.7660$, $sin 55^0 = 0.8192$ and $sin 60^0 = 0.8660$ 8 Marks L3 CO2

b) Evaluate $\int_{0.4}^{1} (x^2 + 3x) dx$ by using Trapezoidal rule. 8 Marks L4 CO2

MODULE-III

6. a) Suppose a continuous random variable 'x' has the probability density function $f(x) = \begin{cases} k(1-x^2), & \text{for } 0 < x < 1 \\ 0, & \text{elsewhere} \end{cases}$ .Find the value of k and also find $P(0.1 < x < 0.2)$ 8 Marks L3 CO3

b) Find the mean and variance of the Binomial distribution. 8 Marks L2 CO3

(OR)

7. a) Find K such that by $f(x) = \begin{cases} kx^2; if\, 0 \le x \le 3 \\ 0; Otherwise \end{cases}$ is a probability function. 8 Marks L3 CO3

i) Mean ii) $P(1 \le X \le 2)$.

b) Derive mean and variance of Poisson distribution. 8 Marks L2 CO3

MODULE-IV

8. a) A researcher claims that the average lifetime of a certain type of electric bulb is 1200 hours**.** A random sample of 25 bulbs gives a mean lifetime of 1180 hours with a standard deviation of 80 hours**.** Formulate the null and alternative hypotheses, identify the critical region at the 5% level of significance, and conclude whether the researcher's claim is acceptable. 8 Marks L2 CO4

b) A machine is supposed to fill packets with 500 g of flour on average. A random sample of 100 packets has a mean weight of 495 g and a standard deviation of 10 g. Test, at the 5% level of significance**,** whether the machine is working correctly. 8 Marks L2 CO4

(OR)

9.	a)	Explain the concepts of null hypothesis, critical region, and level of significance with suitable examples. Using these, test the hypothesis that the proportion of defective items produced in a factory is not more than 5%, given that in a random sample of 200 items, 16 are found defective. Take the level of significance as 1%.	8 Marks	L3	CO4
	b)	Two different fertilizers are applied to test their effect on crop yield. From sample I (n_1 = 64), the mean yield is 525 kg/acre with standard deviation 8 kg. From sample II (n_2 = 81), the mean yield is 539 kg/acre with standard deviation 10 kg. Test, at the 1% level of significance, whether there is a significant difference between the mean yields of the two fertilizers.	8 Marks	L2	CO4

MODULE-V

10.	a)	A random sample of 10 students has an average test score of 56 with a standard deviation of 8. Test, at the 5% level of significance using the Student's t-test, whether the average score of the population of students can be considered as 60.	8 Marks	L3	CO5
	b)	What are the assumptions of the F-test for equality of variances and explain briefly about F-test?	8 Marks	L2	CO5

(OR)

11.	a)	A manufacturer claims that the mean breaking strength of a type of thread is 5.0 kg. A random sample of 16 pieces of thread gives a mean breaking strength of 4.7 kg with a standard deviation of 0.5 kg. Test this claim at the 1% level of significance using the Student's t-test.	8 Marks	L3	CO5
	b)	Explain chi-square test for independence of attributes.	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Regular Examinations, April – 2026

THEORY OF COMPUTATION

[Computer Science and Engineering (Cyber Security), Computer Science and Information Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is meant by Kleene closure (Σ*)?	2 Marks	L2	CO1
	b)	Write the language over Σ = {a, b} that contains all strings of length 1.	2 Marks	L3	CO1
	c)	What is a regular expression**?**	2 Marks	L1	CO2
	d)	Describe the purpose of partitioning in DFA minimization.	2 Marks	L4	CO2
	e)	Briefly explain the role of leaf nodes in a parse tree.	2 Marks	L2	CO3
	f)	What is meant by grammar ambiguity**?**	2 Marks	L2	CO3
	g)	List the components of a PDA**.**	2 Marks	L1	CO4
	h)	What is the role of a stack in a PDA?	2 Marks	L1	CO4
	i)	Briefly explain the purpose of the **tape head** in a TM.	2 Marks	L2	CO5
	j)	Write the transition for a TM that replaces symbol 1 with X.	2 Marks	L3	CO5

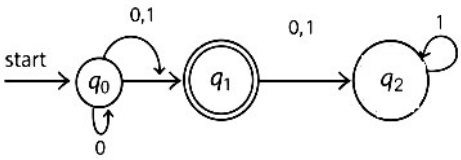
PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2. a) Convert the following NFA to DFA — 8 Marks L3 CO1



b) Write the mathematical model of a DFA and explain each element. — 8 Marks L1 CO1

(OR)

3.	a)	Explain the central concepts of automata theory with examples.	8 Marks	L2	CO1
	b)	Design a DFA over {v, p} that starts with 'v' and has even length.	8 Marks	L3	CO1

MODULE-II

4. a) Explain the applications of regular expressions in detail. — 8 Marks L1 CO2

b) Minimize the following DFA. — 8 Marks L3 CO2

States	a	b
--> P0	P0	P1
P1	P2	P1
P2	P3	P1
*P3	P3	P4
*P4	P5	P4
*P5	P3	P4

(OR)

5.	a)	Construct a regular expression for all strings over {a, b} that contain at least one 'a'	8 Marks	L5	CO2
	b)	Prove using Pumping Lemma that the language $L = \{0^n1^n \mid n \geq 0\}$ **is** not regular**.**	8 Marks	L3	CO2

MODULE-III

6.	a)	Describe the construction of parse trees step by step.	8 Marks	L2	CO3
	b)	State Pumping lemma for CFLs. Write the applications of pumping lemma for CFL s	8 Marks	L3	CO3

(OR)

7.	a)	Create a CFG that generates binary strings with more 1's than 0's**.**	8 Marks	L3	CO4
	b)	Convert the following grammar into CNF. S→A|CB, A→C|D, B→1B|1, C→0C|0, D→2D|2	8 Marks	L4	CO4

MODULE-IV

8.	a)	Explain the steps involved in converting an empty-stack PDA (PN) into a final-state PDA (PF)**.**	8 Marks	L2	CO4
	b)	Design a PDA that accepts strings with twice as many 0's as 1's**.**	8 Marks	L3	CO4

(OR)

9.	a)	Compare PDA and DFA in terms of memory and language recognition.	8 Marks	L4	CO4
	b)	Draw the PDA and show the acceptance of the string (()())**.**	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain the operation of a Turing Machine with a neat diagram.	8 Marks	L2	CO5
	b)	Construct a TM that accepts palindromes over {a, b}**.**	8 Marks	L3	CO5

(OR)

11.	a)	Justify the closure properties of recursive languages**.**	8 Marks	L5	CO5
	b)	Create a TM that accepts binary numbers divisible by 2**.**	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Regular Examinations, April – 2026

OPERATING SYSTEMS

[Computer Science and Engineering (Data Science), Computer Science and Engineering (Cyber Security), Computer Science and Information Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List out any four operating systems.	2 Marks	L1	CO1
	b)	Define a process.	2 Marks	L1	CO1
	c)	Define a semaphore	2 Marks	L1	CO2
	d)	What is critical section problem?	2 Marks	L2	CO2
	e)	What is the use of page table?	2 Marks	L1	CO3
	f)	What is Thrashing in operating system?	2 Marks	L2	CO3
	g)	List out File Attributes.	2 Marks	L1	CO4
	h)	What is meant by interrupt driven I/O Cycle?	2 Marks	L1	CO4
	i)	What are systems threats?	2 Marks	L1	CO5
	j)	Define Cryptography.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss about the operating system structures with neat diagram.	8 Marks	L2	CO1
	b)	Explain the various types of system calls with examples.	8 Marks	L2	CO1
		(OR)			
3.	a)	Explain CPU Scheduling Algorithms with examples.	8 Marks	L2	CO1
	b)	Explain about Multithreading Models?	8 Marks	L2	CO1

MODULE-II

4.	a)	Discuss about process synchronization and explain Peterson solution algorithm.	8 Marks	L2	CO2
	b)	Define Monitor? Explain with any example using monitor.	8 Marks	L2	CO2
		(OR)			
5.	a)	How can Deadlock detected with Banker's algorithm?	8 Marks	L2	CO2
	b)	Write about Deadlock Prevention Methods.	8 Marks	L2	CO2

MODULE-III

6.	a)	What is paging ? Discuss about the basic paging technique.	8 Marks	L2	CO3
	b)	Discuss the following allocation algorithm: i) First fit ii) Best fit iii) Worst fit iv) Next fit	8 Marks	L3	CO3
		(OR)			
7.	a)	Explain Segmentation in detail.	8 Marks	L2	CO3
	b)	Explain the pros and cons of all disks scheduling algorithm	8 Marks	L2	CO3

MODULE-IV

8.	a)	Describe with a neat sketch about the various directory structure	8 Marks	L2	CO4
	b)	Explain in detail about free space management with neat examples.	8 Marks	L4	CO4
		(OR)			
9.	a)	Explain in detail about DMA Structure.	8 Marks	L2	CO4
	b)	Explain in detail about interrupts.	8 Marks	L3	CO4

MODULE-V

10.	a)	What are the different various methods of access rights?	8 Marks	L2	CO5
	b)	Discuss the principles of protection in an operating system.	8 Marks	L3	CO5
		(OR)			
11.	a)	Explain the different methods of user authentication? Explain with examples.	8 Marks	L2	CO5
	b)	Illustrate the different types of program threats and Network Threats	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Regular Examinations, April – 2026

ARTIFICIAL INTELLIGENCE

[Computer Science and Engineering (Artificial Intelligence and Machine Learning)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Summarize the major components of AI	2 Marks	L1	CO1
	b)	What is meant by Turing test	2 Marks	L1	CO1
	c)	What is meant by rationality in AI	2 Marks	L2	CO2
	d)	List any two benefits of Artificial Intelligence	2 Marks	L2	CO2
	e)	Define Perception	2 Marks	L1	CO3
	f)	Importance of Neuroscience	2 Marks	L2	CO3
	g)	Optimal decision in games	2 Marks	L1	CO4
	h)	State any two potential benefits of using AI systems in society.	2 Marks	L1	CO4
	i)	Mention two ethical issues in AI	2 Marks	L2	CO5
	j)	Give an example of privacy concern in A	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the concept of rationality in intelligent agents and distinguish between omniscient, rational, and autonomous agents with suitable examples.	8 Marks	L1	CO1
	b)	Highlight major milestones, AI winters, and recent advancements in the state of the art.	8 Marks	L2	CO1

(OR)

3.	a)	Mention the interdisciplinary roots of AI and their contributions to the development of intelligent systems	8 Marks	L2	CO1
	b)	Discuss the state of the art in Artificial Intelligence and explain recent advances, major AI techniques, and real-world applications.	8 Marks	L1	CO1

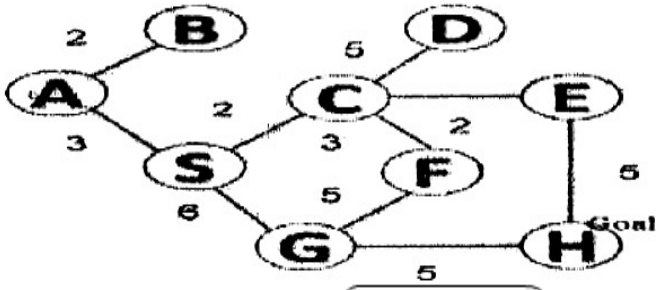
MODULE-II

4.	a)	Describe the PEAS representation for an automated taxi driver and a medical diagnosis system. Explain each component in the context of the agents.	8 Marks	L3	CO2
	b)	Write about simple reflex, model-based reflex, goal-based, utility-based, and learning agents with neat diagrams.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the concept of rationality in intelligent agents and distinguish between omniscient, rational, and autonomous agents with suitable examples	8 Marks	L2	CO2

	b)	Perform BFS, DFS, and Depth Limit Search and Uniform Cost Search strategies on the following graph and explain them.	8 Marks	L4	CO2



MODULE-III

6.	a)	What is local search algorithm how it works in optimization problems. Evaluate with example	8 Marks	L2	CO3
	b)	Explain simulated annealing and local beam search. Highlight the intuition behind each algorithm	8 Marks	L2	CO3

(OR)

7.	a)	Describe hill-climbing search with a suitable example of an optimization problem. Illustrate the search trajectory on a simple landscape diagram	8 Marks	L2	CO3
	b)	Describe alpha-beta pruning and show, on a small game tree, which branches are pruned. Comment on its effect on time complexity	8 Marks	L3	CO3

MODULE-IV

8.	a)	Differentiate between Bayesian networks and Hidden Markov Models in terms of structure, types of variables, and typical applications	8 Marks	L3	CO4
	b)	Explain the terms “time and uncertainty” and “probabilistic reasoning over time”. Distinguish between filtering, prediction, smoothing, and most likely explanation	8 Marks	L2	CO4

(OR)

9.	a)	For a simple 2-state Hidden Markov Model (e.g., “Bull” and “Bear” stock market), illustrate the forward algorithm for computing the likelihood of an observed price sequence.	8 Marks	L3	CO4
	b)	Explain how a Kalman filter differs from an HMM and mention typical application domains where Kalman filters are preferred.	8 Marks	L3	CO4

MODULE-V

10.	a)	Analyze different robotic frameworks and their application domains.	8 Marks	L3	CO5
	b)	Evaluate ethical issues in AI such as bias, fairness, and privacy.	8 Marks	L2	CO5

(OR)

11.	a)	Discuss AI safety challenges and the limitations of AI in autonomous systems.	8 Marks	L2	CO5
	b)	For a high-stakes AI application (such as loan approval or medical diagnosis), identify key ethical issues and propose guidelines or mechanisms (technical and organizational) to ensure privacy, security, and safety of users.	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Regular Examinations, April – 2026

COMPUTER NETWORKS

[Computer Science and Engineering (Data Science)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Identify the key advantages of microwave transmission over fiber.	2 Marks	L1	CO1
	b)	Illustrate the major functions performed by the layers of the ISO - OSI model.	2 Marks	L1	CO1
	c)	List the drawbacks of the stop and wait protocol.	2 Marks	L1	CO3
	d)	Define the principle of 1-persistent CSMA.	2 Marks	L1	CO3
	e)	Enumerate admission control steps helps to prevent congestion in a network?	2 Marks	L1	CO2
	f)	How does the optimality principle influence the decision-making process in routing?	2 Marks	L1	CO2
	g)	What is POP?	2 Marks	L1	CO1
	h)	Discover the services provided by Transport layer protocol?	2 Marks	L1	CO1
	i)	Mention the different levels in domain name space.	2 Marks	L1	CO4
	j)	Explain FTP.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Illustrate the major functions performed by the layers of the ISO - OSI model.	8 Marks	L3	CO1
	b)	Briefly explain any three methods used for data communication using guided media.	8 Marks	L2	CO1
		(OR)			
3.	a)	Summarize the various network topologies with examples.	8 Marks	L2	CO1
	b)	Explain in detail about TCP/IP protocol suite with neat diagram?	8 Marks	L2	CO1

MODULE-II

4.	a)	Discuss the advantages and limitations of stop-and-wait ARQ (Automatic Repeat request) as an elementary data link protocol.	8 Marks	L2	CO3
	b)	Explain Cyclic Redundancy Check? Suppose we want to transmit the message 11001001 and protect it from errors using the CRC polynomial $x^4 + 1$. Use polynomial long division to determine the message that should be transmitted.	8 Marks	L4	CO3
		(OR)			
5.	a)	Examine Bit-map Protocol and Binary Countdown protocol With the help of neat diagrams. Explain the advantage of Binary Countdown over Bit-map protocol.	8 Marks	L3	CO3
	b)	Illustrate the sliding window protocols with neat sketches	8 Marks	L4	CO3

MODULE-III

6.	a)	Discuss in detail about open source shortest path routing with neat diagrams.	8 Marks	L2	CO2
	b)	Explain the working of Link -state Routing in detail	8 Marks	L2	CO2
		(OR)			
7.	a)	Why subnetting is necessary? With suitable example, develop the concept of subnetting in class B network.	8 Marks	L2	CO2
	b)	Interpret the frame format of IPV4 and IPV6 addresses.	8 Marks	L2	CO2

MODULE-IV

8.	a)	Discuss various flow control mechanisms in transport layer	8 Marks	L2	CO1
	b)	Describe about i) TCP connection Establishment. ii) TCP Connection Release	8 Marks	L2	CO1
		(OR)			
9.	a)	Illustrate the header format for a user datagram protocol	8 Marks	L3	CO1
	b)	Demonstrate the timer management of TCP in transport layer.	8 Marks	L2	CO1

MODULE-V

10.	a)	Discuss the protocols associated with WWW. Explain them.	8 Marks	L2	CO4
	b)	Analyze the structure and content of email message formats.	8 Marks	L2	CO4
		(OR)			
11.	a)	How does DNS caching improve the efficiency of DNS resolution? Discuss the benefits and potential challenges of caching.	8 Marks	L2	CO4
	b)	Elaborate the working of HTTP in detail with examples.	8 Marks	L2	CO4

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Regular Examinations, April – 2026

HYDROLOGY AND WATER RESOURCES ENGINEERING

[Civil Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Explain the hydrologic cycle and mention any two of its major components.	2 Marks	L2	CO1
	b)	State any two practical applications of hydrology in water resources engineering.	2 Marks	L1	CO1
	c)	What are abstractions from precipitation and why are they significant in runoff estimation?	2 Marks	L2	CO2
	d)	What is an infiltration index and where is it used?	2 Marks	L1	CO2
	e)	What is a hydrograph and what information does it provide about runoff characteristics?	2 Marks	L2	CO3
	f)	What is flood routing and why is it carried out?	2 Marks	L1	CO4
	g)	Define water resources planning.	2 Marks	L1	CO5
	h)	List any two objectives of water resources planning.	2 Marks	L1	CO5
	i)	Define a reservoir and state its basic purpose.	2 Marks	L1	CO6
	j)	Why is a reservoir constructed in water resources projects?	2 Marks	L2	CO6

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the scope of hydrology and discuss its importance in the planning, design, and operation of water resources projects.	8 Marks	L2	CO1
	b)	Describe the hydrologic cycle with a neat sketch and explain the role of each component in the distribution of water on the Earth.	8 Marks	L1	CO1

(OR)

3.	a)	Discuss the importance of rainfall data in flood estimation and reservoir design.	8 Marks	L2	CO1
	b)	There are six raingauge stations existing in the catchment of a river. The annual rainfall values recorded at these stations during a particular year are 82.6 cm, 102.9 cm, 180.3 cm, 110.3 cm, 98.8 cm, and 136.7 cm, respectively. Determine the standard error in the estimation of mean annual rainfall. If the permissible error is 10%, determine the optimum number of raingauge stations required and the number of additional stations to be installed.	8 Marks	L4	CO1

MODULE-II

4.	a)	Explain runoff and classify its components. Discuss the factors affecting runoff generation in a catchment.	8 Marks	L2	CO2
	b)	Analyze the rainfall–runoff relationship and explain how catchment characteristics influence runoff response.	8 Marks	L3	CO2

(OR)

5.	a)	Analyze Darcy's law and discuss its applications in groundwater flow, seepage analysis, and well hydraulics.	8 Marks	L4	CO2
	b)	During a 2-hour storm, rainfall intensities recorded at 20-minute intervals are 0.8, 1.6, 3.2, 2.4, 1.4, and 0.6 cm/hr. Assuming a ϕ-index of 0.9 cm/hr, determine the effective rainfall and runoff produced.	8 Marks	L3	CO2

MODULE-III

6.	a)	Why does the storm hydrograph generally show a skewed shape, and what does it indicate about catchment storage effects?	8 Marks	L4	CO3
	b)	Explain flood routing using continuity equation and apply it to channel flow analysis.	8 Marks	L3	CO4

(OR)

7.	a)	Explain the concept of design flood and its importance in hydraulic structure design.	8 Marks	L2	CO4
	b)	A 6-hour unit hydrograph has ordinates of 0, 22, 48, 90, 135, 165, 175, 150, 105, 70, 40, 22, and 0 m^3/s. If two successive storms of 6-hour duration produce rainfall excesses of 2 cm and 4 cm, obtain the direct runoff hydrograph.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain the concept of water resources planning and discuss its role in achieving sustainable development.	8 Marks	L2	CO5
	b)	Analyze the role of economic efficiency in selecting and evaluating water resources projects using cost–benefit considerations.	8 Marks	L4	CO5

(OR)

9.	a)	Explain the environmental aspects related to displacement, rehabilitation, and downstream impacts of water resources projects.	8 Marks	L3	CO5
	b)	How does environmental impact assessment (EIA) contribute to sustainable water resources planning and project approval?	8 Marks	L2	CO5

MODULE-V

10.	a)	Explain the purpose and importance of reservoirs in multipurpose river basin development projects.	8 Marks	L2	CO6
	b)	What is erosion, and why is water considered the most significant agent of erosion in a watershed?	8 Marks	L1	CO6

(OR)

11.	a)	Analyze the role of environmental and socio-economic investigations in dam and reservoir projects.	8 Marks	L4	CO6
	b)	Explain the importance of cross-section design of a dam and discuss the objectives it must satisfy.	8 Marks	L2	CO6

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Regular Examinations, April – 2026

STRUCTURAL ANALYSIS

[Civil Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define beam deflection.	2 Marks	L1	CO1
	b)	Discuss the Mohr's theorem.	2 Marks	L1	CO1
	c)	State the Castigliano's first theorem.	2 Marks	L1	CO1
	d)	Write the support moments due sinking of support in the fixed beam.	2 Marks	L1	CO2
	e)	Define Clapeyron's theorem.	2 Marks	L1	CO3
	f)	Define the Slope-Deflection Method in structural analysis.	2 Marks	L1	CO3
	g)	What is the Moment Distribution Method?	2 Marks	L1	CO3
	h)	Define Kani's Method in structural analysis.	2 Marks	L1	CO3
	i)	What is the shear force in case of point load movement for ILD diagram?	2 Marks	L1	CO4
	j)	What is the shape factor in the plastic analysis?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Derive the relation between slope, deflection, and radius of curvature.	8 Marks	L4	CO1
	b)	A cantilever beam 1.5 m long having cross sectional dimensions as 100 mm x 150 mm carries a uniformly distributed load of 5 kN/m throughout. Determine the slope and deflection at the free end.	8 Marks	L4	CO1

(OR)

3.	a)	Derive the expression for slope and deflection of a simply supported beam of span 'l' carrying a point load at mid-span.	8 Marks	L4	CO1
	b)	A girder of uniform cross section and constant depth is freely supported over a span of 4 m. If the point load at the mid-span is 20 kN and moment of inertia is 15.614x106 m4. Calculate the central deflection and the slopes at the ends of the beam. Take E = 200 GN/m2 using Moment area method.	8 Marks	L4	CO1

MODULE-II

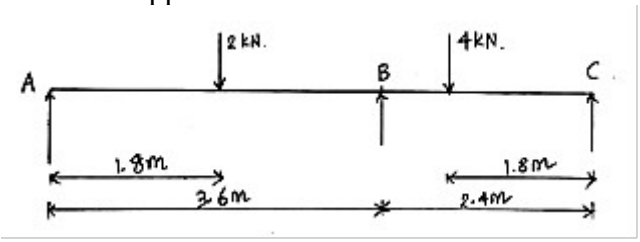
4.	a)	Derive the expression for strain energy due to axial load, bending moment and shear force.	8 Marks	L4	CO1
	b)	Using strain energy method, determine the deflection of the free end of a cantilever of length 'L' subjected to a concentrated load 'P' at the free end.	8 Marks	L4	CO1

(OR)

5.		Analyze a fixed beam AB of span 'l' carrying a point load W at the mid-span. Draw the shear force and bending moment diagrams.	16 Marks	L6	CO2

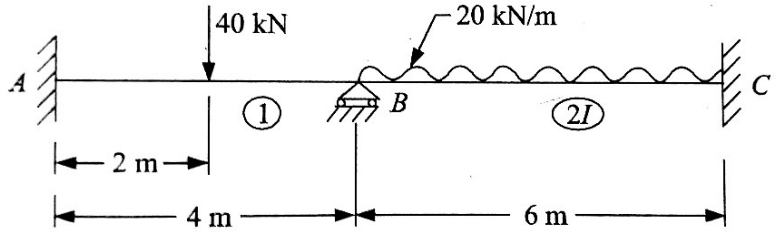
MODULE-III

6. Draw the bending moment and shear force diagrams of a beam shown in the Fig. which is simply supported at the supports A and C and is continuous over the support B. Assume EI is constant. — 16 Marks — L4 — CO3



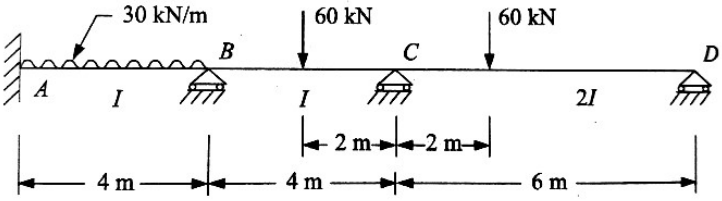
(OR)

7. Analyse the two-span continuous beam shown in figure by slope deflection method and draw the bending moment and shear force diagrams. Assume EI is constant throughout. — 16 Marks — L4 — CO3



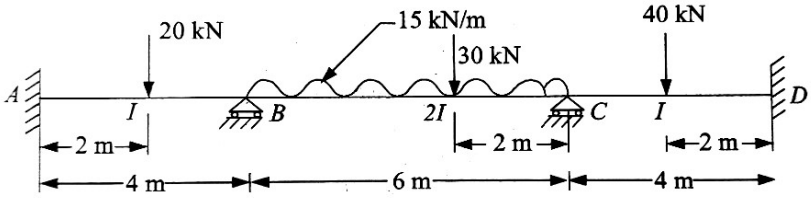
MODULE-IV

8. Analyze the continuous beam shown in Fig. by using moment distribution method and draw the bending moment diagram. — 16 Marks — L4 — CO3



(OR)

9. Analyze the continuous beam shown in Fig. by Kani's method. — 16 Marks — L4 — CO3



MODULE-V

10. A simply supported beam has a span of 20 m. A uniformly distributed load of 20 kN/m and 5 m long crosses the span. Using influence lines, find the maximum bending moment and shear force produced at the point 8 m from the left support. — 16 Marks — L4 — CO4

(OR)

11. a) Derive the moment curvature relationship in plastic analysis — 8 Marks — L2 — CO5

b) A T-section consists of a flange 150x10mm and a web of 140x10mm. The section modulus of the T-section is 54600mm3 This section is used as a simply supported beam of 4m span and carries a UDL of 25kN/m on the whole span. Determine the shape factor of the beam and also calculate the collapse load for the beam. Assume yield stress as 250 Mpa — 8 Marks — L3 — CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Regular Examinations, April – 2026

CONSTRUCTION, PLANNING AND PROJECT MANAGEMENT

[Civil Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define load bearing structure.	2 Marks	L1	CO1
	b)	Write the need for foundation.	2 Marks	L1	CO1
	c)	List the purpose of DPC.	2 Marks	L1	CO2
	d)	Mention any two safety precautions for scaffolding.	2 Marks	L1	CO2
	e)	List the applications of excavator.	2 Marks	L2	CO3
	f)	Define Resource Allocation	2 Marks	L1	CO3
	g)	What is a dummy activity? Write two specialties of dummy activity.	2 Marks	L1	CO4
	h)	Write the formula for average mean time for an activity?	2 Marks	L1	CO4
	i)	Define Float	2 Marks	L1	CO5
	j)	Explain in short resource allocation techniques.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Compare rubble masonry with ashlar masonry.	8 Marks	L2	CO1
	b)	What are the requirements of a good foundation and discuss its types.	8 Marks	L4	CO1

(OR)

3.	a)	Distinguish clearly between a lintel and an arch. How does a flat stone arch differ from a stone lintel	8 Marks	L4	CO1
	b)	Explain any three types of sloped roof with sketches	8 Marks	L4	CO1

MODULE-II

4.	a)	Define formwork and elucidate the chief requirements of a good formwork.	8 Marks	L2	CO2
	b)	How will you prevent the cracks and leaks in the building? And explain the process of repairing cracks and leaks	8 Marks	L4	CO2

(OR)

5.	a)	Discuss how preconstruction anti-termite treatment is carried out in wood works.	8 Marks	L4	CO2
	b)	Explain the shuttering for columns with the help of sketches.	8 Marks	L2	CO2

MODULE-III

6.	a)	Enumerate the stages of planning by different agencies?	8 Marks	L4	CO3
	b)	Discuss the factors affecting the selection of equipment in construction for efficiency in construction project by achieving environment and sustainability.	8 Marks	L3	CO3

(OR)

7. A construction company stores various items in the central stores as tabulated below. The average annual consumption and cost per unit of items stored are given in table. Classify the items using ABC analysis for effective monitoring and management of materials. 16 Marks L5 CO3

Name of the item	Average Annual consumption(in Number)	Average cost per unit (Rs)
a	5000	45.00
b	1000	90.00
c	2000	225.00
d	4000	11.25
e	50	300.00
f	6000	62.50
g	2000	67.50
h	4000	18.75
i	50	375.00
j	250	105.00
k	200	187.50
l	50	150.00

MODULE-IV

8. a) Write down the steps involved in the development of bar chart for better project management. 8 Marks L4 CO4

b) How do you select best method for project management among various alternatives that you have identified? 8 Marks L4 CO4

(OR)

9. Construct a network diagram for a single room with only summary items and give the detailing about the following: 16 Marks L5 CO4

i) Dummy activity ii) Activity iii) Event

MODULE-V

10. a) Briefly Explain "Optimistic Time Estimate", "Pessimistic Time Estimate" and "Most likely Time Estimate" with the help of a network 8 Marks L2 CO5

b) The time estimates for the three activities A,B,C are as follows: 8 Marks L5 CO5

Activity	Optimistic time estimate	Most likely time estimate	Pessimistic time estimate
A	10	12	14
B	6	8	12
C	5	10	12

Determine expected time and variance for each activity. Which activity has more reliable time estimates?

(OR)

11. The network for a construction project is shown in Fig.1; The three time estimates for each activity are given in table below. Compute (a) Expected time of completion of each activity (b) Earliest expected time for each event (c) latest allowable occurrence time for each event for better project management for cost saving. 16 Marks L5 CO5

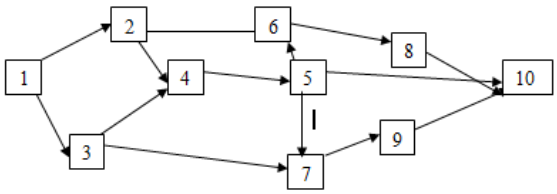

Figure – 1

Activity	Optimistic time	Most likely time	Pessimistic time
1-2	6	9	18
1-3	5	8	17
2-4	4	7	22
3-4	4	7	16
2-6	4	7	10
3-7	2	5	8
4-5	4	10	22
5-6	4	11	23
5-7	3	12	15
6-8	3	5	13
5-10	6	11	20

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Regular Examinations, April – 2026

SOIL MECHANICS

[Civil Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	A sample of dry soil weighs 68 gm. Find the volume of voids if total volume of sample is 40 ml and the specific gravity of solids is 2.65. Also determine the void ratio.	2 Marks	L2	CO1
	b)	Explain the use of particle size distribution curve in soil engineering.	2 Marks	L2	CO1
	c)	The capillary rise in a soil A with an effective size of 0.02 mm was 60 cm. Estimate the capillary rise in a similar soil B with an effective size of 0.04 mm.	2 Marks	L2	CO2
	d)	Classify soil water.	2 Marks	L1	CO2
	e)	Explain the importance of effective stress.	2 Marks	L2	CO3
	f)	Define geostatic stress.	2 Marks	L1	CO3
	g)	Define compression index.	2 Marks	L1	CO4
	h)	Define pre consolidation pressure.	2 Marks	L1	CO4
	i)	A sample of dry cohesion less soil was tested in a tri axial machine. If the angle shearing resistance was 36^0 and the confining pressure, 100 kN/m^2. Determine the deviator stress at which the sample failed.	2 Marks	L2	CO5
	j)	Draw typical strength envelops for a clean sand.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Draw the three phase diagram. Derive the relation between saturated unit weight (γ_{sat}), void ratio (e) and unit weight of water (γ_w).	8 Marks	L4	CO1
	b)	The porosity of a soil is 0.35. If specific gravity = 2.66, calculate i) saturated unit weight, ii) saturated moisture content, and iii) moisture content, when moist unit weight is 17.6 kN/m^3.	8 Marks	L4	CO1

(OR)

3.	a)	Define the terms: i) Liquidity index ii) Flow index iii) Toughness index iv) Activity. Write a brief note on the latest methods of moisture content determination in the field.	8 Marks	L1	CO1
	b)	The dry unit weights of sand in the loosest and densest states are respectively 13.34 kN/m^3 and 21.40 kN/m^3. Assuming the specific gravity of solids is 2.67, determine the relative density of sand with porosity of 30%. Comment on the relative density value with regard to compactness.	8 Marks	L4	CO1

MODULE-II

4.	a)	Define capillarity and permeability. List out the methods available for determination of permeability in the laboratory and in the field? Explain falling head method, in detail with the help of a neat sketch.	8 Marks	L3	CO2
	b)	Explain pumping out method in detail with the help of a neat sketch.	8 Marks	L4	CO2

(OR)

5.	a)	What is flow net? Explain the properties and uses of flow net.	8 Marks	L2	CO2
	b)	Determine the average vertical and horizontal permeability of a soil mass made up of three horizontal strata, each 1m thick, if the coefficient of permeability of three strata are $1x10^{-2}$ cm/s, $3x10^{-2}$ cm/s and $8x10^{-3}$ cm/s.	8 Marks	L4	CO2

MODULE-III

6.	a)	Explain how Newmark's influence chart is constructed and how it is used to find the vertical stress at a point below the ground surface.	8 Marks	L4	CO3
	b)	A water tank is supported by a ring foundation having outer diameter of 10 m and inner diameter of 7.5 m. The ring foundation transmits uniform load intensity of 160 kN/m^2. Compute the vertical stress induced at depth of 4 m below the centre of ring foundation, using i) Boussinesq analysis and ii) Westergaard's analysis, taking μ= 0.	8 Marks	L4	CO3

(OR)

7.	a)	What are the different methods of compaction adopted in the field? How would you select the type of compaction equipment to be used?	8 Marks	L4	CO3
	b)	The following results were obtained in a compaction test: Bulk unit weight (kN/m^3) 18.5 19.50 20.0 21.00 20.50 20.00 Water content (%) 17.0 19.0 20.0 20.8 21.5 22.5 Determine the optimum moisture content and maximum dry density. Also draw 5% air voids line and 90% saturation line if G=2.67.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Discuss the spring analogy for primary consolidation. What are its uses?	8 Marks	L3	CO4
	b)	A layer of soft clay is 6 m thick and lies under a newly constructed building. The weight of sand overlying the clay layer produces a pressure of 2.6 kg/cm^2 and the new construction increases the pressureby1.0 kg/cm^2. If the compression index is 0.5. Compute the settlement. Water content is 40% and specific gravity of grains is 2.65.	8 Marks	L4	CO4

(OR)

9.	a)	Distinguish normally consolidated soils and over consolidated soils. What is over consolidation ratio?	8 Marks	L4	CO4
	b)	An undrained soil sample 30 cm thick got 50% consolidation in 20 minutes with drainage allowed at top and bottom in the laboratory. If the clay layer from which the sample was obtained is 3 m thick in field condition, estimate the time it will take to consolidate 50% with double surface drainage and in both cases, consolidation pressure is uniform.	8 Marks	L4	CO4

MODULE-V

10.	a)	Explain vane shear test with the help of neat sketch.	8 Marks	L2	CO5
	b)	A saturated specimen of cohesionless sand was tested in triaxial compression and the sample failed at a deviator stress of 482 kN/m^2 when the cell pressure was 100 kN/m^2 under the drained conditions. Find the effective angle of shearing resistance of sand. What would be the deviator stress and the major principal stress at failure for another identical specimen of sand, if it is tested under cell pressure of 200 kN/m^2. Use either Mohr's circle method or analytical method.	8 Marks	L4	CO5

(OR)

11.	a)	What is critical void ratio? Explain briefly Skempton's pore pressure coefficients.	8 Marks	L3	CO5
	b)	Following are the results of undrained triaxial compression test on two identical soil specimens, at failure: Lateral pressure,σ_3 (kN/m^2) : 100 300 Total vertical pressure,σ_1 (kN/m^2) : 440 760 Pore water pressure, u (kN/m^2) : - 20 60 Determine the cohesion and angle of shearing resistance	8 Marks	L4	CO5

i) referred to total stress, ii) referred to effective stress.

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Regular Examinations, April – 2026

ELECTROMAGNETIC FIELDS AND TRANSMISSION LINES

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Write Stoke's theorem.	2 Marks	L1	CO1
	b)	State Coulomb's law.	2 Marks	L1	CO1
	c)	What is magnetic field intensity? Write its units.	2 Marks	L1	CO1
	d)	What is Biot-Savart's law?	2 Marks	L1	CO1
	e)	Outline Gauss's law on magnetostatics.	2 Marks	L2	CO2
	f)	Acquire Maxwell's equation from Ampere's law.	2 Marks	L3	CO2
	g)	What is pointing vector?	2 Marks	L1	CO3
	h)	Define Brewster's Angle.	2 Marks	L1	CO3
	i)	Express the Propagation velocity.	2 Marks	L2	CO4
	j)	List out the secondary constants of transmission lines.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Apply Columb's law to an infinite line charge distribution and derive the expression for E.	8 Marks	L3	CO1
	b)	State Gauss law of electrostatics with neat diagram and discuss any one application of it.	8 Marks	L2	CO1

(OR)

3.	a)	Differentiate Convection and Conduction Currents.	8 Marks	L4	CO1
	b)	A charge Q1=-20μC is located at P (-6, 4, 6) and charge Q2=50μC is located at R (5, 8, -2) in free space. Calculate the force exerted on Q2 by Q1 in vector form. The distances are in meters.	8 Marks	L4	CO1

MODULE-II

4.	a)	State Ampere's circuital law of magnetostatics and discuss any one application of it.	8 Marks	L2	CO1
	b)	Derive the Forces due to Magnetic Fields between two loops	8 Marks	L3	CO1

(OR)

5.	a)	Determine the Magnetic Field intensity due to an infinite sheet of current using Ampere's law.	8 Marks	L4	CO1
	b)	Derive magnetic scalar and vector potentials.	8 Marks	L3	CO1

MODULE-III

6.		Develop the Maxwell's equation for time varying fields that relates space varying electric field and time varying magnetic field.	16 Marks	L3	CO2

(OR)

7		Identify and devrive the magnetic boundary conditions that must satisfy at the boundary between two different mediaAril.	16 Marks	L4	CO2

MODULE-IV

8.	a)	Develop the wave equation for a conducting medium	8 Marks	L4	CO3
	b)	Illustrate different types of polarizations with the necessary expressions.	8 Marks	L2	CO3

(OR)

9.	a)	Develop Wave Equations for Dielectric and Conducting Medium.	8 Marks	L3	CO3
	b)	Illustrate the reflection by a perfect conductor at normal incidence for parallel polarization. Formulate the expressions for fields.	8 Marks	L2	CO3

MODULE-V

10.	a)	Develop an expression for the input impedance of a loss less line. Derive Z_{SC} and Z_{OC} and sketch their variations.	8 Marks	L3	CO4
	b)	A 75Ω is terminated by a load of (120+80j)Ω. Calculate the maximum and minimum impedances on the line.	8 Marks	L4	CO4

(OR)

11.	a)	Develop an expression for the input impedance of a transmission line of length L.	8 Marks	L3	CO4
	b)	A loss less Line of 300 Ω is terminated by a load of Z_R. If the VSWR at 200MHz is 4.48, and the first V_{min} is located at 6 cm from the load. Calculate the values of reflection coefficient and Z_R.	8 Marks	L4	CO4

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Regular Examinations, April – 2026

PROBABILITY AND STOCHASTIC PROCESSES

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define probability.	2 Marks	L1	CO1
	b)	Define conditional probability.	2 Marks	L1	CO1
	c)	Define Probability density function.	2 Marks	L1	CO2
	d)	Define the Expectation	2 Marks	L1	CO2
	e)	State interval conditioning	2 Marks	L1	CO2
	f)	Define Marginal density function.	2 Marks	L1	CO2
	g)	What is deterministic Process?	2 Marks	L1	CO3
	h)	Give example for non-deterministic Process.	2 Marks	L1	CO3
	i)	List the types of noise.	2 Marks	L1	CO4
	j)	What is noise factor?	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2. a) Define and express the probability based on set theory and fundamental axioms. — 8 Marks, L2, CO1

   b) An experiment consists of tossing two dice. — 8 Marks, L2, CO1
      i) Find the sample space S.
      ii) Find the event A that the sum of the dots on the dice equals 7.
      iii) Find the event B that the sum of the dots on the dice is greater than 10.
      iv) Find the event C that the sum of the dots on the dice is greater than 12.

(OR)

3. a. Define and express Joint Probability and Conditional Probability — 8 Marks, L2, CO1

   b. In a box there are 100 resistances having resistance and tolerance shown in below table. If a resistor is chosen with same likelihood of being chosen for the three events, A as "draw a 47 ohm resistor', B as "draw a resistor with5% tolerance", C as "draw a 100 ohm resistor". — 8 Marks, L1, CO1

   Calculate: i) Joint probabilities and ii) Conditional probabilities.

Resistance(Ω)	Tolerance		
	5%	10%	Total
22	10	14	24
47	28	16	44
100	24	8	32
Total	62	38	100

MODULE-II

4.	a)	Define Random variable and list the conditions for the function to be a random variable.	8 Marks	L2	CO2
	b)	Let X be a Random Variable with pdf a given by $f_x(x) = \{4x, 0 < x < 1$ $f_x(x) = 0, elsewhere$ Find the pdf of y=2x+1	8 Marks	L2	CO2

(OR)

5.	a)	Explain the Gaussian Random Variable and Exponential Random variable with corresponding neat Sketches.	8 Marks	L1	CO2
	b)	Let x be random variable defined by the density function $f_x(x) = \left\{\left(\frac{5}{4}\right), 0 < x \le 1\right.$ and $f_x(x) = 0, elsewhere$ Find E[X], E[X^2] and variance.	8 Marks	L2	CO2

MODULE-III

6.	a)	Define a Random Variable V and W by V=X+aY and W=x-aY Where 'a' is real number X and Y random variables. Determine 'a' in terms of X and Y such V and Ware orthogonal.	8 Marks	L2	CO2
	b)	Gaussian Random Variables X and Y have first and second order moments m_{10} =-1.1, m_{20} =1.16, m_{01} =1.5, m_{20} = 2.89, R_{xy} = -1.724 i) Find the C_{xx},ρ ii) Write expression for Jointly Gaussian Density function.	8 Marks	L3	CO2

(OR)

7.	a)	Explain the Linear Transformation of Gaussian Random Variables.	8 Marks	L2	CO2
	b)	Two Gaussian Random Variables X_1 and X_2 have zero means and variances 4 and 9. Their Covariance is equal to 3. If X_1 and X_2 are linearly transformed to new variables Y_1 and Y_2 according to $Y_1 = X_1 - 2X_2$; $Y_2 = 3X_1 - 4X_2$. Find : i) Mean ii) Variances iii) Covariance of Y_1 and Y_2	8 Marks	L3	CO2

MODULE-IV

8.	A random process is defined by x(t) =A where A is a continuous random variable uniformly distributed on (0,1) and t represents time. Solve for i) E [x (t)] ii) Rxx [t; t + τ] iii) Is the process stationary	16 Marks	L3	CO3

(OR)

9.	Let two random processes X(t) and Y(t) be defined by $X(t) = A\cos(\omega_o t) + B\sin(\omega_o t)$; $Y(t) = B\cos(\omega_o t) - A\sin(\omega_o t)$ where A and B are random variables and ω_0 is a constant. Assume A and B are uncorrelated, zero mean random variables with same variance. Show that X(t) and Y(t) are jointly stationary.	16 Marks	L3	CO3

MODULE-V

10.	a)	Detail the differences between correlated and uncorrelated noise.	8 Marks	L2	CO5
	b)	Elaborate expression for Noise figure in terms of Equivalent noise temperature for an amplifier.	8 Marks	L2	CO4

(OR)

11.	a)	Discuss the Noise factor equivalent to noise temperature	8 Marks	L2	CO5
	b)	Derive the expression for thermal noise voltage.	8 Marks	L3	CO4

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Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Regular Examinations, April – 2026

LINEAR IC APPLICATIONS

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is an operational amplifier?	2 Marks	L1	CO1
	b)	A Differential amplifier has a differential voltage gain of 2000 and common mode gain of 0.2. Determine CMRR.	2 Marks	L4	CO1
	c)	List the characteristics of instrumentation amplifier	2 Marks	L1	CO2
	d)	What is a voltage regulator?	2 Marks	L1	CO2
	e)	What is a filter. List the types of filters.	2 Marks	L1	CO3
	f)	What are the comparative advantages and limitations of employing a Wien Bridge oscillator in contrast to an RC oscillator	2 Marks	L1	CO3
	g)	Explain the use of VCO.	2 Marks	L2	CO4
	h)	How does the internal flip-flop contribute to the operation of a 555 timer in Astable mode	2 Marks	L2	CO4
	i)	Define resolution of DAC converter.	2 Marks	L1	CO5
	j)	Name the types of resistive techniques for ADC converters.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Compare and contrast ideal and practical op-amp?	7 Marks	L4	CO1
	b)	Draw and explain the various functional blocks of an operational amplifier IC?	9 Marks	L2	CO1

(OR)

3.	a)	Draw the inverting amplifier circuit and non-inverting amplifier circuit of an op-amp in closed loop configuration. Obtain the expression for the closed loop gain for both amplifiers.	8 Marks	L3	CO1
	b)	Determine the output voltage of a differential amplifier for the input voltages of 300μV and 240μV. The differential gain of the amplifier is 5000 and the value of the CMRR is i)100 ii)105	8 Marks	L4	CO1

MODULE-II

4.	a)	What is an instrumentation amplifier? Give the important features of an instrumentation amplifier. Explain the working of three op-amp instrumentation amplifier. Give its application.	10 Marks	L2	CO2
	b)	Design a Schmitt trigger circuit for UTP and LTP of +3V and -3V respectively. Explain its hysteresis curve.	6 Marks	L3	CO2

(OR)

5.	a)	Explain the inverting and non-inverting AC amplifier	8 Marks	L2	CO2
	b)	Demonstrate the operation of Sample & Hold circuit with a neat circuit diagram	8 Marks	L3	CO2

MODULE-III

6.	a)	Design a first order low pass filter for a high cut-off frequency of 2KHz and pass band gain of 2.	8 Marks	L3	CO3
	b)	How does the Wien bridge oscillator circuit operate, and what are its key components and design considerations?	8 Marks	L4	CO3

(OR)

7.	a)	Explain the basic principle of operation of RC phase shift oscillator using op-amp. Derive the condition for frequency of oscillations.	8 Marks	L2	CO3
	b)	What are the various types of active filters implemented using operational amplifiers, and how do they differ in terms of their frequency response, circuit topology, and applications.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Define PLL. Sketch its block diagram and explain its operation.	8 Marks	L2	CO4
	b)	Define timer. Draw and Explain the functional diagram of 555 timer.	8 Marks	L2	CO4

(OR)

9.	a)	Draw and explain VCO working principle and derive a equation for its free running.	8 Marks	L4	CO4
	b)	Design an astable multi vibrator to provide output frequency of 1KHZ with duty cycle of 60% with c=0.1μf.	8 Marks	L3	CO4

MODULE-V

10.	a)	Design a 4bit weighted resistor DAC technique and explain its transfer characteristics.	8 Marks	L3	CO5
	b)	The basic step of a 9-bit DAC is 10mv. If 000000000 represents 0v, what output is produced if the input is 101011011.	8 Marks	L4	CO5

(OR)

11.	a)	Draw the block diagram of R-2R ladder DAC. Explain its operation	8 Marks	L2	CO5
	b)	Discuss in detail about Flash type ADC. Explain its operation	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Regular Examinations, April – 2026

ANALOG COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	List the key differences between AM and SSB.	2 Marks	L1	CO1
	b)	List the differences between DSB-SC and SSB modulation techniques.	2 Marks	L1	CO1
	c)	State the practical bandwidth of WBFM.	2 Marks	L1	CO1
	d)	List the operating ranges of a Phase Locked Loop (PLL).	2 Marks	L2	CO1
	e)	Define noise in communication systems.	2 Marks	L1	CO2
	f)	State the figure of merit of an AM system.	2 Marks	L1	CO2
	g)	Define selectivity of a radio receiver.	2 Marks	L1	CO3
	h)	Define sensitivity of a radio receiver.	2 Marks	L1	CO3
	i)	Define Time Division Multiplexing (TDM).	2 Marks	L1	CO4
	j)	Define Frequency Division Multiplexing (FDM).	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Derive the time-domain expression of a Single Sideband (SSB) modulated signal containing only one sideband.	8 Marks	L4	CO1
	b)	Calculate the percentage of power saved in a DSB-SC system when compared with a conventional AM system.	8 Marks	L3	CO1

(OR)

3.	a)	Derive the standard mathematical expression of an AM signal and explain its time-domain and frequency-domain representations.	8 Marks	L4	CO1
	b)	Explain the Quadrature Null Effect (QNE) in DSB-SC coherent detection and suggest a suitable method to overcome it.	8 Marks	L3	CO1

MODULE-II

4.		Explain the demodulation of an FM signal using a Phase Locked Loop (PLL) with necessary mathematical expressions	16 Marks	L4	CO1

(OR)

5.		Derive the expression for a Wideband FM (WBFM) signal using Bessel functions, sketch the spectrum and estimate the bandwidth.	16 Marks	L4	CO1

MODULE-III

6.	a)	Derive the expressions for SNR and figure of merit of a conventional AM system.	8 Marks	L4	CO2
	b)	Write short notes on Capture Effect, Figure of Merit, and SNR.	8 Marks	L2	CO2

(OR)

7.	a)	Prove that the output SNR of a single-tone FM signal is given by the standard expression.	8 Marks	L4	CO2
	b)	Define the sensitivity factor in FM and PM. Calculate the resulting bandwidth if i) FM Sensitivity $K_f=10^4$Hz/Volt ii) PM Sensitivity $K_P=100\pi$ radian/Volt Assume the carrier frequency = 100MHz	8 Marks	L3	CO2

MODULE-IV

8.	a)	Draw and explain the block diagram of a variable reactance type FM transmitter.	8 Marks	L2	CO3
	b)	Discuss the factors influencing the selection of intermediate frequency (IF) in radio receivers.	8 Marks	L2	CO3

(OR)

9.	a)	In a broadcast super heterodyne receiver having no RF amplifier, the loaded Q of the antenna coupling circuit is 50. If the IF frequency is 455Kz, determine the image frequency and its rejection for tuning at 25MHz	8 Marks	L1	CO3
	b)	Discuss the characteristics of an AM receiver with respect to sensitivity, selectivity, and fidelity.	8 Marks	L2	CO3

MODULE-V

10.	With a neat block diagram, explain the working of TDM technique.	16 Marks	L2	CO4

(OR)

11.	Explain how a PPM signal can be generated from a PWM signal.	16 Marks	L1	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Regular Examinations, April – 2026

ELECTRICAL AND ELECTRONIC MEASUREMENTS

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Enumerate the major advantages and limitations of a Permanent Magnet Moving Coil (PMMC) instrument.	2 Marks	L1	CO1
	b)	Explain the terms deflecting force, controlling force, and damping force used in electrical measuring instruments.	2 Marks	L2	CO1
	c)	Define a polar-type AC potentiometer.	2 Marks	L1	CO2
	d)	State one significant advantage of an AC potentiometer when compared to an AC voltmeter.	2 Marks	L2	CO2
	e)	Identify any two common sources of error in a single-phase energy meter.	2 Marks	L1	CO3
	f)	Explain the concept of a two-element energy meter.	2 Marks	L2	CO3
	g)	List few applications of inductance bridges.	2 Marks	L1	CO4
	h)	State the condition for balance of a Maxwell bridge.	2 Marks	L2	CO4
	i)	Define ratio measurement and mention any two functions of a universal counter.	2 Marks	L1	CO5
	j)	Justify why period measurement is more suitable for low-frequency signal measurement.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Illustrate the construction and working principle of a true RMS voltmeter with a neat diagram.	8 Marks	L2	CO1
	b)	The coil of a moving coil voltmeter is 40 mm long and 30 mm wide and has 100 turns on it. The control spring exerts a torque of 240 x 10^{-6} N-m when the deflection is 100 divisions on full scale. If the flux density of the magnetic field in the air gap is 1.0 Wb/m^2, estimate the resistance that must be put in series with the coil to give one volt per division. The resistance of the voltmeter coil may be neglected.	8 Marks	L3	CO1

(OR)

3.	a)	Design a multi-range D.C. milli-ammeter using a basic movement with an internal resistance R_m =50Ω and a full scale deflection current I_m = 1mA. The ranges required are 0-10 mA: 0-50 mA; 0-100 mA, and 0-500 mA.	8 Marks	L3	CO1
	b)	Explain the construction of an ammeter shunt and derive the expression for shunt resistance connected across a D'Arsonval movement.	8 Marks	L2	CO1

MODULE-II

4.		Derive the expression for the series resistance used in a series-type ohmmeter and explain its significance.	16 Marks	L2	CO2

(OR)

5.	a)	Describe the procedure for measuring unknown EMF using a DC potentiometer.	8 Marks	L2	CO2
	b)	Compare the DC Crompton potentiometer with the coordinate-type AC potentiometer in terms of construction and operation.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the construction and working principle of a single-phase electrodynamometer-type wattmeter with a neat diagram and derive the torque equation.	8 Marks	L2	CO3
	b)	Discuss the errors associated in single phase energy meter.	8 Marks	L2	CO3

(OR)

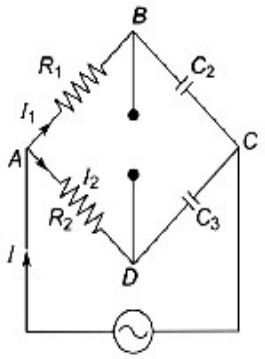
7.		Describe the construction and operation of a three-phase electrodynamometer-type wattmeter with a neat diagram and derive the torque equation.	16 Marks	L2	CO3

MODULE-IV

8.	a)	Analyze the balance condition with necessary equation of Maxwell's inductance bridge.	8 Marks	L4	CO4
	b)	Explain the principle of resonance as applied to a Q-meter and discuss the importance of Q-factor in electrical circuits.	8 Marks	L2	CO4

(OR)

9.		Identify the below bridge network and derive the bridge balance equation to measure capacitance C_2.	16 Marks	L3	CO4



MODULE-V

10.		Build a simplified composite circuit used in digital frequency meter.	16 Marks	L2	CO5

(OR)

11.	a)	Describe the operation of frequency counter briefly.	8 Marks	L1	CO5
	b)	Explain a device which is used for time interval measurement in industrial applications with a neat sketch.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Regular Examinations, April – 2026

EMBEDDED SOFTWARE ENGINEERING - I

[Electrical and Electronics Engineering, Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is a development lifecycle framework?	2 Marks	L2	CO1
	b)	Write any two SDLC models.	2 Marks	L1	CO1
	c)	What is a code repository?	2 Marks	L1	CO2
	d)	Define commit.	2 Marks	L1	CO2
	e)	What is basic embedded architecture?	2 Marks	L1	CO3
	f)	Define microcontroller.	2 Marks	L1	CO3
	g)	What is host–target setup?	2 Marks	L1	CO4
	h)	Name two boot components.	2 Marks	L1	CO4
	i)	What is verification?	2 Marks	L1	CO5
	j)	What is validation?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain how the V-Model connects development phases with verification and validation activities in embedded engineering.	8 Marks	L3	CO1
	b)	Describe what an embedded system design cycle is and how hardware–software co-design is coordinated within it.	8 Marks	L2	CO1

(OR)

3.	a)	Discuss the key hardware considerations that must be addressed before embedded software development begins.	8 Marks	L2	CO1
	b)	Explain the important software processes in the embedded design cycle from requirements capture to testing.	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain the build process and outline the sequence from compilation to image generation for embedded systems.	8 Marks	L3	CO2
	b)	Describe the deployment process and how firmware images are stored on embedded devices.	8 Marks	L3	CO2

(OR)

5.		Explain the importance of software metrics and list examples relevant to embedded quality assurance.	16 Marks	L2	CO2

MODULE-III

6.	a)	Explain the purpose of standard interfaces such as UART, SPI and I²C and how they ensure compatibility between embedded components.	8 Marks	L4	CO3
	b)	Compare UART and SPI serial interfaces in terms of signalling, data rate and communication mechanism used in embedded systems.	8 Marks	L4	CO3

(OR)

7.	a)	Explain the role of schematic diagrams in electronic design and how engineers use them for debugging and hardware–software integration.	8 Marks	L3	CO3
	b)	Describe what a datasheet contains and explain why understanding electrical characteristics is crucial before interfacing devices.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain the role of Boot ROM and how it provides immutable instructions for the earliest stage of booting.	8 Marks	L3	CO4
	b)	Explain what firmware flashing means and outline how firmware images are written to non-volatile memory.	8 Marks	L3	CO4

(OR)

9.	a)	Describe why workspace organization is important and how structured directories improve bootloader and firmware management.	8 Marks	L3	CO4
	b)	Explain hardware security and describe common threats such as probing, bypassing or tampering.	8 Marks	L3	CO4

MODULE-V

10.		Explain the main objectives of testing including defect detection and risk reduction.	16 Marks	L2	CO5

(OR)

11.	a)	Elaborate any two fundamental testing principles and explain how they help improve test effectiveness.	8 Marks	L3	CO5
	b)	Describe what a test case is and list its essential elements such as inputs, conditions and expected outputs.	8 Marks	L4	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MCA II Semester (MBU-25) Regular Examinations, May– 2026

DATA MINING

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is Data Mining?	2 Marks	L1	CO1
	b)	List any two kinds of data that can be mined.	2 Marks	L1	CO1
	c)	What is a data cube?	2 Marks	L1	CO2
	d)	Define the term "cuboid."	2 Marks	L1	CO2
	e)	Explain Classification.	2 Marks	L1	CO3
	f)	What is Decision tree induction?	2 Marks	L1	CO3
	g)	Define cluster analysis.	2 Marks	L1	CO4
	h)	List any two applications of clustering.	2 Marks	L1	CO4
	i)	Define a time series.	2 Marks	L1	CO5
	j)	Explain Symbolic sequence data.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain Data Mining in detail. Discuss motivated data mining, kinds of data to be mined, and kinds of patterns that can be discovered.	8 Marks	L2	CO1
	b)	Summarize the major technologies used in Data Mining and explain the kinds of applications targeted by data mining systems.	8 Marks	L2	CO1

(OR)

3.	a)	Illustrate data reduction and data transformation.	8 Marks	L2	CO1
	b)	Explain which kind of patterns to be mined.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain Data Cube Technology with a neat diagram.	8 Marks	L2	CO2
	b)	Discuss Multidimensional Data Analysis in Cube Space.	8 Marks	L2	CO2

(OR)

5.	a)	Explain various data computation methods in detail.	8 Marks	L2	CO2
	b)	Summarize generating association rules from frequent item sets.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain Decision tree induction, algorithm and suitable example.	8 Marks	L2	CO3
	b)	Discuss attribute selection measures	8 Marks	L2	CO3

(OR)

7.		Summarize the following Concepts i) Bayes' Theorem ii) Naıve Bayesian Classification	16 Marks	L2	CO3

MODULE-IV

8.	a)	Explain overview of basic clustering methods	8 Marks	L2	CO4
	b)	Explain Multiphase Hierarchical Clustering Using Dynamic Modeling	8 Marks	L2	CO4

(OR)

9.		Summarize the following partitioning methods i) k-Means with algorithm and suitable example. ii) k-Medoids with algorithm and suitable example.	16 Marks	L3	CO4

MODULE-V

10.	a)	Explain Regression and Trend Analysis in Time-Series Data.	8 Marks	L2	CO5
	b)	Illustrate Sequential Pattern Mining in Symbolic Sequences.	8 Marks	L2	CO5

(OR)

11.	a)	Elaborate mining graphs and networks.	8 Marks	L2	CO5
	b)	Discuss applications of data mining.	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MCA II Semester (MBU-25) Regular Examinations, May– 2026

COMPUTER NETWORKS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define a computer network.	2 Marks	L1	CO1
	b)	List any two uses of computer networks.	2 Marks	L1	CO1
	c)	Define Data Link Layer.	2 Marks	L1	CO2
	d)	State any two functions of Data Link Layer.	2 Marks	L1	CO2
	e)	Define Network Layer.	2 Marks	L1	CO3
	f)	What is routing?	2 Marks	L1	CO3
	g)	Define Transport Layer.	2 Marks	L1	CO4
	h)	What is UDP?	2 Marks	L1	CO4
	i)	What is DNS namespace?	2 Marks	L1	CO5
	j)	What is name resolution?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

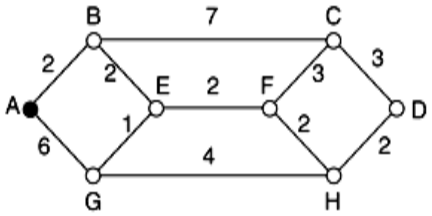
2.	a)	Explain how to build network with OSI and TCP/IP reference model.	8 Marks	L4	CO1
	b)	Recall various guided transmission media used in networks.	8 Marks	L2	CO1
		(OR)			
3.	a)	Differentiate between connection oriented and connectionless services.	8 Marks	L2	CO1
	b)	Analyze the different types of packet switching techniques with suitable networks. Write each of its advantages and disadvantages.	8 Marks	L3	CO1

MODULE-II

4.	a)	Implement the algorithm of hamming code for each of the following data. Assuming the even parity state whether the received code word is correct or wrong. If wrong locate the bit having error (m= 1011001).	8 Marks	L4	CO2
	b)	Examine Selective repeat sliding window Protocol with an example.	8 Marks	L4	CO2
		(OR)			
5.	a)	Discuss the various responsibilities of Data Link Layer.	8 Marks	L2	CO2
	b)	With the help of neat diagrams show that Slotted Aloha improves the performance over Pure Aloha	8 Marks	L1	CO2

MODULE-III

6.	a)	With the help of an example, demonstrate the process of updating the states by using link state routing algorithm.	8 Marks	L3	CO3
	b)	Evaluate the routing path Dijkstra's shortest path routing algorithm with the network given.	8 Marks	L4	CO3



(OR)

7.	a)	Explain Internet Protocol with the neat block diagram of IP header format.	8 Marks	L1	CO3
	b)	Explore various approaches and algorithms used for network congestion control.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Interpret a TCP state transition diagram for connection management.	8 Marks	L3	CO4
	b)	With a neat diagram explain Remote Procedure Call.	8 Marks	L2	CO4

(OR)

9.	a)	Evaluate the various duties of Transport Layer.	8 Marks	L3	CO4
	b)	Define UDP. Discuss the operations of UDP. Explain UDP checksum with one example.	8 Marks	L1	CO4

MODULE-V

10.	a)	Illustrate the structure and content of email message formats. How do email messages accommodate various media types and attachments?	8 Marks	L3	CO5
	b)	Provide an architectural overview of the World Wide Web (WWW), including its foundational components and principles.	8 Marks	L2	CO5

(OR)

11.	a)	Analyze in detail about DNS operation.	8 Marks	L4	CO5
	b)	Interpret Hyper Text Transfer Protocol request and response messages in detail.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MCA II Semester (MBU-25) Regular Examinations, May– 2026

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define JVM.	2 Marks	L1	CO1
	b)	List any four Java buzzwords.	2 Marks	L1	CO1
	c)	Define inheritance.	2 Marks	L1	CO1
	d)	What is final keyword?	2 Marks	L1	CO1
	e)	Recall the purpose of the try and catch blocks in exception handling?	2 Marks	L1	CO2
	f)	What is the difference between a thread and a process in Java?	2 Marks	L1	CO2
	g)	Define Iterator.	2 Marks	L1	CO3
	h)	What is TreeSet?	2 Marks	L2	CO3
	i)	What is the function of the JLabel component in Java Swing?	2 Marks	L1	CO4
	j)	Differentiate AWT and Swing.	2 Marks	L2	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain decision-making statements in Java.	8 Marks	L2	CO1
	b)	Write a Java program using loop constructs.	8 Marks	L2	CO1
		(OR)			
3.	a)	Explain static members with an example.	8 Marks	L2	CO1
	b)	Explain this keyword with example.	8 Marks	L2	CO1

MODULE-II

4.	a)	Write a Java program to demonstrate different types of inheritance.	8 Marks	L3	CO1
	b)	Compare overloading and overriding.	8 Marks	L2	CO1
		(OR)			
5.	a)	Explain how to create, import, and use packages in a Java program.	8 Marks	L2	CO1
	b)	Write a Java program using abstract class.	8 Marks	L2	CO1

MODULE-III

6.	a)	Explain exception handling mechanism.	8 Marks	L2	CO2
	b)	Explain built-in exceptions.	8 Marks	L1	CO2
		(OR)			
7.	a)	State advantages of multithreading.	8 Marks	L2	CO2
	b)	Explain thread life cycle with diagram.	8 Marks	L2	CO2

MODULE-IV

8.	a)	Explain Collection Framework architecture.	8 Marks	L2	CO3
	b)	Write a Java program that compares Array List, Linked List, and Vector.	8 Marks	L3	CO3

(OR)

9.	a)	Explain Map interface.	8 Marks	L2	CO3
	b)	Differentiate Hash Map vs Hash table.	8 Marks	L2	CO3

MODULE-V

10.	a)	Create a simple Applet in Java and explain its structure.	8 Marks	L1	CO4
	b)	Write a Java Swing program to use JLabel and JTextField.	8 Marks	L1	CO4

(OR)

11.	a)	Demonstrate the Delegation Event Model in Java with events and event listeners.	8 Marks	L2	CO4
	b)	Implement JComboBox and JCheckBox in a Java Swing program and demonstrate their usage.	8 Marks	L3	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

3D PRINTING

[Machine Design]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is meant by a generic 3D printing process?	2 Marks	L1	CO1
	b)	List any two key steps in the 3D printing process.	2 Marks	L1	CO1
	c)	What is meant by a 3D printing process chain?	2 Marks	L1	CO2
	d)	Define photo polymerization in additive manufacturing.	2 Marks	L1	CO2
	e)	What is Powder Bed Fusion (PBF)?	2 Marks	L2	CO3
	f)	What does SLS stand for?	2 Marks	L2	CO3
	g)	What is Design for Manufacturing and Assembly (DFMA)?	2 Marks	L1	CO4
	h)	What is meant by Design for 3D Printing?	2 Marks	L1	CO4
	i)	How is 3D printing used in medical applications?	2 Marks	L2	CO5
	j)	What role does 3D printing play in tissue engineering?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the generic 3D printing process in detail.	8 Marks	L2	CO1
	b)	Discuss the benefits of 3D printing technology.	8 Marks	L2	CO1
		(OR)			
3.	a)	Compare 3D printing and CNC machining.	8 Marks	L2	CO1
	b)	Explain other related technologies associated with 3D printing.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the 3D printing process chain.	8 Marks	L2	CO2
	b)	Explain photo polymerization processes in additive manufacturing.	8 Marks	L2	CO2
		(OR)			
5.	a)	Discuss photo polymerization materials used in 3D printing.	8 Marks	L2	CO2
	b)	Explain reaction rates in photo polymerization processes.	8 Marks	L2	CO2

MODULE-III

6.	a)	Describe about Powder Bed Fusion processes.	8 Marks	L2	CO3
	b)	Describe the Selective Laser Sintering (SLS) process.	8 Marks	L2	CO3
		(OR)			
7.	a)	Explain powder handling in PBF processes.	8 Marks	L2	CO3
	b)	Discuss approaches to metal part creation in PBF.	8 Marks	L2	CO3

MODULE-IV

8.	a)	What is Design for Manufacturing and Assembly (DFM) in the context of 3D printing?	8 Marks	L3	CO4
	b)	What are the core concepts and objectives of DFM for 3D printing?	8 Marks	L2	CO4
		(OR)			
9.	a)	What unique capabilities does 3D printing offer compared to traditional manufacturing?	8 Marks	L2	CO4
	b)	How does exploring design freedoms benefit 3D printing?	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain the use of 3D printing to support medical applications.	8 Marks	L2	CO5
	b)	Discuss software support required for medical 3D printing applications.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain the role of 3D printing in patient-specific medical devices.	8 Marks	L2	CO5
	b)	Discuss tissue engineering scaffolds produced using 3D printing.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MCA II Semester (MBU-25) Regular Examinations, May– 2026

MATHEMATICAL FOUNDATIONS FOR COMPUTER APPLICATIONS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	State De Morgan's Laws of predicate logic with an example.	2 Marks	L1	CO1
	b)	Write the sentence "It is not true that all roads lead to Rome" in the symbolic form.	2 Marks	L1	CO1
	c)	Define Complemented Lattice.	2 Marks	L1	CO2
	d)	Define Minterm and Maxterm.	2 Marks	L1	CO1
	e)	Explain compatibility of relations with example.	2 Marks	L1	CO2
	f)	Explain in brief about Greatest common divisor with an example.	2 Marks	L1	CO3
	g)	Define isolated vertex, pendant vertex.	2 Marks	L1	CO5
	h)	State Lagrange's theorem.	2 Marks	L1	CO3
	i)	State the necessary conditions to show that two graphs are isomorphic.	2 Marks	L1	CO5
	j)	Define Minimal Spanning Tree.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Show that $((P \vee Q) \wedge (\neg(P \wedge (\neg Q \vee \neg R)) \vee (\neg P \wedge \neg Q) \vee (\neg P \wedge \neg R)$ is Tautology.	8 Marks	L3	CO1
	b)	Write the following statements in symbolic form as following i) All Natural numbers are not integers ii) Some Apples are sweets iii) Some computers students are studying discrete maths or computer science.	8 Marks	L2	CO1

(OR)

3.	a)	Obtain the Principal Disjunctive Normal Form of $(P \wedge Q) \vee (\neg P \wedge R) \vee (Q \wedge R)$.	8 Marks	L2	CO1
	b)	Show that $R \vee S$ follows logically from the premises $C \vee D$, $(C \vee D) \rightarrow \neg H, \neg H \rightarrow (A \wedge \neg B)$ and $(A \wedge \neg B) \rightarrow (R \vee S)$	8 Marks	L3	CO1

MODULE-II

4.	a)	Define a binary relation with an example. Let R be the relation from the set A = {1, 3, 4} on itself and defined by R = { (1, 1), (1, 3), (3, 3), (4, 4)} the find the matrix of R draw the graph of R .	8 Marks	L3	CO2
	b)	Prove that (S,≤) is a lattice, where S = (1, 2, 3, 6) and ≤ is for divisibility. Prove that this is a distributive lattice.	8 Marks	L4	CO2

(OR)

5.	a)	What is the simplified sum of product form for the Boolean Expression: $(A+\overline{B}+\overline{C})(A+\overline{B}+C)(A+B+\overline{C})$.	8 Marks	L3	CO2
	b)	Simplify the following Boolean expression in i) SOP ii) POS using Karnaugh Map $A\overline{C}+\overline{B}D+\overline{A}CD+ABCD$.	8 Marks	L4	CO2

MODULE-III

6.	a)	Prove that Z is a Monoid but not a Group under multiplication.	8 Marks	L4	CO3
	b)	Prove that set G ={1,2,3,4,5,6} is an abelian group with respect to addition modulo 6.	8 Marks	L3	CO3

(OR)

7.	a)	State and prove Division algorithm.	8 Marks	L4	CO3
	b)	Find the GCD of 5775 and 1008.	8 Marks	L4	CO3

MODULE-IV

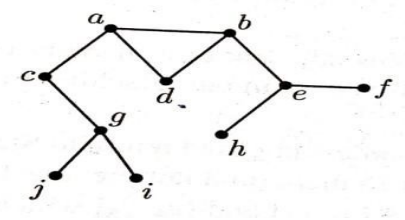
8.	a)	Solve the recurrence relation: $a_n + 2a_{n-1} - 3a_{n-2} = 0$ where $a_0 = 2$, $a_1 = 3$.	8 Marks	L4	CO4
	b)	Determine the Coefficient of x^{12} in $x^3(1-2x)^{10}$.	8 Marks	L4	CO4

(OR)

9.	a)	Solve the recurrence relation $a_n + a_{n-1} - 9a_{n-2} = 0, for\ n \geq 2$ given that $a_0 = 5$ and $a_1 = 12$.	8 Marks	L4	CO4
	b)	Find a Generating function for the recurrence relation $a_{n+2} - 3a_{n+1} + 2a_n = 0, n \geq 0$, and $a_0 = 1$ and $a_1 = 5$. Hence solve it.	8 Marks	L4	CO4

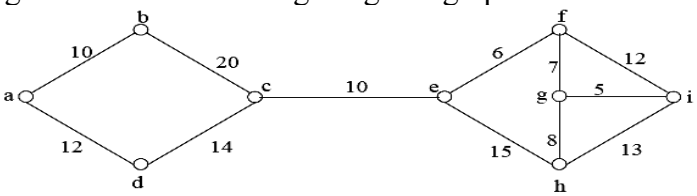
MODULE-V

10.	a)	Show that the number of edges in a complete graph of order n is $\frac{n(n-1)}{2}$.	8 Marks	L2	CO5
	b)	Find DFS and BFS Spanning Trees for the graph shown below.	8 Marks	L4	CO5



(OR)

11.	a)	Explain Kruskal's algorithm and using the same obtain the minimal spanning tree for the following weighted graph.	8 Marks	L4	CO5



	b)	Explain Isomorphism of two graphs? Check whether the given graphs G1 and G2 are isomorphic or not? Give reasons.	8 Marks	L4	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

DATA ANALYTICS

[Computer Science and Engineering (Artificial Intelligence and Data Science)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What are the different types of Data Analytics?	2 Marks	L1	CO1
	b)	Define Data Analytics and its real-world applications.	2 Marks	L1	CO1
	c)	Why is data cleaning important in analytics?	2 Marks	L1	CO3
	d)	Differentiate between classification and clustering.	2 Marks	L4	CO3
	e)	Explain the significance of ARIMA in Time Series Forecasting.	2 Marks	L2	CO4
	f)	What is tokenization in text processing?	2 Marks	L1	CO4
	g)	Why are final deliverables critical in analytics projects?	2 Marks	L1	CO5
	h)	List two common mistakes in data visualization.	2 Marks	L1	CO5
	i)	What is feature extraction in text mining?	2 Marks	L1	CO6
	j)	Define modularity in social network analysis.	2 Marks	L1	CO6

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the role of descriptive analytics in decision-making.	8 Marks	L2	CO1
	b)	Compare and contrast Business Intelligence (BI) with Data Science.	8 Marks	L4	CO1

(OR)

3.	a)	How are data frames used in R for data manipulation? Provide examples.	8 Marks	L4	CO2
	b)	Explain the importance of descriptive statistics in R.	8 Marks	L2	CO2

MODULE-II

4.	a)	Explain different types of data distributions used in analytics.	8 Marks	L2	CO3
	b)	Explain the difference between Type I and Type II errors in hypothesis testing.	8 Marks	L2	CO3

(OR)

5.	a)	Describe the Friedman test and its applications.	8 Marks	L2	CO3
	b)	Describe the process of implementing decision trees in R with an example.	8 Marks	L2	CO3

MODULE-III

6.	a)	Discuss the significance of seasonality in time series analysis.	8 Marks	L2	CO4
	b)	Describe the components and evaluation of an ARIMA model.	8 Marks	L2	CO4

(OR)

7.	a)	Explain Named Entity Recognition (NER) in text analytics.	8 Marks	L2	CO4
	b)	Discuss the role of TF-IDF in text classification.	8 Marks	L2	CO4

MODULE-IV

8.	a)	What are the essential components of a final analytics report?	8 Marks	L1	CO5
	b)	Discuss different visualization techniques used in analytics projects.	8 Marks	L3	CO5
		(OR)			
9.	a)	How can data storytelling enhance data presentations?	8 Marks	L4	CO5
	b)	Discuss the best practices for preparing a data-driven final presentation.	8 Marks	L2	CO5

MODULE-V

10.	a)	Explain how web mining is used in sentiment analysis.	8 Marks	L2	CO6
	b)	What are the different techniques used in recommender systems?	8 Marks	L2	CO6
		(OR)			
11.	a)	How is social network analysis applied in political research?	8 Marks	L4	CO6
	b)	Discuss the key properties of social networks and their significance.	8 Marks	L2	CO6

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

DATA MINING

[Computer Science and Engineering (Artificial Intelligence and Data Science)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List the basic data types used in data mining.	2 Marks	L1	CO1
	b)	What is the streaming scenario in data mining?	2 Marks	L2	CO1
	c)	What is the difference between Frequent Itemset Mining and Association Rule Mining?	2 Marks	L2	CO2
	d)	What is the significance of the Apriori algorithm in association rule mining?	2 Marks	L2	CO2
	e)	What is the main limitation of the k-Means algorithm?	2 Marks	L1	CO3
	f)	How does k-Means determine the number of clusters?	2 Marks	L2	CO3
	g)	What is a probabilistic classifier? Give an example.	2 Marks	L1	CO3
	h)	Define Bayes' Theorem in the context of classification.	2 Marks	L2	CO3
	i)	List two probabilistic models used for outlier detection.	2 Marks	L1	CO4
	j)	How does clustering help in outlier detection?	2 Marks	L2	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	What is the streaming scenario in data mining? How does it differ from traditional data mining?	8 Marks	L2	CO1
	b)	Compare and contrast different data mining techniques used in real-world applications.	8 Marks	L4	CO1

(OR)

3.	a)	Explain the role of data warehouses in data mining.	8 Marks	L4	CO1
	b)	What are the major challenges in data mining?	8 Marks	L2	CO1

MODULE-II

4.	a)	Discuss the Association Rule Generation Framework and its importance in data mining.	8 Marks	L4	CO2
	b)	Explain the working of the FP-Growth algorithm with an example	8 Marks	L3	CO2

(OR)

5.	a)	Compare and contrast the Apriori algorithm and the FP-Growth algorithm.	8 Marks	L4	CO2
	b)	Describe the Eclat algorithm and how it differs from other frequent pattern mining methods.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the working of the k-Means algorithm with an example.	8 Marks	L2	CO3
	b)	What are the main drawbacks of the k-Means algorithm? How can they be addressed?	8 Marks	L4	CO3

(OR)

7.	a)	Compare k-Means with k-Medoids clustering. Which one is more robust and why?	8 Marks	L4	CO3
	b)	Explain the Agglomerative Hierarchical Clustering process with a suitable example.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Describe Naïve Bayes classification with an example.	8 Marks	L2	CO3
	b)	Compare and contrast Naïve Bayes and Decision Trees.	8 Marks	L4	CO3

(OR)

9.	a)	What are Support Vector Machines? Explain their working with an example.	8 Marks	L2	CO3
	b)	Discuss different types of kernels used in SVMs.	8 Marks	L2	CO3

MODULE-V

10.	a)	Describe the Distance-Based Outlier Detection method with its advantages and disadvantages.	8 Marks	L2	CO4
	b)	Explain Density-Based Outlier Detection methods with a relevant algorithm.	8 Marks	L2	CO4

(OR)

11.	a)	What are Information-Theoretic Models, and how are they used in outlier analysis?	8 Marks	L2	CO4
	b)	Explain the concept of Outlier Validity and its significance.	8 Marks	L2	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

BIG DATA FRAMEWORKS

[Computer Science and Engineering (Artificial Intelligence and Data Science)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is the purpose of Hadoop?	2 Marks	L1	CO1
	b)	What are the benefits of distributed storage in Hadoop?	2 Marks	L2	CO1
	c)	Define Hadoop cluster?	2 Marks	L1	CO2
	d)	Write the basic steps to set up a Hadoop cluster?	2 Marks	L2	CO2
	e)	Define Spark and how does it relate to Hadoop?	2 Marks	L2	CO3
	f)	What are the components of a Spark job?	2 Marks	L1	CO3
	g)	What is serialization in Spark and why is it important?	2 Marks	L1	CO4
	h)	How does Spark minimize shuffling?	2 Marks	L1	CO4
	i)	What is the role of the Spark Master in job execution?	2 Marks	L1	CO5
	j)	How does Spark handle node failures during job execution?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	How does HDFS handle data replication and what is the significance of the replication factor?	8 Marks	L1	CO1
	b)	Describe the process of data read and write operations in Hadoop Distributed File System.	8 Marks	L2	CO1

(OR)

3.	a)	What is the purpose of the distcp command in Hadoop and when is it used?	8 Marks	L1	CO1
	b)	Explain the key classes and methods provided by the Hadoop Java API for working with HDFS?	8 Marks	L2	CO1

MODULE-II

4.	a)	How do you submit a Map Reduce job to a Hadoop cluster using the command line?	8 Marks	L3	CO2
	b)	Describe the steps involved in setting up a development environment for Map Reduce.	8 Marks	L4	CO2

(OR)

5.	a)	Discuss the security mechanisms available in Hadoop to protect data.	8 Marks	L2	CO2
	b)	Explain how you would configure a Hadoop cluster for high availability?	8 Marks	L2	CO2

MODULE-III

6.	a)	Write short notes on Workers and Executors?	8 Marks	L2	CO3
	b)	How does Spark address the limitations of Hadoop's Map Reduce framework?	8 Marks	L3	CO3

(OR)

7.	a)	Explain the key components of YARN and their functions within a Spark application.	8 Marks	L2	CO3
	b)	What is Apache Mesos and how does it function as a cluster manager for Spark?	8 Marks	L1	CO3

MODULE-IV

8.	a)	What are the key stages in Spark's execution model and how are they determined?	8 Marks	L2	CO4
	b)	What is partitioning in Spark and why is it important for parallel data processing?	8 Marks	L2	CO4

(OR)

9.	a)	Explain the difference between broadcast variables and accumulators in Spark.	8 Marks	L4	CO4
	b)	Discuss the default serialization frameworks used in Spark?	8 Marks	L2	CO4

MODULE-V

10.	a)	What are the main components involved in the life cycle of a Spark job?	8 Marks	L2	CO5
	b)	Discuss the various scheduling modes available in Spark?	8 Marks	L2	CO5

(OR)

11.	a)	Explain the testing strategies used to ensure the reliability and fault tolerance of Spark applications?	8 Marks	L3	CO5
	b)	What role does check pointing play in fault tolerance for Spark Streaming applications?	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

CLOUD PRACTITIONER

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What are the key components of AWS Cloud Infrastructure?	2 Marks	L1	CO1
	b)	Explain the difference between AWS EC2 and AWS Lambda.	2 Marks	L2	CO1
	c)	What is the role of VPC in AWS?	2 Marks	L2	CO2
	d)	What is an AWS Availability Zone?	2 Marks	L1	CO2
	e)	Define the concept of Auto Scaling in AWS.	2 Marks	L1	CO3
	f)	What is Amazon RDS, and what is its purpose?	2 Marks	L1	CO3
	g)	What is the difference between S3 storage classes?	2 Marks	L2	CO5
	h)	Explain the concept of IAM (Identity and Access Management) in AWS.	2 Marks	L1	CO5
	i)	What are the benefits of using AWS Cloud Watch?	2 Marks	L2	CO4
	j)	Describe the purpose of AWS Cloud Formation.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the AWS Shared Responsibility Model with examples.	8 Marks	L4	CO1
	b)	Discuss the significance of AWS global infrastructure in delivering highly available services.	8 Marks	L4	CO1

(OR)

3.	a)	Discuss the benefits of using a Virtual Private Cloud (VPC) in AWS.	8 Marks	L4	CO4
	b)	Explain how regions and Availability Zones contribute to high availability in AWS	8 Marks	L2	CO1

MODULE-II

4.	a)	What is AWS Elastic Load Balancing, and how does it help in scaling applications?	8 Marks	L5	CO3
	b)	Describe the concept of EC2 pricing models, including On-demand, Reserved, and Spot instances?	8 Marks	L4	CO3

(OR)

5.	a)	Explain the concept of serverless computing and how AWS Lambda works.	8 Marks	L4	CO2
	b)	How does Amazon S3 handle data security and encryption?	8 Marks	L4	CO2

MODULE-III

6.	a)	Explain the purpose and working of Amazon EC2 instances.	8 Marks	L4	CO3
	b)	Discuss the role of Auto Scaling and Elastic Load Balancing in scaling applications automatically.	8 Marks	L5	CO5

(OR)

7.	a)	Describe how AWS S3 works with respect to data storage and retrieval.	8 Marks	L4	CO2
	b)	How does AWS handle data backup and recovery with services like Amazon RDS and S3?	8 Marks	L5	CO2

MODULE-IV

8.	a)	Discuss the importance of monitoring and logging in AWS using AWS Cloud Watch.	8 Marks	L5	CO3
	b)	Explain the concept of Infrastructure as Code (IaC) with AWS Cloud Formation and its benefits	8 Marks	L5	CO4

(OR)

9.	a)	Describe the different storage options available in AWS and how to choose the right one for an application.	8 Marks	L5	CO3
	b)	How does AWS ensure high availability and disaster recovery using services like Amazon RDS and S3?	8 Marks	L5	CO4

MODULE-V

10.	a)	Discuss the security features in AWS and how AWS IAM ensures secure access control?	8 Marks	L5	CO2
	b)	Analyze the role of AWS Cloud Front in improving the performance of web applications.	8 Marks	L5	CO5

(OR)

11.	a)	Describe the importance of cost optimization strategies in AWS and how AWS Cost Explorer helps in managing costs.	8 Marks	L4	CO5
	b)	How does AWS handle data migration using services like AWS Snowball and AWS Database Migration Service?	8 Marks	L5	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

DEEP LEARNING

[Computer Science and Engineering,
Computer Science and Engineering (Artificial Intelligence and Data Science)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is Deep Learning?	2 Marks	L1	CO1
	b)	What are the components of auto encoder?	2 Marks	L1	CO1
	c)	What is a Restricted Boltzmann Machine (RBM)?	2 Marks	L1	CO2
	d)	What is the goal of training an RBM?	2 Marks	L1	CO2
	e)	List out the types of RNN	2 Marks	L2	CO3
	f)	How does LSTM differ from standard RNN?	2 Marks	L4	CO3
	g)	What is max pooling?	2 Marks	L1	CO4
	h)	Why do we use RELU?	2 Marks	L2	CO4
	i)	Name any two applications of convolutional autoencoders.	2 Marks	L3	CO5
	j)	How does the generator in a GAN differ from the discriminator?	2 Marks	L4	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.		Explain the softmax function for the multi-class classification and regression with example.	16 Marks	L2	CO1

(OR)

3.	a)	Compare and contrast the performance of shallow and deep neural networks for complex tasks	8 Marks	L4	CO1
	b)	What are the benefits and challenges associated with deep neural networks in handling complex tasks?	8 Marks	L2	CO1

MODULE-II

4.	a)	Differentiate between Global Learning Rate and Parameter-Specific Learning Rate	8 Marks	L4	CO2
	b)	What is Gradient Clipping? Explain its types.	8 Marks	L2	CO2

(OR)

5.	a)	Analyze the working procedure of computational graphs.	8 Marks	L4	CO2
	b)	Discuss Restricted Boltzmann machine with an example	8 Marks	L2	CO2

MODULE-III

6.	a)	Analyze the similarities and differences in GRU and LSTM architecture and performance on sequence learning tasks	8 Marks	L4	CO3
	b)	How do these components interact to manage long-term dependencies in sequence data?	8 Marks	L2	CO3

(OR)

7.	a)	Compare Gated Recurrent Units (GRUs) with Long Short-Term Memory (LSTM) networks	8 Marks	L4	CO3
	b)	Explain how recurrent neural networks can be used for end-to-end speech recognition	8 Marks	L5	CO3

MODULE-IV

8.	a)	Explain the process of training a Convolutional Neural Network	8 Marks	L2	CO4
	b)	Explain the architecture of ResNet with a neat diagram	8 Marks	L2	CO4

(OR)

9.	a)	Discuss about sequence-to-sequence learning and machine translation.	8 Marks	L2	CO4
	b)	Discuss how VGG and GoogleNet architectures introduced innovations to improve deep learning models.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain the architecture of a convolutional autoencoder	8 Marks	L2	CO5
	b)	How does convolutional autoencoder encode and reconstruct input data	8 Marks	L2	CO5

(OR)

11.	a)	Explain any two deep learning architectures for object detection.	8 Marks	L2	CO5
	b)	Assess the role of attention mechanisms in modern AI architectures	8 Marks	L3	CO6

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

COMPUTER VISION

[Computer Science and Engineering,
Computer Science and Engineering (Artificial Intelligence and Data Science)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What are the basic plot marker formatting commands for plotting with PyLab	2 Marks	L4	CO1
	b)	Define Harris Corner Detector and its primary use	2 Marks	L1	CO1
	c)	What is Augmented Reality	2 Marks	L2	CO2
	d)	What is camera calibration	2 Marks	L3	CO2
	e)	State the role of augmented reality in camera models	2 Marks	L2	CO3
	f)	How does classification aid image content analysis	2 Marks	L1	CO3
	g)	Write Hierarchical Clustering	2 Marks	L2	CO4
	h)	Define Optical Flow in tracking.	2 Marks	L2	CO4
	i)	What is the Microsoft Research Grab Cut dataset	2 Marks	L3	CO5
	j)	Python code for graph to compute the max flow / min cut of a small graph	2 Marks	L4	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe homography estimation using RANSAC; apply to warp two images and create a panorama	8 Marks	L2	C01
	b)	Explain the process of matching geotagged images. Describe how local feature descriptors and spatial information are used to establish correspondences.	8 Marks	L2	C01

(OR)

3.	a)	Explain SIFT feature extraction process; analyze its scale-invariance for matching geotagged images with an example.	8 Marks	L2	C01
	b)	Compare Harris Corner Detector and SIFT descriptors. Analyze their performance with respect to robustness, invariance, and computational complexity.	8 Marks	L3	C01

MODULE-II

4.	a)	Analyze the process of computing 3D structure from multiple camera views. Discuss triangulation and its dependence on camera geometry.	8 Marks	L4	C02
	b)	Describe the concept of camera calibration. Explain intrinsic and extrinsic parameters and discuss why calibration is essential in computer vision applications.	8 Marks	L3	C02

(OR)

5.	a)	Compare pinhole model limitations with real lenses and evaluate in	8 Marks	L2	C02

		augmented reality apps.			
	b)	Apply camera calibration to compute disparity maps from stereo pairs; explain epipolar geometry role.	8 Marks	L4	C02
		MODULE-III			
6.	a)	Explain the Bag of Visual Words (BoVW) model for image searching. Discuss how visual vocabularies are created and how images are represented using visual words.	8 Marks	L2	C03
	b)	Explain image indexing with visual words; rank results using geometry and apply to search engine.	8 Marks	L2	C03
		(OR)			
7.	a)	Explain the concept of image clustering and discuss why unsupervised learning techniques are preferred for clustering large image datasets. Illustrate with suitable examples.	8 Marks	L2	C03
	b)	Compare spectral vs. hierarchical clustering for image organization; evaluate on scalability.	8 Marks	L3	C03
		MODULE-IV			
8.	a)	Explain the complete image classification pipeline, highlighting the role of feature extraction and classifier selection with suitable examples.	8 Marks	L2	C04
	b)	Evaluate the effectiveness of Support Vector Machines over Bayes classifiers in real-world image classification applications. Justify your answer with appropriate reasoning.	8 Marks	L4	C04
		(OR)			
9.	a)	Given a set of image feature vectors, demonstrate how a Bayes classifier assigns a class label. Clearly explain prior probability, likelihood, and posterior probability.	8 Marks	L4	C04
	b)	Analyze SVM vs. KNN limitations and apply to real-world OCR problem.	8 Marks	L3	C04
		MODULE-V			
10.	a)	Analyze the role of Graph Cut–based methods in image segmentation. Explain the graph construction, energy minimization process, and discuss its advantages and limitations in real-world image segmentation applications.	8 Marks	L3	C05
	b)	Evaluate the effectiveness of Vision Transformers (ViT) compared to Convolutional Neural Networks (CNNs) in image analysis.	8 Marks	L4	C05
		(OR)			
11.	a)	Explain the Lucas–Kanade optical flow algorithm for object tracking. Describe the underlying assumptions, mathematical formulation, and demonstrate how it is applied for tracking objects in video sequences.	8 Marks	L2	C05
	b)	Design a video-based human action recognition system using deep learning techniques and illustrate the architecture using either Temporal CNNs or 3D Convolutional Networks and explain the workflow from video input to action classification.	8 Marks	L5	C05

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

ETHICAL HACKING

[Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define ethical hacking and its primary purpose.	2 Marks	L1	CO1
	b)	What is vulnerability analysis, and why is it important?	2 Marks	L1	CO1
	c)	Give an example of an imposed limitation in penetration testing.	2 Marks	L1	CO1
	d)	Why is selecting the right security consultant important?	2 Marks	L2	CO1
	e)	List two common techniques used in social engineering.	2 Marks	L1	CO1
	f)	What is the role of physical security in penetration testing?	2 Marks	L1	CO1
	g)	Define enumeration in the context of penetration testing.	2 Marks	L2	CO4
	h)	What are password crackers, and how are they used in penetration testing?	2 Marks	L2	CO4
	i)	How does aligning findings with business objectives benefit an organization?	2 Marks	L2	CO2
	j)	What is the role of incident management in penetration testing?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe the steps involved in planning a penetration test, highlighting its importance in ethical hacking.	8 Marks	L2	CO3
	b)	Explain the types of Hackers in detail by discussing relevant Case Studies.	8 Marks	L3	CO1

(OR)

3.	a)	Outline the process of an information security program and its relevance to ethical hacking.	8 Marks	L2	CO1
	b)	Differences between Ethical Hacker and Malicious Hacker.	8 Marks	L2	CO1

MODULE-II

4.	a)	Why is timing crucial in executing penetration tests, and how does it impact the test's effectiveness?	8 Marks	L2	CO2
	b)	Describe a multi-phased attack strategy and its advantages in bypassing security measures.	8 Marks	L3	CO4

(OR)

5.	a)	Explain the significance of identifying attack types and source points in penetration testing.	8 Marks	L2	CO2
	b)	What is an engagement planner, and how does it facilitate a successful penetration test?	8 Marks	L2	CO3

MODULE-III

6.	a)	How does proper documentation help in managing an ethical hacking engagement?	8 Marks	L2	CO6
	b)	What is social engineering, and why is it an effective method for gaining unauthorized access?	8 Marks	L2	CO1

(OR)

7.	a)	Discuss the different types of social engineering attacks and their impact on an organization.	8 Marks	L2	CO1
	b)	What is the role of reconnaissance in the ethical hacking framework, and how does it contribute to the overall process?	8 Marks	L2	CO3

MODULE-IV

8.	a)	What are password crackers, and how are they utilized during ethical hacking?	8 Marks	L2	CO4
	b)	What is evasion in ethical hacking, and how does it help bypass security measures?	8 Marks	L2	CO4

(OR)

9.	a)	How do threads and groups play a role in managing large-scale penetration testing tasks?	8 Marks	L2	CO4
	b)	Explain the risks associated with wardialing and how organizations can defend against it.	8 Marks	L2	CO4

MODULE-V

10.	a)	What is the purpose of a deliverable in the context of ethical hacking, and why is it important?	8 Marks	L2	CO5
	b)	How should findings from a penetration test influence updates to an organization's security policy?	8 Marks	L3	CO5

(OR)

11.	a)	What changes to security policies might be recommended based on penetration test results?	8 Marks	L3	CO5
	b)	Discuss the challenges of creating a penetration testing document that is accessible to both technical and non-technical stakeholders.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

COMPUTER SYSTEM SECURITY

[Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What are the three main goals of computer security?	2 Marks	L1	CO1
	b)	What is the difference between administrative security and technical security?	2 Marks	L2	CO1
	c)	What is the purpose of a reference monitor in system security?	2 Marks	L2	CO2
	d)	Define trustworthy computing in the context of security.	2 Marks	L4	CO2
	e)	Mention two key aspects of modern storage security.	2 Marks	L2	CO3
	f)	What is risk remediation in storage security?	2 Marks	L1	CO3
	g)	What is the role of the Data-Link Layer in wireless security?	2 Marks	L1	CO4
	h)	Mention one common security feature of the Data-Link Layer in wireless networks.	2 Marks	L2	CO4
	i)	What is spam, and why is it a security concern?	2 Marks	L1	CO5
	j)	Name two common spam control techniques	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	What is administrative security? Discuss its importance in an organization.	8 Marks	L2	CO1
	b)	Explain the role of security policies in maintaining administrative security.	8 Marks	L4	CO1

(OR)

3.	a)	Discuss various authentication mechanisms used in administrative security	8 Marks	L1	CO1
	b)	Explain access control models and their significance in securing systems.	8 Marks	L4	CO1

MODULE-II

4.	a)	Discuss the various International Standards for Operating System Security and their implementation.	8 Marks	L2	CO2
	b)	How can a Unix System be secured? Explain various security measures.	8 Marks	L4	CO2

(OR)

5.	a)	Discuss the importance of placing servers into network zones for better security.	8 Marks	L1	CO2
	b)	Explain different Authentication Processes in Unix security.	8 Marks	L4	CO2

MODULE-III

6.	a)	Explain how encryption is used to enhance storage security.	8 Marks	L2	CO3
	b)	Compare on-premise storage security with cloud storage security	8 Marks	L5	CO3
		(OR)			
7.	a)	What role does access control play in ensuring storage security?	8 Marks	L5	CO3
	b)	Discuss the importance of data redundancy and backup in storage security.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain the security features implemented at the Data-Link Layer in wireless networks.	8 Marks	L2	CO4
	b)	Discuss common flaws and threats in Data-Link Layer security and how they can be exploited.	8 Marks	L2	CO4
		(OR)			
9.	a)	Compare WEP, WPA, and WPA2 security protocols, highlighting their strengths and weaknesses	8 Marks	L4	CO4
	b)	Explain the vulnerabilities of MAC address filtering and how attackers can bypass it.	8 Marks	L1	CO4

MODULE-V

10.	a)	What is spam, and what techniques are used for spam control?	8 Marks	L2	CO5
	b)	How does email encryption (PGP, S/MIME) enhance security, and what are its challenges?	8 Marks	L4	CO5
		(OR)			
11.	a)	Discuss the common types of attacks on web servers, such as DDoS, SQL Injection, and Cross-Site Scripting (XSS)?	8 Marks	L5	CO5
	b)	Explain the best web server security practices for preventing unauthorized access.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

NETWORK FORENSICS

[Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Identify two common sources of network-based evidence used in forensic investigations.	2 Marks	L1	CO1
	b)	How do switches and routers contribute to the collection of network forensic evidence?	2 Marks	L1	CO1
	c)	What is the primary function of the Berkeley Packet Filter (BPF) language in network analysis?	2 Marks	L1	CO2
	d)	Differentiate between tcp dump and Wire shark in terms of their user interface and functionality.	2 Marks	L1	CO2
	e)	Which IEEE standard governs Wi-Fi communication at Layer 2?	2 Marks	L1	CO3
	f)	Define network forensics and explain its primary objective in digital investigations.	2 Marks	L1	CO1
	g)	List two challenges faced during the collection and preservation of network evidence.	2 Marks	L1	CO1
	h)	What is the purpose of physical interception in evidence acquisition, and name one method used for it?	2 Marks	L1	CO2
	i)	Write a short note on the role of libpcap in network traffic acquisition and mention one platform where it is commonly used.	2 Marks	L1	CO2
	j)	What is the primary goal of wireless network forensics?	2 Marks	L1	CO3

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe the role of DHCP servers in a network forensic investigation. What evidence can be obtained from these servers?	8 Marks	L1	CO1
	b)	Explain how name servers and authentication servers contribute to the process of gathering network evidence. Include examples of typical data they might provide.	8 Marks	L2	CO1

(OR)

3.	a)	Evaluate the role of Network Intrusion Detection/Prevention Systems (NIDS/NIPS) in network forensics. What types of evidence do they generate, and why is it significant?	8 Marks	L1	CO1
	b)	Discuss how firewalls can serve as a source of forensic evidence. What specific data should investigators look for during analysis?	8 Marks	L2	CO1

MODULE-II

4.	a)	Define and differentiate between protocol analysis, packet analysis, flow analysis, and higher-layer traffic analysis.	8 Marks	L2	CO2
	b)	Discuss the challenges associated with traffic analysis in network forensic investigations.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the role of sensors in statistical flow analysis. How are they classified based on functionality?	8 Marks	L3	CO2
	b)	Describe different sensor software used in flow analysis and discuss their importance in network forensics.	8 Marks	L2	CO2

MODULE-III

6.	a)	Discuss the forensic implications of MAC address spoofing in wireless networks.	8 Marks	L2	CO3
	b)	Explain the role of Network Intrusion Detection Systems (NIDS) and Network Intrusion Prevention Systems (NIPS) in cybersecurity.	8 Marks	L2	CO3

(OR)

7.	a)	Describe the functionalities of NIDS/NIPS and how they contribute to network security.	8 Marks	L1	CO3
	b)	Explain the different modes of detection used in NIDS/NIPS and their significance in forensic investigations.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Differentiate between the various types of network switches and their forensic significance.	8 Marks	L2	CO4
	b)	Explain the different types of forensic evidence that can be extracted from switches.	8 Marks	L1	CO4

(OR)

9.	a)	How do automatic self-updates in malware enhance its persistence and effectiveness?	8 Marks	L2	CO4
	b)	Define metamorphic network behavior and explain how malware blends its network activity to evade detection.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain the concept of Advanced Persistent Threats (APTs) and their impact on cybersecurity.	8 Marks	L2	CO5
	b)	Describe the methods used by malware for network propagation and spreading across systems.	8 Marks	L3	CO5

(OR)

11.	a)	Explain command-and-control (C2) communications in malware operations and their significance in cyber attacks.	8 Marks	L1	CO5
	b)	What are the key characteristics of payload behavior in malware, and how does it affect system security?	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

NETWORK ANOMALY DETECTION SYSTEM

[Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define a network anomaly?	2 Marks	L1	CO1
	b)	What are the different types of intruders in a network?	2 Marks	L2	CO1
	c)	List two advantages of feature selection in machine learning models.	2 Marks	L2	CO2
	d)	Mention two common applications of feature selection in real-world scenarios.	2 Marks	L4	CO2
	e)	How does supervised learning contribute to anomaly detection?	2 Marks	L2	CO3
	f)	Differentiate between supervised learning and unsupervised learning in anomaly detection.	2 Marks	L1	CO3
	g)	Explain the concept of completeness in system evaluation	2 Marks	L1	CO4
	h)	How does timeliness affect the evaluation of a cybersecurity system	2 Marks	L2	CO4
	i)	List the key steps involved in launching a cyberattack.	2 Marks	L1	CO6
	j)	What is the significance of reconnaissance in the attack-launching process?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Define network attacks taxonomy and explain its various categories.	8 Marks	L2	CO1
	b)	Describe how network vulnerabilities can be exploited by attackers.	8 Marks	L4	CO1

(OR)

3.	a)	Illustrate the impact of security-related network anomalies on system performance.	8 Marks	L1	CO1
	b)	Compare and contrast different types of intruders with real-world examples	8 Marks	L4	CO1

MODULE-II

4.	a)	Summarize the findings of prior surveys on feature selection.	8 Marks	L2	CO2
	b)	Formulate the problem of feature selection in a machine learning context.	8 Marks	L4	CO2

(OR)

5.	a)	What are the major steps involved in feature selection? Describe each step in detail.	8 Marks	L1	CO2
	b)	Highlight the challenges faced during the feature selection process.	8 Marks	L4	CO2

MODULE-III

6.	a)	What are the key challenges in network anomaly detection?	8 Marks	L2	CO3
	b)	Discuss the role of data preprocessing in network anomaly detection.	8 Marks	L5	CO3

(OR)

7.	a)	How does anomaly detection differ in real-time systems versus static systems?	8 Marks	L5	CO3
	b)	Explain how supervised learning is used for network anomaly detection.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Define completeness in the context of cybersecurity systems and explain its significance.	8 Marks	L2	CO4
	b)	How can completeness be ensured in threat detection mechanisms? Provide practical examples.	8 Marks	L2	CO4

(OR)

9.	a)	Explain the importance of timeliness in detecting and mitigating cyber threats. Provide real-world examples.	8 Marks	L4	CO4
	b)	Discuss challenges in ensuring timeliness in real-time security systems and propose solutions.	8 Marks	L1	CO4

MODULE-V

10.	a)	Explain the process of launching a phishing attack and how it can be detected using cybersecurity systems.	8 Marks	L2	CO5
	b)	How do machine learning techniques assist in detecting attacks? Provide examples of their application.	8 Marks	L4	CO5

(OR)

11.	a)	What are the different categories of attack-related tools? Discuss with examples.	8 Marks	L5	CO6
	b)	Analyze the role of exploit kits in facilitating cyberattacks. Provide real-world examples.	8 Marks	L2	CO6

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

CONSTRUCTION AND CONTRACT LAWS AND REGULATIONS

[Construction Technology and Management]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define a contract according to the Indian Contract Act 1872.	2 Marks	L1	CO1
	b)	List the essential elements of a valid contract.	2 Marks	L1	CO1
	c)	Define tender.	2 Marks	L1	CO2
	d)	Define technical bid.	2 Marks	L1	CO2
	e)	Explain the meaning of arbitration proceedings.	2 Marks	L2	CO3
	f)	Define arbitral award.	2 Marks	L1	CO3
	g)	Define property law.	2 Marks	L1	CO4
	h)	Define Earnest Money Deposit (EMD).	2 Marks	L1	CO4
	i)	Define labour law.	2 Marks	L1	CO5
	j)	Explain workplace safety regulations.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the essential elements of a valid contract with examples.	8 Marks	L2	CO1
	b)	Analyze the provisions of the Indian Contract Act 1872 and their relevance to construction projects.	8 Marks	L4	CO1

(OR)

3.	a)	Analyze the role of contract documents in successful project management.	8 Marks	L4	CO1
	b)	Analyze legal responsibilities of contractors and clients.	8 Marks	L4	CO1

MODULE-II

4.	a)	Explain the tendering process in construction projects.	8 Marks	L2	CO2
	b)	Analyze the tendering process from invitation to contract award.	8 Marks	L4	CO2

(OR)

5.	a)	Analyze the effectiveness of the two-cover tender system.	8 Marks	L4	CO2
	b)	Explain evaluation of technical bids.	8 Marks	L2	CO2

MODULE-III

6.	a)	Analyze the arbitration process used in resolving construction disputes.	8 Marks	L4	CO3
	b)	Apply arbitration procedures to resolve construction disputes.	8 Marks	L3	CO3

(OR)

7.		Evaluate the effectiveness of arbitration in infrastructure projects.	16 Marks	L5	CO3

MODULE-IV

8.	a)	Analyze legal requirements for planning and approval of construction projects.	8 Marks	L4	CO4
	b)	Analyze statutory regulations governing construction projects.	8 Marks	L4	CO4
		(OR)			
9.		Evaluate property law issues affecting construction projects.	16 Marks	L5	CO4

MODULE-V

10.	a)	Explain labour welfare legislation in construction industry.	8 Marks	L2	CO5
	b)	Evaluate social security schemes for construction labourers.	8 Marks	L5	CO5
		(OR)			
11.		Evaluate industrial dispute resolution mechanisms.	16 Marks	L5	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

ENERGY EFFICIENCY AND CONSERVATION IN BUILDINGS

[Construction Technology and Management]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is energy conservation?	2 Marks	L1	CO1
	b)	What is an energy audit?	2 Marks	L1	CO1
	c)	What is a water wall in passive solar heating?	2 Marks	L1	CO2
	d)	What is stack ventilation?	2 Marks	L1	CO2
	e)	What is the purpose of radiant barriers in building construction?	2 Marks	L1	CO3
	f)	What are vacuum insulated panels (VIPs) and why are they considered highly efficient insulation materials?	2 Marks	L1	CO3
	g)	What is meant by peak demand in energy consumption?	2 Marks	L1	CO4
	h)	What is indoor air quality (IAQ) and why is it important in buildings?	2 Marks	L1	CO4
	i)	What is meant by longevity in building design**?**	2 Marks	L1	CO5
	j)	Define process assessment in energy management.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	Consider a solar power plant project: Installation cost: Rs.10 crore Annual energy generation: 4 million kWh Lifetime: 25 years Annual O&M cost: Rs.5 lakh. Unit Price of power: Rs 8 /- Solve for Total energy generation, Total operating cost, Levelized Cost of Energy (LCOE) and Payback period.	16 Marks	L3	CO1

(OR)

3.	Explain the concept of energy and its different forms with neat sketches and discuss their importance in modern society.	16 Marks	L3	CO1

MODULE-II

4.	a)	Explain the general principles of passive solar heating.	8 Marks	L2	CO2
	b)	Discuss how passive solar heating helps in reducing conventional energy consumption in buildings.	8 Marks	L2	CO2

(OR)

5.	Sketch and explain about heat recovery in large and high-rise buildings.	16 Marks	L3	CO2

MODULE-III

6.	Discuss the role of advanced insulation materials such as: i) Vacuum insulated panels (VIPs) ii) Spray foam insulators iii) Radiant barriers Also explain their working principles and applications.	16 Marks	L2	CO3
	(OR)			
7.	Explain how building materials, insulation, ventilation, and daylighting influence energy efficiency in buildings.	16 Marks	L2	CO3

MODULE-IV

8.	Discuss the importance of visual quality and acoustical quality in buildings. Explain the design strategies used to improve lighting conditions and reduce noise levels.	16 Marks	L2	CO4
	(OR)			
9.	A commercial building has the following electrical loads operating simultaneously during peak hours:Lighting load = 12 kW, HVAC load = 25 kW, Equipment load = 8 kW, Calculate the total peak demand of the building. If energy management strategies reduce peak demand by 20%, determine the new peak demand.	16 Marks	L3	CO4

MODULE-V

10.	Discuss how locally available materials, passive techniques, and climate responsiveness contribute to sustainability. Illustrate with suitable examples.	16 Marks	L4	CO5
	(OR)			
11.	What are smart buildings? Discuss the role of automation, IoT, and sensors in improving energy efficiency and occupant comfort in smart buildings.	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

CONSTRUCTION PRACTICES, EQUIPMENT AND AUTOMATION

[Construction Technology and Management]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define modern construction practices.	2 Marks	L1	CO1
	b)	What are the advantages of articulated structures?	2 Marks	L1	CO1
	c)	Mention the advantages of concrete roads over bituminous roads?	2 Marks	L1	CO2
	d)	What is the purpose of a cofferdam in construction?	2 Marks	L1	CO2
	e)	Define depreciation analysis.	2 Marks	L1	CO3
	f)	List out various finishing equipment.	2 Marks	L1	CO3
	g)	List out the methods of size reduction of aggregates?	2 Marks	L1	CO4
	h)	What are different types of pumping equipments	2 Marks	L1	CO4
	i)	What is building automation system	2 Marks	L1	CO5
	j)	List out the challenges in construction robotics	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Compare traditional construction practices with modern construction practices with suitable examples.	8 Marks	L2	CO1
	b)	Explain various tunnelling techniques used in underground construction.	8 Marks	L2	CO1

(OR)

3.	a)	Explain the construction methods of offshore platforms used in marine engineering.	8 Marks	L2	CO1
	b)	Discuss the advantages and applications of articulated structures in modern construction.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the construction process of cement concrete pavements.	8 Marks	L2	CO2
	b)	Explain the materials and equipment used in harbour construction.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the purpose and importance of cofferdams in construction.	8 Marks	L2	CO2
	b)	Explain the necessity of cable anchoring in civil engineering structures.	8 Marks	L2	CO2

MODULE-III

6.	a)	How will you ensure safety in equipment maintenance and management?	8 Marks	L2	CO3
	b)	A lathe machine is purchased for Rs. 84,000/- and the assumed life is 10 years and scrap value is Rs. 20,000/-. If the depreciation is charged by diminishing balance method, calculate the percentage by which, value of the lathe is reduced every year and depreciation fund after 2 years and also find out the cost of the lathe machine for each year.	8 Marks	L4	CO3

(OR)

7.	a)	What are basic earthwork operations? Suggest a multipurpose equipment to perform different earthwork operations	8 Marks	L4	CO3
	b)	What is dump truck? How will you calculate the number of dump trucks required for a project?	8 Marks	L4	CO3

MODULE-IV

8.	a)	How will you enhance the production capacity of: i) Jaw crushers. ii) Hammer mills. iii) Screening plants. iv) Crushing plants	8 Marks	L4	CO4
	b)	Write the uses of Ready Mix Concrete (RMC)	8 Marks	L2	CO4

(OR)

9.	a)	Explain the method of tunnelling by “drill and blast”.	8 Marks	L2	CO4
	b)	Define the process of grouting. Explain the different types of grouting and their applications.	8 Marks	L2	CO4

MODULE-V

10.	a)	How do building automation system work? Explain with neat sketch.	8 Marks	L2	CO5
	b)	What is BIM? Explain which professionals and which areas can BIM is useful.	8 Marks	L2	CO5

(OR)

11.	a)	What steps would you like to choose a drone for surveying the land in construction project?	8 Marks	L4	CO5
	b)	Discuss the use of robots in pre-fabrication works for housing projects.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

URBAN PLANNING AND DESIGN

[Construction Technology and Management]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define urban planning.	2 Marks	L1	CO1
	b)	What is sustainable development?	2 Marks	L1	CO1
	c)	Define planning theory.	2 Marks	L1	CO2
	d)	What is zoning?	2 Marks	L1	CO2
	e)	Define infrastructure.	2 Marks	L1	CO3
	f)	What is smart city concept?	2 Marks	L2	CO3
	g)	Define urban form	2 Marks	L1	CO4
	h)	What is land use planning?	2 Marks	L1	CO4
	i)	Define urban design.	2 Marks	L1	CO5
	j)	What is public space?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the relationship between planning, economy and environment.	8 Marks	L2	CO1
	b)	Discuss the impact of urbanization on climate change.	8 Marks	L4	CO1
		(OR)			
3.	a)	Explain urbanization trends in India.	8 Marks	L2	CO1
	b)	Analyze sustainable urban development strategies.	8 Marks	L4	CO1

MODULE-II

4.	a)	Explain different planning theories.	8 Marks	L2	CO2
	b)	Discuss institutional frameworks in urban planning.	8 Marks	L4	CO2
		(OR)			
5.	a)	Explain master planning process.	8 Marks	L2	CO2
	b)	Analyze the role of governance in urban planning.	8 Marks	L4	CO2

MODULE-III

6.	a)	Explain transportation planning in urban areas.	8 Marks	L2	CO3
	b)	Discuss sustainable infrastructure systems.	8 Marks	L4	CO3
		(OR)			
7.	a)	Explain water supply systems in urban planning.	8 Marks	L2	CO3
	b)	Analyze solid waste management strategies.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Explain urban structure models.	8 Marks	L2	CO4
	b)	Discuss smart city infrastructure.	8 Marks	L4	CO4

(OR)

9.	a)	Explain land use planning techniques.	8 Marks	L2	CO4
	b)	Analyze urban growth patterns.	8 Marks	L4	CO4

MODULE-V

10.	a)	Explain principles of urban design.	8 Marks	L2	CO5
	b)	Discuss role of public spaces in cities.	8 Marks	L4	CO5

(OR)

11.	Design a sustainable urban neighborhood considering transport, land use and environmental aspects.	16 Marks	L6	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

ESTIMATION AND QUANTITY SURVEYING

[Construction Technology and Management]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List four items included in the estimate of plastering for a residential building.	2 Marks	L1	CO1
	b)	Define "abstract of estimate". Why is it prepared?	2 Marks	L2	CO1
	c)	State two differences between a tube well and open well estimates.	2 Marks	L1	CO2
	d)	Name two items included in sewer line estimation.	2 Marks	L1	CO2
	e)	What is "L-section" method in road earthwork estimation?	2 Marks	L1	CO3
	f)	Give two causes of cross-sectional variation in road earthwork.	2 Marks	L2	CO3
	g)	What is a "data statement" in specifications?	2 Marks	L1	CO4
	h)	State two items included in rate analysis for brickwork.	2 Marks	L1	CO4
	i)	What is "mortgage value" and how does it differ from market value?	2 Marks	L2	CO5
	j)	Define "escalation" in valuation context.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Prepare a detailed quantity estimate for roofing (pitched roof with tiles) for a small residential annex of plan area 30 m^2 — include battens, rafters and tile coverings.	8 Marks	L3	CO1
	b)	Give item-wise measurement notes for calculating painting (two coats) for internal walls of the annex.	8 Marks	L3	CO1

(OR)

3.	a)	For a residential building, compute quantities of plaster (internal 12 mm) and external cement pointing for exposed brickwork for given wall areas (assumed values). Show calculations.	8 Marks	L3	CO1
	b)	Explain how arches (semi-circular) brickwork quantities are calculated; show sample calculation for one arch of span 2.0 m and rise 0.5 m.	8 Marks	L4	CO1

MODULE-II

4.	a)	Estimate quantity and brief rate items for 100 m of 150 mm dia sewer line laid in trench: include excavation, bedding, pipe laying and backfill.	8 Marks	L3	CO2
	b)	Describe steps and compute quantities for a small retaining wall (dimensions given by examiner — assume 4 m length, 1.2 m height) in brick masonry.	8 Marks	L4	CO2

(OR)

5.	a)	Prepare an estimate for a small soak pit with dimensions 1.2 m×1.2 m×1.5 m: include excavation, brickwork, and filter material.	8 Marks	L3	CO2
	b)	Discuss estimation items for internal plumbing of a 2BHK flat — list major fixtures and piping quantities.	8 Marks	L2	CO2

MODULE-III

6.	a)	For a laterite hill road alignment 500 m long with sections given, compute earthwork using three-section method (assumed sectional data).	8 Marks	L4	CO3
	b)	Estimate pitching for a slope protection of 50 m length with 1:1 slope — compute stone pitching quantities.	8 Marks	L3	CO3

(OR)

7.	a)	Prepare quantities for a pipe culvert (diameter 1.2 m, length 6 m) placed under a farm track — include inlets and outlets.	8 Marks	L3	CO3
	b)	Outline measurement and estimating approach for R.C.C. T-beam bridge piers — list major quantities and assumptions.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Write a general specification for brick masonry in cement mortar for plinth and superstructure.	8 Marks	L4	CO4
	b)	Carry out a simple rate analysis for 1 m3 of 230 mm thick brickwork in cement mortar 1:6 — include material quantities and labour.	8 Marks	L5	CO4

(OR)

9.	a)	Prepare schedule of rates format for whitewashing and distempering for a residential building.	8 Marks	L3	CO4
	b)	Discuss how plant and machinery hiring charges are included in rate analysis for road construction.	8 Marks	L4	CO4

MODULE-V

10.	a)	A property yields annual net income Rs. 2,40,000. Determine its capitalized value at 6% and comment on effect of yield rate.	8 Marks	L3	CO5
	b)	Explain computation of standard rent under rental valuation and prepare a short worked example.	8 Marks	L4	CO5

(OR)

11.	a)	Explain "value engineering" and give two examples where value engineering reduces construction cost.	8 Marks	L2	CO5
	b)	For a building costing Rs. 30,00,000 new, compute depreciated value after 15 years using reducing balance method at 1.5% annual depreciation.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

MERN STACK DEVELOPMENT

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define the term MERN Stack.	2 Marks	L1	CO1
	b)	Mention the role of MongoDB in the MERN Stack	2 Marks	L1	CO1
	c)	Interpret the role of express.json() middleware	2 Marks	L2	CO2
	d)	Define what "Routing" refers to in the context of an ExpressJS application.	2 Marks	L1	CO2
	e)	Explain the difference between a Mongoose Static method and an Instance method.	2 Marks	L2	CO3
	f)	Name the function used to define a schema in Mongoose.	2 Marks	L1	CO3
	g)	List the two types of components that can be created in React.	2 Marks	L1	CO4
	h)	Mention the attribute used to uniquely identify elements in a rendered list.	2 Marks	L1	CO4
	i)	Identify the function used to create a Redux store.	2 Marks	L1	CO5
	j)	Write the three mandatory parameters typically found in a Redux Middleware function signature.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the steps required to connect a Node.js application to MongoDB using Mongoose.	8 Marks	L2	CO1
	b)	Apply the concept of "Middleware" in a Node.js environment to validate a user's age before allowing them to access a specific data route.	8 Marks	L3	CO1

(OR)

3.	a)	Describe the importance of the package.json file, explaining how it manages metadata, scripts, and project dependencies.	8 Marks	L2	CO1
	b)	Explain the security implications of the Node.js node_modules structure and propose a strategy for auditing and securing project dependencies.	8 Marks	L4	CO1

MODULE-II

4.	a)	Explain the complete lifecycle of an HTTP request as it passes through a series of middleware functions in ExpressJS.	8 Marks	L2	CO2
	b)	Describe the mechanism of "configurable middleware" and how using a wrapper function allows developers to pass custom options to the middleware.	8 Marks	L3	CO2

(OR)

5.	a)	Summarize how HTTP methods are handled in ExpressJS routing	8 Marks	L2	CO2

	b)	Differentiate between application-level routing and router-level routing in ExpressJS	8 Marks	L4	CO2

MODULE-III

6.	a)	Apply ExpressJS route methods to implement Update and Delete operations for a user resource.	8 Marks	L3	CO3
	b)	Show how to integrate custom validators into a Mongoose schema for email and password fields	8 Marks	L3	CO3

(OR)

7.	a)	Summarize the lifecycle of a Mongoose document from the moment a save() is called until it is persisted in the database, including the role of internal validation.	8 Marks	L2	CO3
	b)	Apply Mongoose query methods like .populate() to retrieve a user's profile along with their associated "Post" documents in a single API response.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Describe the characteristics of stateful components in React.	8 Marks	L2	CO4
	b)	Construct an event handler to manage form input changes in a controlled component.	8 Marks	L3	CO4

(OR)

9.	a)	Summarize the role of "Error Boundaries" in a React application and explain why they cannot catch errors inside event handlers or asynchronous code.	8 Marks	L2	CO4
	b)	Analyze the trade-offs between using PropTypes for runtime type checking versus using a static type checker like TypeScript for a large-scale project.	8 Marks	L4	CO4

MODULE-V

10.	a)	Discuss the concept of "Immutability" in Redux and explain how it differs from traditional object mutation in standard JavaScript.	8 Marks	L2	CO5
	b)	Differentiate between "Store Enhancers" and "Middleware," evaluating which is more appropriate for adding persistence logic versus logging logic.	8 Marks	L4	CO5

(OR)

11.	a)	Describe the steps involved in creating a Redux store.	8 Marks	L2	CO5
	b)	How to Use Redux Thunk (or similar middleware) to handle asynchronous API calls.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING FOR EMBEDDED SYSTEMS

[VLSI & Embedded System Design]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List the main types of Machine Learning.	2 Marks	L1	CO1
	b)	What is supervised learning?	2 Marks	L1	CO1
	c)	What is a decision tree?	2 Marks	L1	CO2
	d)	Mention one advantage of random forests.	2 Marks	L1	CO2
	e)	What is a System on Chip (SoC)?	2 Marks	L1	CO3
	f)	What are memory constraints in embedded systems?	2 Marks	L1	CO3
	g)	What is quantization in machine learning?	2 Marks	L1	CO4
	h)	Why is model optimization required for embedded systems?	2 Marks	L2	CO4
	i)	Define predictive maintenance.	2 Marks	L1	CO5
	j)	What is IIoT?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the role of AI in embedded systems.	8 Marks	L2	CO1
	b)	Discuss real-world applications of AI-enabled embedded systems.	8 Marks	L3	CO1
		(OR)			
3.	a)	Explain the architecture of a typical embedded system.	8 Marks	L2	CO1
	b)	Discuss how embedded system architecture supports AI applications.	8 Marks	L3	CO1

MODULE-II

4.	a)	Describe the k-Nearest Neighbors (k-NN) algorithm.	8 Marks	L2	CO2
	b)	Discuss challenges of implementing k-NN on edge devices.	8 Marks	L4	CO2
		(OR)			
5.	a)	Explain k-means clustering algorithm.	8 Marks	L2	CO2
	b)	Discuss its applications in edge AI systems.	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain memory constraints in embedded systems	8 Marks	L3	CO3
	b)	Discuss power constraints in edge AI devices.	8 Marks	L3	CO3
		(OR)			
7.	a)	Explain the need for hardware accelerators	8 Marks	L2	CO3
	b)	Discuss NPU and GPU roles in embedded AI	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain pruning in machine learning models.	8 Marks	L2	CO4
	b)	Discuss quantization techniques and their impact.	8 Marks	L3	CO4
		(OR)			
9.	a)	Describe the process of converting models to Tensor Flow Lite.	8 Marks	L3	CO4
	b)	Discuss challenges in model conversion.	8 Marks	L4	CO4

MODULE-V

10.	a)	Explain autonomous drones using embedded AI.	8 Marks	L2	CO5
	b)	Discuss AI-based robotic systems.	8 Marks	L3	CO5
		(OR)			
11.	a)	Explain computer vision at the edge.	8 Marks	L2	CO5
	b)	Discuss advantages of edge-based vision systems.	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

TESTING AND TESTABILITY

[VLSI & Embedded System Design]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Recall structural modeling in digital system design.	2 Marks	L1	CO1
	b)	List the different levels of modeling used in digital circuit design.	2 Marks	L1	CO1
	c)	Define fault detection.	2 Marks	L1	CO2
	d)	Label redundancy in digital systems?	2 Marks	L1	CO2
	e)	List any two basic steps involved in ATG for combinational circuits.	2 Marks	L1	CO3
	f)	What is the major difference between ATG for combinational circuits and sequential circuits?	2 Marks	L1	CO3
	g)	Find the basic scan architecture used in sequential circuits.	2 Marks	L1	CO4
	h)	What are Board-Level DFT approaches? Mention any two techniques used at system level for testing.	2 Marks	L1	CO4
	i)	Recall any two of the following specific BIST architectures: CSBL, BEST, RTS, LOCST.	2 Marks	L1	CO4
	j)	What is the architecture of STUMPS (Self-Test Using MISR and Parallel SRSG)?	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Demonstrate inertial and transport delay models on a simple NOT gate and sketch the output waveform differences.	8 Marks	L2	CO1
	b)	Assess the importance of different modeling levels in digital system verification.	8 Marks	L5	CO1

(OR)

3.	a)	Construct a 2-bit comparator using structural modeling and explain the simulation procedure.	8 Marks	L3	CO1
	b)	Analyze detail about how output changes propagate in a simple AND-OR circuit using event-driven simulation.	8 Marks	L4	CO1

MODULE-II

4.	a)	Describe the stuck-at fault model with suitable examples.	8 Marks	L2	CO2
	b)	Examine the effectiveness of fault dominance in fault collapsing.	8 Marks	L4	CO2

(OR)

5.	a)	Evaluate fault sampling technique to estimate fault coverage.	8 Marks	L5	CO2
	b)	Interpret redundancy identification method in a given logic circuit.	8 Marks	L2	CO2

MODULE-III

6.	a)	Appraise the effectiveness of scan design in improving fault coverage.	8 Marks	L5	CO3
	b)	Assess the challenges in detecting feedback bridging faults.	8 Marks	L5	CO3
		(OR)			
7.	a)	Evaluate the effectiveness of scan design in improving fault coverage.	8 Marks	L3	CO3
	b)	Summarize the challenges in detecting feedback bridging faults.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Compare scan-based testing and BIST techniques in terms of area, speed, and coverage	8 Marks	L2	CO4
	b)	Apply STA concepts to identify hold violations in a sample circuit.	8 Marks	L3	CO4
		(OR)			
9.	a)	Design a basic scan chain architecture for a small digital block.	8 Marks	L5	CO4
	b)	Demonstrate the impact of poor observability on fault coverage in large SoC's.	8 Marks	L4	CO4

MODULE-V

10.	a)	Design a simple LBIST structure for a sequential circuit.	8 Marks	L5	CO4
	b)	Demonstrate how Scan BIST improves fault coverage in sequential circuits.	8 Marks	L2	CO4
		(OR)			
11.	a)	Summarize STUMPS and BILBO architectures in terms of hardware overhead and fault coverage.	8 Marks	L2	CO4
	b)	Analyze the advantages and limitations of pseudo-random test pattern generation	8 Marks	L4	CO4

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

NANO MATERIALS AND DEVICES

[VLSI & Embedded System Design]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define "Wave Mechanics" in the context of nano-scale particles.	2 Marks	L1	CO1
	b)	What is the significance of the Schrödinger wave equation?	2 Marks	L1	CO1
	c)	Distinguish between lattice-matched and pseudomorphic hetero structures.	2 Marks	L1	CO2
	d)	List the two primary types of carbon nano materials mentioned in the syllabus.	2 Marks	L1	CO2
	e)	Define "Nanolithography".	2 Marks	L1	CO2
	f)	What are "Clusters" in the context of nanostructures?	2 Marks	L1	CO2
	g)	Define "Density of States" (DOS).	2 Marks	L1	CO3
	h)	State the confinement dimensions for a Quantum Dot.	2 Marks	L1	CO3
	i)	What is a "Resonant Tunneling Diode" (RTD)?	2 Marks	L1	CO4
	j)	Define "Nano electromechanical Systems" (NEMS).	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the concept of wave-particle duality and its necessity at the nano scale.	8 Marks	L2	CO1
	b)	Analyze the transition from classical particles to wave mechanics of particles.	8 Marks	L4	CO1
3.	a)	Describe the behavior of electrons in atoms and the nature of atomic orbitals.	8 Marks	L2	CO1
	b)	Solve the Schrödinger wave equation for a particle in a one-dimensional potential well.	8 Marks	L3	CO1

MODULE-II

4.	a)	Discuss the electronic energy bands in semiconductors and their role in device physics.	8 Marks	L2	CO2
	b)	Compare and contrast the properties of Carbon nano tubes and fullerenes.	8 Marks	L4	CO2

(OR)

5.	a)	Explain the concept of semiconductor hetero structures and their bonding.	8 Marks	L2	CO2
	b)	Analyze the advantages of organic semiconductors in nano electronic applications.	8 Marks	L4	CO2

MODULE-III

6.	a)	Detail the methods of nanolithography and etching for nano device fabrication.	8 Marks	L2	CO2
	b)	Apply characterization techniques to determine the properties of nano crystals.	8 Marks	L3	CO2
		(OR)			
7.	a)	Discuss the growth methods for carbon nano tubes and their ordering.	8 Marks	L2	CO2
	b)	Analyze the fabrication process of Nano electromechanical system (NEMS) devices.	8 Marks	L4	CO2

MODULE-IV

8.	a)	Explain the statistics of electrons in solids and the importance of length scales.	8 Marks	L2	CO3
	b)	Derive the Density of States (DOS) for a 1D Quantum Wire.	8 Marks	L3	CO3
		(OR)			
9.	a)	Describe electron transport in Quantum wells and Quantum dots.	8 Marks	L2	CO3
	b)	Analyze how confinement affects the energy levels in semi conducting nanostructures.	8 Marks	L4	CO3

MODULE-V

10.	a)	Explain the operation of Field effect transistors and Potential effect transistors.	8 Marks	L2	CO4
	b)	Analyze the physics of Single electron transfer devices and the Coulomb blockade.	8 Marks	L4	CO5
		(OR)			
11.	a)	Discuss the working principle of Light emitting diodes and Nano lasers.	8 Marks	L2	CO5
	b)	Evaluate the architecture and logic potential of Quantum dot cellular automata (QCA).	8 Marks	L4	CO4

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

ADVANCED LOW POWER VLSI DESIGN

[VLSI & Embedded System Design]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define short-circuit power in CMOS circuits	2 Marks	L1	CO1
	b)	Differentiate between dynamic power and leakage power.	2 Marks	L4	CO1
	c)	What is logic optimization in low power VLSI	2 Marks	L1	CO2
	d)	What is clock gating	2 Marks	L1	CO2
	e)	List any two energy-efficient memory technologies	2 Marks	L1	CO3
	f)	Differentiate MRAM and STT-RAM	2 Marks	L4	CO3
	g)	What is gate-level power estimation? State the key parameters required to compute power at the gate level.	2 Marks	L1	CO3
	h)	Define AI-driven power estimation. List any two machine learning models used for power prediction in VLSI design.	2 Marks	L1	CO3
	i)	Define high-level synthesis in VLSI design	2 Marks	L1	CO4
	j)	What are AI accelerators in VLSI	2 Marks	L2	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Derive the dynamic power dissipation formula and explain switching activity	8 Marks	L1	CO1
	b)	Analyze scaling impact on delay, power and reliability	8 Marks	L4	CO1

(OR)

3.	a)	Discuss performance vs power trade-off in scaling	8 Marks	L2	CO1
	b)	Compare FinFET, TFET and GAAFET	8 Marks	L4	CO1

MODULE-II

4.	a)	Summaries circuit-level power optimization techniques in CMOS design	8 Marks	L2	CO2
	b)	Compare AVS and DVS techniques	8 Marks	L2	CO2

(OR)

5.	a)	Discuss power gating and clock gating in low power VLSI	8 Marks	L2	CO2
	b)	Explain low power adder design techniques	8 Marks	L2	CO2

MODULE-III

6.	a)	Discuss low-power layout methodologies. Explain placement optimization strategies that minimize wire length and power dissipation.	8 Marks	L2	CO2
	b)	Explain the operation of ReRAM memory arrays. Discuss their resistance switching mechanisms and advantages over Flash memory in IoT applications.	8 Marks	L3	CO4

(OR)

7.	a)	Evaluate the effectiveness of thermal-aware placement algorithms in minimizing peak temperature and power density in a high-performance VLSI chip.	8 Marks	L5	CO2
	b)	Explain low-power interconnect design techniques with a neat diagram. How do interconnect parasitics affect power dissipation in VLSI circuits?	8 Marks	L2	CO2

MODULE-IV

8.	a)	List the advanced simulation techniques used for power estimation in VLSI design. Explain transistor-level SPICE simulation and event-driven simulation	8 Marks	L1	CO3
	b)	Explain leakage power estimation techniques in VLSI. Describe sub-threshold leakage, gate oxide leakage, and junction leakage components.	8 Marks	L1	**CO3**

(OR)

9.		Explain the concept of thermal-aware power estimation in VLSI design. Describe the thermal resistance network model& junction temperature computation.	16 Marks	L1	**CO3**

MODULE-V

10.	a)	Describe the process of high-level synthesis for low-power VLSI systems. Explain the key steps involved in transforming a behavioral description into a gate-level.	8 Marks	L1	CO4
	b)	Discuss the role of AI in optimizing power consumption in VLSI circuits	8 Marks	L2	CO4

(OR)

11.	a)	Explain industry applications of low-power VLSI design with suitable example.	8 Marks	L2	CO4
	b)	Analyze the benefits of high-level synthesis in reducing power consumption	8 Marks	L4	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

INNOVATION AND INTELLECTUAL PROPERTY RIGHTS

[Construction Technology and Management, Electrical Power Systems, Machine Design, Computer Science and Engineering, Computer Science and Engineering (Artificial Intelligence and Data Science)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define innovation with an example.	2 Marks	L1	CO1
	b)	Differentiate between creativity and innovation.	2 Marks	L2	CO1
	c)	What are intellectual property rights?	2 Marks	L1	CO2
	d)	List the steps for innovation.	2 Marks	L2	CO2
	e)	Explain the function of trademarks.	2 Marks	L1	CO3
	f)	Describe the trademark registration process.	2 Marks	L3	CO3
	g)	What is copyright ownership?	2 Marks	L3	CO4
	h)	Discuss international copyright law.	2 Marks	L2	CO4
	i)	What is trade secret status?	2 Marks	L1	CO5
	j)	Explain misappropriation of trade secrets.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the different types of intellectual property rights.	8 Marks	L2	CO1
	b)	Distinguish between innovation and invention.	8 Marks	L2	CO1
		(OR)			
3.	a)	What is meant by intellectual property? Why does intellectual property need to be promoted and protected?	8 Marks	L4	CO1
	b)	List of Agencies and treaties related to Intellectual Property and its significance.	8 Marks	L2	CO1

MODULE-II

4.	a)	Describe the process involved for trademark registration.	8 Marks	L3	CO2
	b)	Explain how the trade mark will protect the particular industry.	8 Marks	L3	CO2
		(OR)			
5.		Explain the process involved in trademark selection and evaluation.	16 Marks	L2	CO2

MODULE-III

6.		Write in detail about copy right law. Explain ownership issues in transfer of copy rights and moral rights of the author.	16 Marks	L4	CO3
		(OR)			
7.		Illustrate the application's process and registration of copyright.	16 Marks	L3	CO3

MODULE-IV

8.	State and explain the trade secret Law. Explain the liability for misappropriations of trade secrets.	16 Marks	L2	CO4
	(OR)			
9.	Discuss the legalities involved in protecting against unfair competition.	16 Marks	L3	CO4

MODULE-V

10.	Describe in detail about the international development in patent law.	16 Marks	L3	CO5
	(OR)			
11.	What are the new developments in copy right law and patent law? Explain.	16 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

ADVANCED POWER SYSTEM PROTECTION

[Electrical Power Systems]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What are level detectors? Mention two types of level detectors.	2 Marks	L1	CO1
	b)	State two advantages of numerical relays.	2 Marks	L1	CO1
	c)	Write the advantages of static relays with respect to Electromagnetic relays	2 Marks	L2	CO2
	d)	What is a rectifier bridge comparator?	2 Marks	L1	CO2
	e)	What is a static over current relay and how does it differ from an electromagnetic relay?	2 Marks	L2	CO3
	f)	Define an instantaneous over current relay and state its applications	2 Marks	L1	CO3
	g)	What is a power swing and how does it affect distance relay operation.	2 Marks	L2	CO4
	h)	What is a Mho relay and why is it called a directional relay?	2 Marks	L1	CO4
	i)	Write the generalized mathematical expression for a distance relay.	2 Marks	L2	CO5
	j)	What is a Mho relay and state its characteristic in the R-X plane?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	List the difference between static relays and Electromagnetic relays.	8 Marks	L2	CO1
	b)	Derive the general equation for a two-input amplitude comparator	8 Marks	L3	CO1

(OR)

3.	a)	Analyze the duality between phase and amplitude comparators using vector diagrams.	8 Marks	L4	CO1
	b)	List the types of amplitude comparators and phase comparators used in static relays and write its applications.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the principle and operation of coincidence circuit type (block-spike) phase comparator	8 Marks	L2	CO2
	b)	Discuss the characteristics of multi-input comparators.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the integrating type phase comparator and rectifier type phase comparator with suitable diagrams.	8 Marks	L2	CO2
	b)	Explain conic section characteristics with examples.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the construction and working of static over current relays and highlight their advantages over electromagnetic relays.	8 Marks	L2	CO3
	b)	Describe the operating principle of an instantaneous over current relay and mention its applications.	8 Marks	L2	CO3

(OR)

7.	a)	Explain the working of time over current relays with different characteristics.	8 Marks	L2	CO3
	b)	Discuss the principles of definite time and inverse definite minimum time (IDMT) over current relays with suitable characteristics.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain the operating principle and characteristics of impedance, reactance, and Mho relays with neat diagrams in the R-X plane.	8 Marks	L2	CO4
	b)	Describe the working of an angle impedance relay and compare it with a Mho relay.	8 Marks	L2	CO4

(OR)

9.	a)	Analyze the effect of power swings on the performance of distance relays.	8 Marks	L4	CO4
	b)	Analyze the effect of line length and source impedance on the performance of distance relays.	8 Marks	L4	CO4

MODULE-V

10.	a)	Explain the architecture and working of microprocessor-based over current relays with a neat block diagram.	8 Marks	L2	CO5
	b)	Analyze the operating principles of impedance, reactance, and directional relays with suitable characteristics.	8 Marks	L4	CO5

(OR)

11.	a)	Analyze the operating principle and characteristics of a Mho relay in the R–X plane.	8 Marks	L4	CO5
	b)	Explain the concept of an offset-Mho relay and its advantages in power system protection.	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

POWER SYSTEM SECURITY AND STATE ESTIMATION

[Electrical Power Systems]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define the Π (Pi) representation of a transformer.	2 Marks	L1	CO1
	b)	Explain the importance of network matrices in power system analysis.	2 Marks	L2	CO1
	c)	Define a Phasor Measurement Unit (PMU).	2 Marks	L1	CO2
	d)	Describe the working principle of a modern protection system.	2 Marks	L2	CO2
	e)	Define voltage collapse.	2 Marks	L1	CO3
	f)	Explain the causes and effects of voltage collapse in power systems.	2 Marks	L2	CO3
	g)	Define distributed generation.	2 Marks	L1	CO4
	h)	Explain the role of distributed generation in modern power grids.	2 Marks	L2	CO4
	i)	What is preventive control?	2 Marks	L1	CO5
	j)	Explain the significance of real-time visualization and dynamic state estimation in grid monitoring.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks
5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss the importance of Ybus and Zbus matrices in power system studies.	8 Marks	L3	CO1
	b)	Explain the advantages of sparse matrix techniques in large power systems.	8 Marks	L4	CO1
		(OR)			
3.	a)	Discuss the role of network matrices in smart grid systems.	8 Marks	L4	CO1
	b)	Explain the relationship between primitive network and bus matrices.	8 Marks	L4	CO1

MODULE-II

4.	a)	Compare symmetrical and unsymmetrical faults.	8 Marks	L3	CO2
	b)	Explain fault impedance effect on short circuit current.	8 Marks	L4	CO2
		(OR)			
5.	a)	Explain double line-to-ground fault analysis.	8 Marks	L4	CO2
	b)	Discuss advantages of symmetrical component method	8 Marks	L4	CO2

MODULE-III

6.	a)	Explain impact of distributed generation on power flow.	8 Marks	L3	CO3
	b)	Write short notes on modern power system operation strategies.	8 Marks	L3	CO3
		(OR)			
7.	a)	Explain power flow studies in security assessment.	8 Marks	L4	CO3

	b)	Discuss voltage collapse phenomenon.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Discuss wide area monitoring systems.	8 Marks	L3	CO4
	b)	Explain role of PMU's in security monitoring.	8 Marks	L4	CO4
		(OR)			
9.	a)	Explain the impact of FACTS devices on system security.	8 Marks	L4	CO4
	b)	Explain security assessment in energy management systems.	8 Marks	L4	CO4

MODULE-V

10.	a)	Explain observability analysis in power systems.	8 Marks	L3	CO5
	b)	Discuss real-time grid monitoring using state estimation.	8 Marks	L4	CO5
		(OR)			
11.	a)	Explain future trends in state estimation techniques.	8 Marks	L4	CO5
	b)	Write short notes on wide area monitoring systems.	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

MACHINE LEARNING FOR ELECTRICAL ENGINEERING

[Electrical Power Systems]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is supervised learning?	2 Marks	L1	CO1
	b)	What is accuracy in ML models?	2 Marks	L1	CO1
	c)	What is the difference between classification and regression?	2 Marks	L1	CO2
	d)	What is meant by speed control of a motor using neural networks?	2 Marks	L1	CO2
	e)	What is an independent variable?	2 Marks	L1	CO3
	f)	What is Maximum Likelihood Estimation (MLE)?	2 Marks	L1	CO3
	g)	What is unlabeled data?	2 Marks	L1	CO4
	h)	What is pattern mining?	2 Marks	L2	CO4
	i)	What is meant by hidden layers in deep learning?	2 Marks	L1	CO5
	j)	Define Restricted Boltzmann Machine (RBM).	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Compare supervised, unsupervised, and reinforcement learning in terms of working principles, data requirements, and applications.	8 Marks	L2	CO1
	b)	Explain the role of machine learning in fault classification and predictive maintenance with real-time examples.	8 Marks	L3	CO1

(OR)

3.	a)	Discuss different model evaluation techniques and metrics used in machine learning.	8 Marks	L2	CO1
	b)	Discuss the challenges faced during model training and evaluation in real-time systems.	8 Marks	L3	CO1

MODULE-II

4.	a)	State and explain Bayes theorem. Derive it and discuss its significance in machine learning.	8 Marks	L2	CO2
	b)	Explain the Naïve Bayes classifier, including its assumptions, working, advantages, and limitations.	8 Marks	L3	CO2

(OR)

5.	a)	Discuss the use of machine learning in fault classification of transmission lines.	8 Marks	L2	CO2
	b)	Explain real-time engineering applications of supervised learning algorithms.	8 Marks	L4	CO2

MODULE-III

6.	a)	Explain simple linear regression with mathematical formulation and assumptions.	8 Marks	L2	CO3
	b)	Describe multiple linear regression, including model equation and applications.	8 Marks	L3	CO3

(OR)

7.	a)	Describe a case study on load forecasting using machine learning techniques.	8 Marks	L2	CO3
	b)	Explain different types of load forecasting (short-term, medium-term, long-term) with examples	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain clustering as a machine learning task and its types.	8 Marks	L2	CO4
	b)	Describe different types of clustering techniques in detail.	8 Marks	L3	CO4

(OR)

9.	a)	Explain the optimal allocation of Distributed Generation (DG) using machine learning techniques.	8 Marks	L2	CO4
	b)	Discuss the concept of rule pruning and optimization in association rule mining.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain the vanishing gradient problem in RNN and its impact.	8 Marks	L2	CO5
	b)	Describe how LSTM overcomes the vanishing gradient problem.	8 Marks	L2	CO5

(OR)

11.	a)	Discuss the challenges in short-term load forecasting and how deep learning addresses them.	8 Marks	L2	CO5
	b)	Explain how machine learning models are trained for stability assessment in power systems.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

CONTROL AND INTEGRATION OF RENEWABLE ENERGY SOURCES

[Electrical Power Systems]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define grid stability.	2 Marks	L1	CO1
	b)	What is electricity consumption model.	2 Marks	L1	CO1
	c)	Define dynamic energy conversion technology.	2 Marks	L1	CO2
	d)	What is hydroelectric generation.	2 Marks	L1	CO2
	e)	What is MPPT.	2 Marks	L1	CO3
	f)	Define flywheel energy storage.	2 Marks	L1	CO3
	g)	Define linear controller.	2 Marks	L1	CO4
	h)	What is Phase Locked Loop (PLL).	2 Marks	L1	CO4
	i)	Define hybrid energy system.	2 Marks	L1	CO5
	j)	What is IEC standard.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the challenges in integrating renewable energy into the grid.	8 Marks	L3	CO1
	b)	Explain electricity consumption models used in power systems.	8 Marks	L3	CO1

(OR)

3.	a)	Explain supply guarantee and power quality in power systems.	8 Marks	L2	CO1
	b)	Discuss the importance of renewable energy penetration in electric grids.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain micro turbine-based power generation.	8 Marks	L3	CO2
	b)	Explain advantages and limitations of reciprocating engine power plants.	8 Marks	L2	CO2

(OR)

5.	a)	Discuss wind-based power generation technologies.	8 Marks	L3	CO2
	b)	Compare conventional and non-conventional dynamic generation technologies.	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain different MPPT techniques.	8 Marks	L3	CO3
	b)	Explain battery energy storage technologies.	8 Marks	L3	CO3

(OR)

7.	a)	Explain the operation of wind energy conversion systems.	8 Marks	L3	CO3
	b)	Explain supercapacitor and ultracapacitor technologies.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain load frequency and voltage control.	8 Marks	L3	CO4
	b)	Explain the operation of PLL in grid synchronization	8 Marks	L3	CO4
		(OR)			
9.	a)	Discuss control strategies for PV generators.	8 Marks	L3	CO4
	b)	Discuss modulation techniques used in converters.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain optimized integrated energy systems.	8 Marks	L2	CO5
	b)	Discuss grid connected photovoltaic systems.	8 Marks	L3	CO5
		(OR)			
11.	a)	Discuss stability issues in renewable energy grid integration.	8 Marks	L3	CO5
	b)	Explain operation and control of hybrid energy systems	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

POWER QUALITY MONITORING, ANALYSIS AND CONTROL

[Electrical Power Systems]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define Power Quality.	2 Marks	L1	CO1
	b)	List different types of transients in power systems.	2 Marks	L1	CO1
	c)	What is the typical magnitude range of voltage sag?	2 Marks	L2	CO2
	d)	What is the impact of sag on computers and office equipment?	2 Marks	L2	CO2
	e)	What is the function of a harmonic analyzer?	2 Marks	L2	CO3
	f)	Name the three sequence components used in unbalance analysis.	2 Marks	L1	CO3
	g)	What is total harmonic distortion (THD)?	2 Marks	L2	CO4
	h)	What is the difference between harmonics and transients?	2 Marks	L2	CO4
	i)	Define harmonic filter.	2 Marks	L1	CO5
	j)	What is synchronous detection method?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain different types of power quality disturbances and their classification in detail.	8 Marks	L2	CO1
	b)	Describe transients in power systems and explain their causes and effects on equipment.	8 Marks	L2	CO1

(OR)

3.	a)	Describe voltage fluctuations and power frequency variations with suitable examples.	8 Marks	L2	CO1
	b)	Explain CBEMA and ITIC curves and their significance in power quality assessment.	8 Marks	L4	CO1

MODULE-II

4.	a)	Discuss various sources of voltage sags in transmission and distribution systems.	8 Marks	L2	CO2
	b)	Analyze the effects of voltage sag on AC motor drives and their operational performance.	8 Marks	L3	CO2

(OR)

5.		Analyze the influence of voltage interruptions on various electrical equipment in power systems.	16 Marks	L4	CO2

MODULE-III

6.	a)	Explain various monitoring considerations required for assessing power quality in modern power systems.	8 Marks	L2	CO3
	b)	Discus spectrum analyzer and its role in analyzing waveform distortion in power systems.	8 Marks	L4	CO3

(OR)

7.	a)	Analyze the causes and effects of power outages in electrical power systems.	8 Marks	L4	CO3
	b)	Explain instantaneous real and reactive power theory used for power quality analysis and compensation.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Discuss time domain methods used for analyzing electrical signals in power systems with suitable examples.	8 Marks	L2	CO4
	b)	Explain different methods for measurement of voltage, current, power, energy, and power factor in electrical systems.	8 Marks	L2	CO4

(OR)

9.	a)	Explain Fourier transform and its role in harmonic analysis of electrical waveforms.	8 Marks	L3	CO4
	b)	Discuss harmonic indexes, harmonic sources from commercial and industrial loads, and their impact on power systems.	8 Marks	L4	CO4

MODULE-V

10.	a)	Describe load compensation using DSTATCOM and explain its working principle in distribution systems.	8 Marks	L3	CO5
	b)	Discuss P-Q theory and its application in control strategies for active power filters and custom power devices.	8 Marks	L4	CO5

(OR)

11.	a)	Describe the working of Dynamic Voltage Restorer (DVR) for protecting sensitive loads from disturbances.	8 Marks	L3	CO5
	b)	Describe the concept of custom power park and its advantages in improving power quality for industrial loads.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

TECHNICAL REPORT WRITING

[VLSI & Embedded System Design]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Technical Report Writing and its primary purpose.	2 Marks	L1	CO1
	b)	List four types of technical reports commonly used in engineering.	2 Marks	L1	CO1
	c)	What is the significance of the 'Materials and Methods' section in a research paper?	2 Marks	L1	CO2
	d)	State two rules for preparing effective tables in a report.	2 Marks	L1	CO2
	e)	Why are 'Graphs' preferred over raw data in scientific writing?	2 Marks	L1	CO3
	f)	Differentiate between citing and arranging references.	2 Marks	L1	CO3
	g)	What is the importance of ISO standards in bibliographical data?	2 Marks	L1	CO4
	h)	Define 'Copyright' in the context of technical documentation.	2 Marks	L1	CO4
	i)	Mention two tips for dealing with intermediate questions during a presentation.	2 Marks	L1	CO5
	j)	What is the role of 'Rhetoric' in a technical presentation?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the essential components of a formal technical report in detail.	8 Marks	L2	CO1
	b)	Discuss the planning phase of technical report writing, focusing on audience analysis.	8 Marks	L4	CO1

(OR)

3.	a)	Compare and contrast report writing in Science versus Technology.	8 Marks	L2	CO1
	b)	Elaborate on the language requirements and stylistic choices for a technical title.	8 Marks	L4	CO1

MODULE-II

4.	a)	Describe the step-by-step process of writing an effective 'Introduction'.	8 Marks	L2	CO2
	b)	How should 'Findings/Results' be organized to ensure clarity for the reader?	8 Marks	L4	CO2

(OR)

5.	a)	Critique the common mistakes made when drafting a 'Discussion' section.	8 Marks	L2	CO2
	b)	Illustrate the best practices for using "Tables" to represent complex data.	8 Marks	L4	CO2

MODULE-III

6.	a)	Demonstrate how to design an effective line graph for a scientific journal.	8 Marks	L2	CO3
	b)	Explain the IEEE style of citing references in the text and the bibliography.	8 Marks	L3	CO3
		(OR)			
7.	a)	Analyze the specific requirements for writing a paper for publication in a high-impact journal.	8 Marks	L2	CO3
	b)	Compare different methods of arranging references in a technical document.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Discuss the ethical and legal implications of copyright laws in report writing.	8 Marks	L2	CO4
	b)	Explain how word processing and DTP systems assist in document layout.	8 Marks	L3	CO4
		(OR)			
9.	a)	Describe the systematic approach to editing typographic details in a draft.	8 Marks	L2	CO4
	b)	How do cross-references improve the navigation and integrity of a long report?	8 Marks	L4	CO4

MODULE-V

10.	a)	Outline a strategy for a 15-minute presentation using appropriate "pointing" techniques.	8 Marks	L2	CO5
	b)	Analyze the "Rhetoric tips from A to Z" for persuasive technical speaking.	8 Marks	L4	CO5
		(OR)			
11.	a)	Evaluate the effectiveness of different visual aids in a technical presentation.	8 Marks	L2	CO5
	b)	Explain the process of reviewing and analyzing a presentation for self-improvement.	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

ADVANCED MACHINE DESIGN

[Machine Design]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	List out any six mechanical properties of metals	2 Marks	L2	CO1
	b)	Write a note on the influence of various factors of the endurance limit of a ductile material.	2 Marks	L2	CO1
	c)	What is meant by `stress concentration'? How do you take it into consideration in case of a component subjected to dynamic loading?	2 Marks	L1	CO2
	d)	What is the significance of the theories of failure?	2 Marks	L2	CO2
	e)	Define Factor of safety, and write its importance in design	2 Marks	L2	CO3
	f)	Explain Distortion-Energy theory	2 Marks	L2	CO3
	g)	Define the endurance limit of a material.	2 Marks	L1	CO4
	h)	What are the various corrections factors considered in evaluation of fatigue strength.	2 Marks	L1	CO4
	i)	Write short notes on hydrodynamic lubrication	2 Marks	L2	CO5
	j)	What is Corrosion wear, explain in brief?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

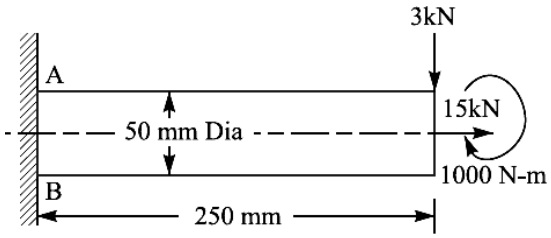
5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the basic procedure involved in design of any machine component.	8 Marks	L2	CO1
	b)	Crucial section in a shaft is subjected to a twisting moment of 20kN-m and a bending moment of 16kN-m. The yield strength of the shaft material is 700Mpa. Determine the diameter of shaft according to any two theories of failure. Take F.O.S = 3 and E = 210Gpa and Poisson ratio = 0.23.	8 Marks	L2	CO1

(OR)

3.	a)	A shaft, as shown in below fig. is subjected to a bending load of 3 kN, pure torque of 1000 N-m and an axial pulling force of 15 kN. Calculate the stresses at A and B.	8 Marks	L2	CO1



	b)	Discuss Ashby material selection charts and factors affecting for the material selection.	8 Marks	L2	CO1

MODULE-II

4.		A pulley is keyed to a shaft midway between two anti-friction bearings. The bending moment at the pulley varies from – 170 N-m to 510 N-m and the torsional moment in the shaft varies from 55 N-mto 165 N-m. The frequency of the variation of the loads is the same as the shaft speed. The shaft is made of cold drawn steel having an ultimate strength of 540 MPa and yield strength of 400 MPa. Determine the required diameter for an indefinite life. The stress concentration factor for the key way in bending and torsion may be taken as 1.6 and 1.3 respectively. The factor of safety is 1.5. Take size factor = 0.85 and surface finish factor = 0.88.	16 Marks	L4	CO2
		(OR)			
5.	a)	Explain the understanding of static failure for ductile and brittle materials	8 Marks	L2	CO2
	b)	A bar of circular cross-section is subjected to alternating tensile forces varying from a minimum of 200 kN to a maximum of 500 kN. It is to be manufactured of a material with an ultimate tensile strength of 900 MPa and an endurance limit of 700 MPa. Determine the diameter of bar using safety factors of 3.5 related to ultimate tensile strength and 4 related to endurance limit and a stress concentration factor of 1.65 for fatigue load. Use Goodman straight line as basis for design.	8 Marks	L3	CO2
		MODULE-III			
6.	a)	Explain Failure of Ductile Materials Under Static Loading using von Mises-Hencky or Distortion-Energy Theory	8 Marks	L4	CO3
	b)	A mild steel shaft of 50 mm diameter is subjected to a bending moment of 2000 N-m and a torque T. Take factor of safety is 1. If the yield point of steel in tension is 200 MPa, find the maximum value of this torque without causing yielding of the shaft according to 1. Maximum Principle stress theory2. Maximum shear stress theory 3. Maximum distortion strain energy theory of yielding.	8 Marks	L3	CO3
		(OR)			
7.	a)	Explain in detail the Case Studies in Static Failure Analysis with proper examples.	8 Marks	L3	CO3
	b)	A region on the surface of a 6061-T4 aluminum alloy component has strain gages attached, which indicate the following stresses: σ_{11} = 70 MPa, σ_{22} = 120 MPa, σ_{12} = 60 MPa. Determine the yielding for both the Tresca and von Mises criteria, given that σ_0 = 150 MPa (the yield stress).	8 Marks	L3	CO3
		MODULE-IV			
8.	a)	i) Describe the words fatigue strength or fatigue life; ii) Effect of mean stress on fatigue life	10 Marks	L4	CO4
	b)	The S-N curve of a material is described by the relationship log $N = 10(1-S/\sigma_{max})$, where N is the number of cycles to failure, S is the amplitude of the applied cyclic stress, and σ max is the monotonic fracture strength i.e., $S = \sigma_{max}$ at N = 1. A rotating component made of this material is subjected to 104 cycles at $S = 0.5\ \sigma_{max}$. If the cyclic load is now increased to $S = 0.75\ \sigma_{max}$, how many more cycles will the material withstand?	6 Marks	L3	CO4
		(OR)			
9.	a)	i) Explain the Miner's rule for cumulative damage in fatigue. ii) Define: a) Endurance strength b) Notch sensitivity	6 Marks	L3	CO4
	b)	Write a notes on various Mechanisms of Fatigue, such as i) Fatigue Crack Propagation ii) Fatigue Crack Nucleation	10 Marks	L3	CO4
		MODULE-V			

10.	a)	What is surface fatigue? Derive expression for size of contact patch and static stress distribution in spherical contact.	6 Marks	L4	CO5
	b)	An overhead crane wheel runs slowly on a steel rail. What is the size of the contact patch between wheel and rail and what are the stresses? What is the depth of maximum shear stress? The diameter of wheel is 305 mm by 22.3 mm thick and the rail is flat. Both parts are steel. The radial load is 22.24 kN.	10 Marks	L2	CO5

(OR)

11.	a)	List down the various types of wear mechanisms. What are the design considerations to reduce the chances of an adhesive wear failure?	10 Marks	L1	CO5
	b)	What are the different types of gear lubrication method? Explain the elasto-hydrodynamic lubrication in detail.	6 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

EXPERIMENTAL STRESS ANALYSIS

[Machine Design]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List the limitations of strain gauges.	2 Marks	L1	CO1
	b)	Identify the different types of strain gauges.	2 Marks	L1	CO1
	c)	Define brittle coating.	2 Marks	L1	CO2
	d)	List the applications of hard coating	2 Marks	L1	CO2
	e)	Explain the geometrical approach.	2 Marks	L2	CO3
	f)	Describe the sharpening of Moire fringes.	2 Marks	L2	CO3
	g)	List the advantages of coating materials.	2 Marks	L1	CO4
	h)	Define coating sensitivity.	2 Marks	L1	CO4
	i)	Explain slicing in 3D photo elasticity.	2 Marks	L2	CO5
	j)	Describe isochromatic fringes.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	Explain the significance of the following in detail. i) Strain indicators ii) Load cells iii) Data acquisition system	16 Marks	L3	CO1
	(OR)			
3.	Derive an expression for potentiometer circuit of a strain gauge.	16 Marks	L3	CO1

MODULE-II

4.	Explain the use of failure theories in brittle coating.	16 Marks	L3	CO2
	(OR)			
5.	Demonstrate the stages involved in application of stress coat with the help of neat sketch.	16 Marks	L2	CO2

MODULE-III

6.	Illustrate the Moire method of strain analysis with a case study	16 Marks	L3	CO3
	(OR)			
7.	Discuss briefly the applications and advantages of the Moire's method of stress analysis. Also list the limitations.	16 Marks	L3	CO3

MODULE-IV

8.	What are the various methods used for coating application, and how do they affect the quality and properties of the coating? Discuss the advantages and disadvantages of each method.	16Marks	L2	CO4
	(OR)			
9.	The thickness of a coating can have a significant impact on its properties and performance. Discuss the effects of coating thickness on the stress and strain behavior of coated materials, and how it can be measured and controlled.	16 Marks	L3	CO4

MODULE-V

10.	Illustrate the concept of plane and circular polariscopes in detail.	16 Marks	L2	CO5
	(OR)			
11.	Enumerate the significance of three-dimensional photo elasticity.	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

ADVANCED OPTIMIZATION TECHNIQUES

[Machine Design]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define optimization.	2 Marks	L2	CO1
	b)	What is an objective function?	2 Marks	L2	CO1
	c)	What is single variable optimization?	2 Marks	L2	CO2
	d)	State the necessary condition for optimization of a single variable function.	2 Marks	L2	CO2
	e)	Define Genetic Algorithm (GA).	2 Marks	L2	CO3
	f)	List the basic operators of GA.	2 Marks	L1	CO3
	g)	Define multi-objective optimization.	2 Marks	L1	CO4
	h)	What is a non-dominated solution?	2 Marks	L1	CO4
	i)	What is path synthesis of a four-bar mechanism?	2 Marks	L2	CO5
	j)	Why is weight minimization important in cantilever beam design?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2. Explain the concept of optimization in detail. 16 Marks L3 CO1

(OR)

3. Describe the steps involved in formulating an optimization problem 16 Marks L3 CO1

MODULE-II

4. Using Kuhn–Tucker conditions, Solve the following 16 Marks L3 CO2

$Max\ Z = -x_1^2 - x_2^2 - x_3^2 + 4x_1 + 6x_2$

Subjected to

$x_1 + x_2 \le 2$

$2x_1 + 3x_2 \le 12$

$x_1\ and\ x_2 \ge 0$

(OR)

5. Minimize $f(x_1, x_2) = x_1 - x_2 + x_1^2 + 2x_1x_2 + x_2^2$ starting from the point X_1=(0,0) using Steepest descent method method 16 Marks L3 CO2

MODULE-III

6.		Explain the concept of genetic programming (GP) and write the procedure and equations using GP	16 Marks	L1	CO3
		(OR)			
7.	a)	Explanation of different cross over operations performed in GA	10 Marks	L1	CO3
	b)	Differentiation of genetic algorithm verses traditional algorithm	6 Marks	L1	CO3

MODULE-IV

8.		A manufacturing firm produces two types of products A and B whose unit profit are Rs.70 and Rs30 respectively. The goal of the firm is to earn a total profit of exactly Rs 800 in the next week. Formulate goal programming model and mention how to solve it.	16 Marks	L3	CO4
		(OR)			
9.		Explain in detail about Analytical hierarchical process	16Marks	L1	CO4

MODULE-V

10.		Describe the general optimization model of a machining process? Explain with a suitable example	16 Marks	L1	CO5
		(OR)			
11.		Explain the general procedure for optimization of path synthesis of a four-bar mechanism	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Tech II Semester (MBU-25) Regular Examinations, May– 2026

PRODUCT DESIGN

[Machine Design]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	State the importance of IPPD	2 Marks	L2	CO1
	b)	What is the need of behaviour analysis	2 Marks	L2	CO1
	c)	Name the hints used for generating concepts.	2 Marks	L1	CO2
	d)	Draw the flow chart for concept selection.	2 Marks	L2	CO2
	e)	What is meant by slot modular architecture?	2 Marks	L2	CO3
	f)	Write down the significance for component standardization	2 Marks	L2	CO3
	g)	Define conceptualization.	2 Marks	L1	CO4
	h)	Name few examples of technology driven products.	2 Marks	L1	CO4
	i)	What is the purpose of prototyping?	2 Marks	L2	CO5
	j)	How to calculate the manufacturing cost of a product?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Differentiate the competitor and customer in IPPD.	8 Marks	L4	CO1
	b)	Explain the management approach in IPPD.	8 Marks	L2	CO1

(OR)

3.	a)	What is the strategic importance of product development in terms of competing with other companies?	8 Marks	L3	CO1
	b)	How can customer behaviour analysis be used to gain a competitive advantage in product development?	8 Marks	L3	CO1

MODULE-II

4.	a)	Why is it important to reflect on the solutions and processes used during concept generation?	8 Marks	L2	CO2
	b)	What is concept selection, and how does it fit into the product design process?	8 Marks	L2	CO2

(OR)

5.	a)	What are some benefits of using a structured approach to concept selection in product design?	8 Marks	L2	CO2
	b)	How can concept selection be used to ensure the success of a new product launch?	8 Marks	L3	CO2

MODULE-III

6.	a)	What are the considerations for manufacturability in product architecture design?	8 Marks	L3	CO3
	b)	What is industrial design, and how is the need for it assessed in product development?	8 Marks	L2	CO3

(OR)

7.	a)	How does industrial design impact the overall product design process?	8 Marks	L3	CO3
	b)	What are the benefits of integrating industrial design into the product development process?	8 Marks	L2	CO3

MODULE-IV

8.	a)	What are the benefits of using QFD in the development of engineering specifications?	8 Marks	L2	CO4
	b)	How can the engineering team ensure that the developed specifications meet customer needs?	8 Marks	L3	CO4

(OR)

9.	a)	How can the engineering team verify that the developed specifications are feasible and can be implemented?	8 Marks	L3	CO4
	b)	What are the key considerations in the development of engineering specifications for complex products?	8 Marks	L3	CO4

MODULE-V

10.	a)	What is robust design, and how can it be used in product evaluation?	8 Marks	L2	CO5
	b)	How can sensitivity analysis be used in product evaluation to identify potential design weaknesses?	8 Marks	L3	CO5

(OR)

11.	a)	What is the importance of cost estimation in product design, and how can it be used in product evaluation?	8 Marks	L2	CO5
	b)	What is design for reliability, and how can it be integrated into the product evaluation process?	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) Regular Examinations, May – 2026

ENGINEERING MECHANICS

[Civil Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define the system of concurrent coplanar forces.	2 Marks	L1	CO1
	b)	Define the Lami's theorem.	2 Marks	L1	CO1
	c)	What is rolling friction?	2 Marks	L1	CO2
	d)	Write the relationship between normal reaction and frictional force.	2 Marks	L1	CO2
	e)	Define the centroid of a geometric shape.	2 Marks	L1	CO3
	f)	What is the center of gravity of a body?	2 Marks	L1	CO3
	g)	What is volumetric strain?	2 Marks	L1	CO4
	h)	What is a composite bar?	2 Marks	L1	CO4
	i)	Define circumferential stress in a thin cylindrical shell.	2 Marks	L1	CO5
	j)	State the term "hoop stress" in the context of thin cylinders.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

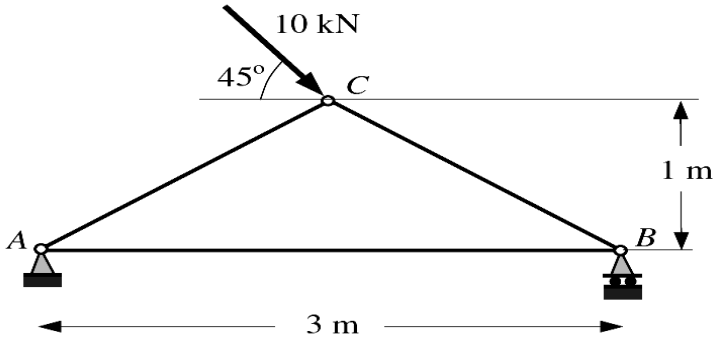
5 x 16 = 80 Marks

MODULE-I

2. Discuss the system of forces with a neat sketches, also provide some examples. 16 Marks L3 CO1

(OR)

3. What kind of frame is the given truss? Solve the forces in all the members of a truss shown in Figure using method of joints. 16 Marks L3 CO1

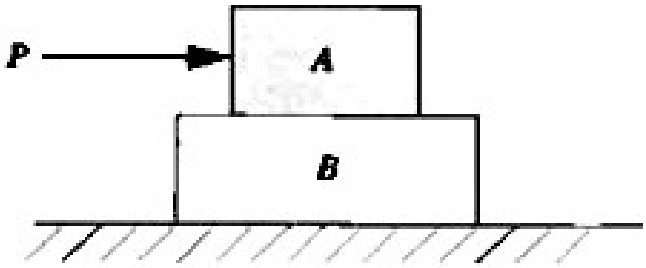


MODULE-II

4. A ladder 5 m long and of 250 N weight is placed against a vertical wall in a position where its inclination to the vertical is 300. A man weighing 800 N climbs the ladder. At what position will he induce slipping? The co-efficient of friction for both the contact surfaces of the ladder with the wall and the floor is 0.2. 16 Marks L3 CO2

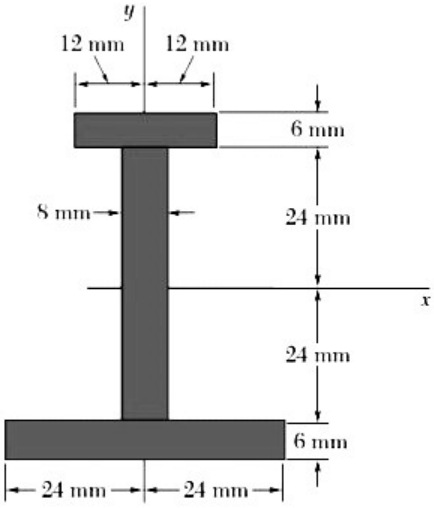
(OR)

5. The coefficient of friction between a copper block A and an aluminum block B is 0.3, and between the block B and the floor is 0.2. The weight of block A is 30 N and of block B is 20 N as shown in the given Figure. What force P will cause the motion of block A to impend? 16 Marks L3 CO2



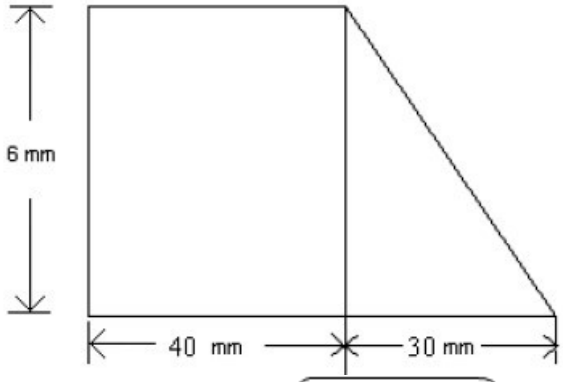
MODULE-III

6. Solve the moment of inertia and the radius of gyration of the I - section shown in the Figure. 16 Marks L3 CO3



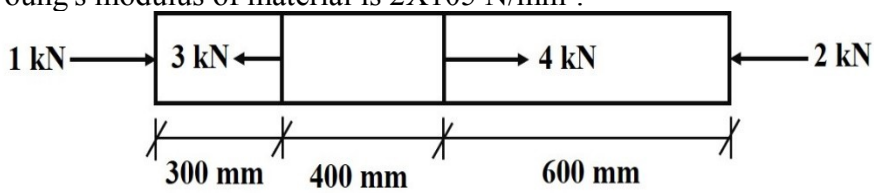
(OR)

7. Find the centroid of the plane area shown in Figure. 16 Marks L3 CO3



MODULE-IV

8. A bar of uniform cross-sectional area 100 mm2 is subjected to forces as shown in the Figure. Calculate the change in the length of the bar. Young's modulus of material is 2X105 N/mm^2. 16 Marks L3 CO4



(OR)

9.	The following data refer to a mild steel specimen tested in a laboratory. Diameter of the specimen= 20 mm; Length of the specimen= 250 mm; Extension under a load of 10 kN= 0.035 mm; Load at yield point= 120.15 kN; Maximum load= 195.50 kN; Length of the specimen under failure= 300 mm; The neck diameter = 15.25 mm Determine Young's Modulus, Yield point, Ultimate stress, percentage of elongation and percentage reduction in area and safe stress adopting factor of safety of 2.	16 Marks	L3	CO4

MODULE-V

10.	A pipe of 200 mm internal diameter and 50 mm thickness carries a fluid at a pressure of 10 MN/m^2. Calculate the maximum and minimum intensities of circumferential stress across the section.	16 Marks	L3	CO5

(OR)

11.	Mention the assumptions in Lame's theory. Derive Lame's equation for radial and circumferential stress of thick cylinder.	16 Marks	L3	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) Regular Examinations, May - 2026

CIVIL ENGINEERING MATERIALS AND CONCRETE TECNOLOGY

[Civil Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Write the four characteristics of good tiles.	2 Marks	L1	CO1
	b)	Classify different types of stones based on their geological origin?	2 Marks	L1	CO1
	c)	What are different methods of seasoning?	2 Marks	L1	CO2
	d)	Write the use of glass	2 Marks	L1	CO2
	e)	List out grades of cement available in market.	2 Marks	L1	CO3
	f)	What is the meaning of aggregate in construction?	2 Marks	L1	CO3
	g)	Define Abram's Law.	2 Marks	L2	CO4
	h)	List different types of NDT tests.	2 Marks	L1	CO4
	i)	Which test is used for durability of concrete?	2 Marks	L2	CO5
	j)	What is the principle of mix proportioning?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain methods of quarrying.	8 Marks	L2	CO1
	b)	Describe the characteristics of good building stones.	8 Marks	L2	CO1
		(OR)			
3.	a)	Illustrate the various methods used in manufacturing of bricks.	8 Marks	L2	CO1
	b)	Discuss briefly about the types of tiles.	8 Marks	L2	CO1

MODULE-II

4.	a)	List and explain the various methods of seasoning of timber.	8 Marks	L4	CO2
	b)	Summarize the various causes of decay of wood work and how its preservation is ensured.	8 Marks	L2	CO2
		(OR)			
5.	a)	Discuss the various materials used in low cost housing.	8 Marks	L4	CO2
	b)	In what way, the waste can be used as alternative building materials.	8 Marks	L2	CO2

MODULE-III

6.	a)	Classify Various types of tests on cement. Explain how to conduct normal consistency test on cement.	8 Marks	L4	CO3
	b)	List out various types chemical admixtures. How these admixtures are supporting to the environment.	8 Marks	L2	CO3
		(OR)			
7.	a)	Bring out the detailed classification of aggregates and physical properties of aggregates.	8 Marks	L2	CO3
	b)	Mention the different tests to be conducted on fine aggregate and explain about bulking of sand.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Discuss the factors affecting the workability in fresh concrete.	8 Marks	L4	CO4
	b)	Distinguish Segregation and Bleeding in concrete in detail.	8 Marks	L2	CO4

(OR)

9.	a)	Why compaction is required to concrete? Explain compaction methods by vibration.	8 Marks	L4	CO4
	b)	Explain how you estimate the quality of concrete by using ultrasonic pulse velocity test.	8 Marks	L4	CO4

MODULE-V

10.	a)	Write in detail about elasticity, creep and shrinkage of concrete.	8 Marks	L2	CO5
	b)	Write about durability of concrete.	8 Marks	L2	CO5

(OR)

11.	Design a M30 concrete mix using IS method of mix design for the following data: i) Maximum size of aggregate: 20 mm (Angular) ii) Workability: 125 mm slump. iii) Quality control: good iv) Type of exposure - Mild (R.C.C) v) Specific Gravity: a) Cement:3.15 b) Sand:2.63 c) CA: 2.66 vi) Water absorption: a) CA - 0.5% b) FA - 1.0% vii) Free surface moisture: a) CA - Nil b) FA - 2.2% viii) Sand confirms to Zone III grading Assume any other data required suitably.	16 Marks	L6	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) Regular Examinations, May – 2026

SENSORS AND TRANSDUCERS

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Illustrate about Observational Errors?	2 Marks	L1	CO1
	b)	List the static characteristics of transducers?	2 Marks	L1	CO1
	c)	Define Capacitive Sensors?	2 Marks	L1	CO2
	d)	What is the main principle behind the operation of an inductive sensor?	2 Marks	L1	CO2
	e)	What are the types of thermocouple?	2 Marks	L1	CO3
	f)	Explain the working principle of radiation sensors?	2 Marks	L1	CO3
	g)	What is torque, and how is it measured in mechanical systems?	2 Marks	L1	CO4
	h)	What is a strain gauge, and how does it work to measure strain?	2 Marks	L1	CO4
	i)	How do gyroscopes maintain accuracy over time, and what factors can cause drift?	2 Marks	L1	CO5
	j)	In what applications are resonant sensors most commonly used?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss briefly about the Generalized Measurement System with block diagram?	8 Marks	L2	CO1
	b)	Discuss the static characteristics of Transducer/Sensor?	8 Marks	L2	CO1

(OR)

3.	a)	Discuss the Statistical Analysis to minimize the errors?	8 Marks	L2	CO1
	b)	Illustrate briefly about i) Instrumental Error ii) Observational Error	8 Marks	L2	CO1

MODULE-II

4.	a)	Illustrate the basic function of a potentiometer.	8 Marks	L2	CO2
	b)	Describe the applications of capacitive sensors in modern technology. How are they utilized in fields such as automotive manufacturing, consumer electronics, and agriculture?	8 Marks	L2	CO2

(OR)

5.	a)	Discuss the types of resistive sensors and applications.	8 Marks	L2	CO2
	b)	Describe the role of ultrasonic sensors in robotics. How do they contribute to navigation, obstacle detection, and collision avoidance in robotic systems?	8 Marks	L2	CO2

MODULE-III

6.	a)	Discuss the impact of temperature gradients on cold junction compensation and how they affect the accuracy of thermocouple measurements.	8 Marks	L2	CO3
	b)	Illustrate about i) Velocity Sensors ii) Tachometers	8 Marks	L2	CO3

(OR)

7.	a)	Discuss briefly about i) Thermistors ii) RTD	8 Marks	L2	CO3
	b)	Explain the construction of RTD?	8 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss the applications of strain gauges in modern engineering and how they contribute to safety and reliability in structural monitoring?	8 Marks	L2	CO4
	b)	Evaluate the challenges associated with accurate torque measurement in high-speed applications and how these challenges are addressed.	8 Marks	L3	CO4

(OR)

9.	a)	Evaluate the applications of potentiometric sensors in the automotive industry, particularly in position sensing and feedback control systems.	8 Marks	L3	CO4
	b)	Evaluate the role of velocity sensors in controlling the speed of conveyor systems in automated manufacturing processes.	8 Marks	L3	CO4

MODULE-V

10.	a)	Discuss the role of SMART sensors in the Internet of Things (IoT) ecosystem and their impact on smart cities.	8 Marks	L2	CO5
	b)	Illustrate briefly about the SAW Sensor and its Applications	8 Marks	L2	CO5

(OR)

11.	a)	What is the principle of operation of an incremental encoder, and how does it measure position?	8 Marks	L2	CO5
	b)	What distinguishes an absolute encoder from an incremental encoder in terms of how it determines position?	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) Regular Examinations, May – 2026

SENSORS AND MEASURING INSTRUMENTS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define caliberation?	2 Marks	L1	CO1
	b)	Discuss about random Errors.	2 Marks	L2	CO1
	c)	What are the types of potentiometers?	2 Marks	L1	CO2
	d)	List the types of inductive sensors?	2 Marks	L1	CO2
	e)	List the applications of kelvins Bridge?	2 Marks	L1	CO3
	f)	What is the primary use of the Maxwell Bridge?	2 Marks	L1	CO3
	g)	What are the types of wave analyzers?	2 Marks	L1	CO4
	h)	What is the difference between a wave analyzer and a spectrum analyzer?	2 Marks	L2	CO4
	i)	What are the main applications of a Cathode Ray Tube?	2 Marks	L1	CO5
	j)	What is advantages of sampling oscilloscopes?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss briefly about the Generalized Measurement System with block diagram?	8 Marks	L1	CO1
	b)	Discuss the dynamic characteristics of Transducer/Sensor?	8 Marks	L2	CO1

(OR)

3.	a)	Discuss about the static Characteristics of Transducer/Sensor?	8 Marks	L2	CO1
	b)	Illustrate briefly about i) Limiting Error ii) Environmental Error.	8 Marks	L1	CO1

MODULE-II

4.	a)	Discuss the advantages and limitations of inductive sensors compared to capacitive and optical sensors in industrial automation applications?	8 Marks	L1	CO2
	b)	Describe the applications of capacitive sensors in modern technology. How are they utilized in fields such as automotive manufacturing, consumer electronics?	8 Marks	L2	CO2

(OR)

5.	a)	Discuss the types of resistive sensors and applications?	8 Marks	L2	CO2
	b)	Discuss the advantages and limitations of ultrasonic sensors compared to other distance measurement technologies like laser and infrared sensors.	8 Marks	L1	CO2

MODULE-III

6.	a)	Explain the working principle of the Schering Bridge and its application in capacitance and loss factor measurement?	8 Marks	L2	CO3
	b)	Compare the Hay's Bridge to the Maxwell Bridge in terms of measuring inductance?	8 Marks	L1	CO3

(OR)

7.	a)	Explain the working principle of the Wheatstone Bridge and how it is used to measure unknown resistances.	8 Marks	L1	CO3
	b)	Discuss the advantages of the Kelvin Bridge over the Wheatstone Bridge when measuring low resistances.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Compare and contrast the working principles of Analog and Digital Oscilloscopes?	8 Marks	L1	CO4
	b)	How do horizontal and vertical deflections contribute to the measurement of key signal parameters such as frequency, period, and amplitude?	8 Marks	L2	CO4

(OR)

9.	a)	Explain the working principle of a Cathode Ray Tube (CRT) and how it is used in oscilloscopes?	8 Marks	L2	CO4
	b)	What are the advantages and limitations of using a Sampling Oscilloscope for high-frequency signal analysis?	8 Marks	L1	CO4

MODULE-V

10.	a)	Explain the working principle of a seven-segment display and its typical applications?	8 Marks	L1	CO5
	b)	What are the advantages and disadvantages of using Plasma Display Panels over other display technologies such as LCD and LED?	8 Marks	L2	CO5

(OR)

11.	a)	Explain the process of converting BCD (Binary Coded Decimal) values to seven-segment display outputs?	8 Marks	L1	CO5
	b)	What are the key technical challenges that led to the decline of Plasma Display Panels in favor of LCD and OLED displays?	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) Regular Examinations, May – 2026

SEMICONDUCTOR DEVICES AND CIRCUITS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Computer Engineering , Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Draw diode's equivalent circuit and name the two components generally included in it.	2 Marks	L2	CO1
	b)	What is the application of a Zener diode	2 Marks	L1	CO1
	c)	Differentiate between series clipper and shunt clipper circuits	2 Marks	L2	CO2
	d)	On what parameters dose the efficiency of a rectifier depends.	2 Marks	L1	CO2
	e)	Explain the basic construction of a transistor	2 Marks	L1	CO3
	f)	Define the operating point of a transistor. Why is it important	2 Marks	L1	CO3
	g)	Write the brief classification of BJT	2 Marks	L1	CO3
	h)	List the applications of MOSFET	2 Marks	L2	CO3
	i)	What is an oscillator, and why is it used in electronic circuits	2 Marks	L1	CO4
	j)	Name two types of oscillators that use LC feedback circuits	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Briefly explain Avalanche break down and Zener break	8 Marks	L1	CO1
	b)	Summarize the formation of PN Junction diode	8 Marks	L1	CO1

(OR)

3.	a)	Explain the working of a Light Emitting Diode (LED) with energy band diagram. Mention its advantages and applications	10 Marks	L1	CO1
	b)	Write the diode equation in forward bias and reverse biased condition and list the parameters in the diode equation.	6 Marks	L1	CO1

MODULE-II

4.		Describe the working of a Full-wave rectifier with a circuit diagram, waveforms, and relevant equations. Discuss its efficiency and ripple factor.	16 Marks	L1	CO2

(OR)

5.	a)	A silicon diode has a saturation current of 7.5 μa at room temperature 300K. calculate the saturation current at 400K.	8 Marks	L3	CO2
	b)	Explain the Role of a Zener Diode in a Voltage Regulator Circuit	8 Marks	L1	CO2

MODULE-III

6.	a)	Describe the input and output characteristics of a transistor in the common-base configuration with relevant diagrams	10 Marks	L1	CO3
	b)	Summarize why operating point changes.	6 Marks	L1	CO3

(OR)

7.	a)	Explain stability factor for Fixed biased configuration	8 Marks	L1	CO3
	b)	Draw the input and output characteristics of CE configuration and explain.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Draw the transfer characteristics and drain characteristics of depletion MOSFET	6 Marks	L2	CO3
	b)	What is the importance of biasing in MOSFET amplifiers? Explain one method of biasing in detail	10 Marks	L1	CO3

(OR)

9.	a)	What is the threshold voltage of a MOSFET? Explain its significance with respect to the I-V characteristics	8 Marks	L1	CO3
	b)	How JFET act as voltage variable resistor, justify	8 Marks	L1	CO3

MODULE-V

10.	a)	Explain the operation of a phase-shift oscillator with a circuit diagram.	8 Marks	L1	CO4
	b)	What are the applications of phase shift oscillators? Highlight their key features and limitations	8 Marks	L1	CO4

(OR)

11.	a)	Compare Hartley and Colpitts oscillators in terms of circuit configuration, working principle, and applications	8 Marks	L2	CO4
	b)	Describe the working of a Wien bridge oscillator with a neat circuit diagram. Derive the condition for oscillation	8 Marks	L1	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) Regular Examinations, May - 2026

GENERATION OF ELECTRIC POWER

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define the term mass curve in the context of hydropower.	2 Marks	L1	CO1
	b)	Mention Various greenhouse gases commonly emitted from hydroelectric reservoirs.	2 Marks	L1	CO1
	c)	Classify nuclear reactors based on their coolant types.	2 Marks	L3	CO2
	d)	Suggest measures to reduce atmospheric pollution from power plants.	2 Marks	L2	CO2
	e)	Classify internal combustion engines based on their operation	2 Marks	L1	CO3
	f)	Mention four factors that should be considered when selecting a site for a gas turbine power plant.	2 Marks	L2	CO3
	g)	What is the primary purpose of a cogeneration system?	2 Marks	L1	CO4
	h)	List two methods of improving the power factor.	2 Marks	L2	CO4
	i)	What is maximum demand, and why is it important in power systems?	2 Marks	L1	CO5
	j)	Write the relationship between loss factor and load factor.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Draw and explain the layout of a typical power system, including generation, transmission, and distribution.	10 Marks	L2	CO1
	b)	Explain the factors influencing the site selection of hydro electric power plants.	6 Marks	L3	CO3

(OR)

3.		Draw a neat layout of a steam power plant and explain the function of each major component in detail.	16 Marks	L2	CO1

MODULE-II

4.		Draw and explain the general layout of a nuclear power station, highlighting its major components.	16 Marks	L3	CO2

OR)

5.	a)	Analyze the environmental impacts of nuclear power stations, focusing on radioactive emissions and their mitigation.	8 Marks	L3	CO2
	b)	What is a breeder reactor? Explain its working principle and significance in nuclear power generation.	8 Marks	L1	CO2

MODULE-III

6.	a)	Explain the concept of pumped storage plants and their role in energy storage and grid stability.	8 Marks	L2	CO3
	b)	Explain the factors influencing the site selection of diesel engine power plants.	8 Marks	L3	CO3

(OR)

7.		Describe the layout and essential components of a simple gas turbine power plant with neat sketch and also list the advantages and disadvantages.	16 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss the economic benefits of cogeneration in industrial applications.	8 Marks	L3	CO4
	b)	Discuss the advantages and limitations of each operational mode of cogeneration systems.	8 Marks	L3	CO4

(OR)

9.	a)	Explain the causes of low power factor in an electrical system.	8 Marks	L3	CO4
	b)	What are the environmental benefits of cogeneration compared to traditional power generation methods?	8 Marks	L3	CO4

MODULE-V

10.	a)	Derive the relationship between loss factor and load factor and explain its applications.	8 Marks	L3	CO5
	b)	Discuss the components of a two-part tariff with advantages and disadvantages.	8 Marks	L2	CO5

(OR)

11.	a)	Compare the effectiveness of two-part tariffs and three-part tariffs	8 Marks	L3	CO5
	b)	Define load factor and explain its significance in system efficiency and cost analysis.	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) Regular Examinations, May - 2026

ELECTRICAL CIRCUITS

[Electrical and Electronics Engineering]

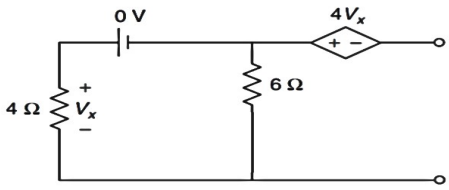
Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Two resistors $R_1 = 5\Omega$ and $R_2 = 10\Omega$ are connected in parallel. A current of 6A enters the parallel circuit. Find the current through R_1.	2 Marks	L3	CO1
	b)	If the length of a wire of resistance R is uniformly stretched to n times its original value, then determine the new resistance.	2 Marks	L3	CO1
	c)	Define peak factor and form factor for an AC waveform.	2 Marks	L2	CO2
	d)	A load takes 10kVA at a power factor of 0.8. Find the active power (P) and reactive power Q.	2 Marks	L3	CO2
	e)	Determine the Thevenin equivalent voltage and resistance for a circuit with a 12V source, a 4Ω resistor, and an 8Ω resistor in series.	2 Marks	L2	CO3
	f)	Determine the Norton's current for the circuit shown in figure	2 Marks	L3	CO3



	g)	An unbalanced star connected load carries the line currents as $I_R = 27.06\angle -8.65^o$, $I_Y = 19.7\angle -121.14^o$ and $I_B = 26.69\angle 128.36^o$. Determine the neutral current.	2 Marks	L3	CO4
	h)	A three-phase, 10 kW load is connected to a 415 V supply with a power factor of 0.9 lagging. Calculate the readings of the two wattmeters.	2 Marks	L3	CO4
	i)	Define self-inductance and mutual inductance.	2 Marks	L2	CO5
	j)	Explain the coefficient of coupling (K) and write its formula.	2 Marks	L2	CO5

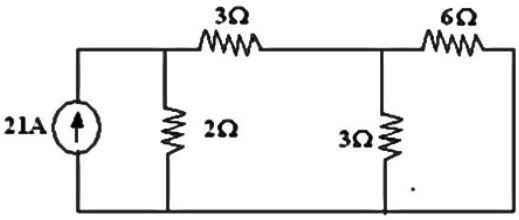
PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

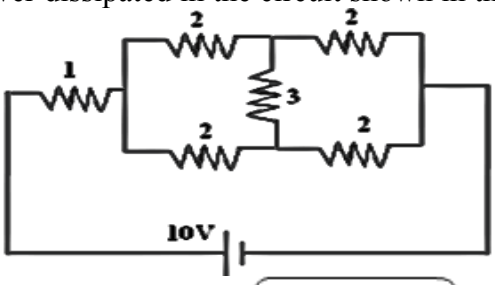
MODULE-I

2.	a)	What is the difference between an ideal source and a practical source? Draw the relevant characteristics of the above sources.	8 Marks	L2	CO1
	b)	Determine the current through 6 resistor and the power supplied by the current source for the circuit shown in figure.	8 Marks	L3	CO1



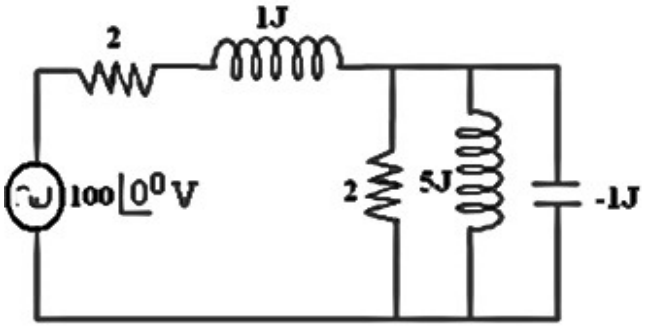
(OR)

3.	a)	Explain how voltage source with a source resistance can be converted into an equivalent current source.	8 Marks	L2	CO1
	b)	Find the total power dissipated in the circuit shown in the figure.	8 Marks	L3	CO1



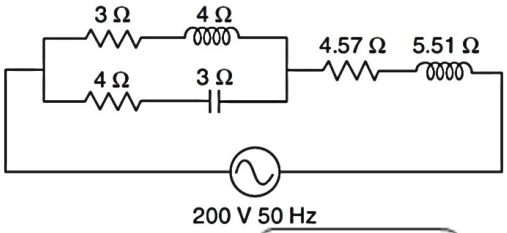
MODULE-II

4.	a)	Define the terms peak, peak to peak, average, RMS values and peak and form factor of sine wave.	8 Marks	L3	CO2
	b)	Find the power factor and complex power drawn by the circuit shown in the figure. Also draw the phasor diagram for the supply voltage and current.	8 Marks	L3	CO2



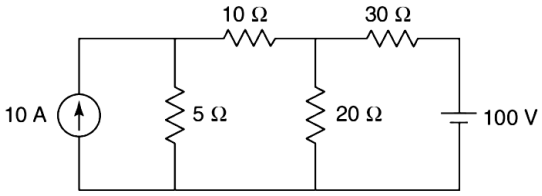
(OR)

5.	a)	Derive the relationships for bandwidth and half power frequencies of RLC series circuit.	8 Marks	L3	CO2
	b)	Find the total impedance, supply current and pf of the entire circuit.	8 Marks	L3	CO2

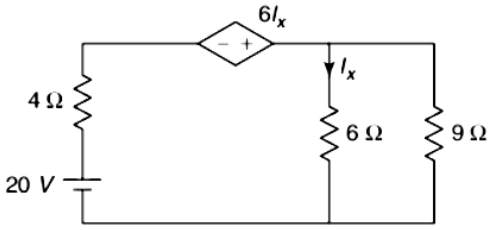


MODULE-III

6.	a)	Find the current in 20Ω resistor using superposition theorem.	8 Marks	L3	CO3

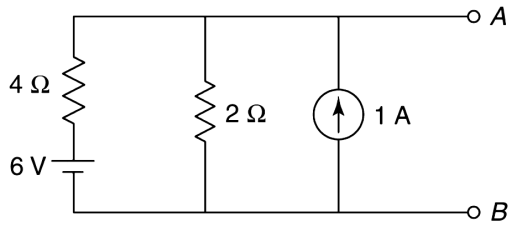


	b)	Find the current through 9Ω resistance shown in circuit using Thevenin's theorem.	8 Marks	L3	CO3



(OR)

7.	a)	Derive the condition for maximum power transfer for DC circuits.	8 Marks	L3	CO3
	b)	Find Millman's equivalent for the left of the terminals A-B in the figure below:	8 Marks	L3	CO3



MODULE-IV

8.	a)	What are the Advantages of a three-phase system?	8 Marks	L2	CO4
	b)	Three identical coils each having a resistance of 20 and a reactance of 20 are connected in Star across 440 V, 3 phase supply. Calculate for each case, line current and reading in each of the wattmeters connected to measure power.	8 Marks	L3	CO4

(OR)

9.	a)	A three-phase, 10 kVA load has a power factor of 0.342. The power is measured by the two-wattmeter method. Find the reading of each wattmeter when the i) power factor is leading, and the ii) power factor is lagging.	8 Marks	L2	CO4
	b)	Explain how a single wattmeter is used to measure reactive power with relevant equations and phasor diagram.	8 Marks	L3	CO4

MODULE-V

10.	a)	Derive the expression for the coefficient of coupling (K) and explain its significance.	8 Marks	L2	CO5
	b)	Two coils have $L_1 = 10H$ *and* $L_2 = 8H$. When the coefficient of coupling is $k = 0.6$, and the current in the first coil changes at a rate of $5\,A/s$, calculate then the emf induced in the second coil.	8 Marks	L3	CO5

(OR)

11.	a)	Discuss the significance of coefficient of coupling (K) in practical applications. What happens if K = 1 or K = 0?	8 Marks	L3	CO5
	b)	Two identical coupled coils have an equivalent inductance of 80 mH when connected series aiding, and 35 mH in series opposing. Find L_1, L_2, M, and k.	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) Regular Examinations, May - 2026

NETWORK ANALYSIS

[Electronics and Communication Engineering, Electronics and Computer Engineering, Electronics and Instrumentation Engineering,]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	A voltage source has internal impedance (4+j5) ohm. Find the load impedance for maximum power transfer	2 Marks	L1	CO1
	b)	What is super mesh?	2 Marks	L1	CO1
	c)	Give the relation between Vph and V_L, I_{ph} and I_L for a star circuit.	2 Marks	L1	CO2
	d)	Write the expressions for the power factor in a balanced three phase circuit.	2 Marks	L1	CO2
	e)	What is two port networks and indicate all variables?	2 Marks	L1	CO3
	f)	What are the four possible forms of transfer functions?	2 Marks	L1	CO3
	g)	What is the transient response of series RC circuits with D.C excitation?	2 Marks	L1	CO4
	h)	Sketch the initial and final conditions of circuit elements in transient analysis.	2 Marks	L1	CO4
	i)	Define cut-off frequency and pass band in filters.	2 Marks	L1	CO5
	j)	What are band pass and band rejection filters?	2 Marks	L1	CO5

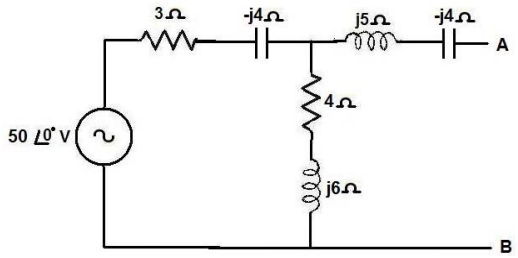
PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

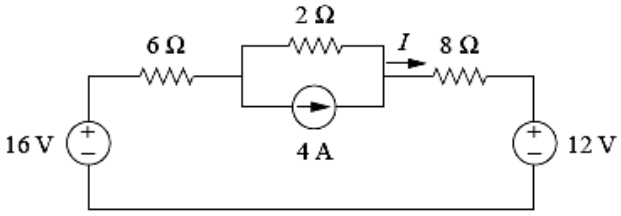
5 X 16 = 80 Marks

MODULE-I

2. a) Determine the Thevenin's equivalent for the figure. 8 Marks L4 CO1

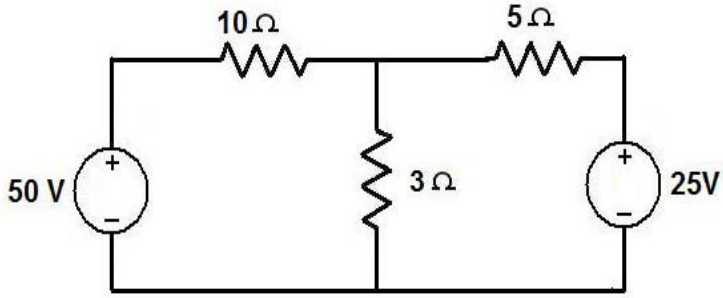


b) Find the current I in the circuit using the superposition principle 8 Marks L3 CO1

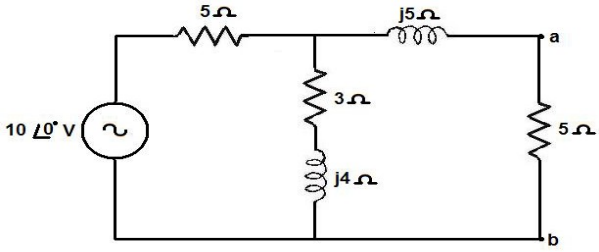


(OR)

3. a) Find the current in 3ohms resistor using superposition theorem. 8 Marks L3 CO1



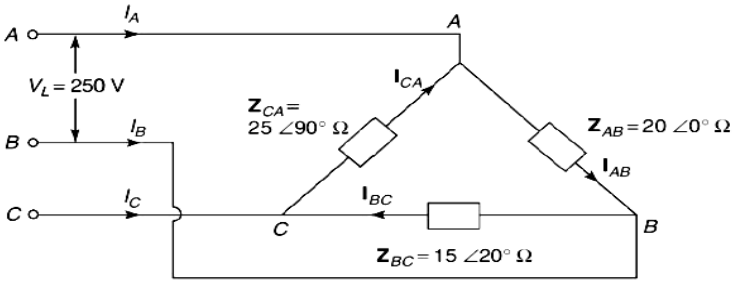
b) Find the current through branch a-b network using Thevenin's theorem. 8 Marks L3 CO1



MODULE-II

4. a) A balanced delta-connected load of impedance (8 − j6) ohms per phase is connected to a three-phase, 230 V, 50 Hz supply. Calculate (a) power factor, (b) line current, and (c) reactive power. 8 Marks L3 CO2

b) A three-phase supply with a line voltage of 250 V has an unbalanced delta-connected load as shown in Figure. Determine (a) phase currents, (b) line currents, (c) total active power and (d) total reactive power 8 Marks L3 CO2



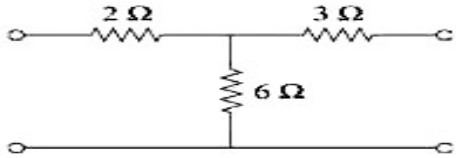
(OR)

5. a) Calculate the total power and readings of the two wattmeters connected to measure power in a three-phase balanced load, if the reactive power is 15 kVAR and load pf is 0.8 lagging. 8 Marks L3 CO2

b) Derive the expression for the wattmeter readings connected to measure the total power in a three-phase balanced circuit. 8 Marks L2 CO2

MODULE-III

6. a) Find theY-parameters for the following circuit. 8 Marks L3 CO3



b) Define reciprocity and symmetry for a generalized two port network and derive the conditions for reciprocity and symmetry in terms of impedance parameters. 8 Marks L2 CO3

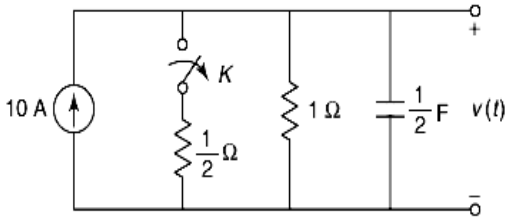
(OR)

7. a) Find the relationship between Z and h parameters. 8 Marks L2 CO3

	b)	In the two-port network compute h-parameters With (i) the output port short-circuited: V_1=25v,I_1=1 A ,I_2=2A (ii) With the input port open-circuited: V_1=10V,V_2=50V,I_2=2A	8 Marks	L3	CO3

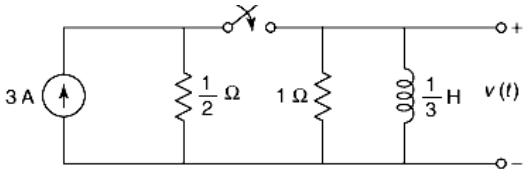
MODULE-IV

8.	a)	Explain the transient properties of a capacitor for DC and AC excitations.	8 Marks	L2	CO4
	b)	For the network shown in Fig., the switch is opened at t = 0. Find v (t) for t > 0.	8 Marks	L3	CO4



(OR)

9.	a)	Explain why the voltage across a capacitor cannot change instantaneously.	8 Marks	L2	CO4
	b)	In the network shown in Fig., the switch is closed at t = 0. Find v (t) for t > 0.	8 Marks	L3	CO4



MODULE-V

10.	a)	What is high pass filter? Explain the general configuration and parameters of a constant-K high pass filter.	8 Marks	L2	CO5
	b)	Give the analysis for the design of constant-K band pass filter.	8 Marks	L3	CO5

(OR)

11.	a)	Design an m-derived p-section low-pass filter having cut-off frequency of 1500 Hz, design impedance of 500 Ω and infinite attenuation frequency of 2000 Hz.	8 Marks	L2	CO5
	b)	Design the p-section of an m-derived high-pass filter having a design impedance of 600 W, cut-off frequency of 4 kHz and an infinite attenuation at 3.6 kHz.	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) Regular Examinations, May – 2026

ENGLISH FOR PROFESSIONALS

[Computer Science and Engineering (Data Science),
Computer Science and Engineering (Artificial Intelligence and Machine Learning)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Complete the statement using a suitable question tag. i) You've watched Iron Man 2, _____? ii) Don't forget to deliver this message to my brother,_____?	2 Marks	L1	CO2
	b)	Correct the usage of the modal in the sentence and give your explanation for your correction. The students can enter the examination hall 10 minutes prior to the commencement of the examination.	2 Marks	L1	CO2
	c)	Frame a 'Yes/No question' and a 'Wh-question' for the following statement: " Martian emerged from the cylinder, unscrewing the lid"	2 Marks	L1	CO2
	d)	Write the meaning of the following idiomatic expression. i) Just beating around the bush ii) Pick up the tab	2 Marks	L1	CO4
	e)	Write a one-word substitute for the description. i) A person who does not believe in the existence of God ii) A person who speaks many languages	2 Marks	L1	CO4
	f)	From which novel is the lesson Aliens extracted? Who is the author of that novel?	2 Marks	L1	CO1
	g)	Who founded Lens Technology? And who were its major customers?	2 Marks	L1	CO1
	h)	Fill in the blank using the given verb in the correct tense. When we reached the class, the teacher _____ (already start) the lesson.	2 Marks	L1	CO2
	i)	Read the sentence below and make the necessary changes. Though he is poor but he is happy.	2 Marks	L1	CO2
	j)	Write any two FAQs commonly asked in interviews and provide appropriate answers.	2 Marks	L1	CO1

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Write the meaning of the following idiomatic expressions. i) Blue-eyed boy ii) At the eleventh hour iii) A red-letter day iv) Don't cry over a split milk v) Pay an arm and a leg vi) Flog a dead horse vii) To be in hot water viii) In seventh heaven	8 Marks	L1	CO4
	b)	Write a review of a laptop that you have recently purchased, highlighting its features, performance, advantages, and limitations.	8 Marks	L1	CO5

(OR)

3.	a)	Discuss the importance of identifying main points and secondary points in classroom communication, and explain effective strategies for taking notes during a lecture.	8 Marks	L2	CO1
	b)	Explain and illustrate the scientific principles underlying superhero abilities, using relevant examples.	8 Marks	L2	CO1

MODULE-II

4.	a)	Do you believe in the existence of aliens in other planets? Support your answer with scientific reasoning and personal reflections	8 Marks	L2	CO1
	b)	Describe a recent exhibition you attended, highlighting its key features and your impressions.(200-250 words)	8 Marks	L2	CO5

(OR)

5.	a)	Explain and illustrate the different channels of communication, supporting your answer with examples.	8 Marks	L2	CO1
	b)	Provide eight one-word substitutes of your choice and illustrate their meanings with examples.	8 Marks	L2	CO2

MODULE-III

6.	a)	Define scanning and skimming, and explain their significance as effective reading strategies for extracting information from a text.	8 Marks	L2	CO4
	b)	Fill in the blanks using verbs in the correct tense. My uncle _____ (visit) Ooty every summer season. Telugu ____ (speak) in both Andhra Pradesh and Telangana. My cousin____ (live) in Australia for the last five years. We_____ (learn) German in Berlin in 2020. By next June, I___(complete) ten years of service in this company. The boys_____ (quarrel) when I reached there. vii) My sister _____ (complete) painting a picture just now. viii) He usually _____ (get) up at 9'O clock in the morning.	8 Marks	L1	CO2

(OR)

7.	a)	Discuss the barriers to effective communication, illustrating your answer with suitable examples.	8 Marks	L2	CO1
	b)	Raman's discovery had caught the attention of the world. According to Raman, why is the sea blue in color?	8 Marks	L1	CO1

MODULE-IV

8.	a)	Define an 'if-clause' and describe the various types of conditional sentences, giving two examples for each.	8 Marks	L1	CO2
	b)	Compare voice-based modes of communication and video-based modes of communication.	8 Marks	L2	CO1

(OR)

9.	a)	Write a descriptive account explaining the steps involved in unboxing and setting up a new Android smart phone for use.	8 Marks	L2	CO5
	b)	Discuss in detail, what happens in the body when you consume soft drinks? List foods that contain high amounts of sodium.	8 Marks	L2	CO1

MODULE-V

10.	a)	Select any eight modal verbs of your choice and create original sentences to show how they are used in everyday communication.	8 Marks	L1	CO2
	b)	Examine the major factors that led to Ms. Zhou's success and discuss their significance.	8 Marks	L3	CO1

(OR)

11.	a)	Draft a formal proposal to organize Women's Day celebration in MBU, outlining objectives, activities, and requirements.	8 Marks	L1	CO5
	b)	Imagine you are selling used electronic gadgets like a smart phone, laptop, and smart watch on OLX. Write a description that makes them appealing to	8 Marks	L2	CO5

buyers.

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) Regular Examinations, May - 2026

ENGLISH FOR PROFESSIONALS

[Electronics and Communication Engineering, Electronics and Computer Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Write the suitable question tags to the following: i) Superheroes always save the city, ___? ii) Teamwork makes superheroes stronger, ___?	2 Marks	L1	CO2
	b)	Define non-verbal communication and give an example.	2 Marks	L1	CO1
	c)	Describe "small talk" in one or two sentences.	2 Marks	L2	CO1
	d)	Fill in the blank with the correct article and explain why: "He gave me_____advice."	2 Marks	L1	CO2
	e)	Name two types of barriers to effective communication.	2 Marks	L1	CO1
	f)	What is skimming in reading?	2 Marks	L1	CO4
	g)	Identify the type of if-clause and explain: "If it rains tomorrow, we will stay home."	2 Marks	L1	CO2
	h)	Mention two technology-based modes of communication used in healthcare and give examples.	2 Marks	L1	CO1
	i)	Define "proposal" in one sentence and give one example from business.	2 Marks	L1	CO5
	j)	Correct the usage of the modal in the following sentence and explain your correction: "Students can to finish the project on time."	2 Marks	L2	CO2

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the superhero's journey from origin to becoming a hero, highlighting major events and challenges.	8 Marks	L2	CO1
	b)	Elucidate how idiomatic expressions improve spoken and written communication, using superhero examples.	8 Marks	L2	CO4

(OR)

3.	a)	Illustrate with examples how superheroes communicate verbally and non-verbally during fights.	8 Marks	L2	CO1
	b)	Construct an essay on how superheroes inspire scientific inventions in real life.	8 Marks	L4	CO5

MODULE-II

4.	a)	In a city where a strange cylinder lands, how does the government use communication channels to alert people? Demonstrate the channels with one example each.	8 Marks	L2	CO1
	b)	Analyze how listening for main points helps in classroom talks and group work.	8 Marks	L4	CO1

(OR)

5.	a)	Construct a 100-word small talk conversation between you and a new neighbor about aliens.	8 Marks	L3	CO1
	b)	Provide eight one-word substitutes for daily life phrases. Use each in a simple sentence.	8 Marks	L2	CO4

MODULE-III

6.	a)	Outline a brief essay about "C.V. Raman's Life Journey and Major Accomplishments”.	8 Marks	L2	CO5
	b)	Illustrate different past tense types with examples from Raman's discovery.	8 Marks	L2	CO2

(OR)

7.	a)	Draft a descriptive paragraph on why clear pronunciation matters for good communication.	8 Marks	L1	CO3
	b)	How identifying main parts from a speaker's description helps overcome listening barriers in classroom discussions.	8 Marks	L1	CO1

MODULE-IV

8.	a)	Explain zero, first, and second if-clauses with two healthy eating examples each.	8 Marks	L2	CO2
	b)	Write a dialogue where one student advises another on balanced diet choices during lunch.	8 Marks	L1	CO1

(OR)

9.	a)	Discuss the advantages and disadvantages of healthcare apps.	8 Marks	L2	CO5
	b)	Examine the impact of junk food on health and provide evidence to justify that it leads to long-term health issues.	8 Marks	L4	CO5

MODULE-V

10.	a)	Develop a proposal to start a student entrepreneurship club in your university.	8 Marks	L3	CO5
	b)	Demonstrate eight ways to show business ethics in real workplace scenarios.	8 Marks	L2	CO5

(OR)

11.	a)	Explain the role of technical communication in entrepreneurship.	8 Marks	L2	CO1
	b)	Write a note on “How to give effective answers during an interview.”	8 Marks	L1	CO1

A

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) Regular Examinations, May - 2026

ENGLISH FOR PROFESSIONALS

[Civil Engineering, Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Write the meaning of the following idiomatic expression. Break the ice	2 Marks	L1	CO4
	b)	Write a meaningful sentence with the following modal verb. Could	2 Marks	L1	CO2
	c)	Write a meaningful sentence with the following idiomatic expression. Under the weather	2 Marks	L1	CO4
	d)	Find one-word substitute for this description. Something that is certain to happen and cannot be avoided.	2 Marks	L1	CO4
	e)	Find the word for the following one-word substitute. No longer produced or used.	2 Marks	L1	CO4
	f)	Fill the blank with a suitable verb form. Sunita_____ (work) in SBI as PO since May 2025.	2 Marks	L1	CO2
	g)	Identify the tense of the underlined verb in the following sentence. Ritu cut her eighteenth birthday cake in the hostel canteen yesterday.	2 Marks	L1	CO2
	h)	Correct the error(s), if any Each of the players were given a medal.	2 Marks	L1	CO2
	i)	Fill in the blanks using suitable forms of the words given in brackets. If I___ (be) a bird, I would fly high in the sky.	2 Marks	L1	CO2
	j)	Fill in the blank with correct modal verb. As I am suffering from fever, I ____ take medicine.	2 Marks	L1	CO2

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Many superheroes themselves are scientists' Explain in detail.	8 Marks	L2	CO1
	b)	**Write the meaning of the following idiomatic expressions**. 1. Costs an arm and a leg 2. Every cloud has a silver lining 3. Kill two birds with one stone 4. Let the cat out of the bag 5. Once in a blue moon 6. Through thick and thin 7. Burn the midnight oil 8. Method to my madness	8 Marks	L1	CO4

(OR)

3.	a)	**Complete the following statements using suitable question tags.** 1. It is raining outside, ? 2. You aren't angry with me, ? 3. She has finished her work, ? 4. It won't take long to fix, ? 5. You've been to Paris before, ? 6. The cake tastes delicious, ? 7. They don't like spicy food, ? 8. The bus hasn't arrived yet, ?	8 Marks	L1	CO2
	b)	Explain the significance of non-verbal communication in professional life with suitable examples.	8 Marks	L2	CO1

MODULE-II

4.	a)	**Find one-word substitutes for the following descriptions:** 1. Lasting for a very short time. 2. Government by the people, of the people, and for the people. 3. Something that is not connected with religious or spiritual matters. 4. Arranged in the order in which events occurred. 5. Not clear enough to be read. 6. A person whose name is not known or made public. 7. Able to be easily carried or moved. 8. Happening four times every year.	8 Marks	L1	CO2
	b)	Discuss the writer's first encounter with the alien with reference to "The Cylinder Opens".	8 Marks	L2	CO1

(OR)

5.	a)	Discuss various channels of communication in detail.	8 Marks	L2	CO1
	b)	Describe a recent exhibition you attended, highlighting its key features and your C. (200-250 words)	8 Marks	L2	CO5

MODULE-III

6.	a)	**Fill in the blanks using verbs in the correct tense.** 1. When my father came home, we ____ FIFA. (watch) 2. I ___ out with my friends yesterday. (go) 3. While Tim ____ towards the field, he saw his friends. (walk) 4. The flight ___ one hour before. (leave) 5. The teacher ___ us about dinosaurs since yesterday morning. (teach) 6. ____ to Las Vegas last week. (drive) 7. The actress ___ next to the actor, before he called her. (stand) 8. The thief ____ into the house last night. (break)	8 Marks	L1	CO2
	b)	Explain the Raman effect with spectrum colour observations.	8 Marks	L2	CO1

(OR)

7.	a)	What are the different types of Barriers to communication? Explain with suitable examples.	8 Marks	L2	CO1
	b)	Define scanning and skimming, and explain their significance as effective reading strategies for extracting information from a text	8 Marks	L1	CO4

MODULE-IV

8.	a)	Define an 'if-clause' and describe the various types of conditional sentences, giving two examples for each.	8 Marks	L1	CO2
	b)	Compare voice-based modes of communication and video-based modes of communication.	8 Marks	L2	CO1

(OR)

9.	a)	Illustrate intonation in statements and orders with examples.	8 Marks	L2	CO4
	b)	"Processed foods and sugary drinks affect our health." Illustrate the effects with suitable examples.	8 Marks	L2	CO1

MODULE-V

10.	a)	Draft a formal proposal to organize Engineer's Day celebration in MBU, outlining objectives, activities, and requirements.	8 Marks	L1	CO5
	b)	You are planning to buy a second-hand car online. Write a detailed description of that.	8 Marks	L2	CO5

(OR)

11.	a)	**Correct the errors in the use of modals in the following sentences:** 1. You should to finish your homework before dinner. 2. We musted leave early because of the storm. 3. He might comes to the party later tonight. 4. They could not found their keys anywhere. 5. You ought not smoke in the hospital. 6. I will can help you with your project tomorrow. 7. May you please pass me the salt? 8. She must has forgotten about the meeting.	8 Marks	L1	CO2
	b)	Ms. Zhou is the world's one of the richest self-made women. Discuss her rags to riches journey.	8 Marks	L1	CO1

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) Regular Examinations, May - 2026

PROFESSIONAL ETHICS AND HUMAN VALUES

[Electronics and Communication Engineering, Electronics and Computer Engineering, Electronics and Instrumentation Engineering, Computer Science and Engineering, Computer Science and Engineering (Cyber Security), Information Technology, Computer Science and Engineering (Cloud Computing), Computer Science and Engineering (DevOps), Computer Science and Engineering (Artificial Intelligence and Data Science)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Explain the concept of moral autonomy in the context of engineering ethics.	2 Marks	L2	CO1
	b)	Distinguish between micro-ethics and macro-ethics.	2 Marks	L2	CO1
	c)	Define virtue ethics and mention its main focus in moral decision-making.	2 Marks	L1	CO2
	d)	Mention two steps involved in resolving a moral dilemma.	2 Marks	L2	CO2
	e)	Outline the varieties of Standards.	2 Marks	L1	CO3
	f)	What characterize engineering experimentation?	2 Marks	L1	CO4
	g)	Describe confidentiality.	2 Marks	L1	CO4
	h)	Describe human rights.	2 Marks	L2	CO4
	i)	List the acknowledgment of human values.	2 Marks	L1	CO5
	j)	Identify the principles of socially and ecologically responsible engineering.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss the variety of moral issues faced by engineers, differentiating between micro-ethical and macro-ethical problems.	8 Marks	L2	CO1
	b)	Analyze the importance of normative inquiry in ethical decision-making.	8 Marks	L2	CO1

(OR)

3.	a)	Explain the types of ethical inquiry with examples.	8 Marks	L2	CO1
	b)	Explain the concept of moral autonomy and its importance in engineering profession.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the concept of virtue ethics. How does it differ from duty-based and consequence-based ethical theories?	8 Marks	L2	CO2
	b)	Define profession and professionalism. Explain the characteristics that distinguish a profession from an occupation.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the difference between self-interest and selfishness.	8 Marks	L2	CO2

	b)	A civil servant manipulates data to satisfy political pressure. Discuss how integrity and self-respect are affected.	8 Marks	L3	CO2

MODULE-III

6.	a)	Tabulate types of Industrial standards and their purposes with examples?	8 Marks	L2	CO3
	b)	How might conscientiousness influence someone's behavior in the workplace or school?	8 Marks	L1	CO3

(OR)

7.	a)	How can engineers ensure responsible experimentation? Discuss the ethical code guiding engineers in their professional conduct	8 Marks	L3	CO3
	b)	What are the key responsibilities of the law in the field of engineering?	8 Marks	L3	CO3

MODULE-IV

8.	a)	What are the main components of risk-benefit analysis, and how do they interact to guide decision-making?	8 Marks	L1	CO4
	b)	What does collective bargaining involve, and how is the process generally carried out?	8 Marks	L2	CO4

(OR)

9.	a)	How can IPR be applied to safeguard inventions or artistic creations in real-world contexts?	8 Marks	L3	CO4
	b)	How would you describe the importance of collegiality and loyalty in professional or personal relationships?	8 Marks	L2	CO4

MODULE-V

10.	a)	How would you explain the importance of competence as an ethical standard in professional practice?	8 Marks	L2	CO5
	b)	What practical steps can individuals or communities take to move closer to a universal human order?	8 Marks	L3	CO5

(OR)

11.	a)	Evaluate the significance of holistic technology in the current context, providing various examples?	8 Marks	L4	CO5
	b)	Summarize socially and ecologically responsible engineers?	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) Regular Examinations, May – 2026

BASIC ENGINEERING MECHANICS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is meant by moment of a force? How will you explain it mathematically?	2 Marks	L1	CO1
	b)	Find the resultant of two forces equal to 50 N and 30 N acting at an angle of 60°.	2 Marks	L1	CO1
	c)	In a statically determinate plane truss, the number of joints (j) and number of members (m) are related by _____	2 Marks	L1	CO2
	d)	Differentiate method of joints from method of sections.	2 Marks	L1	CO2
	e)	Explain the limiting friction.	2 Marks	L1	CO3
	f)	Briefly explain the terms ‘ Co-efficient of friction’ and ‘Angle of friction’.	2 Marks	L1	CO3
	g)	What is Area moment of Inertia and Mass moment of Inertia	2 Marks	L1	CO4
	h)	Briefly discuss Parallel axis theorem.	2 Marks	L1	CO4
	i)	Explain Impulse – Momentum approach to solve kinetics problem.	2 Marks	L1	CO5
	j)	Briefly explain Simple Harmonic Motion.	2 Marks	L1	CO5

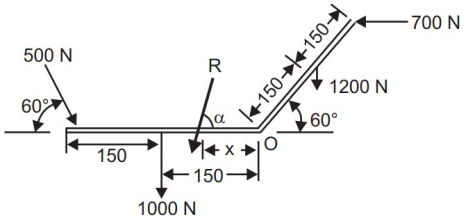
PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

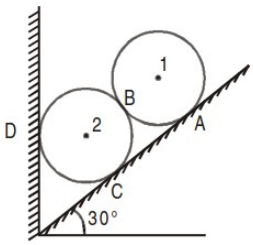
MODULE-I

2. The system of forces acting on a bell crank is shown in following figure. Determine the magnitude, direction and the point of application of the resultant. — 16 Marks, L2, CO1



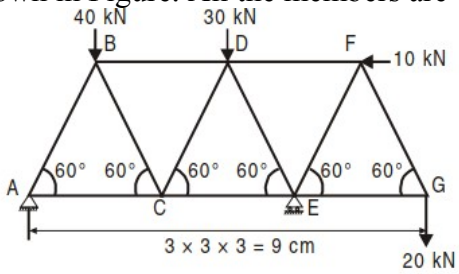
(OR)

3. Two cylinder of diameters 100 mm and 50 mm, weighing 200 N and 50N, respectively are placed in a trough as shown in following figure. Neglecting friction, find the reactions at contact surfaces 1, 2, 3 and 4. — 16 Marks, L2, CO1



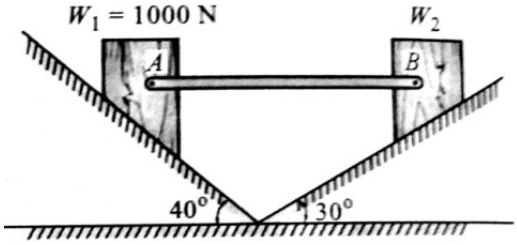
MODULE-II

4. Analyze the truss shown in Figure. All the members are of 3 m length. 16 Marks L2 CO2



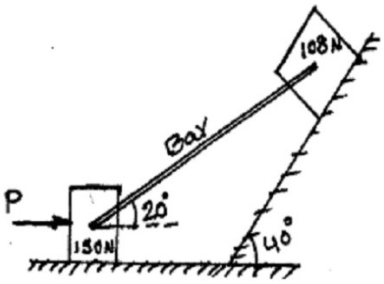
(OR)

5. Two blocks W_1 and W_2 resting on two inclined planes are connected by a horizontal bar AB as shown in figure. If W1 equals 1000N, determine the maximum value of W2 for which the equilibrium can exist. The angle of limiting friction is 200 at all rubbing faces. 16 Marks L3



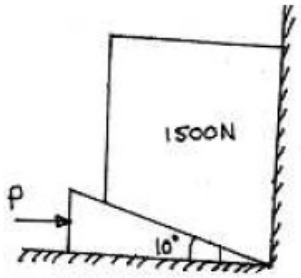
MODULE-III

6. A 108 N block is held on a 400 incline by a bar attached to a 150 N block on a horizontal plane shown in following figure. The bar which is fastened by smooth pins at each end is inclined 200 to the horizontal. The coefficient of friction between each block and its plane is 0.325. For what horizontal force P, applied to 150 N block will motion to the right be impending? 16 Marks L3 CO3



(OR)

7. A block overlying a 100 wedge on a horizontal floor and leaning against a vertical wall and weighing 1500N is to be raised by applying a horizontal force to the wedge. Assuming the coefficient of friction to be 0.3, determine the minimum horizontal force to be applied to raise the block as shown in the Figure. 16 Marks L3 CO3

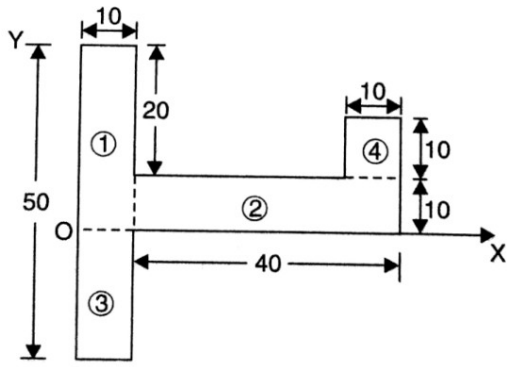


MODULE-IV

8.	Derive an equation for moment of inertia of a Quarter circle.	16 Marks	L2	CO4

(OR)

9.	Locate the Center of gravity of the area as shown in figure with respect to coordinate axes. All dimensions are in mm.	16 Marks	L2	CO4



MODULE-V

10.	A stone, dropped from a certain height, can reach the ground in 5s. It is stopped after 3 seconds of its fall and then allowed to fall again. Find the time taken by the stone to reach the ground for the remaining distance.	16 Marks	L2	CO5

(OR)

11.	A simple pendulum of amplitude 4° performs 24 oscillations in one minute. Find i) length of the pendulum ii) maximum acceleration of the bob, iii) maximum linear velocity of the bob; and iv) maximum angular velocity of the bob.	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) Regular Examinations, May - 2026

MATERIAL SCIENCE ENGINEERING

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	State the Hume Rothery rules for the formation of substitutional solid solutions.	2 Marks	L1	CO1
	b)	Sketch eutectic reaction in the Iron–Iron Carbide diagram.	2 Marks	L2	CO1
	c)	Define vacuum hardening.	2 Marks	L1	CO2
	d)	What is the significance of the critical cooling rate in heat treatment?	2 Marks	L1	CO2
	e)	List the types of stainless steels based on microstructure.	2 Marks	L1	CO3
	f)	Why does nodular cast iron possess higher ductility than gray cast iron?	2 Marks	L1	CO3
	g)	List any two alloying elements used in copper alloys.	2 Marks	L1	CO4
	h)	Why are nickel alloys preferred for high-temperature applications?	2 Marks	L1	CO4
	i)	Classify composite materials based on matrix phase.	2 Marks	L1	CO5
	j)	Why do ceramic materials exhibit high compressive strength but low tensile strength?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the necessity of alloying.	8 Marks	L2	CO1
	b)	Outline Hume Rothery rules for solid solution formation.	8 Marks	L2	CO1

(OR)

3.	a)	Illustrate the Iron–Iron carbide diagram. Discuss the reactions.	8 Marks	L2	CO1
	b)	Construct and interpret the application of the lever rule in the phase diagram using a suitable example.	8 Marks	L2	CO1

MODULE-II

4.	a)	Analyze the microstructure for different cooling rates using CCT diagram.	8 Marks	L4	CO2
	b)	Compare TTT and CCT diagrams.	8 Marks	L2	CO2

(OR)

5.	a)	Explain vacuum hardening.	8 Marks	L2	CO2
	b)	Explain plasma hardening.	8 Marks	L2	CO2

MODULE-III

6.	a)	Analyze the suitability of Hadfield manganese steel for crusher jaw applications with reference to its composition, microstructure, work-hardening mechanism, and mechanical properties.	8 Marks	L4	CO3
	b)	Explain why tool steels are suitable for cutting and forming operations with reference to their composition and properties.	8 Marks	L2	CO3

(OR)

7.	a)	Analyze the specification system of steels and explain how you would interpret a given steel designation (such as IS/SAE/AISI grade) to determine its chemical composition and probable applications.	8 Marks	L3	CO3
	b)	Explain why low alloy steels exhibit improved strength and hardenability compared to plain carbon steels, with reference to alloying elements and their effects.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Compare aluminum and titanium alloys.	8 Marks	L2	CO4
	b)	Compare copper and magnesium alloys.	8 Marks	L2	CO4

(OR)

9.	a)	Select suitable non-ferrous alloy for aerospace application with justification.	8 Marks	L3	CO4
	b)	Explain why nickel alloys are suitable for high temperature applications with reference to their properties.	8 Marks	L2	CO4

MODULE-V

10.	a)	Compare ceramics and polymers.	8 Marks	L2	CO5
	b)	Analyze suitability of composites for structural applications.	8 Marks	L4	CO5

(OR)

11.	a)	Differentiate PMC, CMC and MMC.	8 Marks	L2	CO5
	b)	Select suitable composite for aerospace application with justification.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) Regular Examinations, May – 2026

MANUFACTURING TECHNOLOGY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define pattern making.	2 Marks	L1	CO1
	b)	Mention any two types of patterns.	2 Marks	L1	CO1
	c)	What is sheet metal forming?	2 Marks	L1	CO2
	d)	Differentiate between blanking and piercing.	2 Marks	L2	CO2
	e)	What is weld bead?	2 Marks	L1	CO3
	f)	Mention any two welding defects.	2 Marks	L1	CO3
	g)	Define sintering.	2 Marks	L1	CO4
	h)	State two applications of powder metallurgy.	2 Marks	L2	CO4
	i)	Define blow molding.	2 Marks	L1	CO5
	j)	Mention one product made by blow molding.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the steps involved in the casting process.	8 Marks	L3	CO1
	b)	Discuss the design considerations of a gating system.	8 Marks	L4	CO1
		(OR)			
3.	a)	Explain the solidification of alloys and its effect on casting quality.	8 Marks	L4	CO1
	b)	Explain casting defects and their remedies.	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain principles of rolling process.	8 Marks	L3	CO2
	b)	Analyze forces involved in rolling process.	8 Marks	L4	CO2
		(OR)			
5.	a)	Explain extrusion process and its characteristics.	8 Marks	L3	CO2
	b)	Compare extrusion and wire drawing processes.	8 Marks	L4	CO2

MODULE-III

6.	a)	Classify welding processes and explain arc welding.	8 Marks	L3	CO3
	b)	Explain V–I characteristics of arc welding with sketch.	8 Marks	L3	CO3
		(OR)			
7.		Explain welding defects, their causes and remedies.	16 Marks	L2	CO3

MODULE-IV

8.	a)	Classify ceramic materials and state their applications.	8 Marks	L2	CO4
	b)	Explain ceramic forming techniques.	8 Marks	L3	CO4
		(OR)			
9.	a)	Explain powder metallurgy process with steps involved.	8 Marks	L3	CO4
	b)	Discuss advantages and limitations of powder metallurgy.	8 Marks	L4	CO4

MODULE-V

10.	a)	Explain classification of plastics based on structure.	8 Marks	L2	CO5
	b)	Describe injection molding process with neat sketch.	8 Marks	L3	CO5
		(OR)			
11.	a)	Explain thermoforming process.	8 Marks	L3	CO5
	b)	Compare thermoforming and blow molding processes.	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) Regular Examinations, May – 2026

CALCULUS AND TRANSFORMATION TECHNIQUES

[Computer Science and Engineering (Artificial Intelligence and Machine Learning), Computer Science and Engineering (Data Science).]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Find the derivative of $f(x) = x^3 - 3x^2 - x + 3$ with respect to x.	2 Marks	L1	CO1
	b)	State the Maclaurin series for f(x).	2 Marks	L1	CO1
	c)	State two properties of the Jacobian matrix.	2 Marks	L1	CO2
	d)	Find the critical points of $f(x, y) = x^2 - y^2$.	2 Marks	L2	CO2
	e)	Find the Laplace transform of $t^2 + 3t + 5$	2 Marks	L1	CO3
	f)	State the Laplace transform of periodic functions	2 Marks	L1	CO3
	g)	State the linearity property of the inverse Laplace transform.	2 Marks	L1	CO4
	h)	Find the inverse Laplace transform of $\frac{s^2}{(s-4)^4}$	2 Marks	L1	CO4
	i)	Estimate Fourier sine transform of $\frac{1}{x}$.	2 Marks	L1	CO5
	j)	Find a_0 of the Fourier series for the function $f(x) = \lvert x \rvert$ in $(-\pi, \pi)$.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Prove that $\frac{b-a}{\sqrt{1-a^2}} < \sin^{-1} b - \sin^{-1} a < \frac{b-a}{\sqrt{1-b^2}}$ where $a < c < b < 1$ using Lagrange's mean value theorem.	8 Marks	L2	CO1
	b)	Verify Cauchy's mean value theorem for the function $f(x) = e^x$ and $g(x) = e^{-x}$ in the interval $[a, b]$.	8 Marks	L3	CO1
		(OR)			
3.	a)	Obtain the Maclaurin's series expansion of the following i) e^x ii) $\cosh x$.	8 Marks	L3	CO1
	b)	Verify the Taylor's theorem for $f(x) = (1-x)^{\frac{5}{2}}$ with Lagrange's form of remainder up to 3 terms in the interval $[0,1]$.	8 Marks	L2	CO1

MODULE-II

4.	a)	Find the minimum value of the function $x^2 + y^2 + z^2$ if $xyz = a^3$.	8 Marks	L2	CO2
	b)	A rectangular box open at the top is to have volume of 32 cubic feet, find the dimensions of the box requiring least material for its construction (Volume $V = xyz$, surface area $S = xy = 2yz = 2zx$).	8 Marks	L2	CO2
		(OR)			
5.	a)	If $u = \frac{x+y}{1-xy}$ and $\theta = \tan^{-1}x + \tan^{-1}y$, then find $\frac{\partial(u,\theta)}{\partial(x,y)}$.	8 Marks	L3	CO2
	b)	Find the stationary points of $u(x,y) = \sin x \sin y \sin(x+y)$ where $0 < x < \pi, 0 < y < \pi$ and find the maximum u.	8 Marks	L2	CO2
		MODULE-III			
6.	a)	Find the Laplace transform for $f(t) = \sin at - at\cos at$.	8 Marks	L2	CO3
	b)	Find the Laplace transform for $e^{4t}\cos 3t \sin 2t$	8 Marks	L2	CO3
		(OR)			
7.	a)	Evaluate the Laplace transform of $\int_0^t \frac{1-e^{-2t}}{t}dt$.	8 Marks	L5	CO3
	b)	Find $L\left[e^{-2t}\frac{\sin 2t \cos 3t}{t}\right]$.	8 Marks	L3	CO3
		MODULE-IV			
8.	a)	Solve the following differential equation using Laplace transform $(D^2 - 2D + 1)y = t^2e^t$. Given $y(0) = 2$ *and* $Dy(0) = 3$.	8 Marks	L2	CO4
	b)	Find $L^{-1}\left[\frac{2s-3}{(s-2)^2(s-1)}\right]$	8 Marks	L2	CO4
		(OR)			
9.	a)	Find the Inverse Laplace transform of the following i) $L^{-1}\left[\frac{s-2}{(s-2)^2+8}\right]$ ii) $L^{-1}\left[\frac{s^2-3s+4}{s^3}\right]$	8 Marks	L3	CO4
	b)	By using convolution theorem, find $L^{-1}\left[\frac{1}{(s+2)(s+1)}\right]$.	8 Marks	L2	CO4
		MODULE-V			
10.	a)	Find the Fourier series for $f(x) = e^x$ defined in the interval.	8 Marks	L3	CO5
	b)	Expand $f(x) = x\sin x$ as a Fourier Series in the interval $0 < x < 2\pi$ deduce that to $\sum_{n=2}^{\infty}\frac{1}{n^2-1} = \frac{3}{4}$.	8 Marks	L2	CO5
		(OR)			
11.	a)	Find the Half-range cosine series $f(x) = \cos x$ in the interval $(0,\pi)$.	8 Marks	L3	CO5
	b)	Examine the given function is even or odd and hence obtain Fourier series for the function $f(x) = x\sin x$ in $(-\pi,\pi)$.	8 Marks	L3	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) Regular Examinations, May – 2026

CALCULUS AND TRANSFORMATION TECHNIQUES

[Computer Science and Engineering, Computer Science and Engineering (Cyber Security), Information Technology, Computer Science and Engineering (Cloud Computing), Computer Science and Engineering (DevOps), Computer Science and Engineering (Artificial Intelligence and Data Science)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	State Rolle's Theorem.	2 Marks	L1	CO1
	b)	State Lagrange's Theorem.	2 Marks	L1	CO1
	c)	If $x = r\cos\theta$, $y = r\sin\theta$, find $\frac{\partial(x,y)}{\partial(r,\theta)}$.	2 Marks	L1	CO2
	d)	Define functions of two variables.	2 Marks	L2	CO2
	e)	Find the Laplace transform of $\cos(at)$.	2 Marks	L1	CO3
	f)	State First shifting property.	2 Marks	L1	CO3
	g)	Define Inverse Laplace Transformation.	2 Marks	L1	CO4
	h)	Find the inverse Laplace transform of $\frac{s}{(s+2)^2+4}$	2 Marks	L1	CO4
	i)	Define Fourier Series.	2 Marks	L1	CO5
	j)	Find a_0 in Fourier series for the function $f(x) = x, 0 < x < \pi$.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Verify Rolle's theorem for the function $f(x) = x^2 - 6x + 8$ in the interval $[2,4]$.	8 Marks	L3	CO1
	b)	Verify Lagrange's mean value theorem for the function $f(x) = x^3 - x^2 - 5x + 3$ in $[0,4]$.	8 Marks	L3	CO1

(OR)

3.	a)	Find the Taylor's series expansion of $\sin x$ about $x - \frac{\pi}{4}$.	8 Marks	L3	CO1
	b)	Show that $\log(1+e^x) = \log 2 + \frac{x}{2} + \frac{x^2}{8} - \frac{x^4}{192} + ...$	8 Marks	L2	CO1

MODULE-II

4.	a)	Find the maximum and minimum values of the function $f(x,y) = x^3 + 3xy^2 - 3x^2 - 3y^2 + 4$.	8 Marks	L2	CO2
	b)	Given that $x + y + z = u, y + z = uv, z = uvw$ then prove that $\frac{\partial(x,y,z)}{\partial(u,v,w)} = u^2 v$ and also find its reciprocal.	8 Marks	L3	CO2

(OR)

5.	a)	Given that $u = \frac{yz}{x}, v = \frac{zx}{z}, w = \frac{xy}{z}$ then prove that $\frac{\partial(u,v,w)}{\partial(x,y,z)} = 4$.	8 Marks	L3	CO2
	b)	Find the maximum value of $u = x^2 y^3 z^4$ subject to the condition $2x + 3y + 4z = a$.	8 Marks	L2	CO2

MODULE-III

6.	a)	Find the Laplace transform for $\sinh 2t \cos 3t$.	8 Marks	L3	CO3
	b)	Evaluate $L\left[te^{-t}\cos^2 t\right]$.	8 Marks	L2	CO3

(OR)

7.	a)	Evaluate $L\left[e^{2t} + 4t^3 - \sin 2t \cos 3t\right]$.	8 Marks	L3	CO3
	b)	Find the Laplace transform for $t^2 e^{-2t}\cos t$.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Find the inverse Laplace transform of $\left[\frac{1}{s(s+1)(s+2)}\right]$	8 Marks	L2	CO4
	b)	Find the following (i) $L^{-1}\left[\frac{3s + 5\sqrt{2}}{s^2 + 8}\right]$ (ii) $L^{-1}\left[\frac{1}{4s - 5}\right]$	8 Marks	L2	CO4

(OR)

9.	a)	Find the inverse Laplace transform $\left[\frac{1}{(s^2 + a^2)(s^2 + b^2)}\right]$ by using convolution theorem.	8 Marks	L3	CO4
	b)	By using convolution theorem, find $L^{-1}\left[\frac{s}{(s^2 + a^2)^2}\right]$.	8 Marks	L2	CO4

MODULE-V

10.	a)	Find the Fourier Series for the function $f(x) = x - x^2$ in the interval $(-\pi, \pi)$ hence deduce that $\frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \ldots\ldots = \frac{\pi^2}{12}$.	8 Marks	L3	CO5
	b)	Examine the given function is even or odd and hence obtain Fourier series for the function $f(x) = x^2$ in $(-\pi, \pi)$	8 Marks	L2	CO5

(OR)

11.	a)	Find the Half-range cosine series $f(x) = \sin x$ in the interval $(0, \pi)$ and deduce that $\frac{\pi}{4} = 1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \ldots\ldots$	8 Marks	L3	CO5
	b)	Find Fourier series for $f(x)$ in the interval $(-\pi, \pi)$ where $f(x) = \lvert\cos x\rvert$.	8 Marks	L3	CO5

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B MBU-22

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) Regular Examinations, May – 2026

TRANSFORMATION TECHNIQUES AND LINEAR ALGEBRA

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	List Dirichlet conditions for a function to have a Fourier Series.	2 Marks	L1	CO1
	b)	Define Fourier cosine transform.	2 Marks	L1	CO1
	c)	State the conditions for the existence of the Laplace transform.	2 Marks	L1	CO2
	d)	Define unit step function.	2 Marks	L1	CO2
	e)	Find the inverse Laplace transform of $\frac{1}{(s+2)^2+16}$.	2 Marks	L1	CO2
	f)	State the linearity property of the inverse Laplace transform.	2 Marks	L1	CO2
	g)	State Cayley-Hamilton theorem.	2 Marks	L1	CO3
	h)	Find the characteristic polynomial of the matrix $A = \begin{bmatrix} 8 & -4 \\ 2 & 2 \end{bmatrix}$.	2 Marks	L1	CO3
	i)	Define vector space.	2 Marks	L1	CO4
	j)	Define kernel of a linear transformation.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Examine whether the given function is even or odd and hence obtain Fourier series for the function $f(x) = x\sin x$ in $(-\pi,\pi)$.	8 Marks	L4	CO1
	b)	Find the Half range Cosine Series for the function $f(x) = x^2$ in $(0,\pi)$ and hence find the sum of the series $\frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \ldots\ldots$	8 Marks	L1	CO1

(OR)

3.	a)	Applying Fourier integral theorem, Show that $e^{-ax} - e^{-bx} = \frac{2(b^2-a^2)}{\pi}\int_0^\infty \frac{\lambda \sin\lambda x}{(\lambda^2+a^2)(\lambda^2+b^2)}d\lambda$.	8 Marks	L3	CO1
	b)	Find the fourier cosine transform of $f(x) = 5e^{-2x} + 2e^{-5x}$.	8 Marks	L1	CO1

MODULE-II

4.	a)	Evaluate $L\left\{ e^t\left(\cos 2t + \frac{1}{2}\sinh t\right)\right\}$.	8 Marks	L5	CO2
	b)	By using Laplace transform, Show that $\int_0^\infty te^{-3t}\sin t\,dt = \frac{3}{50}$.	8 Marks	L3	CO2

(OR)

5. a) By using Laplace transform, evaluate $\int_0^\infty \frac{e^{-t}\sin^2 t}{t}dt$. 8 Marks L3 CO2

b) Find the Laplace transform of $f(t)$, where $f(t)=\left(\sqrt{t}+\frac{1}{\sqrt{t}}\right)^3$. 8 Marks L1 CO2

MODULE-III

6. a) Find the inverse Laplace transform of $\frac{1}{s(s+1)(s+2)}$. 8 Marks L1 CO2

b) Evaluate $L^{-1}\left[\frac{1}{s^2(s+1)^2}\right]$ using convolution theorem. 8 Marks L5 CO2

(OR)

7. Using Laplace transform, solve the differential equation $(D^2+2D+5)y=e^{-t}\sin t$, given that $y(0)=0, y'(0)=1$. 16 Marks L3 CO2

MODULE-IV

8. a) Find the rank of the matrix $A=\begin{bmatrix}1&0&1&1\\0&1&-3&-1\\3&1&0&2\\1&1&-2&0\end{bmatrix}$ by reducing it to the Echelon form. 8 Marks L1 CO3

b) Discuss for what values of a,b the equations $x+2y+3z=4; x+3y+4z=5; x+3y+az=b$ have
i) no solution ii) a unique solution iii) an infinite number of solutions 8 Marks L6 CO3

(OR)

9. a) Find the eigen values and eigen vectors of the matrix $A=\begin{bmatrix}5&4\\1&2\end{bmatrix}$. 8 Marks L1 CO3

b) Using Cayley-Hamilton theorem, find the inverse and A^4 of the matrix $A=\begin{bmatrix}1&-1&0\\0&1&1\\2&1&2\end{bmatrix}$. 8 Marks L3 CO3

MODULE-V

10. a) Show that the set P_n of all polynomials of degree less than or equal to n is a vector space. 8 Marks L1 CO4

b) Find the dimension of the vector space W of symmetric 2×2 matrices $\left\{\begin{bmatrix}1&0\\0&0\end{bmatrix},\begin{bmatrix}0&1\\1&0\end{bmatrix},\begin{bmatrix}0&0\\0&1\end{bmatrix}\right\}$. 8 Marks L1 CO4

(OR)

11. a) Examine whether the sets of vectors $\{(1,1,1),(0,1,1),(1,0,1)\}$ are linear independent or not. 8 Marks L4 CO4

b) Find the kernel of linear transformation $T:P_2\to P_3$ defined by $T(p(x))=x\,p(x)$. 8 Marks L1 CO4

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A

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) Regular Examinations, May – 2026

TRANSFORMATION TECHNIQUES AND LINEAR ALGEBRA

[Electronics and Communication Engineering, Electronics and Computer Engineering , Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Write the general form of a Fourier series for a function f(x) in $(-\pi,\pi)$.	2 Marks	L1	CO1
	b)	State Dirichlet's conditions for the existence of a Fourier series.	2 Marks	L1	CO1
	c)	State the conditions for the existence of the Laplace transform of a function.	2 Marks	L1	CO2
	d)	State Laplace transform of unit Step Function.	2 Marks	L1	CO2
	e)	State Laplace transform of Dirac delta Function.	2 Marks	L1	CO2
	f)	Define the inverse Laplace transform and give an example.	2 Marks	L1	CO2
	g)	State any two properties of the rank of a matrix.	2 Marks	L1	CO4
	h)	Define Eigen Values and Eigen Vectors.	2 Marks	L1	CO3
	i)	Define linearly dependent and linearly independent vectors	2 Marks	L1	CO4
	j)	Define a vector space and give an example.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Examine the given function is even or odd and hence obtain Fourier series for the function $f(x) = x^2$ in $(-\pi,\pi)$	8 Marks	L4	CO1
	b)	Find the half range cosine series $f(x) = x(\pi - x)$ in $0 < x < \pi$	8 Marks	L1	CO1

(OR)

3.	a)	Find the Fourier sine transform of $f(x) = \frac{e^{-ax}}{x}$ and deduce that $\int_0^\infty \frac{e^{-ax} - e^{-bx}}{x} \sin sx\, dx = \tan^{-1}\left(\frac{s}{a}\right) - \tan^{-1}\left(\frac{s}{b}\right)$	8 Marks	L1	CO1
	b)	Find the half range sine series $f(x) = \sin x$ in $0 < x < \pi$.	8 Marks	L1	CO1

MODULE-II

4.	a)	Evaluate the Laplace transform of $\int_0^t \frac{1-e^{-t}}{t} dt$.	8 Marks	L5	CO2
	b)	Find $L\left(e^{2t} \sin t \cos 2t\right)$	8 Marks	L5	CO2

(OR)

5.	a)	Determine the Laplace transform of $f(t)$ where $f(t) = e^{4t} \sin 2t \cos t$	8Marks	L1	CO2
	b)	Find the Laplace transform of $t \sin t \cos t$	8 Marks	L5	CO2

MODULE-III

6.	a)	Evaluate $L^{-1}\left[\frac{1}{s(s^2+a^2)}\right]$	8 Marks	L5	CO2
	b)	Find the inverse Laplace transform of $\frac{s}{(s+1)(s+2)(s-3)}$	8 Marks	L1	CO2

(OR)

7.	a)	By using Convolution theorem, find $L^{-1}\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$.	8 Marks	L1	CO2
	b)	Find the inverse Laplace transform of $\log\left(\frac{s^2+4}{s^2+9}\right)$.	8 Marks	L1	CO2

MODULE-IV

8.	a)	Reduce the matrix $A = \begin{bmatrix} 1 & 1 & -3 & -1 \\ 1 & 0 & 1 & 1 \\ 3 & 1 & 0 & 2 \\ 3 & 1 & -2 & 0 \end{bmatrix}$ into Echelon form and hence find its rank by reducing it to echelon	8 Marks	L3	CO3
	b)	Find whether the following system of equations are consistent or not. If so solve them **2x-y+z = 5, 3x+y-2z = -2, x -3y-z = 2**	8 Marks	L3	CO3

(OR)

9.		Diagonalize the matrix $A = \begin{bmatrix} 8 & -8 & -2 \\ 4 & -3 & -2 \\ 3 & -4 & 1 \end{bmatrix}$	16 Marks	L4	CO3

MODULE-V

10.	a)	Show that the set {(1,1,1), (0,1,1), (1,0,1)} forms a basis of $R^3(R)$.	8 Marks	L1	CO4
	b)	In vector space P_2, determine whether $r(x) = 1 - 4x + 6x^2$ is in span $(p(x), q(x))$, where $p(x) = 1 - x + x^2$ and $q(x) = 2 + x - 3x^2$.	8 Marks	L5	CO4

(OR)

11.	a)	Examine whether the sets of vectors $\begin{bmatrix} 1 \\ 1 \\ 0 \end{bmatrix}, \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix}$ and $\begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix}$ are linear independent or not in $R^3(R)$.	8 Marks	L4	CO4
	b)	Determine whether C is a span(A, B) ,where $A = \begin{bmatrix} 1 & 1 \\ -1 & 1 \end{bmatrix}, B = \begin{bmatrix} 1 & -1 \\ 1 & 0 \end{bmatrix}$ and $C = \begin{bmatrix} 3 & -5 \\ 5 & -1 \end{bmatrix}$	8 Marks	L5	CO4

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA II Semester (MBU-25) Regular Examinations, May – 2026

COMPUTER COMMUNICATION

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Write a note on physical structure of multi-point communication.	2 Marks	L1	CO1
	b)	Mention the characteristics of data communication.	2 Marks	L1	CO1
	c)	Discuss the Peer-to-peer process.	2 Marks	L1	CO1
	d)	Write the functions of Data link layer?	2 Marks	L1	CO1
	e)	What are analog and digital signal?	2 Marks	L1	CO3
	f)	Write the parameters that define a sine wave.	2 Marks	L1	CO3
	g)	Compare PCM and DM.	2 Marks	L1	CO2
	h)	Distinguish between data rate and signal rate.	2 Marks	L1	CO2
	i)	Define spread spectrum and its goal.	2 Marks	L1	CO4
	j)	What are the common Standard Ethernet implementations.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Write the concept of network criteria.	8 Marks	L4	CO1
	b)	Examine the different methods utilized for data representation.	8 Marks	L2	CO1

(OR)

3.	a)	Discuss about protocol and describe about the role of different key elements in regulating data exchange in a network.	8 Marks	L2	CO1
	b)	Write how does the concept of data flow manifest through different transmission modes, and what are the advantages and disadvantages associated with each?	8 Marks	L4	CO1

MODULE-II

4.	a)	Investigate the concept of encapsulation in the context of OSI model.	10 Marks	L4	CO1
	b)	Discuss the importance of layered architecture.	6 Marks	L2	CO1

(OR)

5.	a)	Write the concept TCP/IP Protocol Suite with neat sketch.	10 Marks	L3	CO1
	b)	Briefly write about any two functionalities of network layer.	6 Marks	L2	CO1

MODULE-III

6.	a)	Analyze a sine wave with all parameters and discuss Time and Frequency domains with an example.	8 Marks	L4	CO3
	b)	Discuss attenuation as a transmission impairment. How does it affect signal strength.	8 Marks	L2	CO3

(OR)

7.	a)	Discuss two different approaches for transmission of digital signals.	8 Marks	L2	CO3
	b)	Explain the concepts of phase, wavelength, and time/frequency domains in periodic analog signals.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain Delta Modulation (DM) in analog-to-digital conversion. How does DM approximate analog signal changes with digital steps?	8 Marks	L2	CO2
	b)	Analyze Quadrature Amplitude Modulation in digital-to-analog conversion.	8 Marks	L4	CO2

(OR)

9.	a)	Discuss Amplitude Modulation (AM) as an analog-to-analog conversion technique.	8 Marks	L2	CO2
	b)	Examine the use of scrambling in digital-to-digital conversion. How does it randomize data patterns to reduce transmission errors? Evaluate the impact of scrambling on signal integrity.	8 Marks	L2	CO2

MODULE-V

10.	a)	Analyze the significance of bridged Ethernet networks in modern networking. How do bridges improve network scalability and performance, illustrating with relevant examples.	10 Marks	L4	CO4
	b)	Show how the address 47:20:1B:2E:08:EE is sent out on line.	6 Marks	L2	CO4

(OR)

11.	a)	Analyze the principles behind Frequency Hopping Spread Spectrum (FHSS) in spread spectrum communication. Evaluate its effectiveness in maintaining data integrity and confidentiality. Support your discussion with relevant examples.	8 Marks	L4	CO4
	b)	Discuss the principles of synchronous Frequency division multiplexing (FDM) and how does it allocate frequency slots for multiple signals efficiently?	8 Marks	L2	CO4

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SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA II Semester (MBU-25) Regular Examinations, May – 2026

OBJECT ORIENTED PROGRAMMING THROUGH C++

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is procedural programming?	2 Marks	L1	CO1
	b)	Recall type conversion in C++.	2 Marks	L2	CO1
	c)	Define constructor.	2 Marks	L1	CO2
	d)	What is a friend function?	2 Marks	L2	CO2
	e)	Define copy constructor.	2 Marks	L1	CO3
	f)	What are default arguments?	2 Marks	L2	CO3
	g)	Define derived class.	2 Marks	L1	CO4
	h)	What is protected member?	2 Marks	L2	CO4
	i)	What is text file.	2 Marks	L1	CO5
	j)	What is insertion operator overloading?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss characteristics of OOP with examples.	8 Marks	L3	CO1
	b)	Explain C++ program structure.	8 Marks	L2	CO1
		(OR)			
3.	a)	Discuss operators in C++ with suitable examples.	8 Marks	L3	CO1
	b)	Explain library functions and their uses.	8 Marks	L2	CO1

MODULE-II

4.	a)	Discuss inline member functions and their benefits.	8 Marks	L2	CO2
	b)	Explain static data members and static member functions with examples.	8 Marks	L3	CO2
		(OR)			
5.	a)	Describe the scope resolution operator (::) and its uses.	8 Marks	L2	CO2
	b)	Explain nested classes and local classes with examples.	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain default function arguments with suitable programs.	8 Marks	L2	CO3
	b)	Discuss the concept of operator overloading in C++.	8 Marks	L2	CO3
		(OR)			
7.	a)	Explain the rules and restrictions of operator overloading.	8 Marks	L2	CO3
	b)	Describe operator overloading using member functions with examples.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain constructors and destructors in inheritance.	8 Marks	L2	CO4
	b)	Discuss granting access and inheritance visibility modes.	8 Marks	L2	CO4
		(OR)			
9.	a)	Explain the concept of virtual functions with examples.	8 Marks	L3	CO4
	b)	Compare pure virtual functions and abstract classes.	8 Marks	L4	CO4

MODULE-V

10.	a)	Explain overloading insertion (<<) and extraction (>>) operators.	8 Marks	L2	CO5
	b)	Discuss the concept of multi-file programs.	8 Marks	L3	CO5
		(OR)			
11.	a)	Explain simple exception handling with a program.	8 Marks	L2	CO5
	b)	Discuss multiple exception handling in C++.	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA II Semester (MBU-25) Regular Examinations, May – 2026

NUMERICAL ANALYSIS, PROBABILITY AND STATISTICS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	State iterative formula for Regula Falsi Method.	2 Marks	L1	CO1
	b)	State the iterative formulae for gauss Jacobi method to solve the system of linear equations.	2 Marks	L1	CO1
	c)	What is the condition for Simpson's 3/8 th rule and state the formula.	2 Marks	L1	CO1
	d)	Give the Lagrange's Formula.	2 Marks	L1	CO1
	e)	Define Binomial and Poisson distributions.	2 Marks	L1	CO2
	f)	Using Poisson distribution with mean 2, find the probability of happening exactly 5 accidents	2 Marks	L1	CO2
	g)	A bike salesman sells an average of 3 bikes each week. Use Poisson's formula to find the probability of him selling some bikes in a week.	2 Marks	L1	CO2
	h)	If $r_{xy} = 0.8$, $b_{xy} = 032$ then find the value of byx.	2 Marks	L2	CO4
	i)	Write the formula for Spearman's Rank Correlation coefficient .	2 Marks	L1	CO4
	j)	Give the properties of Regression lines.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Using Regula Falsi method find square root of number N = 12.	8 Marks	L3	CO1
	b)	Explain the procedure of finding solution for system of linear equations by using Gauss Jacobi Method.	8 Marks	L2	CO1

(OR)

3.	a)	Solve the equations $2x_1 + x_2 + x_3 = 10;\ 3x_1 + 2x_2 + 3x_3 = 18;$ $x_1 + 4x_2 + 9x_3 = 16;$ using Guass-Jordan method.	8 Marks	L3	CO1
	b)	Find the root of the equation $x^3 + 6x - 10 = 0$ using Newton Raphson method.	8 Marks	L4	CO1

MODULE-II

4. a) The table below shows the temperature *f(t)* as a function of time. 8 Marks L4 CO1

t	1	2	3	4	5
f(t)	82	76	62	48	54

Use Simpson's $\frac{1}{3}$ method to estimate $\int_1^5 f(t)dt$.

b) The population of a town in the decimal census was given below. Estimate the population for the given year 1896 and 1926. 8 Marks L3 CO1

Year(X)	1891	1901	1911	1921	1931
Population(in thousands) (Y)	50	62	84	100	120

(OR)

5. a) Apply Newton's forward formula, and the given table of values. 8 Marks L3 CO1

X :	1.1	1.3	1.5	1.7	1.9	2.1	2.3	2.5
Y :	0.21	0.69	1.25	1.89	2.61	3.82	5.69	7.25

Obtain the value of $f(x)$ when $x = 1.2$.

b) Evaluate $\int_0^4 (3x^2 + 2x)dx$. by Simpson's $\frac{1}{3}$ rule and $\frac{3}{8}$ rule 8 Marks L4 CO1

MODULE-III

6. a) Explain the following with examples: 8 Marks L2 CO2
   i) Probability density Function
   ii) Distribution function and its properties.

   b) State and Prove Multiplication theorem of Mathematical expectation 8 Marks L2 CO2

(OR)

7. a) State and prove Addition Theorem of Mathematical Expectation 8 Marks L2 CO2

   b) Find the distribution function F(X) which corresponds to the probability distribution defined by $f(x) = \frac{x}{15}$, for X = 1, 2, 3, 4, 5. 8 Marks L2 CO2

MODULE-IV

8. a) Derive the moment generating function of Poisson distribution 8 Marks L3 CO3

   b) If the mean and variance of a Binomial distribution are 6.4 and 2.56 respectively, Fit a Binomial distribution and hence calculate the expected frequencies by considering the total frequency as 200. 8 Marks L3 CO3

(OR)

9. a) If the variance of a Poisson variate is 8, then find the probability that i) X = 2 ii) $1 < X \leq 4$ iii) $2 \leq X < 6$. 8 Marks L3 CO3

   b) A discrete random variable X has the mean 8 and variance3. If it is assumed that the distribution is Binomial, find the probability that $4 \leq x \leq 7$ and $3 \leq x \leq 7$. 8 Marks L2 CO3

MODULE-V

10. a) Calculate Karl Pearson's Coefficient of correlation the following data: 8 Marks L3 CO4

X:	56	62	58	52	62	64	58	60
Y:	80	76	86	90	66	60	70	62

   b) Using the following data fit the two regression lines 8 Marks L3 CO4

X	20	32	26	24	28	34	30	36
Y	24	28	30	36	32	28	34	30

(OR)

11. a) Ten competitors in a musical contest were ranked by the three judges A,B and C in the following order : 8 Marks L3 CO4

Ranks by A	1	6	5	10	3	2	4	9	7	8
Ranks by B	3	5	8	4	7	10	2	1	6	9
Ranks by C	6	4	9	8	1	2	3	10	5	7

Using rank correlation method, discuss which pair of judges has the nearest approach to common liking in music.

   b) Fit the two regression lines from the following data 8 Marks L4 CO4

X:	30	36	32	28	44	42	46	50	54	52
Y:	40	42	46	38	50	52	56	60	68	70

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T. III Semester Fasttrack (MBU-22) Supplementary Examinations, March - 2026

PATHOLOGY FOR PHYSIOTHERAPY

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define necrosis add a note on fat necrosis	2 Marks	L2	CO1
	b)	What is apoptosis?	2 Marks	L1	CO1
	c)	Recall SLE and add a short note on it.	2 Marks	L1	CO2
	d)	Name four hypersensitivity reactions.	2 Marks	L1	CO2
	e)	Mention a note on Neoplasia?	2 Marks	L2	CO3
	f)	Write any two chemical carcinogens.	2 Marks	L1	CO3
	g)	What is Poikilocytosis?	2 Marks	L2	CO4
	h)	Mention on Hypochromasia.	2 Marks	L1	CO4
	i)	Add note on Gouty arthritis.	2 Marks	L2	CO4
	j)	Define Osteomalacia.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Define cell injury. Explain aetiology and Pathogenesis of it?	8 Marks	L2	CO1
	b)	Explain the different types of irreversible cell injury.	8 Marks	L1	CO1
		(OR)			
3.	a)	What is gangrene. Explain dry and wet Gangrene.	8 Marks	L1	CO1
	b)	Define necrosis. Explain coagulative necrosis?	8 Marks	L2	CO1

MODULE-II

4.	a)	Define AIDS. Explain the pathogenesis and clinical manifestations of HIV.	8 Marks	L1	CO2
	b)	Explain pathogenesis and clinical manifestations of Poliomyelitis?	8 Marks	L2	CO2
		(OR)			
5.	a)	What is syphilis. Explain pathogenesis and clinical manifestations of it?	8 Marks	L2	CO2
	b)	Define autoimmunity. Explain any two autoimmune disorders?	8 Marks	L1	CO2

MODULE-III

6.	a)	Define carcinoma. Explain the properties of squamous papilloma and squamous cell carcinoma?	8 Marks	L2	CO3
	b)	Define Shock. Add a short note on etiopathogenesis clinical manifestations of it?	8 Marks	L1	CO3

(OR)

7.	a)	Define thrombosis. Classification, pathophysiology and clinical features of thrombosis.?	8 Marks	L1	CO3
	b)	Define Metastasis. Explain the local and distract spread of metastasis.	8 Marks	L2	CO3

MODULE-IV

8.	a)	What is Anemia? Explain the etiopathogenesis of Iron Deficiency anemia.	8 Marks	L1	CO4
	b)	Discuss various types of cyanotic congenital heart diseases.	8 Marks	L2	CO4

(OR)

9.	a)	Explain the etiology and clinical features of rheumatic heart disease?	8 Marks	L1	CO4
	b)	Explain the etiopathogenesis and clinical features of pernicious anemia?	8 Marks	L1	CO4

MODULE-V

10.	a)	What is Pneumonia? Add a short note on clinical manifestations of Pneumonia.	8 Marks	L1	CO4
	b)	What is arthritis? Etiopathogenesis and clinical features of on Osteoarthritis.	8 Marks	L2	CO4

(OR)

11.	a)	Enumerate the clinical features and diagnosis of patent ductus arteriosus.	8 Marks	L1	CO4
	b)	Define myocardial infarction. Explain Complications of myocardial Infarction.	8 Marks	L2	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T II Semester Fasttrack (MBU-22) Supplementary Examinations, March - 2026

ANATOMY-II

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is hepatopancreatic ampulla of vater?	2 Marks	L2	CO1
	b)	Write a brief note on trigone of urinary bladder.	2 Marks	L1	CO1
	c)	How laryngeal prominence is formed in larynx?	2 Marks	L3	CO2
	d)	What are paranasal air sinuses?	2 Marks	L3	CO2
	e)	Define reflex arc.	2 Marks	L1	CO3
	f)	Name the three coverings of brain, spinal cord, and its applied anatomy.	2 Marks	L2	CO3
	g)	List out the structures present in portal triad.	2 Marks	L2	CO4
	h)	How many zones are in suprarenal gland? and mention its hormones.	2 Marks	L3	CO4
	i)	Prepare a brief note on ***"gastrulation".***	2 Marks	L3	CO5
	j)	What is in-vitro fertilization?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Name the parts of the urinary system, and add a note on ureter and its constrictions.	8 Marks	L1	CO1
	b)	Illustrate the external features, internal features, relations, blood supply, nerve supply, and applied anatomy of kidney.	8 Marks	L3	CO1

(OR)

3.	a)	Define the attachments of diaphragm muscle under following headings: i) Origin ii) Insertion iii) Nerve supply iv) Action v) Applied anatomy.	8 Marks	L1	CO1
	b)	Discuss the structure of pancreas under following headings: i) External features ii) Internal features iii) Relations iv) Blood supply & Nerve supply v) Applied anatomy.	8 Marks	L3	CO1

MODULE-II

4.	a)	Illustrate the structure of lateral wall of nose with a diagram.	8 Marks	L2	CO2
	b)	Explain external features, internal features, relations, blood supply, nerve supply, and applied anatomy of tongue.	8 Marks	L3	CO2

(OR)

5.	a)	What are carotid arteries? Explain the branches of it.	8 Marks	L3	CO2
	b)	Describe the structure of hyoid bone, and what are suprahyoid & infrahyoid muscles?	8 Marks	L2	CO2

MODULE-III

6.	a)	Name the parts of cerebellum, and list out the functions of cerebellum.	8 Marks	L1	CO3
	b)	Describe visual pathway, and mention visual defects.	8 Marks	L2	CO3
		(OR)			
7.	a)	Discuss the structure fourth ventricle of brain.	8 Marks	L3	CO3
	b)	What are basal ganglia? Write the functions of basal ganglia.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Draw the microscopic structure of liver, and gall bladder with a neat labeled diagram.	8 Marks	L3	CO4
	b)	Depict the histology of spinal cord, and spinal ganglia with a neat labeled diagram.	8 Marks	L2	CO4
		(OR)			
9.	a)	Sketch the microscopic structure of spleen, and thymus with a neat labeled diagram.	8 Marks	L2	CO4
	b)	Describe the histology of thick skin, and thin skin with a neat labeled diagram.	8 Marks	L1	CO4

MODULE-V

10.	a)	What are the three germ layers, and their derivatives?	8 Marks	L3	CO5
	b)	Write a note on ectodermal clefts, and its derivatives.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain stages of spermiogenesis.	8 Marks	L3	CO5
	b)	Define primitive streak, and mention its derivatives.	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Allied Sciences) II Semester Fasttrack (MBU-22) Supplementary Examinations, March - 2026

HUMAN ANATOMY

[Dialysis Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define the planes of the body.	2 Marks	L1	CO1
	b)	List out the divisions of Epithelium tissues.	2 Marks	L1	CO1
	c)	State bone ossification and its types.	2 Marks	L1	CO2
	d)	How many bones are present in human during birth and how its count change with growth?	2 Marks	L1	CO2
	e)	State the need of digestion.	2 Marks	L3	CO3
	f)	What is pericardium?	2 Marks	L1	CO3
	g)	Give the location of the testis and its function.	2 Marks	L2	CO4
	h)	State the importance of the thyroid gland with its location.	2 Marks	L1	CO4
	i)	Define basal ganglia.	2 Marks	L2	CO5
	j)	What is the brain stem and give one function?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Mention the terms of relations and terms of comparisons.	8 Marks	L2	CO1
	b)	Write a brief note on: Gross anatomy Microscopic anatomy.	8 Marks	L2	CO1

(OR)

3.	a)	Discuss in detail about anatomical terms.	8 Marks	L2	CO1
	b)	Write short note on: General features of connective tissues. Tissues	8 Marks	L2	CO1

MODULE-II

4.	a)	Discuss about sternum bone.	8 Marks	L2	CO2
	b)	Classify types of joints in human body.	8 Marks	L2	CO2

(OR)

5.	a)	Discuss the muscles of the trunk and their role in maintaining posture and supporting the vertebral column.	8 Marks	L2	CO2
	b)	Explore the muscles of the lower limb involved in locomotion and weight-bearing activities	8 Marks	L3	CO2

MODULE-III

6.	a)	Summarize the external structure of the heart.	8 Marks	L2	CO3
	b)	Describe about the alimentary canal.	8 Marks	L1	CO3
		(OR)			
7.	a)	Illustrate the large intestine.	8 Marks	L2	CO3
	b)	Explain about human teeth with appropriate diagrams.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Describe the anatomy of the structure of nails.	8 Marks	L2	CO4
	b)	Illustrate the thyroid gland in detail.	8 Marks	L2	CO4
		(OR)			
9.	a)	Explain the structure of the salivary gland with a diagram.	8 Marks	L2	CO4
	b)	Elaborate on the mammary gland in detail.	8 Marks	L2	CO4

MODULE-V

10.	a)	Illustrate the structure of the circle of Willis.	8 Marks	L2	CO5
	b)	What are the parts of the cerebellum and list out the functional area?	8 Marks	L2	CO5
		(OR)			
11.	a)	Name the parts of the corpus callosum, and explain the structure and function of the corpus collosum.	8 Marks	L1	CO5
	b)	Discuss about the parts of the ear. And explain the inner ear cavity?	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Allied Sciences) II Semester Fasttrack (MBU-22) Supplementary Examinations, March - 2026

HUMAN ANATOMY – I

[Anaesthesia & Operation Theatre Technology, Cardio Vascular Technology, Emergency Medical and Critical Care Technology, Respiratory Therapy Technology, Medical Lab Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Write a brief note on cadaveric anatomy.	2 Marks	L2	CO1
	b)	Name the parts of a muscle.	2 Marks	L1	CO1
	c)	What is a muscle spindle?	2 Marks	L3	CO2
	d)	Define synovial joint.	2 Marks	L1	CO2
	e)	Prepare a brief note on cardiomegaly.	2 Marks	L3	CO3
	f)	Name the valves present in the heart.	2 Marks	L1	CO3
	g)	Write a brief note on pharyngitis and tonsilitis.	2 Marks	L2	CO4
	h)	Outline the functions of gall bladder.	2 Marks	L3	CO4
	i)	Prepare a brief note on pseudo-stratified epithelium.	2 Marks	L3	CO5
	j)	What is perichondrium? and mention its functions.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe types of body movements with examples?	8 Marks	L2	CO1
	b)	What are the different positions of human body used in clinical studies and give examples for it?	8 Marks	L3	CO1

(OR)

3.	a)	Enumerate the terms used for describing muscles?	8 Marks	L1	CO1
	b)	Explain structural classification of bone (Macroscopic and Microscopic) with examples?	8 Marks	L3	CO1

MODULE-II

4.	a)	Write a note on features of femur bone and its muscle attachments?	8 Marks	L3	CO2
	b)	Describe the terms used for describing bone features?	8 Marks	L2	CO2

(OR)

5.	a)	Explain types of muscles with examples?	8 Marks	L3	CO2
	b)	Write in detail about blood supply of a long bone with a neat labeled diagram?	8 Marks	L2	CO2

MODULE-III

6.	a)	Illustrate conducting system of heart with a diagram and its clinical importance?	8 Marks	L2	CO3
	b)	What is aorta? Explain parts of aorta, relations of aorta & its branches?	8 Marks	L3	CO3

(OR)

7.	a)	Illustrate blood supply of heart with a diagram?	8 Marks	L2	CO3
	b)	Describe external features of heart and internal features of right atrium?	8 Marks	L2	CO3

MODULE-IV

8.	a)	Write the differences between right lung and left lung with a neat labeled diagram?	8 Marks	L3	CO4
	b)	List out the parts of digestive system? And outline the structure of stomach under following headings? i) External features ii) Internal features iii) Relations iv) Blood supply & Nerve supply v) Applied anatomy?	8 Marks	L3	CO4

(OR)

9.	a)	Explain the structure of spleen under following headings? i) External features ii) Internal features iii) Relations iv) Blood supply & Nerve supply v) Applied anatomy?	8 Marks	L3	CO4
	b)	Describe the structure of liver under following headings? i) External features ii) Internal features ii) Relations iv) Blood supply & Nerve supply v) Applied anatomy?	8 Marks	L1	CO4

MODULE-V

10.	a)	Illustrate microscopic structure of hyaline cartilage with a diagram.	8 Marks	L2	CO5
	b)	Draw a neat labeled diagram of compound microscope?	8 Marks	L1	CO5

(OR)

11.	a)	Illustrate microscopic structure of elastic cartilage.	8 Marks	L2	CO5
	b)	Define cell division? Explain stages of Meiosis with a neat labeled diagram?	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T III Semester Fasttrack (MBU-22) Supplementary Examinations, March - 2026

BIOMECHANICS-I

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	How does the patella function as anatomical pulley in knee joint?	2 Marks	L2	CO1
	b)	What is third class lever and give an example?	2 Marks	L3	CO1
	c)	What is hysteresis?	2 Marks	L2	CO2
	d)	State wolff's law.	2 Marks	L3	CO2
	e)	Mention the primary muscles responsible for mandibular depression.	2 Marks	L1	CO3
	f)	Write a note on joints of luschka.	2 Marks	L2	CO3
	g)	Define angle of inclination and angle of torsion for humerus.	2 Marks	L1	CO4
	h)	Prepare a note on resting position of scapula.	2 Marks	L2	CO4
	i)	Define "TFCC". write any two functions of "TFCC".	2 Marks	L1	CO5
	j)	Which muscles primarily contributes to wrist extension?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Differentiate between segmental centers of mass and composition of gravitational forces with neat diagrams.	8 Marks	L4	CO1
	b)	Discuss about line of gravity and base of support.	8 Marks	L2	CO1

(OR)

3.	a)	Explore about torque with examples.	8 Marks	L3	CO1
	b)	Discuss about shear and friction forces with examples.	8 Marks	L2	CO1

MODULE-II

4.	a)	Outline the properties of connective tissue.	8 Marks	L2	CO2
	b)	Illustrate the isometric length tension relation ship and plot the graph.	8 Marks	L4	CO2

(OR)

5.	a)	Discuss about open and closed kinematic chains with examples.	8 Marks	L2	CO2
	b)	Differentiate between different types of muscle fibers.	8 Marks	L4	CO2

MODULE-III

6.	a)	Elucidate the kinematics of sacral region.	8 Marks	L3	CO3
	b)	Elaborate the structure of intervertebral disk with neat labelled diagram.	8 Marks	L3	CO3

(OR)

7.	a)	How does the muscles attached to ribcage contribute to the ventilation?	8 Marks	L1	CO3
	b)	Compare stoop lifting and squat lifting in injury prevention with lifting tasks.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Discuss about valgus and varus injuries of elbow.	8 Marks	L2	CO4
	b)	Illustrate the motions of sternoclavicular joint with neat labelled diagram.	8 Marks	L4	CO4

(OR)

9.	a)	Discuss how the elbow flexors and extensors together perform eccentric and concentric contractions during biceps curl.	8 Marks	L2	CO4
	b)	Outline the functions of muscles of elevation in shoulder joint.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain the role of palmar arches in hand.	8 Marks	L2	CO5
	b)	Explore the functional role of lumbrical muscles during activities like typing.	8 Marks	L3	CO5

(OR)

11.	a)	Elucidate the influence of extensor mechanism on metacarpophalangeal joint.	8 Marks	L3	CO5
	b)	Explain about precision handling with neat labelled diagram	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T. III Semester Fasttrack (MBU-22) Supplementary Examinations, March - 2026

EXERCISE THERAPY-I

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Name any eight anatomical movements.	2 Marks	L1	CO1
	b)	Tell about movement arm.	2 Marks	L2	CO1
	c)	What is Babinski sign?	2 Marks	L2	CO2
	d)	Name first six cranial nerves.	2 Marks	L1	CO2
	e)	Define passive movements. Write any two contraindications of passive movements.	2 Marks	L3	CO3
	f)	List out the causes of incoordination.	2 Marks	L1	CO3
	g)	Define Isokinetic exercises with two examples.	2 Marks	L1	CO4
	h)	Write two examples of closed chain exercises with diagram.	2 Marks	L2	CO4
	i)	Mention any four uses of axial suspension.	2 Marks	L3	CO5
	j)	List out any four uses and effects of friction.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Define parallelogram of forces and, explain levers with various examples.	8 Marks	L2	CO1
	b)	Summarize anatomical movements in detail.	8 Marks	L2	CO1
		(OR)			
3.	a)	Define force and discuss four types of forces.	8 Marks	L1	CO1
	b)	Interpretation of equilibrium and its types.	8 Marks	L2	CO1

MODULE-II

4.	a)	Describe types of goniometer and explain measuring the ROM for hip Joint.	8 Marks	L2	CO2
	b)	Summarize clinical examination on cranial nerves.	8 Marks	L3	CO2
		(OR)			
5.	a)	Explain about superficial reflexes and it is assessed.	8 Marks	L1	CO2
	b)	Discuss the tests of coordination.	8 Marks	L2	CO2

MODULE-III

6.	a)	Describe free exercises and discuss about its uses, types and characteristics.	8 Marks	L2	CO3
	b)	Explain application of suspension therapy for hip medial and lateral rotators.	8 Marks	L2	CO3

(OR)

7.	a)	Describe passive movements and mention its indications, contraindications, effects and uses.	8 Marks	L3	CO3
	b)	Apply your knowledge on suspension therapy for knee flexion and extension with neat labelled diagrams.	8 Marks	L4	CO3

MODULE-IV

8.	a)	What is Resisted exercises? Discuss about its types, uses and characteristics?	8 Marks	L2	CO4
	b)	Outline the principles, indications, uses and techniques of relaxation.	8 Marks	L3	CO4

(OR)

9.	a)	Discuss about Static and Dynamic Exercises.	8 Marks	L2	CO4
	b)	Describe Manual resisted exercises and discuss about its advantages and disadvantages.	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss in detail about shaking and vibrations.	8 Marks	L2	CO5
	b)	Apply your knowledge on kneeling and half kneeling positions.	8 Marks	L3	CO5

(OR)

11.	a)	Illustrate the history of massage therapy.	8 Marks	L2	CO5
	b)	Explain the tapotement techniques of massage therapy.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T. III Semester Fasttrack (MBU-22) Supplementary Examinations, March – 2026

ELECTROTHERAPY-I

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is traditional electro physiological techniques?	2 Marks	L1	CO1
	b)	Define decision making in electrotherapy.	2 Marks	L2	CO1
	c)	What is faradic current and where is it applied?	2 Marks	L1	CO2
	d)	Mention the properties of galvanic current.	2 Marks	L1	CO2
	e)	Detail about chemical messenger of pain.	2 Marks	L1	CO3
	f)	Express about indication of re box currents.	2 Marks	L2	CO3
	g)	Write any four indications of re- box current.	2 Marks	L1	CO4
	h)	Add a brief note on working mechanism of Russian currents.	2 Marks	L2	CO4
	i)	Mention the types of EMG electrodes.	2Marks	L1	CO5
	j)	What are strength duration curves?	2Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the different types of electricity, and their therapeutic effects.	8 Marks	L2	CO1
	b)	Describe the working mechanism of current in treatment.	8 Marks	L3	CO1
		(OR)			
3.	a)	Discuss the importance of current in medical treatment.	8 Marks	L2	CO1
	b)	Explain the concept of resting membrane potential, and its relevance in physiotherapy.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain in-detail about iontophoresis and its applications.	8 Marks	L2	CO2
	b)	Summarize Galvanic current and its applications in physiotherapy.	8 Marks	L3	CO2
		(OR)			
5.	a)	Define Faradic current. Discuss it as therapeutic effects.	8 Marks	L2	CO2
	b)	Discuss the role of biophysical effects in iontophoresis.	8 Marks	L3	CO2

MODULE-III

6.	a)	Discuss the indications, and contraindications in TENS.	8 Marks	L2	CO3
	b)	Summarize the Nerve muscle electric stimulation.	8 Marks	L3	CO3
		(OR)			
7.	a)	Explore the clinical efficacy of electrical stimulation.	8 Marks	L2	CO3
	b)	Demonstrate recent advance treatment in the galvanic current.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss the vector sweep in interferential therapy, and short note on beat frequency in IFT.	8 Marks	L2	CO4
	b)	Explain the interferential therapy. what conditions are treated gave the methods of treatment.	8 Marks	L3	CO4

(OR)

9.	a)	Elaborate in detail interferential therapy.	8 Marks	L2	CO4
	b)	Explain in detail about therapeutic, and physiological effects of IFT.	8 Marks	L2	CO4

MODULE-V

10.	a)	Sketch the electro diagnostic test, and strength duration curve.	8 Marks	L2	CO5
	b)	Evidence based applications of electro-physiological studies in physiotherapy.	8 Marks	L3	CO5

(OR)

11.	a)	Explain in detail following headings of radial nerve: i) Morphology ii) Nerve conduction study.	8 Marks	L2	CO5
	b)	Discuss the applications of EMG in Biofeedback therapy in muscle rehabilitation, and motor control training.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc.(Allied Sciences) III Semester Fasttrack (MBU-22) Supplementary Examinations, March - 2026

OCULAR ANATOMY

[Optometry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Explain about lens placode.	2 Marks	L2	CO1
	b)	Anophthalmia occurs due to what developmental defect?	2 Marks	L2	CO1
	c)	Implement your knowledge of eyelid muscles in the mobility of the eyelid.	2 Marks	L3	CO2
	d)	Mention the names of the muscles available on the eyebrow.	2 Marks	L1	CO2
	e)	Name the parts of the lacrimal sac.	2 Marks	L1	CO3
	f)	Mention the bones of the orbital floor.	2 Marks	L2	CO3
	g)	What do you understand by the three distinct of lens?	2 Marks	L2	CO4
	h)	Show the angle of grade 0 to IV of Shaffer's gonioscopy grading	2 Marks	L3	CO4
	i)	Name the functions of the ciliary muscle.	2 Marks	L1	CO5
	j)	Applying your knowledge brief about fovea centralis.	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Organize the key events of the development of the crystalline lens and the retina, highlighting the primary differences in their origin, structure, and function.	8 Marks	L3	CO1
	b)	How Mesoderm acts in embryonic eye formation and explain how alterations in mesodermal development can result in ocular abnormalities.	8 Marks	L3	CO1

(OR)

3.	a)	Describe the key milestones in the development of the accessory structures of the eye and how they contribute to overall eye function.	8 Marks	L2	CO1
	b)	How does the development of the cornea and sclera differ from the development of the retina in the embryonic eye?	8 Marks	L3	CO1

MODULE-II

4.	a)	Considering the structures of the lids, describe the role of Meibomian Glands and Glands of Zeiss in maintaining eye health.	8 Marks	L3	CO2
	b)	What are the lymphatic drainages of the lids and mention their importance as well?	8 Marks	L3	CO2

(OR)

5.	a)	Explain the primary functions of the Muscles of the eyelid and the eyebrow.	8 Marks	L2	CO2
	b)	Apply your knowledge of the blood supply and nerve supply of the eyebrows to explain how a simple injury to this area can result in excessive bleeding or impaired sensation.	8 Marks	L3	CO2

MODULE-III

6.	a)	Define Orbit and write its dimensions.	8 Marks	L2	CO3
	b)	Illustrate the entrance and contribution of the orbital cavity with the necessary diagram.	8 Marks	L3	CO3

(OR)

7.	a)	Describe the walls of the orbit.	8 Marks	L2	CO3
	b)	Discuss in detail the base and apex of the orbit.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Summarize the dimensions of the Cornea	8 Marks	L2	CO4
	b)	Illustrate layers of cornea with a proper diagram.	8 Marks	L3	CO4

(OR)

9.	a)	State the microanatomy of the sclera along with nerve innervation.	8 Marks	L1	CO4
	b)	Outline the structure of the lens.	8 Marks	L1	CO4

MODULE-V

10.	a)	Demonstrate the microscopic appearance of Iris with a diagram.	8 Marks	L2	CO5
	b)	Illustrate the structure of Iris with a proper diagram.	8 Marks	L3	CO5

(OR)

11.	a)	Mention the general features of Vitreous humor.	8 Marks	L2	CO5
	b)	Contrast about hyaloid layers of vitreous Humor.	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Allied Sciences) II Semester Fasttrack (MBU-22) Supplementary Examinations, March - 2026

OPTICAL PHYSICS

[Optometry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is light?	2 Marks	L2	CO1
	b)	Who discovered Raman effect?	2 Marks	L1	CO2
	c)	Define superposition principle.	2 Marks	L1	CO3
	d)	List the types of scattering.	2 Marks	L1	CO4
	e)	What is irradiance?	2 Marks	L2	CO5
	f)	Identify the various applications of refraction.	2 Marks	L1	CO1
	g)	Define Tyndall scattering.	2 Marks	L1	CO2
	h)	What is interference?	2 Marks	L2	CO3
	i)	Mention limit of resolution of telescope formula.	2 Marks	L1	CO4
	j)	Define solid angle.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Elucidate the wave theory and its practical applications.	8 Marks	L3	CO1
	b)	Summarize the main attributes and limitations of the corpuscular theory, with the inclusion of a ray diagram.	8 Marks	L4	CO1

(OR)

3.	a)	Articulate the concept of electromagnetic oscillation in conjunction with electromagnetic radiation.	8 Marks	L3	CO1
	b)	Discuss the various types of waves and their characteristics.	8 Marks	L2	CO1

MODULE-II

4.	a)	Define Raman effect, explain experimental setup of Raman effect and its applications.	8 Marks	L3	CO2
	b)	Provide a definition of a crystal, and describe the differences between positive and negative crystals.	8 Marks	L2	CO2

(OR)

5.	a)	Outline the different sources of light and their relevance in daily life activities.	8 Marks	L4	CO2
	b)	What are the applications of birefringence? It types.	8 Marks	L3	CO2

MODULE-III

6.	a)	Illustrate Lloyd's single mirror technique, accompanied by a diagram.	8 Marks	L3	CO3
	b)	Elaborate on the characteristics of Fresnel's bi-prism with an emphasis on the obtuse angle it features.	8 Marks	L2	CO3
		(OR)			
7.	a)	Explain the concept of interference and derive the condition for constructive and destructive interference.	8Marks	L2	CO3
	b)	Provide an overview of antireflection coating and its application.	8Marks	L3	CO3

MODULE-IV

8.	a)	Describe about advantages and applications Mie scattering.	8 Marks	L2	CO4
	b)	Explain the concept of scattering and compare Rayleigh and Mie scattering.	8 Marks	L2	CO4
		(OR)			
9.	a)	Define resolution instruments and explain resolution instrument used in ophthalmology.	8 Marks	L2	CO4
	b)	Explain Rayleigh Criterion for Resolution**.** Draw the wave diagram.	8 Marks	L3	CO4

MODULE-V

10.	a)	Discuss the inverse square law formula and explain how it works.	8 Marks	L2	CO5
	b)	Elaborate the significance of photometry and describe its diverse applications.	8 Marks	L3	CO5
		(OR)			
11.	a)	Define radiometric units, explain radiometric units.	8 Marks	L2	CO5
	b)	Explain about scotopic luminous efficacy with diagram.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) II Semester Fasttrack (MBU-22) Supplementary Examinations, March - 2026

GEOMETRICAL OPTICS-I

[Optometry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define light.	2 Marks	L1	CO1
	b)	Mention the spectrum range of UV light.	2 Marks	L3	CO1
	c)	Define mirror.	2 Marks	L1	CO2
	d)	Explain Brukner's reflex.	2 Marks	L2	CO2
	e)	Give a brief idea about the prism.	2 Marks	L2	CO3
	f)	When a prism is referred to as a thick prism?	2 Marks	L1	CO3
	g)	What do you understand by Diopter?	2 Marks	L3	CO4
	h)	Mention the difference between parallel rays and diverging rays	2 Marks	L3	CO4
	i)	What are the cardinal points of a coaxial combination of lenses?	2 Marks	L2	CO5
	j)	What do you understand by paraxial approximation?	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Establish the relationship between wavelength and photons.	8 Marks	L3	CO1
	b)	Discuss the concept of primary and secondary wavefront using the Huygens principle.	8 Marks	L3	CO1

(OR)

3.	a)	What is a wave? What are the types and properties of waves?	8 Marks	L1	CO1
	b)	Define wave front and its types with the required diagram.	8 Marks	L2	CO1

MODULE-II

4.	a)	Elaborate the laws of reflection.	8 Marks	L2	CO2
	b)	A 5 cm long needle is placed 10 cm from a convex mirror of focal length 40 cm. Find the position, nature and size of the image of the needle.	8 Marks	L3	CO2

(OR)

5.	a)	Give a short definition of a mirror. Describe all the types of mirrors.	8 Marks	L2	CO2
	b)	Explain the characteristics of an image formed by a plane mirror.	8 Marks	L2	CO2

MODULE-III

6.	a)	Draw a diagram to show what is meant by angle of deviation in a Prism. What is the minimum angle of deviation? Calculate the minimum deviation angle for an RI 1·5 equilateral prism.	8 Marks	L3	CO3
	b)	Prove that for a small angle prism $\delta = A(\mu - 1)$, when the angle of incidence is very small.	8 Marks	L3	CO3

(OR)

7.	a)	What is Decentering? Why its important in spectacle lens fitting?	8 Marks	L2	CO3
	b)	Define a thin prism and explain the concept of a prism diopter. Describe how a thin prism deviates light and how the deviation depends on the refractive index of the prism material.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Define Vergence and its types. Derive vergence equation for a curved surface.	8 Marks	L3	CO4
	b)	Find out the vergence for radiating point source of light at 1m, 1/2 m, 1/4 m, 1/10m.	8 Marks	L3	CO4

(OR)

9.	a)	Define: i) Reflectivity ii) Transmissivity How are these properties related to the behavior of light when it encounters different surfaces?	8 Marks	L3	CO4
	b)	Explain refraction and the laws of Refraction with a needful diagram.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain the concept of paraxial approximation. Provide a step-by-step derivation of the vergence equation for a thin lens using this approximation.	8 Marks	L3	CO5
	b)	Define a lens as a combination of two refracting surfaces. Explain the different types of lens shapes and their characteristics.	8 Marks	L3	CO5

(OR)

11.	a)	Draw all the cardinal points of a thick lens system	8 Marks	L3	CO5
	b)	What do you mean by real and virtual images? Discuss the situations for image formation in convex and concave lenses where the images are virtual.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. III Semester Fasttrack (MBU-22) Supplementary Examinations, March – 2026

VISUAL OPTICS

[Optometry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is the corneal and lens power?	2 Marks	L1	CO1
	b)	Which type of lens is used to correct myopia and hypermetropia?	2 Marks	L1	CO2
	c)	Where will the far point and near point lie in the emmetropic?	2 Marks	L2	CO3
	d)	Define RM and RSM.	2 Marks	L1	CO5
	e)	Mention test for color vision.	2 Marks	L1	CO4
	f)	Define optical magnification.	2 Marks	L1	CO5
	g)	Mention rod and cone cell function.	2 Marks	L1	CO4
	h)	Give a rough estimation of addition correction presbyopia according to the age.	2 Marks	L1	CO3
	i)	Write about with-rule astigmatism.	2 Marks	L2	CO2
	j)	Define schematic eye.	2 Marks	L1	CO1

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain about crystalline lens and function of crystalline lens.	8 Marks	L2	CO1
	b)	Explain about listing reduced eye. With diagram.	8 Marks	L2	CO1
		(OR)			
3.	a)	Write the functions and clinical significance of anterior chamber.	8 Marks	L2	CO1
	b)	Discuss about phakometry and its clinical application	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain about irregular astigmatism. its clinical features.	8 Marks	L2	CO2
	b)	Write note on corneal astigmatism and lenticular astigmatism.	8 Marks	L2	CO2
		(OR)			
5.	a)	Determine the advantages and disadvantages of different types of optical correction in aphakia.	8 Marks	L3	CO2
	b)	Explain the effect of different drugs used in Wet Retinoscopy. And write drug action for cyclo- drugs.	8 Marks	L2	CO2

MODULE-III

6.	a)	Demonstrate Gulstrand's mechanical model of accommodation. with ray diagram.	8 Marks	L3	CO3
	b)	Classify types of accommodation. Explain accommodation excess.	8 Marks	L3	CO3
		(OR)			
7.	a)	Describe the types of convergence. Explain convergence insufficiency.	8 Marks	L2	CO3
	b)	What is the angle of convergence and the units of measurement?	8 Marks	L1	CO3

MODULE-IV

8.	a)	Draw a dark adaptation curve and explain it.	8 Marks	L1	CO4
	b)	Discus about light adaption. Explain about curve.	8 Marks	L2	CO4
		(OR)			
9.	a)	Define the color blindness, Describe the types of color blindness.	8 Marks	L1	CO4
	b)	List about the visual acuity tests. its importance.	8 Marks	L2	CO4

MODULE-V

10.	a)	Write note on effective power on multiple lens. mention formula.	8 Marks	L2	CO5
	b)	Explain optical magnification. its applications.	8 Marks	L2	CO5
		(OR)			
11.	a)	Define knapps Write principles of knapps law.	8 Marks	L2	CO5
	b)	What are Limitation of knapp's law, and write depth of field formula?	8 Marks	L1	CO5

CODE No.: 23PA201001 SOP- MPH-23

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M. Pharmacy I Semester (SOP- MPH-23) Regular Examinations, March – 2026

MODERN PAHARMACEUTICAL ANALYTICAL TECHNIQUES

[Pharmaceutics]

Time: 3 hours **Max. Marks: 75**

PART - A

Answer any SIX Question.
All Questions Carry Equal Marks

6 X 5 = 30 Marks

1.	a)	Write note on different types of Electronic transions in UV spectroscopy	5 Marks	L6	CO1
	b)	Explain the limitations and applications of flourimetry ..	5 Marks	L1	CO1
	c)	What are the applications of NMR Spectroscopy	5 Marks	L6	CO2
	d)	Breifly explain about Quadrapole mass analyzer.	5 Marks	L1	CO2
	e)	What are the applications of GC.	5 Marks	L1	CO3
	f)	Write note on principles methodlogy and applications of Gel chromatography	5 Marks	L6	CO4
	g)	What are the different types of Electrophoretic techniques	5 Marks	L2	CO4
	h)	Write note Radio immune assay.	5 Marks	L6	CO5

PART - B

Answer any THREE Question.
All Questions Carry Equal Marks

3 X 15 = 45 Marks

2.	a)	Write note on mathemetical derivation of Beers-Lamberts law	8 Marks	L6	CO1
	b)	Explain about deviation of Beers law	7 Marks	L1	CO1
3.		Explain in detail about principle Instrumentation of IR spectrophotometer.	15 Marks	L1	CO1
4.		Explain briefly about principle &Instrumentation of NMR spectroscopy.	15 Marks	L1	CO2
5.		Explain briefly priniciple instrumentation of HPLC.	15 Marks	L1	CO3
6.		Write note on X-ray diffraction methods&its applications .	15 Marks	L6	CO4

CODE No.: 23PH201001 SOP- MPH-23

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M. Pharmacy I Semester (SOP- MPH-23) Regular Examinations, March – 2026

DRUG DELIVERY SYSTEM

[Pharmaceutics]

Time: 3 hours **Max. Marks: 75**

PART - A

Answer any SIX Questions.
All Questions Carry Equal Marks

6 X 5 = 30 Marks

1.	a)	Write the Objectives of sustained release dosage forms.	5 Marks	L1	CO1
	b)	Give the Evaluation parameters for TDDS.	5 Marks	L2	CO3
	c)	What are single-shot vaccines?	5 Marks	L1	CO5
	d)	Write about Intestinal epithelial & enzymatic barriers.	5 Marks	L1	CO4
	e)	Define microspheres and microgels and list their basic characteristics	5 Marks	L1	CO2
	f)	List the novel ophthalmic dosage forms used in ocular drug delivery.	5 Marks	L1	CO2
	g)	What various approaches to extend GI transit in GRDDS.	5 Marks	L1	CO3
	h)	Give the advantages & disadvantages of BDDS	5 Marks	L2	CO3

PART - B

Answer any THREE Question.
All Questions Carry Equal Marks

3 X 15 = 45 Marks

2.	Discuss about Dissolution-controlled mechanism of drug release.	15 Marks	L2	CO1
3.	Explain the various physiological, physicochemical, and formulation-related factors that affect transdermal drug delivery systems, and describe how each factor influences drug permeation through the skin.	15 Marks	L2	CO3
4.	Illustrate how transdermal vaccine delivery systems can be applied to enhance antigen uptake and improve immunogenicity, using suitable examples.	15 Marks	L3	CO5
5.	Explain the various physiological, enzymatic, and physicochemical barriers that limit the effective delivery of protein and peptide drugs, and describe how each barrier affects their absorption, stability, and therapeutic efficacy.	15 Marks	L2	CO4
6.	Demonstrate how buccal patches are formulated and evaluated by outlining the key steps involved and explaining how each step contributes to the performance of the final dosage form.	15 Marks	L3	CO3

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CODE No.: 23PH201001 SOP- MPH-23

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M. Pharmacy I Semester (SOP- MPH-23) Regular Examinations, March – 2026

MODERN PHARMACEUTICS

[Pharmaceutics]

Time: 3 hours **Max. Marks: 75**

PART - A

Answer any SIX Question.
All Questions Carry Equal Marks

6 x 5 = 30 Marks

1.	a)	Write about the evaluation of small volume parenterals.	5 Marks	L6	CO1
	b)	Enlist the factorial designs and application in pharmaceutical formulation.	5 Marks	L4	CO1
	c)	Explain the Calibration and Validation of equipments as ICH guidelines.	5 Marks	L1	CO2
	d)	Write about the principles of GMP.	5 Marks	L6	CO3
	e)	Describe the master formula record.	5 Marks	L1	CO3
	f)	Relate the applications of force displacement curves of tablet compression.	5 Marks	L3	CO4
	g)	Write notes on Consolidation parameters.	5 Marks	L6	CO4
	h)	Summarize the Applications of Heckel plot.	5 Marks	L2	CO4

PART - B

Answer any THREE Question.
All Questions Carry Equal Marks

3 x 15 = 45 Marks

2.	Summarize in detail the types, manufacturing methods and evaluation of Large Volume Parenterals (LVP).	15 Marks	L2	CO1
3.	Explain about various optimization techniques in formulation processing with suitable examples.	15 Marks	L1	CO1
4.	Write a note on inventory management and production control management.	15 Marks	L6	CO2
5.	Define compaction profile? Explain the phases of compaction profile with suitable examples.	15 Marks	L1	CO4
6.	Explain about various parameters influencing dissolution. Write in brief about students T test.	15 Marks	L1	CO4

CODE No.: 23PH201003 SOP- MPH-23

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M. Pharmacy I Semester (SOP- MPH-23) Regular Examinations, March – 2026

REGULATORY AFFAIRS

[Pharmaceutics]

Time: 3 hours **Max. Marks: 75**

PART - A

Answer any SIX Question.
All Questions Carry Equal Marks

6 x 5 = 30 Marks

1.	a)	Explain about bioequivalence review process for generic products.	5 Marks	L2	CO1
	b)	Discuss the role of bioavailability in drug product performance.	5 Marks	L2	CO1
	c)	Explain regulatory requirements for combination products.	5 Marks	L2	CO2
	d)	Write a short note on post-market surveillance for medical devices.	5 Marks	L2	CO2
	e)	Describe the New Drug Application (NDA) submission process in a global context.	5 Marks	L2	CO3
	f)	Define Investigational Medicinal Product Dossier (IMPD) and explain its importance.	5 Marks	L2	CO3
	g)	Define HIPAA and write a short note on HIPAA.	5 Marks	L1	CO4
	h)	Discuss the importance of protocol design in clinical trials.	5 Marks	L2	CO4

PART - B

Answer any THREE Question.
All Questions Carry Equal Marks

3 x 15 = 45 Marks

2.	a)	Describe the contents and importance of distribution records in pharmaceutical industries.	5 Marks	L2	CO1
	b)	Discuss in-vivo and in-vitro approaches for establishing bioequivalence.	10 Marks	L2	CO1
3.	a)	Discuss Good Clinical Practice (ICH-E6).	8 Marks	L2	CO2
	b)	Summarize the regulatory requirements for medical devices.	7 Marks	L2	CO2
4.	a)	Discuss challenges in global regulatory submissions of IND, NDA, and ANDA.	8 Marks	L2	CO3
	b)	Summarize investigation of medicinal product dossier.	7 Marks	L2	CO3
5.	a)	Explain the working procedures of an IEC.	8 Marks	L2	CO4
	b)	Summarize pharmacovigilance safety monitoring in clinical trials.	7 Marks	L2	CO4
6.	a)	Describe the importance of CFR in pharmaceutical regulation.	5 Marks	L1	CO1
	b)	Explain the importance of dissolution testing in evaluating drug product performance.	10 Marks	L3	CO1

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Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) VI Semester (SOA-22) Regular Examinations, May – 2026

FARM MANAGEMENT, PRODUCTION & RESOURCE ECONOMICS

[B.Sc. Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 X 1 = 20 Marks**

1.	A farm in which no single enterprises contribute 50% of the total gross income is called as _____ type of farming.	1 Mark	L1	CO1
2.	Ownership and type of operation is individual in case of cooperative_____farming.	1 Mark	L1	CO1
3.	What to produce' decision is taken under _____	1 Mark	L1	CO2
4.	_____ are called special types of isoclines	1 Mark	L2	CO2
5.	Y=f (x) is a_____	1 Mark	L1	CO2
6.	_____ denotes the rate of substitution between 2 resources	1 Mark	L2	CO2
7.	Cost function expresses the relationship between_____	1 Mark	L1	CO2
8.	Optimum output decision is provided by_____	1 Mark	L1	CO3
9.	Imputed value of family labour is added in_____	1 Mark	L1	CO3
10.	Total cost is addition TFC and _____	1 Mark	L1	CO3
11.	Family labour income =_____	1 Mark	L2	CO3
12.	Labour records are kept under_____Physical farm records	1 Mark	L1	CO4
13.	Statement of assets and liabilities is called as_____	1 Mark	L1	CO4
14.	Total asset/Total liability= _____	1 Mark	L2	CO4
15.	Farm plan implemented for major changes in farm business is called as _____ Plan	1 Mark	L1	CO4
16.	Leverage ratio more than one indicates _____	1 Mark	L1	CO4
17.	Premium rate for kharif crops under present crop insurance schemes _____	1 Mark	L1	CO5
18.	_____ is branch of economics deals with the supply, demand, and allocation of the Earth's natural resources.	1 Mark	L1	CO5
19.	_____Externality refers to uncharged benefit enjoyed by one economic agent due to action of another economic agent.	1 Mark	L2	CO5
20.	Premium rate for the annual horticultural and commercial crops	1 Mark	L1	CO5

PART - B

Answer any Ten Question
All Questions Carry Equal Marks

II **10 X 3 = 30 Marks**

1.	Distinguish between Commercial farming and Diversification	3 Marks	L2	CO1
2.	What is farm management explain its nature and scope	3 Marks	L3	CO1
3.	Explain law of returns	3 Marks	L1	CO2
4.	List 4 Objectives of agricultural production economics	3 Marks	L2	CO2
5.	Explain Uses of production function in decision making on a farm	3 Marks	L2	CO2
6.	Write about different kinds of farm records	3 Marks	L3	CO3
7.	Write a note on Financial efficiency and ratio measures	3 Marks	L3	CO3
8.	What is risk explain the risk management strategies	3 Marks	L4	CO4
9.	Explain basic assumption of linear programming	3 Marks	L2	CO4
10.	List the steps in farm planning and characteristics of a good farm plan	3 Marks	L3	CO4
11.	Define externality? Explain different types of externality?	3 Marks	L4	CO5
12.	Explain Management of natural resources or solutions	3 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) VI Semester (SOA-22) Regular Examinations, May – 2026

PROTECTED CULTIVATION AND SECONDARY AGRICULTURE

[B.Sc. Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 x 1 = 20 Marks**

1.	The need to protect crops against unfavourable environmental conditions led to the development of _____ agriculture.	1 Mark	L1	CO1
2.	Due to emissions, the percentage of carbon dioxide increases, forming a _____ in the outer atmosphere.	1 Mark	L1	CO1
3.	In India, as per 1994-95 estimates, approximately _____ ha was under greenhouse cultivation.	1 Mark	L1	CO1
4.	In the 16th century, _____ lanterns, bell jars, and hotbeds covered with glass were used for crop protection.	1 Mark	L2	CO1
5.	A _____ type greenhouse has two roof slopes of equal pitch and width.	1 Mark	L1	CO2
6.	_____ framed greenhouses are used for spans of less than 6 meters.	1 Mark	L1	CO2
7.	The _____ greenhouse is used primarily for growing crops in areas with heavy snow, and its snow load is considered during construction.	1 Mark	L1	CO2
8.	_____ greenhouses are suitable for regions with hot climates and require a high amount of cooling.	1 Mark	L1	CO2
9.	The structure of a greenhouse should be designed to resist a wind velocity of _____	1 Mark	L1	CO3
10.	The two types of galvanizing processes used for steel structures are _____ _____ and _____	1 Mark	L1	CO3
11.	Glass greenhouses have a higher _____, reducing interior humidity.	1 Mark	L1	CO3
12.	Overwatering reduces _____ and _____ in plants.	1 Mark	L1	CO3
13.	The southern region greenhouses need only _____ since the winter cold effect is not that severe.	1 Mark	L1	CO4
14.	A second covering of polyethylene can reduce heat loss by _____	1 Mark	L1	CO4
15.	The _____ consists of a central boiler that produces steam or hot water.	1 Mark	L1	CO4
16.	Engineering properties are useful in the design and operation of equipment employed in _____.	1 Mark	L1	CO4
17.	All porous food materials, when in contact with moist air, adsorb or desorb water molecules to attain _____.	1 Mark	L2	CO5
18.	_____ moisture foods lose moisture when exposed to air, whereas _____ moisture foods gain moisture in humid air.	1 Mark	L1	CO5
19.	_____ is the moisture content where constant rate drying ceases, and falling rate starts.	1 Mark	L1	CO5
20.	In _____ continuous flow dryers, baffles are used to divert the flow of grains.	1 Mark	L1	CO5

PART - B

Answer any Ten Question
All Questions Carry Equal Marks

II **10 x 3 = 30 Marks**

1.	Write about the advantages of a greenhouse for crop production.	3 Marks	L2	CO1
2.	Describe the greenhouse effect and its impact on global warming. Explain the scope of the greenhouses.	3 Marks	L2	CO1
3.	What are the major considerations while selecting a greenhouse type based on construction?	3 Marks	L1	CO2
4.	Describe the ridge and furrow-type greenhouse and its benefits.	3 Marks	L2	CO2
5.	Explain the rules of watering in greenhouse irrigation systems.	3 Marks	L2	CO3
6.	Describe the different materials used for constructing greenhouses and their properties.	3 Marks	L3	CO3
7.	Outline the key steps involved in the construction of a pipe-framed greenhouse.	3 Marks	L2	CO3
8.	How can a second layer of polyethylene reduce heat loss in greenhouses?	3 Marks	L1	CO4
9.	Describe the impact of mechanical properties on threshing and milling operations.	3 Marks	L2	CO4
10.	Explain the different heating systems used in greenhouses.	3 Marks	L2	CO4
11.	What are the main stages in the drying process, and what happens during the first and second falling rate periods?	3 Marks	L1	CO5
12.	Explain the mechanism of drying with respect to capillary flow, liquid diffusion, and vapor diffusion.	3 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) VI Semester (SOA-22) Regular Examinations, May – 2026

RAINFED AGRICULTURE & WATERSHED MANAGEMENT

[B.Sc. Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 X 1 = 20 Marks**

1	About _____ percent of India's net cultivated area is under rainfed agriculture.	1 Mark	L1	CO1
2	Nearly _____ percent of pulses production in India comes from rainfed areas.	1 Mark	L1	CO1
3	The area under rainfed agriculture in India is about _____ million hectares.	1 Mark	L1	CO1
4	Expand the CRIDA_____	1 Mark	L1	CO1
5	In dryland agriculture, more than _____ percent of rainfall is received in 3–5 rainy days.	1 Mark	L1	CO1
6	Breaks in monsoon for more than _____ days cause serious moisture stress.	1 Mark	L1	CO2
7	Black soils are also known as _____ soils.	1 Mark	L1	CO2
8	Alfisols are commonly referred to as _____ soils.	1 Mark	L1	CO2
9	Drought adaptation refers to the ability of crops to grow satisfactorily under _____ stress.	1 Mark	L1	CO2
10	Drought generally denotes scarcity of _____ in a region.	1 Mark	L1	CO2
11	Runoff farming and _____ agriculture are synonymous terms.	1 Mark	L1	CO3
12	Water harvesting systems consist of _____ and _____ areas.	1 Mark	L1	CO3
13	The part of land that contributes rainwater is called the _____ area.	1 Mark	L1	CO3
14	Precision farming technologies provide _____ data for efficient water management.	1 Mark	L1	CO3
15	Expand the PET_____	1 Mark	L1	CO3
16	Soil, water, and _____ are the three important natural resources.	1 Mark	L1	CO4
17	_____ is a spatial area from which runoff from precipitation is collected and drained through a common point.	1 Mark	L1	CO4
18	The first watershed management program in India, RVP, was started in the year _____.	1 Mark	L1	CO4
19	_____is best described as a unit that drains runoff into a common point.	1 Mark	L1	CO4
20	Expand the NWDPRA _____	1 Mark	L1	CO4

PART - B

Answer any Ten Question
All Questions Carry Equal Marks

II **10 X 3 = 30 Marks**

1	Define the following terms: i) Dry land farming ii) Dry Farming.	3 Marks	L2	CO1
2	Differentiate between Dryland Farming and Rainfed Farming.	3 Marks	L3	CO1
3	Enlist the major constraints of rainfed farming**.**	3 Marks	L2	CO1
4	Define the following terms: i) In-situ soil moisture conservation ii) Contour bunding.	3 Marks	L2	CO2
5	Enlist the major climatic constraints in rainfed areas.	3 Marks	L3	CO2
6	Differentiate between contour bunding and graded bunding.	3 Marks	L2	CO2
7	Define the following terms: i)Water harvesting ii) Runoff Farming.	3 Marks	L2	CO3
8	Enlist the components of a water harvesting system.	3 Marks	L2	CO3
9	Enlist crop management practices used for efficient utilization of water.	3 Marks	L2	CO3
10	Write about the crop management in watershed management.	3 Marks	L3	CO4
11	Write in brief about the effect of intermediate dry spells at flowering stage	3 Marks	L2	CO4
12	Write in brief about the role of short-duration crops in contingency planning.	3 Marks	L3	CO4

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) VI Semester (SOA-22) Regular Examinations, May – 2026

PRINCIPLES OF ORGANIC FARMING

[B.Sc. Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 x 1 = 20 Marks**

1.	_____is known as the Father of modern organic agriculture.	1 Mark	L1	CO1
2.	Urban organic farming in Cuba is supported through _____.	1 Mark	L1	CO1
3.	The four principles of organic farming are _____, _____, _____ and _____.	1 Mark	L1	CO1
4.	Beneficial microbes used in organic farming are called _____.	1 Mark	L2	CO1
5.	FAO defines organic agriculture as a _____system.	1 Mark	L1	CO2
6.	IFOAM was formed on _____.	1 Mark	L1	CO2
7.	Biodynamic agriculture was derived from the teachings of _____.	1 Mark	L2	CO2
8.	Formulation BD-500 is known as _____.	1 Mark	L1	CO2
9.	Amruthpani was developed under _____technique.	1 Mark	L1	CO3
10.	_____avoids or largely excludes the use of synthetic inputs such as fertilizers and pesticides.	1 Mark	L1	CO3
11.	Formulation BD-500 is known as _____.	1 Mark	L1	CO3
12.	_____ pheromones are chemical substances released mostly by female insects.	1 Mark	L1	CO3
13.	Methyl eugenol and _____are used against fruit flies.	1 Mark	L1	CO4
14.	Red palm weevil in coconut is controlled using _____ traps.	1 Mark	L2	CO4
15.	Minimum _____ pheromone traps per hectare are required for monitoring.	1 Mark	L1	CO4
16.	The apex decision-making body under NPOP is _____.	1 Mark	L1	CO4
17.	NPOP is managed by _____ under the Ministry of Commerce and Industry.	1 Mark	L2	CO5
18.	The minimum conversion period for perennial crops is _____ months.	1 Mark	L1	CO5
19.	The certification mark for organic products in India is called _____.	1 Mark	L1	CO5
20.	TRACENET is an online system managed by _____.	1 Mark	L1	CO5

PART - B

Answer any Ten Question
All Questions Carry Equal Marks

II **10 x 3 = 30 Marks**

1.	Differentiate between organic agriculture and conventional agriculture?	3 Marks	L2	CO1
2.	Is organically produced foods are better in quality?	3 Marks	L4	CO1
3.	Write about various government schemes to promote organic agriculture?	3 Marks	L3	CO1
4.	Write the functions of IFOAM?	3 Marks	L2	CO2
5.	What are the restrictions on nutrient use in organic farming?	3 Marks	L2	CO2
6.	Write a short note on criteria for crop selection in organic farming?	3 Marks	L3	CO2
7.	Define vermin composting? What are the advantages and dis advantages of vermin composting?	3 Marks	L1	CO3
8.	Write the classification of bio agents for weed management?	3 Marks	L3	CO3
9.	Explain about the functions of APEDA?	3 Marks	L3	CO4
10.	Discuss about the processing, levelling, economic considerations & viability, marketing and export potential of organic products?	3 Marks	L3	CO4
11.	Explain about the standards to be maintained for organic products?	3 Marks	L3	CO5
12.	Write a brief note on NPOP?	3 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) VI Semester (SOA-22) Regular Examinations, May – 2026

AGRICULTURAL JOURNALISM

[B.Sc. Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 X 1 = 20 Marks**

1.	Radio and television news belong to _____ journalism.	1 Mark	L1	CO1
2.	News shared through websites and social media is called _____ journalism.	1 Mark	L2	CO1
3.	In-depth reporting to expose issues is known as _____ journalism.	1 Mark	L2	CO1
4.	Women empowerment and self-help groups are covered under _____ journalism.	1 Mark	L1	CO1
5.	Newspapers are economical and affordable to_____ and _____farmers	1 Mark	L1	CO2
6.	Magazine readers are generally more _____than newspaper readers.	1 Mark	L2	CO2
7.	Farmers prefer _____stories of fellow farmers for motivation.	1 Mark	L2	CO2
8.	Information on dairy, poultry, and fisheries helps in income _____	1 Mark	L1	CO2
9.	Advertisements are an important source of _____ for newspapers.	1 Mark	L2	CO3
10.	Magazines are printed on _____quality paper..	1 Mark	L2	CO3
11.	The most attractive part of a magazine is the _____ page.	1 Mark	L1	CO3
12.	Feature articles in magazines are more _____ and informative than news reports.	1 Mark	L1	CO3
13.	Extension personnel act as a link between _____ and _____	1 Mark	L2	CO4
14.	Secondary sources help journalists in _____study and reference.	1 Mark	L1	CO4
15.	Informal sources are based on _____relationships	1 Mark	L1	CO4
16.	Fellow farmers strongly influence the adoption of _____practices.	1 Mark	L1	CO4
17.	Photographs are useful in depicting different stages of _____ growth.	1 Mark	L1	CO5
18.	Pest and disease symptoms can be easily identified using _____.	1 Mark	L1	CO5
19.	Illustrations improve learning and _____ of information.	1 Mark	L1	CO5
20.	Infographics and posters are examples of _____ visual aids.	1 Mark	L1	CO5

PART - B

Answer any Ten Question
All Questions Carry Equal Marks

II **10 X 3 = 30 Marks**

1.	Explain the scope of Agricultural Journalism?	3 Marks	L1	CO1
2.	What are training is required for an Agricultural Journalist and Explain?	3 Marks	L1	CO1
3.	Explain different types of Agricultural Journalism?	3 Marks	L4	CO1
4.	Mention the different kinds of magazines?	3 Marks	L2	CO2
5.	List out the characteristics of newspaper readers?	3 Marks	L1	CO2
6.	List the major contents included in magazines?	3 Marks	L3	CO2
7.	Why are clarity, simplicity, and accuracy important in agricultural writing?	3 Marks	L4	CO3
8.	Explain the structure of an agricultural story?	3 Marks	L3	CO3
9.	Explain the role of informal sources in agricultural information dissemination?	3 Marks	L4	CO4
10.	List out the various types of interviews and explain them?	3 Marks	L2	CO4
11.	Discuss the importance of artwork and illustrations in agriculture?	3 Marks	L2	CO5
12.	Briefly explain about copy reading?	3 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) VI Semester (SOA-22) Regular Examinations, May – 2026

PRINCIPLES OF FOOD SCIENCE AND NUTRITION

[B.Sc. Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 X 1 = 20 Marks**

1.	One tablespoon is approximately_____ mL.	1 Mark	L1	CO1
2.	Lettuce and popcorn are examples of _____ type of foods.	1 Mark	L1	CO1
3.	Nuts and cheese are examples of _____ type foods.	1 Mark	L1	CO1
4.	Anthocyanins are antioxidant compounds responsible for _____ and blue colors in foods.	1 Mark	L2	CO1
5.	Polyphenols help neutralize _____ radicals in the body.	1 Mark	L1	CO2
6.	The Maillard reaction occurs between reducing sugars and _____.	1 Mark	L1	CO2
7.	Caramelization involves the breakdown of _____ when heated.	1 Mark	L2	CO2
8.	Toxic compounds produced by molds are called _____.	1 Mark	L1	CO3
9.	Nutritional yeast is rich in _____ vitamins.	1 Mark	L1	CO3
10.	Fermentation improves food preservation by producing _____ or alcohol.	1 Mark	L1	CO3
11.	Refrigeration slows down _____ growth in food.	1 Mark	L1	CO3
12.	_____ bacteria convert lactose into lactic acid in milk.	1 Mark	L1	CO3
13.	Amylase is an enzyme that breaks down _____.	1 Mark	L1	CO4
14.	Food irradiation doses are measured in _____.	1 Mark	L2	CO4
15.	Ascorbic acid functions as an _____ in food preservation.	1 Mark	L1	CO4
16.	Pectin is widely used as a _____ agent in jams and jellies.	1 Mark	L1	CO4
17.	Triglycerides are broken down into _____ and _____ during digestion.	1 Mark	L1	CO5
18.	Fatty acids undergo _____ to produce acetyl-CoA.	1 Mark	L1	CO5
19.	Removal of the amino group from amino acids is called _____.	1 Mark	L1	CO5
20.	Energy metabolism of carbohydrates primarily produces energy in the form of _____.	1 Mark	L1	CO5

PART - B

Answer any Ten Question
All Questions Carry Equal Marks

II **10 X 3 = 30 Marks**

1.	Explain dry heat methods of cooking with suitable examples.	3 Marks	L4	CO1
2.	Differentiate between moist heat and dry heat methods of cooking with examples.	3 Marks	L3	CO1
3.	Describe fat composition in foods, explaining saturated, unsaturated, and trans fats along with their health effects.	3 Marks	L4	CO2
4.	Write a short note on essential fatty acids, highlighting omega-3 and omega-6 fatty acids and their functions.	3 Marks	L1	CO2
5.	Describe enzymatic browning and lipid oxidation, explaining their causes and effects on food quality.	3 Marks	L4	CO2

6.	Describe the role of temperature control in preventing microbial growth in foods.	3 Marks	L4	CO3
7.	Write a short note on food preservation methods used to control microorganisms.	3 Marks	L1	CO3
8.	Explain the process of fermentation and its importance in food preservation.	3 Marks	L4	CO4
9.	Explain the role of antioxidants in preventing food spoilage.	3 Marks	L4	CO4
10.	Describe any three methods of food drying with examples.	3 Marks	L4	CO5
11.	Explain the concept of a balanced modified diet and its key components.	3 Marks	L4	CO5
12.	Explain deamination and the urea cycle in protein metabolism.	3 Marks	L4	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) VI Semester (SOA-22) Regular Examinations, May – 2026

PRINCIPLES OF SEED TECHNOLOGY

[B.Sc. Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 x 1 = 20 Marks**

1.	A seed that does not germinate under normal environmental conditions is known as _____.	1 Mark	L1	CO1
2.	The seed replacement rate in hybrids is _____.	1 Mark	L1	CO1
3.	A mature ovule develops into _____.	1 Mark	L1	CO1
4.	The structural arrangement of male and female reproductive organs that prevents self-pollination is called _____.	1 Mark	L1	CO1
5.	Pollination carried out by bats is termed _____.	1 Mark	L1	CO1
6.	The prescribed genetic purity standard for certified seeds is _____.	1 Mark	L1	CO2
7.	The seed multiplication ratio in groundnut is _____.	1 Mark	L1	CO2
8.	The seed multiplication ratio in rice is _____.	1 Mark	L1	CO2
9.	Nucleus seed production is directly supervised by the _____.	1 Mark		
10.	The required isolation distance for hybrid maize seed production is _____.	1 Mark	L1	CO3
11.	Rouging is an operation performed to maintain genetic purity by removing _____.	1 Mark	L1	CO3
12.	The statement "Hybrid seed production in rice utilizes CGMS technology" is correct/incorrect.	1 Mark	L1	CO3
13.	The tools used for hybridization in cotton include _____ _____.	1 Mark	L1	CO4
14.	The isolation distance required for foundation seed production in hybrid sunflower is _____.	1 Mark	L1	CO4
15.	The chemical commonly used for extracting seeds in tomato is _____.	1 Mark	L1	CO4
16.	PCR (Polymerase Chain Reaction) is a molecular technique used to amplify _____.	1 Mark	L1	CO4
17.	The primary objective of seed treatment is to enhance seedling vigor and establishment. This statement is correct/incorrect.	1 Mark	L1	CO5
18.	Seed treatments may include growth regulators to stimulate faster growth. This statement is correct/incorrect.	1 Mark	L1	CO5
19.	A common seed treatment method is fungicide coating, which protects seeds from weeds. This statement is correct/incorrect.	1 Mark	L1	CO5
20.	Seed drying refers to the process of reducing the _____ content of seeds to a safe storage level.	1 Mark	L1	CO5

PART - B

Answer any Ten Question
All Questions Carry Equal Marks

II **10 x 3 = 30 Marks**

1.	What the causes for genetic deterioration in seed production?	3 Marks	L2	CO1
2.	Explain the mechanism involved in cross pollination with examples?	3 Marks	L4	CO1
3.	State the parts of a good seed and illustrate with diagram.	3 Marks	L1	CO1
4.	Briefly explain the steps involved in release of a variety?	3 Marks	L3	CO2
5.	Discuss the concept of "DUS " test during seed production?	3 Marks	L4	CO2
6.	Describe the steps involved in sorghum seed production?	3 Marks	L4	CO2
7.	Analyze the duties and powers of a seed inspector as per the Seed Act.	3 Marks	L3	CO3
8.	Explain the offences and corresponding penalties prescribed under the Seeds Act.	3 Marks	L4	CO3
9.	Describe the key roles and responsibilities of the National Seed Corporation.	3 Marks	L4	CO3
10.	Explain the basic principles of electrophoresis and its applications in seed testing. Also discuss its advantages and limitations in comparison with other testing methods.	3 Marks	L4	CO4
11.	Briefly describe the concepts of Extant Variety, Farmers' Variety, and Essentially Derived Variety.	3 Marks	L4	CO5
12.	Write a concise note on the Seed Bill, 2004.	3 Marks	L1	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) VI Semester (SOA-22) Regular Examinations, May – 2026

POST-HARVEST MANAGEMENT AND VALUE ADDITION OF FRUITS AND VEGETABLES
[B.Sc. Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 x 1 = 20 Marks**

1.	Expand- CIPHET_____	1 Mark	L1	CO1
2.	High _____ conditions promote microbial spoilage in fresh produce	1 Mark	L2	CO1
3.	Proper _____ can significantly extend the shelf life of fruits and vegetables	1 Mark	L1	CO1
4.	_____ is a packaging technique that helps in extending the shelf life of perishable fruits and vegetables by modifying the gas composition	1 Mark	L1	CO1
5.	Ethylene is known as the _____ hormone in fruits	1 Mark	L2	CO2
6.	The process of fruits reaching an edible state after maturity is called _____	1 Mark	L2	CO2
7.	_____ is the process where starch is converted into simple sugars during ripening	1 Mark	L1	CO2
8.	The respiration rate _____ after harvesting	1 Mark	L2	CO2
9.	_____ is the process of increasing the economic value of raw fruit and vegetable products	1 Mark	L2	CO3
10.	Cold storage helps in delaying _____ and extending shelf life.	1 Mark	L1	CO3
11.	_____is defined as the removal of field heat from freshly harvested produce in order to slow down metabolism and reduce deterioration prior to transport or storage	1 Mark	L2	CO3
12.	_____ is a low-cost storage system that works on evaporative cooling principles	1 Mark	L3	CO3
13.	Fermentation increases the shelf life of beverages. (True/False)	1 Mark	L2	CO4
14.	Packaging prevents contamination and extends shelf life. (True/False)	1 Mark	L2	CO4
15.	The primary goal of food preservation is to prevent _____	1 Mark	L1	CO4
16.	The process of immersing fruit in sugar syrup for preservation is called _____	1 Mark	L2	CO4
17.	Write example of non-fermented products _____	1 Mark	L2	CO5
18.	The right packaging reduces _____during transport.	1 Mark	L1	CO5
19.	Dehydration reduces _____ activity to prevent spoilage	1 Mark	L2	CO5
20.	Write example of non-fermented products _____	1 Mark	L1	CO5

PART - B

Answer any Ten Question
All Questions Carry Equal Marks

II **10 x 3 = 30 Marks**

1.	Explain about packaging techniques used in post-harvest losses minimizing	3 Marks	L2	CO1
2.	Describe importance and scope of post-harvest technology	3 Marks	L3	CO1
3.	Write possible causes of post-harvest losses	3 Marks	L3	CO1
4.	Define ripening and write changes occur during	3 Marks	L2	CO2
5.	Explain pre-harvest factors affecting postharvest quality of fruits and vegetables	3 Marks	L3	CO2
6.	Enlist different storage methods and What are the advantages of ZECC storage for small-scale farmers? How does it work?	3 Marks	L4	CO3
7.	Describe about Harvesting and field handling procedures of fruits and vegetables	3 Marks	L2	CO3
8.	Explain the principles of food preservation and their importance in food safety.	3 Marks	L1	CO4
9.	Write different methods followed in preservation	3 Marks	L2	CO4
10.	Define Jelly. Give flow chart of jelly preparation and list out problems while preparing jelly	3 Marks	L3	CO4
11.	Write different types of drying and dehydration techniques	3 Marks	L3	CO5
12.	What is canning? Explain the process and its advantages	3 Marks	L1	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Hons) VI Semester (SOA-22) Regular Examinations, May – 2026

DISEASES OF FIELD AND HORTICULTURAL CROPS AND THEIR MANAGEMENT -II

[B.Sc. Agriculture]

Time: 3 hours **Max. Marks: 50**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

I **20 x 1 = 20 Marks**

1.	_____ and _____are acting as alternate hosts for black stem rust of wheat.	1 Mark	L1	CO1
2.	Aecial and pycnial stages of orange rust of wheat is produced on _____	1 Mark	L1	CO1
3.	The teleutospores are dark brown, two celled, thick walled and flattened at the top in _____(Scientific name).	1 Mark	L1	CO1
4.	In wheat, twisting of the stem, distortion of the ear head and rotting of the spikelets with a profuse oozing of yellow liquid from the affected tissues is due to _____	1 Mark	L1	CO1
5.	Grassy shoot of sugar cane is transmitted by _____	1 Mark	L4	CO2
6.	The most commonly used effective fungicide against powdery mildew diseases is _____	1 Mark	L3	CO2
7.	Greyish white irregular necrotic patches develop on the lower surface of the leaves of mustard is due to _____ (Scientific Name).	1 Mark	L2	CO2
8.	Name the fastidious vascular bacterial (FVB) disease in sugarcane _____	1 Mark	L1	CO2
9.	_____ and _____ were the first to describe the fungicidal nature of dithiocarbamates.	1 Mark	L1	CO3
10.	Expand DIPA_____	1 Mark	L1	CO3
11.	Soils which are saturated by the pathogen are often referred as_____	1 Mark	L1	CO3
12.	Antibiosis mediated by volatile compounds has been observed in the management of _____ pathogens.	1 Mark	L1	CO3
13.	The fungus that causes downy mildew in pea survives in _____ and _____.	1 Mark	L2	CO4
14.	The individual flower is greatly enlarged with hypertrophied bracts in mango is due to _____	1 Mark	L1	CO4
15.	Red Sultana is the resistant variety of grapevines used for the management of _____ disease.	1 Mark	L1	CO4
16.	Sunken spots with ashy grey centre and dark margin appear on fruits (bird's eye symptom) is due to _____disease	1 Mark	L1	CO4
17.	Dark brown necrotic spots with yellow halo with zonations or concentric rings that give a target board look in potato leaves is due to _____(Scientific Name).	1 Mark	L2	CO5
18.	Whitish or dirty grey, powdery growth on foliage, stems and young growing parts of cucurbit plants is due to _____(Scientific Name).	1 Mark	L1	CO5

19.	Elliptical to oblong spots of different sizes appear on both the surfaces, but more on upper surface of turmeric leaves is due to _____(Scientific Name).	1 Mark	L1	CO5
20.	Ashwini, Ambika, Angeles, American pride, Surabhi are the resistant varieties of rose used for the management of _____	1 Mark	L1	CO5

PART - B

Answer any Ten Question
All Questions Carry Equal Marks

II **10 x 3 = 30 Marks**

1.	Write the differences between three rusts of wheat	3 Marks	L2	CO1
2.	Describe in detail about disease cycle and management of earcockle/ tundu disease of wheat?	3 Marks	L1	CO1
3.	Difference between grassy shoot and ratoon stunting of sugarcane?	3 Marks	L1	CO1
4.	List the diseases of potato and write the binomial of causal organism of disease	3 Marks	L1	CO2
5.	Write about symptomology and management of ascochyta blight of gram?	3 Marks	L3	CO2
6.	Write a short note on symptomology and management of blackarm of cotton?	3 Marks	L2	CO2
7.	Write a short note calculation of EIL?	3 Marks	L4	CO3
8.	Define avoidance? Write a short note on avoidance of pathogen?	3 Marks	L2	CO3
9.	Explain in detail about symptomology and management of anthracnose of mango?	3 Marks	L2	CO4
10.	Explain in detail about symptomology and management of fire blight of apple?	3 Marks	L1	CO4
11.	Explain in detail about symptomology and management of anthracnose and fruit rot of chilli?	3 Marks	L1	CO5
12.	Difference between powdery mildew and downy mildew of cucurbits?	3 Marks	L1	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. I Semester Fasttrack (MBU-22) Supplementary Examinations, March - 2026

INTRODUCTION TO BIOLOGY

[Microbiology, Biotechnology, Bioinformatics]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	How do prokaryotic cells differ from eukaryotic cells in terms of their genetic material?	2 Marks	L1	CO1
	b)	Identify two organelles that are unique to plant cells.	2 Marks	L3	CO1
	c)	Give classification of plant kingdom.	2 Marks	L1	CO2
	d)	Explain differentiation, dedifferentiation and redifferentiation	2 Marks	L2	CO2
	e)	What is the function of a promoter in gene regulation?	2 Marks	L1	CO3
	f)	Name two enzymes that are essential for recombinant DNA technology.	2 Marks	L1	CO3
	g)	How is a nerve impulse transmitted across a neuromuscular junction?	2 Marks	L2	CO4
	h)	What is the role of neurotransmitters in synaptic transmission	2 Marks	L1	CO4
	i)	How does Photo system II (PS II) contribute to the splitting of water molecules?	2 Marks	L2	CO5
	j)	What is the difference between cyclic and non cyclic photo phosphorylation?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	What are membrane proteins and transport proteins? Explain lipid bilayer of plasma membrane.	10 Marks	L3	CO1
	b)	Describe Golgi complex and nucleolus.	6 Marks	L5	CO1
		(OR)			
3.	a)	Describe chromatin and microtubules.	8 Marks	L5	CO1
	b)	Explain centrioles and channel proteins.	8 Marks	L5	CO1

MODULE-II

4.	a)	Define morphology of Wucheririabancrofti and Plasmodium.	8 Marks	L1	CO2
	b)	Elaborate life cycle of Taenia solium.	8 Marks	L1	CO2
		(OR)			
5.	a)	How an animal kingdom is classified into phyla and give examples for each phyla	8 Marks	L2	CO2
	b)	Elaborate life cycle of Fasciotopsisbuski.	8 Marks	L2	CO2

MODULE-III

6.	a)	Outline the process of transcription in eukaryotes. Include the roles of RNA polymerase, transcription factors, and the promoter region in your explanation.	6 Marks	L6	CO3
	b)	Describe in detail the Hershey-Chase experiment. How did this experiment confirm that DNA, and not protein, is the genetic material in organisms?	10 Marks	L5	CO3

(OR)

7.	a)	Describe the mechanism of translation in protein synthesis. Include the role of mRNA, tRNA, ribosomes, and explain how the process occurs in three stages: initiation, elongation, and termination.	6 Marks	L2	CO3
	b)	Explain the double-helix model of DNA proposed by Watson and Crick. Discuss the significance of the base pairing rules, the role of hydrogen bonds, and the antiparallel nature of the strands.	10 Marks	L5	CO3

MODULE-IV

8.	a)	What is a synapse, and how is a nerve impulse transmitted across a chemical synapse? Mention the role of synaptic vesicles, neurotransmitters, and receptors.	6 Marks	L1	CO4
	b)	Describe the complete process of digestion and absorption of carbohydrates, proteins, and fats in the digestive system. Discuss the roles of the stomach, pancreas, liver, and small intestine in this process.	10 Marks	L2	CO4

(OR)

9.	a)	Describe the ABO blood group system and its importance in blood transfusion. What are the consequences of mismatched blood transfusions?	6 Marks	L2	CO4
	b)	Explain the mechanics of breathing (inspiration and expiration) in the human body. Include the roles of the diaphragm, intercostal muscles, and lung elasticity in your explanation.	10 Marks	L2	CO4

MODULE-V

10.	a)	Differentiate between cyclic and noncyclic photophosphorylation. Discuss how each process contributes to the production of ATP and NADPH in the light-dependent reactions.	6 Marks	L5	CO5
	b)	Explain the differences between oxygenic and anoxygenic photosynthesis in terms of their mechanisms, organisms involved, and environmental significance.	10 Marks	L5	CO5

(OR)

11.	a)	Explain the function of Photosystem II (PS II) in the process of photolysis of water. How does it contribute to oxygen production in photosynthesis?	6 Marks	L5	CO5
	b)	Discuss the structure and function of chlorophyll in photosynthesis. How does it absorb light, and what role do other pigments play in capturing solar energy?	10 Marks	L5	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. II Semester Fasttrack (MBU-22) Supplementary Examinations, March - 2026

FOOD AND NUTRITION

[Microbiology, Biotechnology & Bioinformatics]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Differentiate between macronutrients and micronutrients.	2 Marks	L4	CO1
	b)	Explain the concept of optimum nutrition.	2 Marks	L2	CO1
	c)	What is the SI unit of energy?	2 Marks	L1	CO2
	d)	Define a joule in the context of energy measurement.	2 Marks	L1	CO2
	e)	Explain the significance of assessing nutritional status. Why is it important for individuals and populations?	2 Marks	L2	CO3
	f)	Define health and discuss the relationship between nutrition and overall health.	2 Marks	L1	CO3
	g)	Discuss the primary functions of proteins in the human body.	2 Marks	L2	CO4
	h)	How do proteins contribute to muscle building and repair?	2 Marks	L1	CO4
	i)	List common dietary sources of vitamin A.	2 Marks	L4	CO5
	j)	What are the recommended daily intake levels for vitamin A?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	What is balanced diet and explain its components and functions.	8 Marks	L1	CO1
	b)	Discuss the concept of bioavailability in nutrition. How do factors such as nutrient interactions, food matrix, and individual characteristics impact the absorption and utilization of nutrients in the body?	8 Marks	L2	CO1

(OR)

3.	a)	Define food guide pyramid and its uses.	8 Marks	L1	CO1
	b)	Explore the nutritional significance of "superfoods." What criteria are used to classify certain foods as superfoods, and how can they contribute to a well-balanced diet?	8 Marks	L3	CO1

MODULE-II

4.	a)	Write a brief account on SDA(Specific Dynamic Action).	8 Marks	L1	CO2
	b)	Examine the factors influencing Basal Metabolic Rate (BMR) and their physiological significance. How does BMR contribute to the total energy expenditure in an individual?	8 Marks	L4	CO2

(OR)

5.	a)	What do you mean by thermic effect of food? What are the factors that affect thermic effects of food?	8 Marks	L1	CO2
	b)	Examine the role of dietary fiber in influencing the Thermic Effect of Food. How does the consumption of high-fiber foods impact postprandial energy expenditure, and what implications does this have for weight management and metabolic health?	8 Marks	L4	CO2

MODULE-III

6.	a)	Name some disorders related to deficiency and excess intake of carbohydrates.	8 Marks	L1	CO3
	b)	Explain the process of assessing nutritional status in individuals. What are the key indicators used to evaluate nutritional adequacy, and how do they contribute to overall health outcomes?	8 Marks	L2	CO3

(OR)

7.	a)	What is the role of fiber in human health?	8 Marks	L1	CO3
	b)	Explore the relationship between nutrition and chronic diseases. How can dietary choices influence the risk of conditions such as heart disease, diabetes, and obesity?	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain the consequences of protein deficiency, focusing on the development of kwashiorkor and marasmus. Discuss the impact on growth, immune function, and overall health.	8 Marks	L2	CO4
	b)	Elaborate on the process of lipid digestion, absorption, and transport in the digestive system. How are fatty acids and glycerol metabolized and utilized in the body?	8 Marks	L4	CO4

(OR)

9.	a)	Explore the dietary sources of lipids, including saturated and unsaturated fats. Discuss the recommended dietary fat intake, considering the balance between different types of fats.	8 Marks	L4	CO4
	b)	Discuss the importance of essential fatty acids (omega-3 and omega-6) in maintaining health. What health consequences can arise from a deficiency of these essential fatty acids?	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss the antioxidant properties of vitamin E and its role in protecting cell membranes. How does vitamin E contribute to the prevention of oxidative stress and its associated health benefits?	8 Marks	L2	CO5
	b)	Explain the significance of vitamin K in blood clotting and bone metabolism. How does vitamin K contribute to the synthesis of clotting factors and bone proteins?	8 Marks	L4	CO5

(OR)

11.	a)	Explore the role of thiamine in carbohydrate metabolism and energy production. How does thiamine deficiency lead to conditions such as beriberi?	8 Marks	L3	CO5
	b)	Examine the functions of riboflavin in energy metabolism and antioxidant defense. How does riboflavin contribute to the conversion of nutrients into usable energy?	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. I Semester Fasttrack (MBU-22) Supplementary Examinations, March - 2026

ENVIRONMENTAL STUDIES

[Computer Science, Forensic Science, Microbiology, Biotechnology, Bioinformatics]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	How does wind energy differ from tidal energy in terms of generation?	2 Marks	L2	CO1
	b)	Define renewable energy resources.	2 Marks	L1	CO1
	c)	Evaluate the effectiveness of ultraviolet (UV) light treatment compared to chemical disinfection in terms of water safety and environmental impact.	2 Marks	L5	CO2
	d)	Apply the principle of chlorination to explain how it can be used to ensure water is safe to drink in an emergency.	2 Marks	L3	CO2
	e)	Design a straightforward safety checklist for handling radioactive materials.	2 Marks	L6	CO3
	f)	What are the common causes of land pollution?	2 Marks	L1	CO3
	g)	Explain how rapid population growth can affect resources and infrastructure in a country.	2 Marks	L2	CO4
	h)	What is the role of ozone (O_3) in the stratosphere?	2 Marks	L1	CO4
	i)	What is the primary goal of Green Chemistry?	2 Marks	L2	CO5
	j)	What are the three pillars of sustainable development?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Assess the role of natural gas as a bridge towards more sustainable energy solutions, considering its environmental footprint.	6 Marks	L5	CO1
	b)	Evaluate the effectiveness of different policies aimed at promoting renewable energy adoption and their impact on environmental sustainability.	10 Marks	L5	CO1

(OR)

3.	a)	Analyze the effects of transitioning to electric vehicles on the demand for electricity and the potential impact on power generation from various sources.	6 Marks	L4	CO1
	b)	Evaluate the ecological and social impacts of building large-scale hydroelectric dams on river ecosystems and local communities.	10 Marks	L4	CO1

MODULE-II

4.	a)	Identify common impurities in drinking water and explain their potential health effects.	6 Marks	L1	CO2
	b)	Analyze the effectiveness of various water purification technologies in removing specific impurities.	10 Marks	L4	CO2

(OR)

5.	a)	Define eutrophication and list its primary causes.	6 Marks	L1	CO2
	b)	Explain how advanced treatment processes like tertiary treatment can improve the quality of treated wastewater.	10 Marks	L2	CO2

MODULE-III

6.	a)	Define land pollution and identify its primary causes.	6 Marks	L1	CO3
	b)	Describe the potential health risks of pesticide overuse in agriculture and its contribution to soil and water pollution.	10 Marks	L1	CO3

(OR)

7.	a)	Explain the environmental effects of overgrazing on soil quality and biodiversity.	6 Marks	L2	CO3
	b)	Describe the effects of modern agricultural practices, particularly the use of fertilizers and pesticides, on the environment.	10 Marks	L1	CO3

MODULE-IV

8.	a)	Create a proposal for reducing the environmental impact of pesticide use in a specific crop. Include alternative practices, potential benefits, and implementation steps.	6 Marks	L6	CO4
	b)	Design a watershed management plan for an urban area to address the challenges of water conservation and sustainable development.	10 Marks	L6	CO4

(OR)

9.	a)	Assess the role of sustainable urban drainage systems (SUDS) in managing storm water and reducing urban flooding.	6 Marks	L5	CO4
	b)	Evaluate the potential impacts of global warming on sea levels and coastal communities.	10 Marks	L5	CO4

MODULE-V

10.	a)	Explain the principles of green chemistry and how they contribute to reducing environmental hazards.	6 Marks	L4	CO5
	b)	Describe the role of energy efficiency in green computing and how it can be achieved.	10 Marks	L5	CO5

(OR)

11.	a)	Assess the benefits and challenges of energy-efficient computing practices in a large organization. Consider hardware, software, and behavioral changes.	6 Marks	L5	CO5
	b)	Evaluate the impact of virtualization technologies on reducing energy consumption in data centers. Compare it with traditional computing methods using data or case studies.	10 Marks	L5	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. II Semester Fasttrack (MBU-22) Supplementary Examinations, March - 2026

BIOPHYSICAL TECHNIQUES

[Microbiology, Biotechnology & Bioinformatics]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What are the main components of a pH meter and their functions?	2 Marks	L1	CO1
	b)	Describe the BOD measurement in water quality analysis?	2 Marks	L2	CO1
	c)	Compare among the High speed centrifuge and ultra centrifuge.	2 Marks	L2	CO2
	d)	Classify the Liquid homogenization methods.	2 Marks	L2	CO2
	e)	Describe the types of Ion exchange resins.	2 Marks	L1	CO3
	f)	What are the important methods of planar chromatography?	2 Marks	L1	CO3
	g)	Classify the methods of Gel electrophoresis.	2 Marks	L2	CO4
	h)	Summarize the molecular weight determination of a protein using in SDS-PAGE.	2 Marks	L2	CO4
	i)	Describe the emission of α, β & γ radiation with suitaLe examples.	2 Marks	L1	CO5
	j)	Define Curie and Bequerel. Relate the Ci and Bq.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Draw a neat labeled diagram of Clark Oxygen Electrode.	8 Marks	L2	CO1
	b)	Two water samples A and B recorded Electrical Conductivity value of 250 µS/cm & 40 mS/cm. Which one of the water sample is safe to consume by human beings? Give reasons.	8 Marks	L3	CO1

(OR)

3.	a)	Compare between the BOD and COD.	8 Marks	L2	CO1
	b)	Describe the properties of water. Add a note on quality parameters of water.	8 Marks	L2	CO1

MODULE-II

4.	a)	Describe the rate zonal centrifugation and its applications.	8 Marks	L2	CO2
	b)	Draw a neat labeled diagram of an ultra centrifuge. Add a note on the optical system used in ultra centrifuges.	8 Marks	L3	CO2

(OR)

5.	a)	Differentiate between isopycnic and rate zonal centrifugation.	8 Marks	L2	CO2
	b)	Discuss about types of rotors used in centrifuges.	8 Marks	L2	CO2

MODULE-III

6.	a)	Describe the components required for column chromatography.	8 Marks	L2	CO3
	b)	Classify chromatography and add a note on column chromatography.	8 Marks	L2	CO3

(OR)

7.	a)	Discuss the principle and biological applications of TLC.	8 Marks	L2	CO3
	b)	What are adsorbents? Give their uses in chromatography.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Describe the method of separation of proteins through isoelectric focusing.	8 Marks	L2	CO4
	b)	Give a brief account of types and properties of carrier ampholytes used in Isoelectric focusing.	8 Marks	L2	CO4

(OR)

9.	a)	What is 2-D gel electrophoresis? How is it performed?	8 Marks	L1	CO4
	b)	Describe the principle and uses of counter immune electrophoresis.	8 Marks	L2	CO4

MODULE-V

10.	a)	How does radioactivity interact with matter?	8 Marks	L1	CO5
	b)	Explain the principle of radioactive measurements using a GM counter.	8 Marks	L2	CO5

(OR)

11.	a)	Draw a schematic diagram of a fluorimeter. Why does a fluorimeter require two monochromators?	8 Marks	L3	CO5
	b)	What is fluorescence? How is Jabalonski diagram useful to explain fluorescence and phosphorescence?	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. II Semester Fasttrack (MBU-22) Supplementary Examinations, March – 2026

BASIC ORGANIC CHEMISTRY

[Microbiology, Biotechnology & Bioinformatics]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is the difference between a primary, secondary, and tertiary carbon atom? Give examples.	2 Marks	L1	CO1
	b)	Define keto- enol tautomerism.	2 Marks	L2	CO1
	c)	Define cycloalkanes and provide some examples of them. What is the general formula for cycloalkanes?	2 Marks	L1	CO2
	d)	Explain the term ring strain. How does ring strain affect the stability of cycloalkanes.	2 Marks	L2	CO2
	e)	What is the difference between markownikoff's and anti-markownikoff's rule?	2 Marks	L1	CO3
	f)	Explain peroxide effect in alkenes.	2 Marks	L2	CO3
	g)	Explain the difference between aromatic and non- aromatic compounds. What is the criteria for a compound to be considered as an aromatic compound?	2 Marks	L1	CO4
	h)	How do cycloalkenes differ from aromatic compounds?	2 Marks	L2	CO4
	i)	What is the difference between a cis and a trans isomer? Give examples.	2 Marks	L1	CO5
	j)	What is stereo center? How many stereocenters are present in a molecule of glucose?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the concept of resonance in the context of reaction intermediates. How does resonance affect the stability of a reaction intermediate?	8 Marks	L3	CO1
	b)	Describe the difference between a primary, secondary, and tertiary intermediate. How does the stability of these intermediates vary with their degree of substitution?	8 Marks	L3	CO1

(OR)

3.	a)	Describe briefly about inductive effect and mesomeric effect.	8 Marks	L3	CO1
	b)	What is the relationship between keto- enol tautomerism and chemical reactivity? How does the presence of the enol form affect the chemical properties of a molecule?	8 Marks	L2	CO1

MODULE-II

4.	a)	Give the conformations of cyclohexane with energy diagram.	8 Marks	L2	CO2
	b)	Distinguish between the types of cycloalkanes and their relative stability.	8 Marks	L2	CO2

(OR)

5.	a)	Describe the chemical properties of alkanes including their reactivity towards halogens and oxygen. How do alkanes react with halogens and what products are formed in these reactions? Explain with suitable examples.	8 Marks	L2	CO2
	b)	Describe the physical properties of alkanes including their boiling point, melting point, density, and solubility in different solvents with suitable solvents.	8 Marks	L3	CO2

MODULE-III

6.	a)	Illustrate the general methods of preparation of dienes.	8 Marks	L3	CO3
	b)	Explain E1 and E2 reaction mechanism with suitable examples.	8 Marks	L2	CO3

(OR)

7.	a)	Illustrate the mechanism of 1,2- and 1,4- additions.	8 Marks	L3	CO3
	b)	Give a brief account on the acidity of alkynes.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Using the concept of huckel's rule, explain the aromaticity of benzene and naphthalene.	8 Marks	L3	CO4
	b)	Explain the mechanism involved in nitration of benzene.	8 Marks	L2	CO4

(OR)

9.	a)	Discuss the effect of amino group and nitro group in aromatic substitution reactions with suitable examples.	8 Marks	L2	CO4
	b)	Illustrate the mechanism involved in Friedel crafts alkylation with example.	8 Marks	L3	CO4

MODULE-V

10.	a)	Taking suitable examples illustrate different rules followed to assign R and s notation to optical isomers.	8 Marks	L3	CO5
	b)	Discuss with suitable example, the E and Z system of nomenclature of geometrical isomers.	8 Marks	L2	CO5

(OR)

11.	a)	Explain the concept of conformational isomers. What is the difference between a gauche and an anti-conformation? Provide an example of a molecules that exhibits both conformations.	8 Marks	L2	CO5
	b)	Discuss briefly about chiral molecules with examples.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA IV Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

UNIX SHELL PROGRAMMING

[Computer Applications]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define shell and kernel?	2 Marks	L1	CO1
	b)	What are the layers in UNIX operating system?	2 Marks	L2	CO1
	c)	What does the "uname" command display?	2 Marks	L1	CO2
	d)	Write short notes on the use of "passwd" command.	2 Marks	L1	CO2
	e)	Define inode?	2 Marks	L1	CO3
	f)	Write all the attributes for a directory.	2 Marks	L1	CO3
	g)	Write syntax for saving and unsaved quit commands.	2 Marks	L1	CO4
	h)	Write the syntax for Undoing Last Editing Instructions	2 Marks	L1	CO4
	i)	Write short note on Expressions involving variables.	2 Marks	L2	CO5
	j)	What is Shell Scripting?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the functionalities of UNIX operating System.	8 Marks	L2	CO1
	b)	Describe the components of man documentation?	8 Marks	L2	CO1
		(OR)			
3.	a)	Explain the directory structure in UNIX.	8 Marks	L3	CO1
	b)	Describe briefly about the UNIX architecture with neat diagram.	8 Marks	L2	CO1

MODULE-II

4.	a)	What are the differences between internal command and external command?	8 Marks	L2	CO2
	b)	Briefly explain the mechanism of killing processes with signals.	8 Marks	L2	CO2
		(OR)			
5.	a)	Define process states and explain about Zombie process.	8 Marks	L2	CO2
	b)	Write short notes on following commands with examples? i) cp ii) Cal iii) date iv) uname v) script	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain how to change the user, group and others permissions for file and directory.	8 Marks	L2	CO3
	b)	Write the difference between hard links and symbolic links.	8 Marks	L4	CO3
		(OR)			
7.	a)	Explain default umask values for file and directory with example.	8 Marks	L2	CO3
	b)	Explain Modification and access time for files.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain search and replace commands in VI editor.	8 Marks	L1	CO4
	b)	Explain input modes commands of VI editor.	8 Marks	L2	CO4
		(OR)			
9.	a)	Explain the three different modes in which VI editor works.	8 Marks	L2	CO4
	b)	Describe Navigation Command mode?	8 Marks	L2	CO4

MODULE-V

10.	a)	Write a shell script to accept student name register number and marks of four subjects of 10 students. Find the total mark and grade of each student.	8 Marks	L3	CO5
	b)	Write a shell script by using conditional statements .	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain How do you execute a shell script with an example.	8 Marks	L1	CO5
	b)	What is the difference between sleep and wait commands in shell? Explain with examples.	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com I Semester Fasttrack (MBU-22) Supplementary Examinations, March - 2026

FUNDAMENTALS OF ACCOUNTING

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Explain Branches of Accounting.	2 Marks	L2	CO1
	b)	Give brief note on Accounting Cycle.	2 Marks	L2	CO1
	c)	Explain the advantages of Subsidiary Books.	2 Marks	L2	CO2
	d)	Discuss the concept of Contra Entry with Three contexts.	2 Marks	L2	CO2
	e)	Briefly explain the term favorable balance as per cash book.	2 Marks	L2	CO3
	f)	Explain the statement 'wrongly debited by the bank' with the help of an example.	2 Marks	L2	CO3
	g)	Explain the concept of suspense Account.	2 Marks	L2	CO3
	h)	Discuss the concept of Depreciation, Amortization and Depletion.	2 Marks	L2	CO4
	i)	Write a note on capital and revenue receipts.	2 Marks	L2	CO4
	j)	Explain the outstanding expenditure concept in adjustment with an example.	2 Marks	L2	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Define Accounting. Explain the difference between Book Keeping and Accounting.	8 Marks	L2	CO1
	b)	**Journalize the flowing transaction**: 2019-Jan-2 Purchase of goods Rs. 5,000 2019-Jan-4 Sold goods for cash Rs. 8,000 2019-Jan-5 Purchased goods from Ajay Rs. 2,000 2019-Jan-8 Sold goods to Deepak Rs. 3,000 2019-Jan-9 Cash paid to AjayRs. 1,600 2019-Jan-10 Received cash from Deepak Rs. 2,500 2019-Jan-17 Paid rent Rs. 400 & Received Commission Rs. 100 2019-Jan-24 Goods returned to Ajay Rs. 200	8 Marks	L3	CO1

(OR)

3.	a)	Define Double Entry System. Explain its advantages and limitations.	8 Marks	L2	CO1
	b)	Give brief note on Conventions of GAAP.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the difference between trade discount and cash discount.	8 Marks	L2	CO2
	b)	Mention the proforma of Bill Receivable and Bill Payable Book.	8 Marks	L2	CO2

(OR)

5.	a)	Define Subsidiary Books. Explain the types of subsidiary books.	8 Marks	L2	CO2
	b)	Explain the procedure to prepare Three Column Cash Book.	8 Marks	L2	CO2

MODULE-III

6.	a)	Enumerate the steps to ascertain the correct cash book balance.	8 Marks	L2	CO3
	b)	Explain the process of preparing a bank reconciliation statement with an amended cash balance.	8 Marks	L2	CO3

(OR)

7.	a)	From the following particulars, find out the errors in cash book and bank statement and prepare Bank Reconciliation Statement as on 31-05-2016 for Ammar Ahmed Sugar Mill Ltd: Balance as per bank statement overdraft of Rs. 2,118. The debit side of the cash book had been undercast by Rs. 300. i. A check for Rs. 182 drawn for the payment of telephone bill had been entered in the cash book as Rs. 281 but was shown correctly in the bank statement. ii. A check for Rs. 210 by the customer having been deposited into bank was dishonored by the bankA check was credited twice in Cash Book for worth Rs. 3,000. iii. A Dividend of worth Rs. 90 had been collected by the bank but not recorded in the cash book. iv. Checks Rs. 3,000 drawn in December but only 1,200 presented for payment. v. Interest amounting 228 had been debited by the bank but not entered in the cash book. vi. A check for Rs. 2,077 was issued by the company for purchase of merchandise and was paid by the bank but not recorded in company's book. vii. A check for Rs. 10,500 issued to Salman & Co. for purchase of Equipment was not encashed.	8 Marks	L4	CO3
	b)	State the causes of difference that occurred due to time lag.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain the errors disclosed by a trial balance and not disclosed by a trail balance.	8 Marks	L2	CO3
	b)	Rectify the following errors : i) Credit sales to Mohan 7,000 were not recorded. ii) Credit purchases from Rohan 9,000 were not recorded. iii) Goods returned to Rakesh 4,000 were not recorded. iv) Goods returned from Mahesh 1,000 were not recorded.	8 Marks	L3	CO3

(OR)

9.	a)	Write a note on one-sided errors and two sided errors with examples.	8 Marks	L2	CO3
	b)	Rectify the following errors : i) Credit sales to Mohan 7,000 were recorded as 7,200. ii) Credit purchases from Rohan 9,000 were recorded as 9,900. iii) Goods returned to Rakesh 4,000 were recorded as 4,040. iv) Goods returned from Mahesh 1,000 were recorded as 1,600	8 Marks	L3	CO3

MODULE-V

10.	a)	Define Final Accounts. Explain the Profit and Loss Account Proforma.	8 Marks	L2	CO4
	b)	Explain the Balance Sheet Proforma.	8 Marks	L2	CO4

(OR)

11. a) Explain the following adjustment with examples. 8 Marks L2 CO4

i) Prepaid Insurance ii) Bad Debts

iii) Provision for bad Debts iv) Depreciation on Machinery

b) 8 Marks L4 CO4

Following is the Trial Balance of Sita and Gita as on 31st March, 2011:

Debit Balances	Amount (Rs.)	Credit Balances	Amount (Rs.)
Opening stock	160000	Sundry creditors	150000
Purchases	400000	Bank loan	87200
Bills receivable	4000	Sales	840000
Cash in hand	26000	Bills payable	40000
Bad debts	2000	Interest	10000
Machinery	132000	Capitals:	
Advertisement	16000	Sita:	320000
Sundry Debtors	100000	Gita	200000
Goodwill	140000		
Land and Building	450000		
Fuel	30000		
Wages and Salaries	80000		
Rent and Taxes	40000		
Discount	17200		
Commission	20000		
Furniture	30000		
	16,47,200		16,47,200

From the following additional information, you are required to prepare trading and profit and loss account for the year ended on 31st march, 2011 and a Balance sheet as on that date: (4+5+5=14)

(i) Closing stock as on 31st march, 2011: Rs. 120000.

(ii) Depreciate machinery by 10% and furniture by 5%.

(iii) Create a reserve of 5% on sundry debtors for doubtful debts.

(iv) Write off 1/4th of advertising.

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

SOFTWARE ENGINEERING

[Computer Science and Engineering, Computer Science and Engineering (Artificial Intelligence and Machine Learning), Computer Science and Engineering (Data Science), Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List out and define the different types of Software Myths.	2 Marks	L2	CO1
	b)	Sketch Software engineering layered technology.	2 Marks	L2	CO1
	c)	Define Requirement Engineering.	2 Marks	L2	CO2
	d)	Draw and describe the Flow Modelling notations.	2 Marks	L2	CO2
	e)	List out the relationships in UML with Notation.	2 Marks	L2	CO3
	f)	What is the role of design pattern?	2 Marks	L2	CO3
	g)	Define Alpha and Beta Testing.	2 Marks	L2	CO4
	h)	Write the purpose of verification and validation testing.	2 Marks	L2	CO4
	i)	Define Measures of Reliability and Availability with Formulae.	2 Marks	L2	CO5
	j)	Write the SQA Activities of Software.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe five activities of a generic process framework for Software Engineering.	8 Marks	L2	CO1
	b)	Illustrate and Explain Incremental Model.	8 Marks	L2	CO1
		(OR)			
3.	a)	Discuss the process of Extreme Programming (XP) in detail.	8 Marks	L2	CO1
	b)	State and explain the principles defined in Agile Process.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain in detail about four activities involved in Requirement Engineering Process.	8 Marks	L3	CO2
	b)	What is the use case technique of requirement elicitation? Describe its component.	8 Marks	L3	CO2
		(OR)			
5.	a)	Compare and contrast Functional and Non-Functional requirements with example.	8 Marks	L3	CO2
	b)	Discuss Flow-Oriented Modeling Concepts of Requirements modeling with Example.	8 Marks	L3	CO2

MODULE-III

6.	a)	Discuss various design concepts.	8 Marks	L4	CO3
	b)	Design a sequence diagram that models the data processing involved when a customer withdraws cash from the bank ATM machine.	8 Marks	L4	CO3

(OR)

7.	a)	Discuss in detail about Metrics in the process and project domains.	8 Marks	L4	CO3
	b)	Describe in detail about class-based modelling.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Compare between white-box testing and black-box testing.	8 Marks	L4	CO4
	b)	Explain the steps involved in Debugging Process with a neat sketch.	8 Marks	L4	CO4

(OR)

9.	a)	Discuss the analysis of two types of test strategies for object-oriented software.	8 Marks	L4	CO4
	b)	Explain Basis Path Testing with Example.	8 Marks	L4	CO4

MODULE-V

10.	a)	How Software Quality Assurance is useful to enhance quality? List out all the activities of it.	8 Marks	L3	CO5
	b)	Why do we use Defect Amplification Model?	8 Marks	L3	CO5

(OR)

11.	a)	Discuss the steps involved in Business process engineering model with a neat sketch.	8 Marks	L3	CO5
	b)	Explain the RMMM Plan and Risk Information Sheet with neat Diagram.	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. I Semester Fasttrack (MBU-22) Supplementary Examinations, March – 2026

SANSKRIT

[Microbiology, Biotechnology , Bioinformatics & Computer Science, Forensic Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	रामस्य पत्नी का ?	2 Marks	L1	CO1
	b)	वाल्मीकिः कः ग्रन्थः विरचितः ?	2 Marks	L2	CO1
	c)	गङ्गानदीम् भूलोकं कः आनीतवान् ?	2 Marks	L1	CO1
	d)	महाभारतस्य लेखकः कः ?	2 Marks	L3	CO2
	e)	गुरुपत्न्याः नाम किम ?	2 Marks	L3	CO2
	f)	आदिशङ्कराचार्यस्य मातुः नाम किम्?	2 Marks	L2	CO1
	g)	दशरथस्य कति पुत्राः सन्ति ?	2 Marks	L1	CO1
	h)	**चम्पूरामायाणस्य रचयिता कः** ?	2 Marks	L2	CO1
	i)	हितोपदेशस्य कर्ता कः?	2 Marks	L3	CO2
	j)	वाल्मीकेः वास्तविक नाम किम् ?	2 Marks	L2	CO1

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	"आर्यपादुकाभिषेकः" पाठ्यंशस्य सारांशं लिखत?	8 Marks	L3	CO1
	b)	रामायण कथा सविस्तरं व्याख्यात?	8 Marks	L1	CO1

(OR)

3.	a)	संपूर्णमहाभारतस्य सारांशं प्रतिपादयत?	8 Marks	L1	CO1
	b)	यक्ष प्रश्नानां सारांशं लिखत	8 Marks	L1	CO1

MODULE-II

4.	a)	चम्पूरामायणे गङ्गायाः वर्णनं लिखत?	8 Marks	L3	CO2
	b)	गङ्गावतरण कथां लिखत?	8 Marks	L1	CO2

(OR)

5.	a)	राजकुमार्याः सुनन्दायाः मोहः कथम् अयनीतः?	8 Marks	L3	CO2

	b)	"मोहापनोदः" पाठ्यांशस्य सारांशं लिखत?	8 Marks	L1	CO2

MODULE-III

6.	a)	"अत्युत्कटैः पापपुण्यैः इहैव फलमश्नुते" कथां वर्णयत?	8 Marks	L2	CO3
	b)	काक-मृग-जम्बुक कथां विशदयत	8 Marks	L1	CO3
		(OR)			
7.	a)	वीरवरकथां विशदयत?	8 Marks	L2	CO3
	b)	वीरवरस्य राज्यभक्तिं त्यागबुद्धिं विवृणुत ?	8 Marks	L1	CO3

MODULE-IV

8.	a)	पाणिनिमुद्दिश्य निबन्धमेकं लिखत?	8 Marks	L2	CO4
	b)	कौटिल्यमुद्दिश्य निबन्धं लिखत?	8 Marks	L1	CO4
		(OR)			
9.	a)	भरतमुनेः परिचयं प्रतिपादयत?	8 Marks	L2	CO4
	b)	शङ्कराचार्यस्य जीवनचारित्रं लिखत?	8 Marks	L1	CO4

MODULE-V

10.	a)	"देव" शब्दः संपूर्णतया लिखत	8 Marks	L2	CO5
	b)	"भानु" शब्दः संपूर्णतया लिखत	8 Marks	L2	CO5
		(OR)			
11.	a)	इकारान्तः पुंल्लिङ्गः "हरि" शब्दः लिखत	8 Marks	L2	CO5
	b)	आकारान्तः स्त्रीलिङ्गः "रमा" शब्दः लिखत	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. I Semester Fasttrack (MBU-22) Supplementary Examinations, March – 2026

GENERAL ENGLISH

[Microbiology, Biotechnology , Bioinformatics & Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	List the plural forms to the following: i) Company ii) Loaf iii) Delay iv) Quiz	2 Marks	L1	CO3
	b)	Find the vowel sound in the given words. i) Key ii) Odd iii) Whole iv) Light	2 Marks	L1	CO3
	c)	State the meanings to the following words. i) Equilibrium ii) Brooding over	2 Marks	L1	CO2
	d)	List any two examples for imperative sentences.	2 Marks	L1	CO3
	e)	List any two examples for past perfect tense.	2 Marks	L1	CO3
	f)	List two examples for euphemism.	2 Marks	L1	CO3
	g)	State the passive voice for the give sentences. i) John is repairing radios. ii) She doesn't like insects.	2 Marks	L1	CO3
	h)	Use the following conjunctions in a sentence. i) Although ii) Either …. or	2 Marks	L3	CO1
	i)	Find the suitable article to fill the blank. i) People with pets often lead.....(A, An, The) healthier life. ii) I want to join ……. (A, An, The) university for higher studies.	2 Marks	L1	CO3
	j)	Find the number of syllables in the given words. i) Elephant ii) Game	2 Marks	L1	CO3

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss the story 'A Snake in the Grass'.	8 Marks	L2	CO1
	b)	Do you consider Dasa actions as "a snake in the grass".	8 Marks	L2	CO1

(OR)

3.	a)	How does the family try to catch a cobra in 'A Snake in the Grass'?	8 Marks	L1	CO1
	b)	What superstitions or rituals are indicated in the story?	8 Marks	L1	CO1

MODULE-II

4.	a)	"Small courtesies play a major role in creating an impression on other people." Explain the statement with reference to the Lesson 'On Saying Please'.	8 Marks	L2	CO2
	b)	Suggest some ways to encourage people to adopt politeness.	8 Marks	L2	CO2

(OR)

5.	a)	Discuss the bus conductor's behavior with the passengers.	8 Marks	L2	CO2
	b)	Convert the following sentences into exclamatory sentences. i) He bowls very fast. ii) Sumitra sings melodiously. iii) Srinagar is a very cool place. iv) He brought a surprising gift.	8 Marks	L1	CO3

MODULE-III

6.	a)	Interpret the poem "If You Forget Me" in your own words.	8 Marks	L2	CO4
	b)	What do the flower and the land symbolize "if you forget me".	8 Marks	L2	CO4

(OR)

7.	a)	"The poem 'If You Forget Me' describe the nature of unrequited love". Explain.	8 Marks	L2	CO1
	b)	Use appropriate tense form to fill the blanks given. i) She.....in college. (Play) ii) .....is a great form of exercise. (Run) iii) They …… the seminar scheduled tomorrow. (Attend) iv) I.....my presentation tomorrow. (Finish) v) Sam _____(go)to school yesterday. vi) I____(read) this book for the last two days. vii) Prem _____(like) music. viii) John_____ (live) with her parents.	8 Marks	L2	CO3

MODULE-IV

8.	a)	The activities of terrorists disrupt the regular lives of common people. Explain in the context of 'After the Sunset'.	8 Marks	L2	CO1
	b)	Write a dialogue between friends on the causes of global warming?	8 Marks	L2	CO1

(OR)

9.	a)	How do the rich and powerful people treat the poor in the story?	8 Marks	L1	CO1
	b)	The story 'after the sunset' illiterates that ordinary people are the victims in many cases .Explain	8 Marks	L1	CO3

MODULE-V

10.	a)	Analyze the significance of the title 'Man's Peril' with reference to the text you read.	8 Marks	L1	CO2
	b)	Write a summary of Russell's essay 'mans peril'	8 Marks	L1	CO2

(OR)

11.	a)	What is Russell's opinion about the importance of humanity and the futility of war? Explain	8 Marks	L3	CO5
	b)	Rewrite the sentences with necessary corrections. i) The idea of having many colleges are nice. ii) The structure of buildings are good. iii) Dal and rice are her regular diet. iv) Neither you nor your sister have seen it.	8 Marks	L3	CO4

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Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA I Semester Fasttrack (MBU-22) Supplementary Examinations, March - 2026

PERSONALITY DEVELOPMENT

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Why is it important to overcome hurdles in life?	2 Marks	L1	COI
	b)	How does personality affect an individual development?	2 Marks	L1	CO1
	c)	What do you mean by external and internal motivators	2 Marks	L1	CO2
	d)	What are the factors that lead to the development of attitude?	2 Marks	L1	CO2
	e)	Explain about self -image?	2 Marks	L2	CO3
	f)	Discuss about socializing?	2 Marks	L1	CO3
	g)	What is meant by team work?	2 Marks	L1	CO4
	h)	Briefly explain about good manners	2 Marks	L1	CO4
	i)	Explain about character building?	2 Marks	L1	CO5
	j)	Briefly explain about negative stress?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	What are the three dimensions of psychoanalytic theory?	8 Marks	L2	CO1
	b)	What do Freud's and Erickson's theories have in common?	8 Marks	L2	CO1
		(OR)L2			
3.	a)	Explain about SWOT Analysis.	8 Marks	L3	CO1
	b)	What are the strategies to overcome hurdles in life?	8 Marks	L2	CO1

MODULE-II

4.	a)	Current scenario what are the ways to develop positive attitude.	8 Marks	L3	CO2
	b)	Explain about external motives helpful in life with examples?	8 Marks	L2	CO2
		(OR)			
5.	a)	Explain the Concept of Attitude. Discuss with examples the types of attitudes.	8 Marks	L2	CO2
	b)	Briefly explain about internal motives.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain how to resolve confusion in our life with examples.	8 Marks	L2	CO3
	b)	What the factors affecting attitude?	8 Marks	L3	CO3
		(OR)			
7.	a)	Discuss on the ways of Increasing our self-image with apt examples.	8 Marks	L2	CO3
	b)	Explain the different types of interpersonal skills.	8 Marks	L2	CO3

MODULE-IV

8.	a)	What are coping strategies of stress explain?	8 Marks	L2	CO4
	b)	Explain about steps of decision-making skills.	8 Marks	L2	CO4

(OR)

9.	a)	Strategies how to overcome challenges of conflict and difficult behavior in a team.	8 Marks	L2	CO4
	b)	What is the importance of body language in shaping personality?	8 Marks	L2	CO4

MODULE-V

10.	a)	List out failures of your personal and professional life how to overcome that?	8 Marks	L3	CO1
	b)	What are the advantages of positive attitude?	8 Marks	L2	CO2

(OR)

11.	a)	What is the difference between self- esteem and self- confidence?	8 Marks	L3	CO3
	b)	What are the benefits of Time management explain with your own experiences.	8 Marks	L2	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA II Semester Fasttrack (MBU-22) Supplementary Examinations, March – 2026

FUNDAMENTALS OF STATISTICS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What are various methods of data classification?	2 Marks	L1	CO1
	b)	What are the types of Statistics?	2 Marks	L1	CO1
	c)	What is grouped data? Give an example.	2 Marks	L1	CO1
	d)	Find the median for the following observations 12, 18, 10, 22, 23, 20, 31 and 11.	2 Marks	L2	CO3
	e)	Define Skewness.	2 Marks	L1	CO1
	f)	The following are the wages of 8 workers in a factory. Find the range and coefficient of range. Wages are in dollars: 1400, 1450, 1520, 1380, 1485, 1495, 1575, and 1440.	2 Marks	L2	CO2
	g)	Define Correlation analysis.	2 Marks	L1	CO1
	h)	Distinguish between Correlation and Regression.	2 Marks	L1	CO1
	i)	Define null hypothesis.	2 Marks	L2	CO3
	j)	What are the types of errors in hypothesis testing?	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Define Primary Data. Explain various methods used for collecting Primary data.	8 Marks	L2	CO1
	b)	What are the types of data? Explain.	8 Marks	L2	CO1

(OR)

3.	a)	Explain the following: i) Individual series ii) Discrete series iii) Continuous series iv) Exclusive type of series Inclusive type of series.	8 Marks	L2	CO2
	b)	Explain the limitation of statistics	8 Marks	L1	CO3

MODULE-II

4. a) Calculate Mode Marks from the following data: 8 Marks L2 CO2

Marks	0-4	4-8	8-12	12-16	16-20
No. of students	13	29	48	22	8

b) Find the geometric mean of the following data. 8 Marks L1 CO3

C.I	60-80	80-100	100-120	120-140	140-160
f_i	22	38	45	35	20

(OR)

5. a) A survey was conducted to determine the age (in years) of 120 automobiles and the result of such a survey is as follows. — 8 Marks — L2 — CO3

Age of Auto	0-4	4-8	8-12	12-16	16-20
No. of Autos	13	29	48	22	8

What is the median age for autos?

b) Find the harmonic mean of the following data. — 8 Marks — L3 — CO2

x	10	11	12	13	14
f_i	5	8	10	9	6

MODULE-III

6. Calculate Inter quartile range, quartile deviation and coefficient of quartile deviation marks from the following data: — 16 Marks — L2 — CO4

Marks	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
No of Students	5	12	32	27	11	9	4	3	1

(OR)

7. Find the Mean Deviation from mean, Coefficient of mean deviation for the following frequency distribution of sales (Rs in thousands) in a co – operative store. — 16 Marks — L3 — CO3

Sales	50-100	100-150	150-200	200-250	250-300	300-350
No of days	11	23	44	19	8	7

MODULE-IV

8. The following table shows the scores given by three judges A, B and C for ten participants in a competition. — 16 Marks — L4 — CO4

A	1	6	5	10	3	2	4	9	7	8
B	3	5	8	4	7	10	2	1	6	9
C	6	4	9	8	1	2	3	10	5	7

Which pair of judges has the nearest opinion?

(OR)

9. The following data relate to the scores obtained by 9 salesmen of a company in an intelligent test and their weekly sales (Rs in 1000) — 16 Marks — L3 — CO3

Salesmen	A	B	C	D	E	F	G	H	I
Test scores	50	60	50	60	80	50	80	40	70
Weekly sales	30	60	40	50	60	30	70	50	60

i) Obtain the regression equation of sales on intelligence test scores of the salesman.

ii) If the intelligence test score of a salesman is 65, what would be his expected weekly sales?

MODULE-V

10. a) Explain the procedure generally followed in the testing of the hypothesis. — 8 Marks — L2 — CO3

b) Explain type I and type II of errors in the testing of the hypothesis. — 8 Marks — L1 — CO2

(OR)

11. a) Differentiate two–tailed test of hypothesis from one–tailed test. — 8 Marks — L2 — CO3

b) Write about: — 8 Marks — L1 — CO1

i) Critical region ii) Left tailed test

iii) Right tailed test iv) Two-tailed test

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA I Semester Fasttrack (MBU-22) Supplementary Examinations, March - 2026

FUNDAMENTALS OF MARKETING MANAGEMENT

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define Marketing.	2 Marks	L1	CO1
	b)	Define selling.	2 Marks	L1	CO1
	c)	Explain the demographic basis for consumer market segmentation.	2 Marks	L1	CO2
	d)	Why is questionnaire design crucial in marketing research?	2 Marks	L1	CO2
	e)	Discuss the process of Marketing Research .	2 Marks	L1	CO3
	f)	Explain the different types of data used in Marketing Research.	2 Marks	L1	CO3
	g)	Define 4Ps in Marketing.	2 Marks	L1	CO4
	h)	What is meant by Sales Promotion?	2 Marks	L1	CO4
	i)	Discuss the causes of the rising popularity of digital marketing	2 Marks	L1	CO5
	j)	List out the benefits of green marketing	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	What is meant by Customer value? Explain.	16 Marks	L1	CO1
	(OR)			
3.	Discuss the various functions of Marketing	16 Marks	L2	CO1

MODULE-II

4.	How positioning can be a source of differentiating products from that of competitors? Explain	16 Marks	L1	CO2
	(OR)			
5.	Briefly explain the micromarketing with suitable example.	16 Marks	L2	CO2

MODULE-III

6.	Examine the scope and significance of Marketing Research.	16 Marks	L1	CO3
	(OR)			
7.	What is marketing productivity? How can it be measured? Explain.	16 Marks	L2	CO3

MODULE-IV

8.	Questionnaire is considered as a very significant instrument tool in research – Why? Explain.	16 Marks	L1	CO4
	(OR)			
9.	Explain in detail about the promotional mix.	16 Marks	L2	CO4

MODULE-V

10.	Discuss the role and significance of Green Marketing. What is meant by e-buying? How it influences to redefine the marketing strategies? Explain.	16 Marks	L1	CO5
	(OR)			
11.	What is meant by e-buying? How it influences to redefine the marketing strategies? Explain.	16 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA I Semester Fasttrack (MBU-22) Supplementary Examinations, March - 2026

BUSINESS MATHEMATICS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Find the value of $\lim_{x\to 2}(2x+4)$.	2 Marks	L1	CO1
	b)	The value of $\lim_{x\to \alpha}\frac{(7x+2)}{10x-1}$.	2 Marks	L2	CO1
	c)	Define identity matrix?	2 Marks	L1	CO1
	d)	Which of the given values of x and y make the following pair of matrices equal $\begin{bmatrix} 3x+7 & 5 \\ y+1 & 2-3x \end{bmatrix} = \begin{bmatrix} 0 & y-2 \\ 8 & 4 \end{bmatrix}$.	2 Marks	L1	CO2
	e)	Find the derivative of (2x+3)	2 Marks	L2	CO2
	f)	The integration of (x^2 + 2x+4) w. r t x.	2 Marks	L2	CO3
	g)	Define marginal cost	2 Marks	L2	CO3
	h)	Elasticity of demand	2 Marks	L1	CO4
	i)	Find the sum of 7 terms of G.P .3,6,12,…….	2 Marks	L1	CO5
	j)	Find the sum of 5, 10, 15, 20, …..	2 Marks	L2	CO1

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Evaluate $\lim_{x\to 3}\frac{(x^2-9)}{x^2-5x+6}$.	8 Marks	L2	CO1
	b)	Find $\lim_{x\to 4}\frac{(x^2-16)}{x-4}$.	8 Marks	L2	CO1

(OR)

3.	a)	Find $\lim_{x\to 1}\frac{x^2+x-2}{x-1}$.	8 Marks	L2	CO1
	b)	Evaluate $\lim_{x\to \alpha}\frac{5x+10}{2x+4}$.	8 Marks	L4	CO1

MODULE-II

4.	a)	Find the A^{-1} where $A=\begin{pmatrix} -3 & 2 & 5 \\ 4 & 1 & 7 \\ 3 & 0 & 6 \end{pmatrix}$.	8 Marks	L2	CO2

	b)	If $A=\begin{pmatrix}-1 & 2 & 3\\ 5 & 7 & 9\\ -2 & 1 & 1\end{pmatrix}$ and $B=\begin{bmatrix}-4 & 1 & -5\\ 1 & 2 & 0\\ 1 & 3 & 1\end{bmatrix}$ then verify that i) $(A+B)' = A'+B'$ ii) $(A-B)' = A'-B'$	8 Marks	L3	CO3
		(OR)			
5.	a)	Find A^3-5A-13I, where $A=\begin{bmatrix}5 & 3 & 1\\ 2 & -1 & 2\\ 4 & 1 & 3\end{bmatrix}$.	8 Marks	L2	CO2
	b)	Solve the following equations 5x-6y+4z=15, 7x+4y-3z=19, 2x+y+6z=46.	8 Marks	L2	CO2
		MODULE-III			
6.	a)	Find the derivative of i) six x – cos x + tan x ii) tan x + 2x + log x	8 Marks	L2	CO3
	b)	Differentiate the following function (2x+3) (x+2).	8 Marks	L4	CO3
		(OR)			
7.	a)	Evaluate $\int x\log x\, dx$.	8 Marks	L3	CO4
	b)	Evaluate $\int (2x+4)(7x+2)\,dx$.	8 Marks	L2	CO5
		MODULE-IV			
8.	a)	Explain the various types of elasticity of demand.	8 Marks	L4	CO5
	b)	A one-product firm estimates that its daily total cost function is $C(x) = x^3-6x^2+13x+5$ and its total revenue function is R(x) = 28x. Find the value of x that maximizes the daily profit.	8 Marks	L3	CO4
		(OR)			
9.	a)	The total cost of producing guitars is $C(x) = 1000+100x-0.25x^2$. i) Find the exact cost of producing the 51st guitar. ii) Use the marginal cost to approximate the cost of producing the 51st guitar.	8 Marks	L3	CO2
	b)	A company manufactures automatic transmissions for automobiles. The total cost at a production level is given by $C(x) =5000 + 600x -75x^2$. i) Find the marginal cost function ii) Find the marginal cost at a production level of 200 transmissions.	8 Marks	L2	CO3
		MODULE-V			
10.	a)	Find the sum of natural numbers from 1 to 200 which are divisible by 5.	8 Marks	L1	CO5
	b)	Find three numbers in A.P whose sum is 9 and the product is -165.	8 Marks	L1	CO5
		(OR)			
11.	a)	The 3rd terms of a G.P is 2/3 and 6th term is 2/8 find the 8th term.	8 Marks	L1	CO4
	b)	Find the 3 numbers in G.P such that their sum is 130 and their product is 27000.	8 Marks	L1	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA II Semester Fasttrack (MBU-22) Supplementary Examinations, March – 2026

ORGANIZATIONAL BEHAVIOUR

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define the term 'management'	2 Marks	L1	CO1
	b)	Define the term 'code of 'conduct'	2 Marks	L1	CO1
	c)	List out the characteristics of personality	2 Marks	L1	CO2
	d)	Define the word 'attitude'	2 Marks	L1	CO2
	e)	List out the features of motivation	2 Marks	L1	CO3
	f)	Define 'teams'	2 Marks	L1	CO3
	g)	Describe the term 'grapevine'	2 Marks	L1	CO4
	h)	Describe the meaning of term 'collective bargaining'	2 Marks	L1	CO4
	i)	Describe stress	2 Marks	L1	CO5
	j)	Define the term 'intervention'	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss the nature the scope of Management.	8 Marks	L1	CO1
	b)	Explain about the emerging aspects of organizational behaviour.	8 Marks	L1	CO1
		(OR)			
3.	a)	Explain the nature and levels of organizational behavior.	8 Marks	L1	CO1
	b)	Discuss the nature and importance of perception in understanding organizational behavior.	8 Marks	L1	CO1

MODULE-II

4.	a)	List out different models of OB in detail.	8 Marks	L1	CO2
	b)	Describe in detail the steps of learning process.	8 Marks	L1	CO2
		(OR)			
5.	a)	Explain different determinants of personality.	8 Marks	L1	CO2
	b)	Describe different individual differences in personality.	8 Marks	L1	CO2

MODULE-III

6.	a)	Describe in detail Maslow's Needs Hierarchy theory.	8 Marks	L1	CO3
	b)	Explain in detail the different types of leadership styles.	8 Marks	L1	CO3
		(OR)			
7.	a)	Explain the concept of Johari Window.	8 Marks	L1	CO3
	b)	Define 'groups' and discuss the factors that determine group cohesiveness.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Explain the conflict resolution process in groups.	8 Marks	L1	CO4
	b)	Identify different effective negotiation techniques for effective team building.	8 Marks	L1	CO4

(OR)

9.	a)	Explain different types of stress.	8 Marks	L1	CO4
	b)	Explain different types of problem-solving techniques in groups.	8 Marks	L1	CO4

MODULE-V

10.	a)	Classify different types of organizational communication barriers.	8 Marks	L1	CO5
	b)	Explain the ways to overcome communication barriers.	8 Marks	L1	CO5

(OR)

11.	a)	Explain the concept of Organizational Development (OD).	8 Marks	L1	CO5
	b)	Explain the importance of OD intervention techniques in bringing effective change towards organizations.	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA IV Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

INNOVATION, INCUBATION AND ENTREPRENEURSHIP

[Computer Applications]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Entrepreneurship.	2 Marks	L1	CO1
	b)	List any four types of Entrepreneurship.	2 Marks	L1	CO1
	c)	Define Innovation.	2 Marks	L1	CO2
	d)	State any three Functions of Frugal Engineering.	2 Marks	L1	CO2
	e)	State any three Methods of Digitalization.	2 Marks	L1	CO3
	f)	Define Cloud Method.	2 Marks	L1	CO3
	g)	State any three Methods of Product Feasibility .	2 Marks	L1	CO4
	h)	Define Product Market.	2 Marks	L1	CO4
	i)	Define Business Model.	2 Marks	L1	CO5
	j)	State any three types of Boot Strapping.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	What are the types of the Entrepreneurship and how one will differ to another.	16 Marks	L2	CO1
	(OR)			
3.	Explain the benefits of Entrepreneurs and how it will benefit the Organizations Globally.	16 Marks	L2	CO1

MODULE-II

4.	Discuss the Engineering Design process involved in Global Companies.	16 Marks	L2	CO2
	(OR)			
5.	Describe the Internal & External Sources of Frugal Innovation.	16 Marks	L2	CO2

MODULE-III

6.	Describe the Internal Factors affecting Technology in Small Scale Industries.	16 Marks	L2	CO3
	(OR)			
7.	Explain in detail the Various User Applications followed in MNC's.	16 Marks	L2	CO3

MODULE-IV

8.	What are the various characteristics of start-up used by the organizations Comment.	16 Marks	L2	CO4
	(OR)			
9.	Infer various Funding strategies followed in Indian Start-Ups.	16 Marks	L2	CO4

MODULE-V

10.	What are the types of Innovation. Explain.	16 Marks	L2	CO5
	(OR)			
11.	Elucidate the Scope of Business Model Innovation.	16 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA I Semester Fasttrack (MBU-22) Supplementary Examinations, March - 2026

MANAGEMENT AND ORGANISATIONAL BEHAVIOUR

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What do you mean by Management?	2 Marks	L1	CO1
	b)	Define Decision Making.	2 Marks	L1	CO1
	c)	Define Personality.	2 Marks	L1	CO2
	d)	Define Perception.	2 Marks	L1	CO2
	e)	What is Motivation?	2 Marks	L1	CO3
	f)	Define Conflict.	2 Marks	L1	CO3
	g)	What do you mean by Organizational Ethics?	2 Marks	L1	CO4
	h)	Define resistance to change.	2 Marks	L1	CO4
	i)	Define Transactional Analysis.	2 Marks	L1	CO5
	j)	State any three advantages of Johari Window.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Define Management. Explain the nature and significance of Management.	16 Marks	L2	CO1
	(OR)			
3	Describe the levels of Management.	16 Marks	L2	CO1

MODULE-II

4	Define Learning. Explain the theories of Learning.	16 Marks	L2	CO2
	(OR)			
5	List the merits and significance of Learning.	16 Marks	L2	CO2

MODULE-III

6	Explain the theory of Maslow's Need Hierarchy.	16 Marks	L2	CO3
	(OR)			
7	Describe the Herzberg's two factor theory.	16 Marks	L2	CO3

MODULE-IV

8	What is Organizational Ethics? Outline the core values of Organizational Ethics.	16 Marks	L2	CO4
	(OR)			
9	Describe the importance of Organizational Ethics.	16 Marks	L2	CO4

MODULE-V

10	Define Organizational Development and describe its significance.	16 Marks	L2	CO5
	(OR)			
11	Classify the different phases of Organizational Development.	16 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. III Semester Fasttrack (MBU-22) Supplementary Examinations, March - 2026

ORDINARY DIFFERENTIAL EQUATIONS

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Solve $(x^2 - ay)dx = (ax - y^2)dy$.	2 Marks	L1	CO1
	b)	Solve $\frac{dy}{dx} = \frac{yCos\,x + Sin\,y + y}{Sin\,x + x\,Cos\,y + x}$.	2 Marks	L1	CO1
	c)	Solve $p = Sin(y - xp)$.	2 Marks	L1	CO2
	d)	Solve $\frac{dy}{dx} - \frac{dx}{dy} = \frac{x}{y} - \frac{y}{x}$.	2 Marks	L1	CO2
	e)	Find the general solution of $(D^3 - 3D + 2)y = 0$.	2 Marks	L1	CO3
	f)	Find the particular integral of $(D^3 + 3D + 2)y = e^x$.	2 Marks	L1	CO3
	g)	Find complementary function of $(D^3 - 1)y = 0$.	2 Marks	L1	CO4
	h)	Find complementary function of $(D^4 - 8D^2 + 16)y = 0$.	2 Marks	L1	CO4
	i)	Construct a partial differential equation by eliminating the arbitrary constants a and b from $z = ax + by + a^2 + b^2$.	2 Marks	L2	CO5
	j)	Construct a partial differential equation by eliminating the arbitrary constants a and b from $z = (x + a)(y + b)$.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Solve $(x+1)\frac{dy}{dx} - y = e^{3x}(x+1)^2$.	8 Marks	L3	CO1
	b)	Solve $y(\log x)dx + (x - \log y)dy = 0$.	8 Marks	L3	CO1
		(OR)			
3.	a)	Solve $X\frac{dy}{dx} + y = x^3(y)^6$.	8 Marks	L3	CO1
	b)	Solve $\frac{dy}{dx} + x\sin 2y = x^3\cos^2 y$.	8 Marks	L5	CO1

MODULE-II

4.	a)	Solve $p^2 + 2py\,Cot(x) = y^2$.	8 Marks	L1	CO2
	b)	Solve $y = 2px + p^n$.	8 Marks	L1	CO2

(OR)

5.	a)	Solve $y - 2px = \tan^{-1}(xp^2)$.	8 Marks	L1	CO2
	b)	Solve using Clauriat's equation $(px - y)(px + y) = (a^2 p)$.	8 Marks	L1	CO2

MODULE-III

6.	a)	Find the solution of $(D+2)(D-1)^2 y = e^{-2x} + 2\sin h\,x$.	8 Marks	L1	CO3
	b)	Find the solution of $(D^3 + 1)y = Cos(2x - 1)$.	8 Marks	L3	CO3

(OR)

7.	a)	Find the solution of $(D^2 + 4D + 5)y = -2\,Cosh\,x$.	8 Marks	L1	CO3
	b)	Find the solution of $(D^2 + 3D + 2)y = 4\,Cos^2 x$.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Solve the differential equation $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = xe^x \sin x$.	8 Marks	L1	CO4
	b)	Solve the differential equation $(D^3 - 7D^2 + 14D - 8)y = e^x \cos 2x$.	8 Marks	L1	CO4

(OR)

9.	a)	Solve the differential equation $(D^2 + 2D - 3)y = e^{-3x} x^2$.	8 Marks	L1	CO4
	b)	Solve the differential equation $(D^2 + 1)y = e^{-x} + x^3 + e^x \sin x$.	8 Marks	L1	CO4

MODULE-V

10.	a)	Using the method of variation of parameters, Solve $y'' - 2y' + y = e^x \log x$.	8 Marks	L2	CO5
	b)	Solve the Cauchy's linear homogeneous equation $x^3D^3 + 2x^2D^2 + 2y = 10\left(x + \frac{1}{x}\right)$.	8 Marks	L1	CO5

(OR)

11.	a)	Applying the method of variation of parameters, to solve the differential equation $(D^2 + 1)y = x \sin x$.	8 Marks	L5	CO5
	b)	Solve $(1+x)^2 \frac{d^2y}{dx^2} + (1+x)\frac{dy}{dx} + y = 2\sin(\log(1+x))$.	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. II Semester Fasttrack (MBU-22) Supplementary Examinations, March - 2026

DATA STRUCTURES

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Differentiate between primitive data types and abstract data types.	2 Marks	L1	CO1
	b)	Differentiate between program design and algorithm design.	2 Marks	L1	CO1
	c)	List any two operations that can be performed on arrays.	2 Marks	L1	CO2
	d)	What is dynamic memory allocation?	2 Marks	L1	CO2
	e)	What is meant by a stack as an abstract data type (ADT)?	2 Marks	L1	CO3
	f)	What is the purpose of a rear and front pointer in a queue?	2 Marks	L1	CO3
	g)	What are the properties of a binary tree?	2 Marks	L2	CO4
	h)	What is the height of a binary tree?	2 Marks	L1	CO4
	i)	Mention two differences between bubble sort and insertion sort.	2 Marks	L1	CO5
	j)	Define adjacency matrix representation of a graph.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe in detail the importance of abstract data types (ADT) in the theory of data structures.	8 Marks	L1	CO1
	b)	Explain program design and its principles with relevant examples.	8 Marks	L1	CO1

(OR)

3.	a)	Explain Tips and Techniques for writing programs in C with an example.	8 Marks	L2	CO1
	b)	What are the Control Structures used in Algorithms? Explain.	8 Marks	L2	CO1

MODULE-II

4.	a)	Describe the implementation and operations of two-dimensional arrays with examples.	8 Marks	L2	CO2
	b)	Write a detailed note on atomic linked lists and their applications.	8 Marks	L3	CO2

(OR)

5.	a)	Explain in detail about one dimension array with example.	8 Marks	L3	CO2
	b)	Explain about various types of linked list with an example.	8 Marks	L3	CO2

MODULE-III

6.	a)	Discuss the various applications of stacks in computer science.	8 Marks	L3	CO3
	b)	Discuss the working of priority queues with examples.	8 Marks	L3	CO3

(OR)

7.	a)	What are the basic operations on Stack using arrays?	8 Marks	L2	CO3
	b)	Explain about implementation of queues using arrays?	8 Marks	L3	CO3

MODULE-IV

8.	a)	Discuss the various methods of representing binary trees in memory.	8 Marks	L3	CO4
	b)	Discuss the difference between full binary trees, complete binary trees, and skewed binary trees with diagrams.	8 Marks	L2	CO4

(OR)

9.	a)	How to create binary search tree with in order, preorder and post order with example	8 Marks	L2	CO4
	b)	Explain about applications, advantages and disadvantages of binary search trees?	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain binary search with an example and analyze its time complexity.	8 Marks	L2	CO5
	b)	Explain how graphs are used to find the shortest path between two vertices.	8 Marks	L2	CO5

(OR)

11.	a)	Explain the importance of sorting in searching algorithms.	8 Marks	L3	CO5
	b)	Discuss the sequential and linked representations of graphs with examples.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

THEORY OF COMPUTATION

[Computer Science and Engineering (Data Science)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What does the term "deterministic" mean in DFA?	2 Marks	L2	CO1
	b)	What is a nondeterministic finite automaton (NFA)?	2 Marks	L2	CO1
	c)	How can a regular expression be converted into a finite automaton?	2 Marks	L3	CO1
	d)	Name one real-world application of regular expressions.	2 Marks	L2	CO2
	e)	How are context-free grammars used in programming languages?	2 Marks	L3	CO3
	f)	Why is ambiguity in a grammar a problem?	2 Marks	L3	CO3
	g)	Where do context-free languages fall in the Chomsky hierarchy?	2 Marks	L4	CO3
	h)	Give an example of a well-known undecidable problem.	2 Marks	L4	CO5
	i)	What does it mean for a language to be accepted by a Turing machine?	2 Marks	L2	CO5
	j)	What is the role of the tape in a Turing machine?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2. a) Convert the following Moore machine into Melay machine — 8 Marks, L3, CO1

Present State	Next State		Output
	a = 0	a = 1	
→a	d	b	1
B	a	d	0
C	c	c	0
D	b	a	1

b) Discuss on Finite Automata with epsilon Transitions — 8 Marks, L4, CO1

(OR)

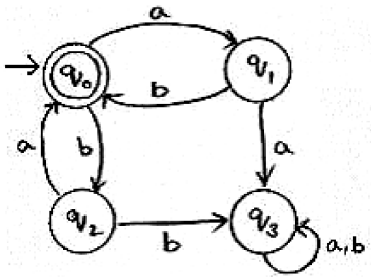
3. a) Convert the following NFA to a DFA. — 8 Marks, L3, CO1

δ	a	b
p	$\{p\}$	$\{p,q\}$
q	$\{r\}$	$\{r\}$
r	$\{\phi\}$	$\{\phi\}$

b) Find an equivalent ε-NFA for the following regular expression (a|b)*abb. — 8 Marks, L3, CO1

MODULE-II

4.	a)	Differentiate regular expression and regular language	8 Marks	L2	CO2
	b)	Construct the regular expression accepted by following finite automaton.	8 Marks	L3	CO2



(OR)

5.	a)	Construct a DFA for the regular expression 10 + (0+11) 0*1 and optimize the states.	8 Marks	L3	CO1
	b)	Construct NFA for the regular expression a*b*.	8 Marks	L3	CO1

MODULE-III

6.	a)	Construct equivalent grammar in Chomsky Normal Form for the grammar G=({S,A,B},{a,b}, {S→aAbB, A→aA|a, B→bB|b }	8 Marks	L4	CO3
	b)	Write down the context free grammar for the language L = { $a^n b^n$ | n>=1}	8 Marks	L4	CO3

(OR)

7.	a)	Reduce the following CFG to Chomsky Normal Form. S → aAD , A → aB | bAB , B → b , D → d.	8 Marks	L2	CO1
	b)	Find left most derivation, rightmost derivation and parse tree for (((a,a),^(a)),a)(10)	8 Marks	L4	CO3

MODULE-IV

8.	a)	Design a PDA to accept the following CFG: S □AA/a A □SA/b.	8 Marks	L4	CO4
	b)	Explain properties of Context Free Languages.	8 Marks	L4	CO4

(OR)

9.	a)	Explain in detail about the model of Linear Bounded Automata.	8 Marks	L4	CO5
	b)	What is deterministic PDA? Explain with an example	8 Marks	L3	CO4

MODULE-V

10.	a)	Design a Turing Machine to recognize the language L={ $1^n 2^n 3^n$| n≥1}	8 Marks	L4	CO5
	b)	Briefly explain Universal Turing Machine.	8 Marks	L3	CO5

(OR)

11.	a)	Design a Turing Machine which can multiply two positive integers.	8 Marks	L4	CO5
	b)	Design a TM that accepts the language of odd integers written in binary.	8 Marks	L4	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

DATA MINING

[Information Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is data integration?	2 Marks	L1	CO1
	b)	What is the purpose of data reduction?	2 Marks	L2	CO1
	c)	State Bayes' theorem as used in Bayesian classification.	2 Marks	L1	CO2
	d)	Differentiate between classification and prediction.	2 Marks	L4	CO2
	e)	What is the role of a distance metric in clustering?	2 Marks	L2	CO3
	f)	Name two density-based clustering methods.	2 Marks	L1	CO3
	g)	What is the role of methodologies in data mining?	2 Marks	L2	CO4
	h)	List two ways in which data mining impacts society.	2 Marks	L2	CO4
	i)	What is volume rendering in data visualization?	2 Marks	L1	CO5
	j)	State two applications of Kiviat diagrams.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Define Data mining? Explain about data mining on what kind of data?	8 Marks	L2	CO1
	b)	Explain major issues in data mining	8 Marks	L2	CO1

(OR)

3.	a)	What is data mining? Explain the steps in data mining process?	8 Marks	L4	CO1
	b)	Describe about Data discretization?	8 Marks	L2	CO1

MODULE-II

4.	a)	What are the advantages and disadvantages of Bayesian classification methods?	8 Marks	L5	CO2
	b)	Discuss entropy and information gain as splitting criteria in decision tree algorithms.	8 Marks	L4	CO2

(OR)

5. 16 Marks L3 CO2

RID	age	income	student	credit_rating	Class: buys_computer
1	youth	high	no	fair	no
2	youth	high	no	excellent	no
3	middle_aged	high	no	fair	yes
4	senior	medium	no	fair	yes
5	senior	low	yes	fair	yes
6	senior	low	yes	excellent	no
7	middle_aged	low	yes	excellent	yes
8	youth	medium	no	fair	no
9	youth	low	yes	fair	yes
10	senior	medium	yes	fair	yes
11	youth	medium	yes	excellent	yes
12	middle_aged	medium	no	excellent	yes
13	middle_aged	high	yes	fair	yes
14	senior	medium	no	excellent	no

Calculate an Induction of a decision tree using the Gini index on income.

MODULE-III

6.	a)	Describe the concepts of core points, border points, and noise points in DBSCAN.	8 Marks	L2	CO3
	b)	Discuss the STING method for grid-based clustering. How is it different from other clustering methods?	8 Marks	L4	CO3

(OR)

7.	a)	Explain the role of density in density-based clustering methods. Provide examples of scenarios where such methods are useful.	8 Marks	L3	CO3
	b)	What are the major differences between density-based methods and grid-based methods?	8 Marks	L4	CO3

MODULE-IV

8.	a)	Describe the challenges of mining web data and suggest solutions to overcome them.	8 Marks	L4	CO4
	b)	Discuss how data mining methodologies vary when dealing with structured vs. unstructured data.	8 Marks	L4	CO4

(OR)

9.	a)	Explain the applications of data mining in healthcare. Provide examples of specific use cases.	8 Marks	L3	CO4
	b)	What are the emerging trends in mining multimedia data? Discuss their potential impacts.	8 Marks	L2	CO4

MODULE-V

10.	a)	Evaluate the effectiveness of 3D visualization techniques in decision-making.	8 Marks	L5	CO5
	b)	Provide a detailed example of using animation to visualize real-time stock market data.	8 Marks	L3	CO5

(OR)

11.	a)	Explain how multidimensional visualization can aid in predictive analytics.	8 Marks	L3	CO5
	b)	Discuss the ethical implications of using animation and advanced visualization techniques in data mining.	8 Marks	L5	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

ARTIFICIAL INTELLIGENCE

[Computer Science and Engineering,
Computer Science and Engineering (Artificial Intelligence and Machine Learning)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define Artificial Intelligence	2 Marks	L1	CO1
	b)	What is the difference between an agent and its environment?	2 Marks	L1	CO1
	c)	What is the difference between a tree search and a graph search?	2 Marks	L2	CO2
	d)	What is the main characteristic of uninformed search strategies?	2 Marks	L2	CO2
	e)	What is the primary advantage of local beam search over hill climbing?	2 Marks	L1	CO3
	f)	Define a local search algorithm.	2 Marks	L2	CO3
	g)	What are the main components of a Hidden Markov Model?	2 Marks	L1	CO4
	h)	How does the structure of a Bayesian network affect its semantics?	2 Marks	L2	CO4
	i)	What are the main limitations of artificial intelligence in terms of decision-making and reasoning?	2 Marks	L2	CO5
	j)	Name two common sensors used in robotic perception and briefly describe their functions.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Analyze how the history and foundations of AI have shaped the current state of the art in AI research.	8 Marks	L3	CO1
	b)	Compare the architectures of simple reflex agents, model-based agents, goal-based agents, and utility-based agents.	8 Marks	L3	CO1

(OR)

3.	a)	Explain the challenges of designing intelligent agents for complex, real-world environments.	8 Marks	L3	CO1
	b)	Explain the significance of deep learning in advancing AI capabilities, with examples of recent breakthroughs.	8 Marks	L3	CO1

MODULE-II

4.	a)	What are heuristic functions, and how are they used in informed search? Provide an example.	8 Marks	L2	CO2
	b)	Explain the working of greedy best-first search and analyze its time complexity and limitations.	8 Marks	L2	CO2

(OR)

5.	a)	Compare the time and space complexities of search algorithms in terms of branching factor and depth.	8 Marks	L4	CO2
	b)	Describe the key components of a search problem and explain how they interact during the search process.	8 Marks	L2	CO2

MODULE-III

6.	a)	How does decision-making in multiplayer games differ from two-player games? Discuss with examples.	8 Marks	L2	CO3
	b)	Explain the alpha-beta pruning technique and its role in optimizing the Minimax algorithm. Provide an example.	8 Marks	L4	CO3

(OR)

7.	a)	What is the Kalman Filter, and how is it used in state estimation? Explain its working with a suitable example.	8 Marks	L3	CO3
	b)	What is local beam search, and how does it differ from hill climbing? Discuss its advantages and limitations.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Describe the three main problems addressed by Hidden Markov Models (HMMs) and how they are solved.	8 Marks	L3	CO4
	b)	Compare the strengths and weaknesses of Bayesian networks and temporal probabilistic models in dealing with dynamic systems.	8 Marks	L3	CO4

(OR)

9.	a)	What are the key assumptions of the Kalman Filter? How do they impact its applicability?	8 Marks	L4	CO4
	b)	Explain the difference between discrete-time and continuous-time probabilistic models. Discuss their applications.	8 Marks	L5	CO4

MODULE-V

10.	a)	Discuss an example of a robotic framework that is commonly used in research and development and its benefits.	8 Marks	L5	CO5
	b)	What are the inherent limitations of artificial intelligence when it comes to understanding human language and context?	8 Marks	L5	CO5

(OR)

11.	a)	How does the reliance on data quality impact the performance and accuracy of AI algorithms?	8 Marks	L3	CO5
	b)	What is robotic perception, and why is it crucial for a robot to interact effectively with its environment?	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA III Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

COMPUTER NETWORKS

[Computer Applications]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List the functionalities of Switch.	2 Marks	L1	CO1
	b)	What is meant by network and discuss about types of networks.	2 Marks	L2	CO1
	c)	State Bit Stuffing & its importance.	2 Marks	L1	CO2
	d)	Explain about the control Variables of sliding window Protocol and Functions.	2 Marks	L2	CO2
	e)	State Request and Acknowledgement in Synchronization.	2 Marks	L1	CO3
	f)	Explain about Multi casting routing algorithm.	2 Marks	L2	CO3
	g)	List out the services of Transport layer.	2 Marks	L1	CO3
	h)	Explain the three-way handshake mechanism.	2 Marks	L2	CO4
	i)	List out the names of agents in E-mail architecture.	2 Marks	L1	CO4
	j)	Discuss about the Generic domains with example.	2 Marks	L2	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	What are the different Layers in the OSI Reference Model and Explain the functions of each Layer.	8 Marks	L2	CO1
	b)	Interpret the similarities and dissimilarities between OSI & TCP/IP reference models.	8 Marks	L3	CO1

(OR)

3.	a)	Briefly explain different Network Topologies and its Pros and Cons.	8 Marks	L2	CO1
	b)	Discuss the functionalities of each layer in TCP/IP protocol suite with neat sketch.	8 Marks	L3	CO1

MODULE-II

4.	a)	Show the generation of code word at the sender site and check the same at the receiver site using CRC where data word is 1010011010 and the divisor is 10111.	8 Marks	L2	CO2
	b)	Write Briefly about Data Link Layer Design Issues.	8 Marks	L3	CO2

(OR)

5.	a)	What is framing and explain any two framing methods with example.	8 Marks	L2	CO2
	b)	Discuss the concept of Elementary Data Link Layer Protocols with neat sketches.	8 Marks	L3	CO2

MODULE-III

6.	a)	Describe the Functionality of Shortest Algorithm step by step procedure with example.	8 Marks	L2	CO3
	b)	Explain the implementation of connection less and connection oriented service.	8 Marks	L2	CO3

(OR)

7.	a)	Explain the concept of Network Layer Design Issues with neat sketches.	8 Marks	L2	CO3
	b)	Illustrate the concept of Routing Algorithm Classification and Discuss Key points of various routing algorithms.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain the functional characteristics of TCP Protocol and Interpret the importance of TCP Header with neat sketch.	8 Marks	L2	CO3
	b)	Explain the concept of Remote Procedure Call (RPC), Buffering and Flow Control Mechanism.	8 Marks	L2	CO3

(OR)

9.	a)	Explain the functional characteristics of UDP Protocol and Interpret the importance of UDP Header with neat sketch.	8 Marks	L2	CO4
	b)	Describe the concept of congestion control mechanisms : fast network feeding with low capacity of receiver and slow network feeding with high capacity of receiver.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain the concept of Electronic Mail Architecture with neat sketch & discuss the functional characteristics of agents.	8 Marks	L2	CO4
	b)	Explain the Generic domains and Inverse domain characteristics with example.	8 Marks	L2	CO4

(OR)

11.	a)	Interpret the concept of DNS in the internet classification with suitable examples.	8 Marks	L3	CO4
	b)	Explain the functions of i) User Agents ii) Message Transfer Agents C. Message Access Agents	8 Marks	L2	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA III Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

JAVA PROGRAMMING

[Computer Applications]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define classes and objects.	2 Marks	L1	CO1
	b)	Define static keyword.	2 Marks	L1	CO1
	c)	Explain nested interface in java?	2 Marks	L1	CO2
	d)	what is the use of super keyword?	2 Marks	L1	CO2
	e)	Explain thread life cycle.	2 Marks	L1	CO3
	f)	What is the use of try and catch?	2 Marks	L1	CO3
	g)	What is collection framework?	2 Marks	L1	CO4
	h)	Explain iterator interface.	2 Marks	L1	CO4
	i)	List out any five AWT controls.	2 Marks	L1	CO5
	j)	Explain the role of check boxes in AWT controls.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain in detail about arrays and its types.	8 Marks	L3	CO1
	b)	What is variable and its types with Example.	8 Marks	L2	CO1
		(OR)			
3.	a)	What is Operator and its types with Any one Example.	8 Marks	L3	CO1
	b)	Discuss about Arithmetic Operators with Example.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain multilevel inheritance in detail with example .	8 Marks	L4	CO2
	b)	Discuss in detail about Usage of Final Keyword.	8 Marks	L3	CO2
		(OR)			
5.	a)	Discuss Hybrid Inheritance in detail with example	8 Marks	L4	CO2
	b)	Defining Interface & How to declare an interface?	8 Marks	L4	CO2

MODULE-III

6.	a)	Describe the difference between unchecked and checked exceptions in Java.	8 Marks	L3	CO3
	b)	Write a java program using try, catch and finally blocks in exception.	8 Marks	L3	CO3
		(OR)			
7.	a)	What is the Synchronization with Example	8 Marks	L1	CO3
	b)	Explain briefly about Usage Java Exception Keywords.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Explain stringtokenizer in detail	8 Marks	L1	CO4
	b)	Explain briefly about Methods of Set	8 Marks	L4	CO4
		(OR)			
9.	a)	Write a program for linked hashset in java	8 Marks	L3	CO4
	b)	Explain briefly about Stack and Examples	8 Marks	L4	CO4

MODULE-V

10.	a)	Explain about list concept with example	8 Marks	L2	CO5
	b)	Difference between Applet and Application programming.	8 Marks	L3	CO5
		(OR)			
11.	a)	Define AWT in detail with example.	8 Marks	L4	CO5
	b)	Differents between text area & text field with example.	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA III Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

COMPUTER GRAPHICS

[Computer Applications]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Explain image processing.	2 Marks	L1	CO1
	b)	List the application graphics.	2 Marks	L1	CO1
	c)	What is CRT?	2 Marks	L1	CO2
	d)	What is three dimensional viewing system?	2 Marks	L1	CO2
	e)	Define boundary fill algorithm.	2 Marks	L1	CO3
	f)	Explain hard copy devices.	2 Marks	L1	CO3
	g)	What is parallel projection?	2 Marks	L1	CO4
	h)	Define scaling in 2d.	2 Marks	L1	CO4
	i)	Define animation.	2 Marks	L1	CO5
	j)	Explain free hand drawing.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

1.	a)	What is computer graphics in detail ?	8 Marks	L3	CO1
	b)	Application of computer graphics?	8 Marks	L2	CO1
		(OR)			
2.	a)	Discuss in detail about image processing .	8 Marks	L3	CO1
	b)	Explain graphical user interface in computer graphics.	8 Marks	L2	CO1

MODULE-II

3.	a)	Discuss in detail about flat panel display .	8 Marks	L4	CO2
	b)	Define the internal structure of CRT.	8 Marks	L3	CO2
		(OR)			
4.	a)	What is virtual reality system ?	8 Marks	L4	CO2
	b)	Explain the concept of LCD's in detail.	8 Marks	L4	CO2

MODULE-III

5.	a)	Explain about keyboard,mouse in detail.	8 Marks	L3	CO3
	b)	Explain monitor and its types.	8 Marks	L3	CO3
		(OR)			
6.	a)	Explain about boundary-fill algorithm with example program .	8 Marks	L1	CO3
	b)	Explain about homogeneous coordinates in detail.	8 Marks	L4	CO3

MODULE-IV

7.	a)	Explain about translation, rotation in 3d transformations.	8 Marks	L1	CO4
	b)	Explain detail about two dimensional viewing.	8 Marks	L4	CO4

(OR)

8.	a)	Define view volume in detail.	8 Marks	L3	CO4
	b)	Explain in detail about general projection transformation.	8 Marks	L4	CO4

MODULE-V

9.	a)	What is animation and explain its applications.	8 Marks	L2	CO5
	b)	Write a c program to move a car .	8 Marks	L3	CO5

(OR)

10.	a)	Explain about patterns in detail with example program .	8 Marks	L4	CO5
	b)	Write a program for filling irregular shapes.	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

COMPUTER NETWORKS

[Computer Science and Engineering(AI&ML)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List some of the social issues related to computer networks.	2 Marks	L1	CO1
	b)	Define switch and hub.	2 Marks	L1	CO1
	c)	Explain about flow control mechanism.	2 Marks	L1	CO3
	d)	Describe the drawbacks of the stop and wait protocol.	2 Marks	L1	CO3
	e)	Briefly state count to infinity problem.	2 Marks	L1	CO2
	f)	Why was IPv6 developed, and what are its main advantages over IPv4?	2 Marks	L1	CO2
	g)	Mention the responsibilities of Transport layer.	2 Marks	L1	CO3
	h)	Draw the UDP Header format	2 Marks	L1	CO3
	i)	Explain the role of Hypertext Transfer Protocol (HTTP) in web communication.	2 Marks	L1	CO4
	j)	Mention the record types of DNS resource record.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the principles of wireless transmission in networking. Discuss the challenges and advantages of wireless communication in comparison to wired communication.	8 Marks	L2	CO1
	b)	Classify computer networks based on scale and explain them in brief.	8 Marks	L2	CO1

(OR)

3.	a)	Compare and contrast the OSI and TCP/IP reference models, highlighting their similarities and differences. Explain their importance in networking.	8 Marks	L2	CO1
	b)	Analyze the concept of packet switching in detail, including how it works and why it has become the dominant switching technology in modern networks.	8 Marks	L3	CO1

MODULE-II

4.	a)	Determine the steps involved in detecting error through checksum with 32-bit data.	8 Marks	L4	CO3
	b)	Explain and demonstrate Selective repeat sliding window Protocol with an example.	8 Marks	L2	CO3

(OR)

5.	a)	Discuss the conceptual model of CSMA with Collision Detection with relevant diagrams	8 Marks	L2	CO3
	b)	Explain Bit-map Protocol and Binary Countdown protocol With the help of neat diagrams.	8 Marks	L2	CO3

MODULE-III

6.	a)	Write a short note on Boarder Gateway Protocol.	8 Marks	L2	CO2
	b)	Explore various approaches and algorithms used for network congestion control.	8 Marks	L2	CO2

(OR)

7.	a)	Explain the concept of hierarchical routing in computer networking.	8 Marks	L2	CO2
	b)	Sketch the format of IPv4 header and describe its significance of each field.	8 Marks	L2	CO2

MODULE-IV

8.	a)	Provide a comprehensive overview of the TCP three-way handshake in the context of connection establishment.	8 Marks	L1	CO3
	b)	Explain the purpose and importance of the following header fields of TCP i) Version ii) Type of service iii) Header checksum iv) Sequence number	8 Marks	L1	CO3

(OR)

9.	a)	Analyze the characteristics of Real-time Transport Protocols (RTP) and their significance in real-time multimedia applications.	8 Marks	L3	CO3
	b)	Explain the exponential increase, additive increase and multiplicative decrease congestion policies of TCP.	8 Marks	L2	CO3

MODULE-V

10.	a)	Explore the concept of Uniform Resource Locators (URLs) and their role in identifying web resources.	8 Marks	L2	CO4
	b)	Discuss the hierarchical structure of the DNS name space.	8 Marks	L2	CO4

(OR)

11.	a)	Trace the path of an email message from its creation to final delivery, highlighting the steps involved in message transfer.	8 Marks	L2	CO4
	b)	Explain the Hypertext Transfer Protocol (HTTP) and its role in facilitating communication between web clients and servers.	8 Marks	L2	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

INTERNET OF THINGS

[Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Explain data consolidation in IoT.	2 Marks	L1	CO1
	b)	Define device management at Gateway in IoT.	2 Marks	L1	CO1
	c)	Define Internet connectivity in the context of IoT.	2 Marks	L1	CO2
	d)	What is IP addressing in IoT?	2 Marks	L1	CO2
	e)	Define the concept of "Things always connected to the Internet/Cloud" in IoT.	2 Marks	L1	CO3
	f)	What are the benefits of connecting IoT devices to the cloud?	2 Marks	L1	CO3
	g)	What does information model specification mean in IoT design?	2 Marks	L1	CO4
	h)	Define service specification in IoT methodology.	2 Marks	L1	CO4
	i)	Define security requirements in IoT.	2 Marks	L1	CO5
	j)	What is threat analysis in IoT security?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the importance of IoT in healthcare and lifestyle improvements.	8 Marks	L2	CO1
	b)	Provide a detailed explanation of communication technologies used in IoT.	8 Marks	L2	CO1

(OR)

3.	a)	Describe how IoT gateways consolidate data and manage devices effectively.	8 Marks	L2	CO1
	b)	Evaluate the role of M2M communication in the IoT ecosystem.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the role of sensors in smart home applications and the types of sensors commonly used.	8 Marks	L2	CO2
	b)	Explain the concept of actuators and describe their usage in IoT-enabled home automation systems.	8 Marks	L2	CO2

(OR)

5.	a)	Provide examples of RFID-based IoT applications in logistics and inventory management.	8 Marks	L2	CO2
	b)	Discuss the working of IoT communication protocols and their need for IP addressing.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the process of integrating embedded systems with IoT cloud platforms.	8 Marks	L3	CO3
	b)	Discuss the importance of Amazon Web Services (AWS) for IoT and its core features.	8 Marks	L3	CO3
		(OR)			
7.	a)	Compare the functionality of two popular embedded platforms: Arduino and Raspberry Pi.	8 Marks	L3	CO3
	b)	Describe the role of embedded systems in connecting IoT devices to the Internet/Cloud.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Describe the process of device and component integration in IoT systems.	8 Marks	L3	CO4
	b)	Discuss the challenges and solutions in IoT application development.	8 Marks	L3	CO4
		(OR)			
9.	a)	Provide a detailed explanation of IoT design methodology for home automation systems.	8 Marks	L3	CO4
	b)	Discuss the steps involved in designing IoT applications for smart cities, focusing on traffic management and energy optimization.	8 Marks	L3	CO4

MODULE-V

10.	a)	Discuss the importance of identity management in IoT systems and its implementation.	8 Marks	L3	CO5
	b)	Explain the concept of access control in IoT and how it ensures secure operations.	8 Marks	L3	CO5
		(OR)			
11.	a)	Discuss secure message communication in IoT, highlighting the protocols involved.	8 Marks	L3	CO5
	b)	Analyze the advantages and limitations of using Hadoop for IoT data analytics.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

STRUCTURAL ANALYSIS

[Civil Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What are the common methods for calculating beam deflection?	2 Marks	L1	CO1
	b)	State the governing differential equation for beam deflection.	2 Marks	L1	CO1
	c)	Write the expression for the strain energy stored in an element due to the bending moment.	2 Marks	L1	CO1
	d)	Write the support moments due sinking of support in the fixed beam.	2 Marks	L1	CO2
	e)	What are the implications of sinking supports on the behavior of continuous beams?	2 Marks	L1	CO3
	f)	How is the support settlement accounted for in the Slope-Deflection Method?	2 Marks	L1	CO3
	g)	What is the carryover moment in moment distribution method.	2 Marks	L1	CO3
	h)	Define Kani's Method in structural analysis.	2 Marks	L1	CO3
	i)	What is the purpose of constructing influence lines diagrams?	2 Marks	L1	CO4
	j)	Define the term plastic analysis in structural engineering.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.		A steel girder of uniform section, 10 m long is simply supported at its ends. It carries concentrated loads 40 kN and 30 kN at two points 2 m and 3 m from the two ends respectively. Calculate the deflection of the girder at the points under the two loads.	16 Marks	L4	CO1

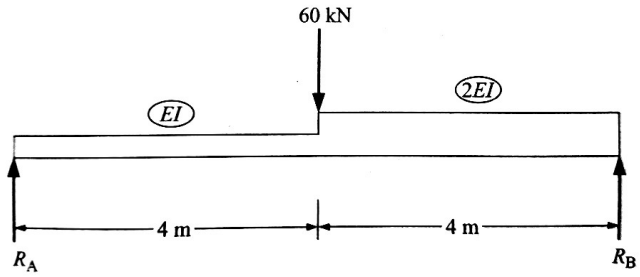
(OR)

3.	a)	A girder of uniform cross section and constant depth is freely supported over a span of 3 m. If the point load at the mid-span is 20 kN and moment of inertia is 15.614×10^6 m4. Calculate the central deflection and the slopes at the ends of the beam. Take E = 200 GN/m^2 using Moment area method	8 Marks	L4	CO1
	b)	Calculate the maximum deflection of a cantilever beam, 4 meters long, subjected to a concentrated load of 25 kN at its free end. The beam has a square cross-section with a side length of 200 mm and a modulus of elasticity of 195 GPa. using Conjugate beam method	8 Marks	L4	CO1

MODULE-II

4. a) Derive the expression for strain energy due to bending moment. 8 Marks L4 CO1

b) Determine the deflection under 60 kN load in the beam shown in figure. 8 Marks L4 CO1



(OR)

5. A fixed beam of 6 m span is loaded with point loads of 150 kN at distance 2 m from each support. Draw the B.M. and S.F. diagrams. Find also the maximum deflection. Take E = 2x108 kN/m^2 and I = 10000 cm^4. 16 Marks L4 CO2

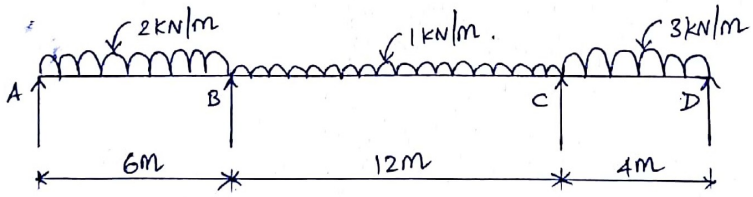
MODULE-III

6. A continuous beam ABCD of uniform cross – section is loaded as shown in the figure. Find: 16 Marks L4 CO3

i) Bending moments at the supports B and C

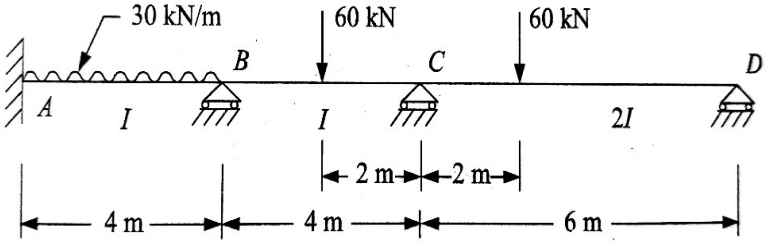
ii) Reactions at the supports.

Draw the B.M. and S.F. diagrams. using Clapeyron's Theorem.



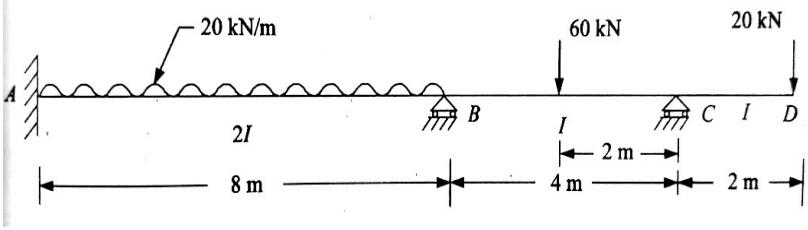
(OR)

7. Analyse the continuous beam ABCD shown in figure by slope deflection method and draw the bending moment diagram. 16 Marks L4 CO3



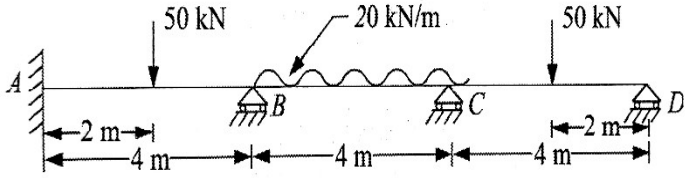
MODULE-IV

8. Analyse the beam ABCD shown in figure using moment distribution method. 16 Marks L4 CO3



(OR)

9.	Analyse the continuous beam shown in figure by Kani's method. Flexural rigidity is constant throughout.	16 Marks	L4	CO3



MODULE-V

10.	A uniformly distributed load of 50 kN/m of 6 m length crosses a girder of span 40 m from left to right. With the help of influence lines, determine the values of shear force and bending moment at a point 12 m from the left support, when the head of the load is 16 m from the left support.	16 Marks	L4	CO4

(OR)

11.	a)	Derive the moment curvature relationship in plastic analysis	8 Marks	L2	CO5
	b)	A T-section consists of a flange 150x10mm and a web of 140x10mm. The section modulus of the T-section is 54600mm3 This section is used as a simply supported beam of 4m span and carries a UDL of 25kN/m on the whole span. Determine the shape factor of the beam and also calculate the collapse load for the beam. Assume yield stress as 250 Mpa	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

HYDROLOGY AND WATER RESOURCES ENGINEERING

[Civil Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Write the basic difference between recording and non-recording rain gauges.	2 Marks	L1	CO1
	b)	Name two methods to calculate mean precipitation over an area.	2 Marks	L1	CO1
	c)	Define evapotranspiration.	2 Marks	L1	CO2
	d)	Write the equation for Horton's infiltration model.	2 Marks	L2	CO2
	e)	What is the primary purpose of an S-Curve unit hydrograph?	2 Marks	L1	CO3
	f)	Write the role of baseflow in a hydrograph.	2 Marks	L1	CO3
	g)	What are the primary objectives of water resources planning?	2 Marks	L2	CO4
	h)	State two principles that guide water resources planning.	2 Marks	L1	CO4
	i)	State the basic difference between gravity dams and arch dams.	2 Marks	L2	CO5
	j)	Write two key factors to consider when selecting a site for a reservoir.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.		Differentiate between the various types and forms of precipitation. Discuss the methods used for measuring rainfall.	16 Marks	L4	CO1

(OR)

3.		Discuss the common errors encountered in the measurement of rainfall.	16 Mark	L3	CO1

MODULE-II

4.	a)	Explain the process of evaporation and list the major factors affecting evaporation.	8 Marks	L3	CO2
	b)	Differentiate between confined and unconfined aquifers.	8 Marks	L2	CO2

(OR)

5.	a)	Discuss two methods to estimate evaporation.	8 Marks	L2	CO2
	b)	Describe the Penman-Monteith method for estimating evapotranspiration.	8 Marks	L3	CO2

MODULE-III

6.	a)	Define a hydrograph and explain its components in detail.	8 Marks	L2	CO3
	b)	Discuss the assumptions and limitations of the unit hydrograph.	8 Marks	L3	CO3

(OR)

7.		What is a design flood? Explain the significance of estimating peak discharge in flood management.	16 Marks	L4	CO3

MODULE-IV

8.		Explain the key principles and objectives of water resources planning.	16 Marks	L4	CO4
		(OR)			
9.		Describe the different levels of planning involved in water resources management.	16 Marks	L4	CO4

MODULE-V

10.	a)	Discuss the factors that influence the site selection for a reservoir.	8 Marks	L2	CO5
	b)	Define the various zones of storage in a reservoir with suitable diagrams.	8 Marks	L2	CO5
		(OR)			
11.	a)	Describe the process of erosion and list its major types.	8 Marks	L4	CO5
	b)	Discuss the factors influencing the selection of a dam site.	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

SOIL MECHANICS

[Civil Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Distinguish activity and sensitivity of clays. If a soil has sensitivity of '7', what is its degree of sensitivity?	2 Marks	L4	CO1
	b)	What is the soil "SP" represents?	2 Marks	L1	CO1
	c)	Define permeability.	2 Marks	L1	CO2
	d)	List the factors affecting permeability of soil	2 Marks	L2	CO2
	e)	Given that a 120t load is uniformly distributed on a surface area of 3 m x 2 m. Find the approximate value of vertical stress at a depth of 2.5 m, using 2V: 1H distribution method.	2 Marks	L4	CO3
	f)	Is 100 % saturation line and zero air voids line same?	2 Marks	L4	CO3
	g)	State the assumptions made in Terzaghi's one dimensional consolidation theory.	2 Marks	L1	CO4
	h)	Differentiate compaction and consolidation.	2 Marks	L4	CO4
	i)	Write the types of triaxial compression tests based on drainage.	2 Marks	L2	CO5
	j)	Write the plastic equilibrium equation of soil with regard to shear strength.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Sketch the phase diagram for a soil and indicate the volumes and weights of the phases on it. Define 'void ratio', 'degree of saturation', and 'water content'. What is a unit phase diagram?	8 Marks	L2	CO1
	b)	Define flow index and toughness index. A fine grained soil has a plasticity index of 15%, flow index of 38% and percentage of silt fraction is 28% out of 60% of fines. Determine the toughness index and activity of the soil. Also comment on the activity of the soil.	8 Marks	L4	CO1

(OR)

3.	a)	Explain the IS soil classification system for classifying the fine-grained soil.	8 Marks	L2	CO1
	b)	The Atterberg limits of a soil sample are: liquid limit = 50%, plastic limit = 30% and shrinkage limit = 15%. If the specimen of this soil shrinks from a volume of 10 cm^3 at liquid limit to 5.94 cm^3 when oven dried, calculate the shrinkage ratio and specific gravity of soil solids.	8 Marks	L4	CO1

MODULE-II

4. a) Write down the procedure for determination of permeability by constant head test in the laboratory. 8 Marks L2 CO2

b) In a falling head permeability test on a soil of length L1, the head of water in the stand pipe takes 5 seconds to fall from 900 to 135 mm above the tail water level. When another soil of length 60 mm is placed on the first soil, the time taken for the head to fall between the same limits is 150 seconds. The parameters have a cross sectional area of 4560 mm^2 and stand pipe area of 130 mm^2. Calculate the permeability of second soil. 8 Marks L4 CO2

(OR)

5. a) What is quick sand condition? Derive the expression for the critical hydraulic gradient. 8 Marks L4 CO2

b) For a homogeneous earth dam 52 m high and 2 m free board, a flow net was constructed and following results were obtained. 8 Marks L4 CO2

No. of potential drops = 25

No. of flow channels = 4

The dam has a horizontal filter of 40 m length at its downstream end. Calculate the discharge per meter length of the dam if the coefficient of permeability of the dam material is 3 x 10^{-3} cm/sec.

MODULE-III

6. a) Differentiate between Boussinesq's and Westergaard's methods of calculating stresses in a soil mass due to an external loading. Discuss which method you would prefer and why? 8 Marks L4 CO3

b) A concentrated load of 22.5 kN acts on the surface of a homogeneous soil mass of large extent. Find the stress intensity at a depth of 3 m, 6 m, 9 m, 12 m and 15 m directly below the point load; draw the vertical stress distribution diagram along vertical axis. Use Boussinesq's theory. 8 Marks L4 CO3

(OR)

7. a) Distinguish standard proctor test and modified proctor test. How would you decide the type of compaction test to be conducted in the laboratory? 8 Marks L4 CO3

b) A proposed embankment fill requires 5000 m^3 of compacted soil. The void ratio of compacted fill is specified as 0.70. Four borrow area soils are available as described in the following table. 8 Marks L4 CO3

Barrow area	Void ratio	Cost of transportation Rs./m^3
A	0.85	250
B	1.20	300
C	0.95	350
D	0.75	200

Make the necessary calculations to select the borrow area from which the soil should be brought to minimize the cost. Let specific gravity of all four soils equal to 2.70.

MODULE-IV

8. a) Distinguish between compaction and consolidation. Explain the spring analogy for primary consolidation. 8 Marks L4 CO4

b) A clay layer 6 m thick sitting on top of bedrock experiences a consolidation of 0.22m. Find: 8 Marks L4 CO4

i) The degree of consolidation when the settlement reaches 0.05 m,

ii) The time to reach 50% settlement if c_v = 0.002 cm^2/sec,

iii) The time for 50% consolidation if the stratum is doubly

drained.

(OR)

9. a) Define and explain: i) Coefficient of compressibility ii) Coefficient of volume change iii) Compression index iv) Expansion index v) Recompression index. 8 Marks L1 CO4

b) A 15 m thick hydraulically isotropic clay stratum overlies an impervious stratum. If the coefficient of consolidation is 5 x 10^{-4} cm^2/s, find the time required for 50% and 90% consolidation (T_v = 0.20 and 0.85 respectively). 8 Marks L4 CO4

MODULE-V

10. a) What are the various methods of determination of shear strength in the laboratory? Explain triaxial compression test with the help of a neat sketch. 8 Marks L2 CO5

b) A series of undrained shear box tests (area of box = 3600mm^2) were carried out on a soil with the following results. 8 Marks L4 CO5

Normal Load (N)	90	180	270
Shear force at failure (N)	70	90	117

Determine the cohesion and angle of friction of the soil with respect to total stresses.

(OR)

11. a) Explain in detail the determination of shear strength using direct shear test, with neat sketch. 8 Marks L2 CO5

b) Direct shear test was conducted on compacted sand. Shear box dimensions are 60 mm × 60 mm. The readings are as listed below. 8 Marks L4 CO5

Normal Load (N)	Shear Load (N)
110	95
225	195
340	294

Determine the angle of shearing resistance.

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

DESIGN AND ANALYSIS OF ALGORITHMS

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define an algorithm?	2 Marks	L1	CO1
	b)	Differentiate between time complexity and space complexity?	2 Marks	L1	CO1
	c)	What are disjoint sets?	2 Marks	L1	CO2
	d)	Write general method for divide-and-conquer technique?	2 Marks	L1	CO2
	e)	Define principle of optimality.	2 Marks	L1	CO2
	f)	What is matrix-chain multiplication?	2 Marks	L1	CO3
	g)	What is greedy technique?	2 Marks	L1	CO3
	h)	List out the implementation procedure of Backtracking?	2 Marks	L1	CO3
	i)	Give the formula used to find the upper bound for knapsack problem.	2 Marks	L1	CO3
	j)	What is the difference between tractable and intractable?	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss the methods to compute time complexity of an algorithm	8 Marks	L2	CO1
	b)	Explain asymptotic notations with examples.	8 Marks	L2	CO1

(OR)

3.	a)	Define Amortized analysis? Explain types and with example for each method?	8 Marks	L2	CO1
	b)	Solve the recurrence relation T(n)=2T(n/2)+n using substitution method	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain the algorithm for simple union and collapsing find with an example?	8 Marks	L2	CO2
	b)	Write algorithm for Binary Search and derive the time complexity	8 Marks	L1	CO2

(OR)

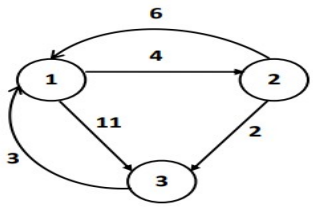
5.	a)	Implement merge sort for the given list of elements 543,234,465,654,342,236,765,854,346,985	8 Marks	L2	CO2
	b)	Explain Strassen's matrix multiplication and derive its time complexity	8 Marks	L2	CO2

MODULE-III

6.		Solve 0/1 knapsack for the given instance and find optimal solution. M = 6,N = 3,W1 = 2, W2 = 3, W3 = 4 and P1 = 1, P2 =2, P3 = 5	16 Marks	L2	CO3

(OR)

7.	a)	Solve All-pairs shortest path problem.	16 Marks	L2	CO3



MODULE-IV

8.	a)	Explain general method of greedy design technique.	8 Marks	L1	CO3
	b)	Explain Job scheduling with deadlines and find solution for n=5, (P1,P2,…,P5)=(20,15,10,5,1) and (d1,d2….d5)=(2,2,1,3,3).	8 Marks	L1	CO3

(OR)

9.	a)	Explain sum of subsets problem and solve for m=30, s={10,12,13,5,15,18}.	6 Marks	L2	CO3
	b)	Solve N-queen's problem and write the algorithm of it.	10 Marks	L2	CO3

MODULE-V

10.	a)	Solve knapsack problem for the given instance using LCBB M = 6,N = 3,W1 = 2, W2 = 3, W3 = 4 and P1 = 1, P2 =2, P3 = 5.	16 Marks	L3	CO3

(OR)

11.	a)	Define Decision problem and Explain class P, class NP,NP-Hard with examples	8 Marks	L1	CO4
	b)	State and Explain cook's theorem	8 Marks	L1	CO4

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

DATABASE MANAGEMENT SYSTEMS

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define a data model.	2 Marks	L1	CO1
	b)	List the steps in designing a database?	2 Marks	L1	CO2
	c)	Recall database schema	2 Marks	L1	CO1
	d)	Define a tuple variable in tuple relational calculus	2 Marks	L1	CO2
	e)	Write the basic form of SQL query.	2 Marks	L1	CO1
	f)	Discuss nested query and write one example for it.	2 Marks	L1	CO1
	g)	What are functional dependencies (FDs) in the context of database design?	2 Marks	L1	CO2
	h)	Define a database transaction in the context of database management.	2 Marks	L1	CO1
	i)	Define the term "lock" in the context of concurrency control.	2 Marks	L1	CO1
	j)	Discuss Indexed sequential Access Method.	2 Marks	L1	CO1

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain main functional components of the DBMS	8 Marks	L2	CO1
	b)	What are the different types of database archtectures? Explain	8 Marks	L2	CO1
		(OR)			
3.	a)	Explain the key constraints and weak entities with an example for each.	8 Marks	L2	CO1
	b)	Discuss Database Management Systems architecture.	8 Marks	L2	CO1

MODULE-II

4.	a)	Illustrate integrity constraints over relations with examples.	8 Marks	L3	CO2
	b)	Outline different types of operators used in relational algebra with suitable examples.	8 Marks	L3	CO2
		(OR)			
5.		Consider the following schema for Restaurant Database Customer (CID int primary key, CName varchar (30) Not null, Contact varchar (10) null) Item_List (IID int primary key, IName varchar (30) not null, IType varchar (10) null) Create the relations with the datatypes and constraints given in the schema and modify (Update, Delete, Drop, Truncate, Alter) the tuples, attributes in the given relations.	16 Marks	L4	CO3

MODULE-III

6.	a)	Explain the brief introduction of triggers.	8 Marks	L2	CO3
	b)	Discuss the concept and the purpose of the active databases.	8 Marks	L2	CO3

(OR)

7.	a)	Construct PL/SQL block to find whether the given number is palindrome or not.	8 Marks	L3	CO2
	b)	Write a function that accepts two numbers A and B and performs the following operations. • Addition • Subtraction • Multiplication • Division	8 Marks	L3	CO1

MODULE-IV

8.	a)	Draw the state diagram of a transaction and explain the states.	8 Marks	L2	CO4
	b)	Illustrate the procedure for achieving the transaction atomivity and durability.	8 Marks	L2	CO4

(OR)

9.		Define normalization. List and explain different normal forms with examples.	16 Marks	L3	CO2

MODULE-V

10.	a)	Write a detailed note on indexing with relevant examples.	8 Marks	L2	CO5
	b)	State the difference between static hashing and dynamic hashing.	8 Marks	L2	CO5

(OR)

11.	a)	In detail explain about the hash-based indexing with an example	8 Marks	L3	CO1
	b)	Explain about primary and secondary indexing with an example each.	8 Marks	L3	CO1

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

FOUNDATIONS OF DATA SCIENCE

[Computer Science and Engineering (Data Science)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Differentiate between Structured Versus Unstructured Data	2 Marks	L2	CO1
	b)	List any four ufuncs and their properties.	2 Marks	L2	CO1
	c)	How you insert a given element at a given index in a list using Python	2 Marks	L1	CO2
	d)	Write any Four reindex methods and properties	2 Marks	L2	CO2
	e)	Write any four Vectorized string methods with purpose.	2 Marks	L1	CO3
	f)	Write a program to return a list of tuples when the pattern has groups using findall.	2 Marks	L1	CO3
	g)	Define Data Aggregation and give any 4 methods for it.	2 Marks	L1	CO4
	h)	Give an example for Filling Missing Values with Group-specific Values.	2 Marks	L1	CO4
	i)	Mention the importance of Upsampling and Interpolation in data analysis.	2 Marks	L1	CO5
	j)	Give an example for Resampling with Periods.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe Array set operations with suitable examples.	8 Marks	L2	CO1
	b)	Write a Python program to perform arithmetic computations using NumPy.	8 Marks	L3	CO1

(OR)

3.	a)	Illustrate the importance of using linalg and random module in NumPy with suitable examples.	8 Marks	L2	CO1
	b)	Differentiate unique(x), intersect1d(x, y) and union1d(x, y) functions.	8 Marks	L2	CO1

MODULE-II

4.	a)	Discuss Arithmetic methods with fill values on DataFrames using suitable syntax and examples.	8 Marks	L2	CO2
	b)	Illustrate the methods Unique Values, Value Counts, and Membership on Series data structure	8 Marks	L3	CO2

(OR)

5.	a)	Write about the different file formats that pandas support for reading and writing data with relevant examples	8 Marks	L2	CO2
	b)	How data is represented in JSON and Write a Python program to read data from JSON fileand store data in JSON file.	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain the functions used to handle missing data with relevant example.	8 Marks	L2	CO3
	b)	Create a DataFrame with normally distributed data using random sampling and detect possible outliers.	8 Marks	L3	CO3

(OR)

7.	a)	Analyze the importance of using regular expression methods in Python with examples.	8 Marks	L2	CO3
	b)	Write a Python code to perform data transformation by modifying set of values using map and replace method.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Write a Python program for plotting bar plot and boxplot with suitable example.	8 Marks	L3	CO4
	b)	Describe pandas.crosstab() function and pandas.pivot_table() functionwith suitable examples.	8 Marks	L2	CO4

(OR)

9.	a)	Discuss the advantages of using Python visualization tools to perform exploratory data analysis.	8 Marks	L2	CO4
	b)	Create Box plots to visualize data with many categorical variables.	8 Marks	L3	CO4

MODULE-V

10.	a)	Define time zone. Discuss the operations that are relevant on time zones.	8 Marks	L2	CO5
	b)	What is Time Zone? Discuss the conversion of given date and time data into a particular time zone of interest, write a Python code snippet.	8 Marks	L3	CO5

(OR)

11.	a)	What is Time Zone? Briefly write about UTC. Are pandas by default timezone native? Discuss.	8 Marks	L2	CO5
	b)	Briefly discuss resamplings, upsampling and downsampling of Time Series data with respect to pandas in Python.	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

PROBABILITY AND STOCHASTIC PROCESSES

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define events.	2 Marks	L1	CO1
	b)	What is outcome?	2 Marks	L1	CO1
	c)	In an experiment when two dice are thrown simultaneously, find expected value of the sum of number of points on them.	2 Marks	L1	CO2
	d)	Define Moment generating function	2 Marks	L1	CO2
	e)	Give the statement of central limit theorem.	2 Marks	L1	CO2
	f)	Define correlation and covariance of two random variables X& Y.	2 Marks	L1	CO2
	g)	Find the mean value of Response of a linear system.	2 Marks	L1	CO3
	h)	Define Power Spectrum Density.	2 Marks	L1	CO3
	i)	Define noise factor.	2 Marks	L1	CO4
	j)	Give the characteristics of shot noise.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	State and Prove Bayesian Probability	8 Marks	L1	CO1
	b)	When are two events said to be collectively exhaustive events? Explain with examples.	8 Marks	L1	CO1

(OR)

3.		Suppose the probability that a bit transmitted through a digital communication channel and received in error is 0.1. Assuming that the transmissions are independent events, find the probability that the third error occurs at the 10th bit.	16 Marks	L1	CO1

MODULE-II

4.	a)	Explain the Uniform Random Variable with neat Sketches of CDF and PDF	8 Marks	L1	CO2
	b)	A submarine attempts to sink an aircraft carrier. It will be successful only if two or more torpedoes hit the carrier. If the sub fires three torpedoes and the probability of a hit 0.4 for each torpedo, what is the probability that the carrier will be sunk?	8 Marks	L1	CO2

(OR)

5.	a)	Define the following: i) Expected value of a function of a random variable. ii) Moments about the origin iii) Central moments.	8 Marks	L1	CO2
	b)	Define Moment Generating Function (MGF). List MGF Properties	8 Marks	L1	CO2

MODULE-III

6.	a)	The joint p.d.f. of (X,Y) is $f_{xy}(x,y)=4xy$, $0<x,y<1$ and $f_{xy}(x,y)=0$, otherwise, Find E(XY).	8 Marks	L2	CO2
	b)	The joint cdf of a bivariate r.v. (X, Y) is given by $F(x,y)=\begin{cases}(1-e^{-ax})(1-e^{-by}) \\ 0, otherwise\end{cases}, X\geq 0, Y\geq 0, a>0, b>0$ i) Find the marginal cdf's of X and Y. ii) Show that X and Y are independent. iii) Find P(X ≤1, Y≤1), P(X≤1), P(Y >1), and P(X >x, Y > y).	8 Marks	L2	CO2

(OR)

7.	a)	Find the density of W=X+Y where the densities of X and Y are assumed to be $f(x,y)=\frac{1}{a}[U(X)-U(X-a)]$ $f(x,y)=\frac{1}{b}[U(Y)-U(Y-B)]$ Where 0 < a < b	8 Marks	L2	CO2
	b)	The joint probability density function of the random variable (X,Y) is given by $f(x,y)=K_{xy}e^{-(x^2+y^2)}, x>0, y>0$. Find the value of K.	8 Marks	L2	CO2

MODULE-IV

8.	a)	Define cross correlation function of two random processes X(t) and Y(t) and state the properties of cross correlation function.	8 Marks	L1	CO3
	b)	Derive Cross Correlation between input and output of a linear time invariant system.	8 Marks	L3	CO3

(OR)

9.	a)	Derive the autocorrelation output of LTI system.	8 Marks	L3	CO3
	b)	Let Y(n)=X(n)+W(n), where X(n) = A (for all n) and A is a Random variable with zero mean and variance σ_A^2, and W(n) is a discrete-time white noise with average power σ^2. It is also assumed that X(n) and W(n) are independent. i) Show that Y(n) is WSS. ii) Find the probability density of W (n).	8 Marks	L2	CO3

MODULE-V

10.	a)	Define shot noise and explain its effect on various parameters.	8 Marks	L1	CO5
	b)	An amplifier with gain=30dB and Bandwidth=25kHz is found to have T=120K. Noise Figure =2 Find T_e and output noise power.	8 Marks	L2	CO4

(OR)

11.	a)	Classify noise and explain thermal noise in detail for stochastic processes.	8 Marks	L2	CO5
	b)	Show that the overall noise figure for cascaded linear devices is the signal $F=F_1+\frac{F_2+1}{G_1}+\frac{F_3+1}{G_1G_2}+\frac{F_4+1}{G_1G_2G_3}+\ldots$	8 Marks	L2	CO4

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

LINEAR IC APPLICATIONS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	An op-amp in open loop is not used for most of the applications. Justify	2 Marks	L4	CO2
	b)	List the advantages of integrated circuits over discrete component circuit.	2 Marks	L1	CO1
	c)	What is sample and hold circuit. Point out where it is used and why?	2 Marks	L2	CO2
	d)	Differentiate Schmitt trigger and comparator	2 Marks	L4	CO2
	e)	Explain how positive feedback is achieved in a 741 op-amp based oscillator and its impact on the oscillation process.	2 Marks	L3	CO2
	f)	Assess the advantages and limitations of using a Wien Bridge oscillator over an RC oscillator .	2 Marks	L4	CO2
	g)	Identify the major components of the functional diagram of a 555 timer.	2 Marks	L2	CO1
	h)	How does the internal flip-flop contribute to the operation of a 555 timer in astable mode?	2 Marks	L2	CO2
	i)	List out the DAC and ADC specifications in detail.	2 Marks	L1	CO1
	j)	Define resolution of a D/A converter.	2 Marks	L1	CO1

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Illustrate the open loop op-amp configurations also explain about the virtual ground concept.	8 Marks	L1	CO1
	b)	Analyse the DC characteristics of an OP-AMP in detail.	8 Marks	L4	CO1

(OR)

3.	a)	Explain closed loop configuration of Inverting and non-inverting amplifiers.	8 Marks	L	CO1
	b)	Draw the circuit diagram of Differential amplifier and explain its operation.	8 Marks	L1	CO1

MODULE-II

4.	a)	With a suitable circuit diagram, explain the operating principle of an instrumentation amplifier and derive its gain.	10 Marks	L2	CO2
	b)	Interpret the operation of Current to Voltage and Voltage to current converter circuits.	6 Marks	L3	CO2

(OR)

5.	a)	Draw the inverting amplifier circuit and non-inverting amplifier	8 Marks	L2	CO2

		circuit of an opamp in closed loop configuration. Obtain the expression for the closed loop gain for both amplifiers.			
	b)	Prove that the difference amplifier with unity gain is a subtractor	8 Marks	L1	CO2

MODULE-III

6.	a)	Investigate the impact of Butterworth filter design using IC741 on the overall filter response.	8 Marks	L3	CO3
	b)	Design a first-order low-pass Butterworth filter using a 741 op-amp. Provide the values for the resistors and capacitors for a cut off frequency of 1 kHz. Justify your choices.	8 Marks	L3	CO3

(OR)

7.	a)	Explain the first order band reject filter with a neat diagram. Derive its frequency response and plot the same	8 Marks	L3	CO3
	b)	Design a triangular waveform generator circuit using a 741 op-amp. Specify the frequency and amplitude of the output waveform.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Draw the internal diagram of a 555 timer IC and explain significance of each pin.	8 Marks	L1	CO4
	b)	Explain the operation of Monostable multi vibrator using 555 timer. Derive the expression for quasi stable state time period of a Monostable multi vibrator using 555 timer.	8 Marks	L1	CO4

(OR)

9.	a)	Interpret how 555 timer can be used as an astable multi vibrator.	8 Marks	L3	CO4
	b)	Design a monostable multi vibrator using 555 timer to produce a pulse width Of 100 m sec.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain the working principles of R-2R ladder DAC.	8 Marks	L1	CO5
	b)	Discuss about successive-approximation type ADC.	8 Marks	L2	CO5

(OR)

11.	a)	List the advantages and disadvantages of flash type ADC.	8 Marks	L1	CO5
	b)	Explain in detail with a neat circuit diagram the operation of anR-2R ladder digital to analog converter.	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

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SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

VLSI SYSTEM DESIGN

[Electronics and Communication Engineering,Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Explain the concept of Moore's law?	2 Marks	L1	CO1
	b)	Draw the logic level diagram for CMOS Logic.	2 Marks	L2	CO1
	c)	Draw the basic structure of NMOS Inverter.	2 Marks	L2	CO2
	d)	Explain the concept of Channel Length modulation.	2 Marks	L1	CO2
	e)	List out the Limitations of Scaling.	2 Marks	L1	CO3
	f)	Explain the concept of MOS layers.	2 Marks	L2	CO3
	g)	How to design a high speed adder?	2 Marks	L2	CO4
	h)	Give the applications of high speed adders.	2 Marks	L2	CO4
	i)	Name the elements in a configurable logic blocks.	2 Marks	L2	CO4
	j)	Draw the structure of CPLD.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Sketch the circuit diagram for basic CMOS gate. Explain its operation.	8 Marks	L2	CO1
	b)	Design a CMOS based logic for the complex function F =(D + A· (B +C))'	8 Marks	L3	CO1

(OR)

3.	a)	Explain the following terms with reference to CMOS logic i) Logic levels ii) Power supply rails iii) DC noise margin iv) Propagation delay.	8 Marks	L2	CO1
	b)	Reproduce basic ECL NOR/OR gate with its truth table. Also recognize the importance of ECL.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain in detail of the fabrication procedure for p-Well CMOS technology with a neat diagram.	8 Marks	L3	CO2
	b)	Estimate g_m of the device for NMOS transistor operating saturation region with the following parameters: V_{GS} = 5V, V_{tn} = 1.0V, W/L = 3μm/0.18μm and $\mu_n C_{ox}$ = 95μA/V^2.	8 Marks	L2	CO2

(OR)

5.	a)	Determine the Pull up to pull down ratio for an NMOS inverter driven by another NMOS inverter.	8 Marks	L4	CO2
	b)	Discuss about Latch up, Hot carrier Effects in MOSFETs.	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain the concept of sheet resistance and apply it to compute the ON resistance (VDD to GND) of an NMOS inverter having pull up to pull down ratio of 1:1,if n channel resistance is Rsn = 10^4 per square.	8 Marks	L3	CO3
	b)	Calculate the gate capacitance value of 1μm technology minimum size transistor with gate to channel capacitance value is 4×10^{-4}pF/μm^2.	8 Marks	L2	CO3

(OR)

7.	a)	Design a symbolic layout for a complementary CMOS circuit that implements **Y= (AB+CD)'.**	8 Marks	L2	CO3
	b)	Explain the concept of Gate delays and its Delay estimation with neat sketch.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Outline the features of 4-by-4 barrel shifter using complementary transmission gates. Sketch its circuit diagram and explain its shifting operation.	8 Marks	L3	CO4
	b)	Assess the operation of Manchester carry chain adder and find the worst case delay of carry chain	8 Marks	L2	CO4

(OR)

9.	a)	Explain carry select adder with neat diagram. Examine the trade-offs associated with this adder.	8 Marks	L2	CO4
	b)	Explain the principle of working of a 4-bit carry-look ahead adder and draw the logical schematic used to obtain the generate and propagate signals.	8 Marks	L3	CO4

MODULE-V

10.	a)	Show the basic one row and one column RAM architecture and explain its Operation.	8 Marks	L3	CO4
	b)	Compare anti-fuse and via link programmable interconnections for PALs	8 Marks	L3	CO4

(OR)

11.	a)	Explain in detail about UV Erasable, Electrically Erasable with its applications.	8 Marks	L4	CO4
	b)	Explain the concept of Design Approach used in VLSI to optimize the trade-offs parameters.	8 Marks	L3	CO4

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

PERSONALITY DEVELOPMENT

[Information Technology , Computer Science and Engineering (Artificial Intelligence and Machine Learning), Computer Science and Engineering (Data Science), Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is self-esteem?	2 Marks	L1	CO1
	b)	Mention the critical factor in the development of attitudes.	2 Marks	L1	CO1
	c)	What are the impacts of positive attitude?	2 Marks	L1	CO2
	d)	What is the critical factor in the development Of attitudes?	2 Marks	L1	CO2
	e)	Define self-motivation.	2 Marks	L1	CO3
	f)	Why it is important to learn on your own?	2 Marks	L1	CO3
	g)	Mention two qualities of a good supervisor.	2 Marks	L1	CO4
	h)	How to avoid negative reactions to criticism?	2 Marks	L1	CO4
	i)	Define Performance Appraisal.	2 Marks	L1	CO5
	j)	Define Leadership.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	Discuss the initiative you would take to handle criticism or negative feedback that may affect self – esteem.	16 Marks	L2	CO1

(OR)

3.	How can a supportive positive social circle contribute in self-improvement?	16 Marks	L2	CO1

MODULE-II

4.	Write about a book you have read that helped you in acquiring positive attitude.	16 Marks	L2	CO2

(OR)

5.	Analyse the specific habits or behaviors you would like to change to enhance your positive attitude and development.	16 Marks	L4	CO2

MODULE-III

6.	What does self-motivation mean to you, and how do you personally define it?	16 Marks	L1	CO3

(OR)

7.	Explain the role of goal-setting in self-motivation process.	16 Marks	L2	CO3

MODULE-IV

8.	Differentiate between deserved and undeserved criticism.	16 Marks	L1	CO4
	(OR)			
9.	Mention specific strategies to implement in order to enhance professional relation with supervisors.	16 Marks	L1	CO4

MODULE-V

10.	Explain the role of effective communication in achieving workplace success?	16 Marks	L4	CO5
	(OR)			
11.	List out the strategies to stay updated in industry trends to remain competitive in the job market.	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

DISCRETE MATHEMATICSL STRUCTURES

[Computer Science and Engineering, Information Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define tautology give an example.	2 Marks	L1	CO1
	b)	Write the truth tables for $p \wedge q$ and $p \rightarrow q$.	2 Marks	L1	CO1
	c)	Define Function and give one example.	2 Marks	L1	CO2
	d)	Define Lattice and give one examples which is not Lattice.	2 Marks	L1	CO2
	e)	What is the use of Mathematical induction.	2 Marks	L1	CO3
	f)	Explain Pigeon hole principle.	2 Marks	L1	CO3
	g)	Find the sequence for the function $2x^2(1-x)^{-1}$.	2 Marks	L2	CO4
	h)	Find the generating function for the sequence 1,-1,1,-1,1,-1…	2 Marks	L1	CO4
	i)	Define complete graph and give one example.	2 Marks	L1	CO5
	j)	Explain briefly about trees.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the connectives and their truth tables.	8 Marks	L2	CO1
	b)	Show that $((P \rightarrow Q) \rightarrow Q) \Rightarrow P \vee Q$ without constructing truth table.	8 Marks	L4	CO1

(OR)

3.	a)	Construct the truth table for $(p \rightarrow r) \wedge [(q \wedge \neg r) \rightarrow (p \vee r)]$.	8 Marks	L3	CO1
	b)	Write the following statements in symbolic form. i) If Jack doesn't miss many classes through illness, then he passes high school. ii) If Jack passes high school, then he is educated. iii) If Jack doesn't read a lot of books, then he is uneducated. iv) Jack doesn't miss many classes through illness and doesn't read a lot of books.	8 Marks	L4	CO1

MODULE-II

4.	a)	Define a binary relation with an example. Let R be the relation from the setA = {1, 3, 4} on itself and defined by R = { (1, 1), (1, 3), (3, 3), (4, 4)} the find the matrix of R draw thegraph of R .	8 Marks	L3	CO2
	b)	Draw the Hasse diagram of the set $\{2,4,8,16\}$ under the partial ordering relation "divides" and indicate those which are totally ordered.	8 Marks	L3	CO2

(OR)

5.	a)	Draw Hasse diagram representing the positive divisor of 36.	8 Marks	L3	CO2
	b)	Let $R = \{(1,1),(1,2),(2,3),(3,3),(3,4)\}$ be a relation on $A = \{1,2,3,4\}$. Draw the diagraph of R. Obtain R^2 and draw the diagraph of R^2.	8 Marks	L4	CO2

MODULE-III

6.	a)	Examine the relation $a * b = a + b - ab$ for all $a, b \in G$ is a group or not.	8 Marks	L3	CO3
	b)	Find the minimum number of students in a class to be sure that four out of them are born in the same month.	8 Marks	L3	CO3

(OR)

7.	a)	By using mathematical induction, prove that $\frac{1}{1.2} + \frac{1}{2.3} + \frac{1}{3.4} + \ldots\ldots + \frac{1}{n(n+1)} = \frac{n}{n+1}$.	8 Marks	L3	CO3
	b)	Let $G = \{-1,0,1\}$ verify whether Gforms a group under usual addition.	8 Marks	L2	CO3

MODULE-IV

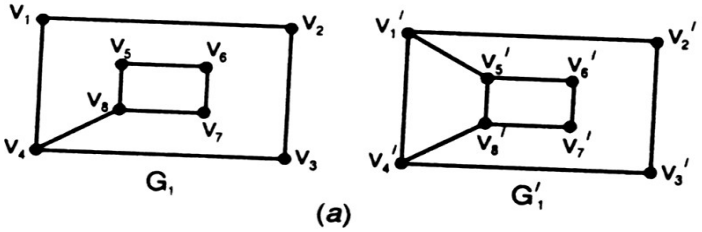
8.	a)	Determine the Coefficient of x^{12} in $x^3(1-2x)^{10}$.	8 Marks	L3	CO4
	b)	Solve the recurrence relation $a_n = a_{n-1} + n,\ n \geq 1$ where $a_0 = 2$ by substitution method.	8 Marks	L3	CO4

(OR)

9.	a)	Find the Coefficient of x^{20} in $(x^2 + x^3 + x^4 + x^5 + x^6)^5$.	8 Marks	L3	CO4
	b)	Using the generating function find the number of ways an advertising agent can purchase n minutes of air time, if time slots for commercials come in blocks of 30,60, or 120.	8 Marks	L3	CO4

MODULE-V

10.	a)	Define the following with examples: i) Degree of a vertex ii) Complete Graph iii) Regular Graph.	8 Marks	L3	CO5
	b)	Is the following pairs of graphs are isomorphic or not ?	8 Marks	L3	CO5



(a)

(OR)

11.	a)	Explain the following i) Graph Isomorphism and sub graphs ii) Hamilton Paths iii) Planar Graph Dual of aplanargraph.	8 Marks	L3	CO5
	b)	Prove that isomorphism is an equivalence relation on diagraphs.	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

DATA STRUCTURES AND ALGORITHMS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Name all the Asymptotic Notation used in Data Structures	2 Marks	L1	COs
	b)	What is time complexity of an algorithm?	2 Marks	L2	CO1
	c)	How the doubly linked list can be represented?	2 Marks	L1	CO1
	d)	List down the applications of List.	2 Marks	L2	CO2
	e)	What is a queue, and how does it differ from a stack?	2 Marks	L2	CO2
	f)	Write the routine to push an element into a stack.	2 Marks	L1	CO3
	g)	Define non-linear data structure	2 Marks	L1	CO3
	h)	What are the different types of traversing?	2 Marks	L1	CO4
	i)	What is Extendible Hashing?	2 Marks	L2	CO4
	j)	What is a Heap tree and what are its two variations?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Write a program for removing the duplicates in a given list of number and print the same in ascending orders	8 Marks	L2	CO2
	b)	What is Linear Search algorithm? Explain the process with [13, 9, 21, 15, 39, 19, and 27]. What are the time complexity faced for linear search	8 Marks	L3	CO2

(OR)

3.	a)	What are the Asymptotic Notation used in Data Structures Explain each with a good example.	8 Marks	L1	CO1
	b)	Write the characteristics of Insertion sort, explain the working of Insertion sort algorithm for [5, 4, 3, 12, 14, 1, 3, 5] with a pseudo code	8 Marks	L2	CO2

MODULE-II

4.	a)	What is a linked list, and how does it differ from other data structures? Discuss the basic operations that can be performed on a linked list.	8 Marks	L2	CO2
	b)	Create a program to implement a circular double linked list and add elements to the list using a loop.	8 Marks	L3	CO2

(OR)

5.	a)	How can linked lists be used to represent sparse matrices, and what is the performance analysis for this approach?	8 Marks	L3	CO3
	b)	Write a program that compares the performance of linked lists with arrays for adding polynomials. Vary the size of the polynomials and measure the performance of the two approaches.	8 Marks	L2	CO3

MODULE-III

6.	a)	Explain the working of a priority queue and provide examples of real-world applications that use this data structure. How is a priority queue implemented using an array or a linked list? What is the time complexity of common operations such as insertion, deletion, and retrieval?	8 Marks	L3	CO2
	b)	Design a program to simulate the functioning of a queue-based ticketing system at a movie theater.	8 Marks	L4	CO3
		(OR)			
7.	a)	How can you use stack to convert an infix expression to postfix expression? Show the process of conversion for (X+Y)*(A/B)	8 Marks	L4	CO3
	b)	Consider a scenario where you need to implement a queue using two stacks. Design and implement the enqueue and dequeue operations for the queue, making sure that the time complexity of both operations is O(1). You are not allowed to use any other data structures or extra space apart from the two stacks. How would you ensure that the queue follows the First-In-First-Out (FIFO) principle, despite being implemented using stacks?	8 Marks	L3	CO4

MODULE-IV

8.	a)	How are operations such as insertion and deletion performed on Binary Search trees? What are the time complexities of these operations?	8 Marks	L3	CO2
	b)	Write a program to find the kth smallest element in an array using a max heap.	8 Marks	L3	CO4
		(OR)			
9.	a)	Explain the different methods for traversing a binary tree without recursion.	8 Marks	L2	CO2
	b)	Write a program to sort an array of integers using heap sort algorithm	8 Marks	L3	CO2

MODULE-V

10.	a)	Implement a B+ tree with a minimum degree of 2 and insert the following keys: 3, 6, 8, 10, 13, 15, 18, 21, 23, 25, 27, 30. Print the resulting B+ tree after each insertion.	8 Marks	L4	CO3
	b)	Compare Linear Open Addressing and Chaining in terms of performance and efficiency.	8 Marks	L3	CO5
		(OR)			
11.	a)	Compare and contrast Breadth First Search and Depth First Search algorithms in terms of their applications and performance.	8 Marks	L2	CO4
	b)	What is the performance analysis of Hashing? How is it calculated and what factors affect it?	8 Marks	L3	CO5

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SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA II Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

DATA STRUCTURES

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is a Linear Data Structure?	2 Marks	L1	CO1
	b)	What are the applications of a linked list?	2 Marks	L1	CO1
	c)	Stack Vs Queue which is the best and why?	2 Marks	L2	CO2
	d)	Define the priority queue	2 Marks	L1	CO2
	e)	How to measure the height of a tree?	2 Marks	L2	CO3
	f)	What operations can be performed on an AVL search tree	2 Marks	L2	CO3
	g)	What is the purpose of searching?	2 Marks	L1	CO4
	h)	What is a Merge Sort?	2 Marks	L1	CO4
	i)	How to represent a graph?	2 Marks	L2	CO5
	j)	What is folding?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	What is a Big O notation? What is the other name given for it? What are the rules of using Big O notation?	8 Marks	L2	CO1
	b)	What is a Linked List? Name different types of Linked List and describe them briefly with a neat diagram.	8 Marks	L1	CO1

(OR)

3.	a)	What operations can be performed on a linked list? Explain each in detail.	8 Marks	L2	CO1
	b)	Explain Doubly Linked List in detail with a good example.	8 Marks	L1	CO1

MODULE-II

4.	a)	Write a program and explain the process of implementing a stack using an array.	8 Marks	L3	CO2
	b)	What is a double ended queue? Where do we use these queues explain.	8 Marks	L2	CO2

(OR)

5.	a)	What is a stack? Explain the applications of a stack.	8 Marks	L2	CO2
	b)	Write a program and explain the process of implementing a queue based on an linked list.	8 Marks	L1	CO2

MODULE-III

6.	a)	What is a binary tree? What are the advantages of a binary tree? Explain a binary tree with a neat diagram.	8 Marks	L2	CO3
	b)	Draw an AVL tree on following inputs, assume that tree is initially empty: 41,52,62,73,81,89,110,111,123,131,141,42,13,22,21,14,12,8.	8 Marks	L4	CO3

(OR)

7.	a)	Create a tree and Find the position of the element 19 using binary search method in an array 'Z' given below : Z = {18, 77, 3, 21, 9, 19, 2, 32}.	8 Marks	L4	CO3
	b)	What is a Red- Black Tree? How do we represent a Red-Black Tree? Explain the process of inserting a node into it.	8 Marks	L2	CO3

MODULE-IV

8.	a)	What is Linear Search algorithm? Explain the process with [3, 19, 22, 45, 19, 29, and 27]. What are the time complexity for linear search.	8 Marks	L3	CO4
	b)	What is Selection Sort? Draw the flow chart for the Selection Sort and explain it for [8, 42, 24, 51, 2, 33].	8 Marks	L3	CO4

(OR)

9.	a)	Explain the concept of Binary search with example.	8 Marks	L1	CO4
	b)	What is an Insertion sort? explain the working of Insertion sort algorithm for [15, 24, 31, 12, 44, 16, 32, 3] with a pseudo code.	8 Marks	L3	CO4

MODULE-V

10.	a)	What is the difference between Depth-First Search and a Breadth-First Search.	8 Marks	L2	CO5
	b)	Explain Open Addressing and its implementation in Hashing.	8 Marks	L1	CO5

(OR)

11.	a)	What is Minimum Spanning Tree? Consider a undirected graph G with vertices { A, B, C, D, E}. In graph G, every edge has distinct weight. Edge CD is edge with minimum weight and edge AB is edge with maximum weight. Explain which edge will be the minimum spanning tree.	8 Marks	L3	CO5
	b)	Brief the Random and Non-Random Keys.	8 Marks	L1	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA II Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

PYTHON PROGRAMMING

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Mention the Literals in Python.	2 Marks	L1	CO1
	b)	Mention the Types of Conversions in Python.	2 Marks	L1	CO1
	c)	Give the Syntax Structure of if else statement.	2 Marks	L1	CO2
	d)	What is the role of Break Statement in python?	2 Marks	L1	CO2
	e)	What are lists in python?	2 Marks	L1	CO3
	f)	Why tuples are mutable.	2 Marks	L1	CO3
	g)	What is the need of functions?	2 Marks	L1	CO4
	h)	What are different types of files in Python?	2 Marks	L1	CO4
	i)	What do you mean by Polymorphism?	2 Marks	L1	CO5
	j)	Mention any three types of Errors in Python	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Mention different types of tokens in python and explain them with their syntaxes and examples.	8 Marks	L2	CO1
	b)	Demonstrate in detail about Fundamental data types, Expressions with necessary syntaxes and examples.	8 Marks	L2	CO1

(OR)

3.		Design a python script to perform the various computations for the amount payable by the customer for Challenger Computers Store. A customer buying two numbers of SSD device, one SSD device cost is Rs. 3575/-. The stores offer 15% of the total cost. The customer has to pay 9% CGST, and 9% SGST. Prepare the Net Amount to be payable by the customer.	16 Marks	L3	CO1

MODULE-II

4.	a)	Illustrate in detail about while and for loop statements and write a python program that demonstrates the usage of for Statement.	8 Marks	L2	CO2
	b)	Explain in detail about if-else and if-elif-else statements with a sample program.	8 Marks	L2	CO2

(OR)

5.		Develop a python program that demonstrates the functioning of Break, continue and pass statements.	16 Marks	L3	CO2

MODULE-III

6.	a)	Demonstrate in detail about Creating, Inserting elements, Updating elements into a list with an example	8 Marks	L2	CO3
	b)	Write a python program to create a Tuple Search an Element in the created tuple.	8 Marks	L2	CO3

(OR)

7.		A list has the AP City Names [Tirupati, Kurnool, Kadapa]. Design a python script and perform the operations like, add 3 more AP City names Chittoor, Nellore, Guntur, insert Hyderabad in 3 rd position, delete any two city names, update all city names as in Uppercase. Displays the list data, whenever an operation completes.	16 Marks	L3	CO3

MODULE-IV

8.	a)	Explain in detail about Positional arguments and Keyword arguments with an example and necessary structures and Syntaxes.	8 Marks	L2	CO4
	b)	Write a python program that illustrates the functioning of opening, reading and writing data into a file.	8 Marks	L2	CO4

(OR)

9.		Design a function Learner_Age_Days with two formal parameters name, age and it computes Learner's age in days, then displays learners name and age in days. i) Design a driver code to call the function using positional arguments, keyword arguments. ii) Apply the necessary changes in Learner_Age_Days function and design a driver code to call the function using default arguments.	16 Marks	L3	CO4

MODULE-V

10.		Construct a Python script to implement the below requirements. Create a base class Basic_Info with data members name, rollno, gender and two member functions getdata() and display(). Derive a class Physical_Fit from Basic_Info which has data members height and weight and member functions getdata() and display(). Display all the information using object of derived class.	16 Marks	L3	CO5

(OR)

11.		Demonstrate in detail about Abstract Classes and interfaces. Construct a python program for the same.	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA V Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

DIGITAL IMAGE PROCESSING

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is a pixel?	2 Marks	L2	CO1
	b)	State the difference between 4-adjacency and 8-adjacency.	2 Marks	L2	CO1
	c)	What is histogram equalization?	2 Marks	L2	CO2
	d)	Differentiate between smoothing and sharpening filters.	2 Marks	L2	CO2
	e)	What is Poisson noise?	2 Marks	L2	CO3
	f)	Define speckle noise.	2 Marks	L2	CO3
	g)	What is arithmetic coding?	2 Marks	L2	CO4
	h)	What is redundancy in images?	2 Marks	L2	CO4
	i)	What is region-based segmentation?	2 Marks	L2	CO5
	j)	Define pseudo-color image processing.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe Haar Transform and its advantages in image analysis.	8 Marks	L2	CO1
	b)	What is KL Transform? Discuss its importance.	8 Marks	L2	CO1
		(OR)			
3.	a)	Explain 2D-DFT and its properties in detail.	8 Marks	L2	CO1
	b)	Write short notes on spatial operations in image processing.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain spatial filtering techniques used for image enhancement.	8 Marks	L2	CO2
	b)	Discuss image smoothing using average and Gaussian filters.	8 Marks	L2	CO2
		(OR)			
5.	a)	Explain image sharpening using Laplacian and high-pass filters.	8 Marks	L2	CO2
	b)	Discuss histogram equalization with suitable diagrams.	8 Marks	L2	CO2

MODULE-III

6.	a)	Discuss restoration using mean and order-statistic filters.	8 Marks	L2	CO3
	b)	Explain adaptive filtering technique for image restoration.	8 Marks	L2	CO3
		(OR)			
7.	a)	Explain constrained least squares filtering with applications.	8 Marks	L2	CO3
	b)	Explain Wiener filtering with mathematical expression.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain dictionary-based compression methods.	8 Marks	L2	CO4
	b)	Discuss arithmetic coding with its advantages.	8 Marks	L2	CO4
		(OR)			

9.	a)	Discuss applications of image compression in medical field.	8 Marks	L2	CO4
	b)	Explain entropy coding in image compression.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain HSI color model with conversions.	8 Marks	L3	CO5
	b)	Discuss pseudo-color image processing techniques.	8 Marks	L2	CO5

(OR)

11.	a)	Explain watershed segmentation algorithm.	8 Marks	L2	CO5
	b)	Explain practical applications of image segmentation in robotics.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

RURAL TECHNOLOGY

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What are Rural Business Hubs?	2 Marks	L1	CO1
	b)	What is the significance of MNREG act 2005?	2 Marks	L2	CO1
	c)	Distinguish between conventional energy and non conventional energy. Give examples.	2 Marks	L4	CO2
	d)	Give the full form of NABARD and CAPART.	2 Marks	L1	CO2
	e)	What is tissue sterilization?	2 Marks	L1	CO3
	f)	Give any two social impacts of tissue culture.	2 Marks	L1	CO3
	g)	Distinguish between Apiculture and Aquaculture.	2 Marks	L4	CO4
	h)	What is rain water harvesting?	2 Marks	L1	CO4
	i)	What is the contribution of Saansad Adarsh Gram Yojana in rural development?	2 Marks	L2	CO5
	j)	What is ICT?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Write about the NABARD. Analyze the technological issues problems related to NABARD.	8 Marks	L4	CO1
	b)	Analyze the role of science and technology in eradication of poverty in rural areas.	8 Marks	L4	CO1

(OR)

3.	a)	Discuss about Rural Business Hubs and NREG act.	8 Marks	L3	CO1
	b)	What are the objectives of the rural development?	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain about Solar water Heating systems. Also distinguish between FPC and ETC solar collectors.	8 Marks	L4	CO2
	b)	List the different forms of non conventional energy. Compare and contrast various methods used for energy generation from biomass.	8 Marks	L4	CO2

(OR)

5.	a)	State the working principle of solar energy. What are the various applications of solar energy?	8 Marks	L2	CO2
	b)	What is bio-gas? Discuss how one can process and generate biogas using the locally available raw materials as an alternative for conventional cooking fuel.	8 Marks	L3	CO2

MODULE-III

6.	a)	Compare various technologies and prioritize the latest developments in building construction technologies that are feasible to implement in rural India.	8 Marks	L3	CO3
	b)	Discuss cultivation and processing techniques of mushroom cultivation.	8 Marks	L2	CO3

(OR)

7.	a)	Recognize the need for water conservation. Explain about rain water harvesting techniques in detail.	8 Marks	L3	CO4
	b)	Write a short note on tissue culture and its applications. Also report latest advancements in tissue culture.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Recognize the need for water conservation. Explain about rain water harvesting techniques in detail.	8 Marks	L2	CO4
	b)	What is meant by apiculture? Explain opportunities present in apiculture.	8 Marks	L2	CO4

(OR)

9.	a)	Explore the possibilities of improving the sanitation in the rural areas by adopting latest techniques that would have positive effect on the public health and environment.	8 Marks	L2	CO4
	b)	Comment on employment generation technologies that are easy to adopt and implement by the rural community.	8 Marks	L4	CO4

MODULE-V

10.	a)	Compare various ICT tools and explain how ICT is helpful to the people living in rural areas. List some of the ICT applications which can be used?	8 Marks	L4	CO5
	b)	Enlist the program focusing on social and cultural development in rural areas and explain in detail.	8 Marks	L3	CO5

(OR)

11.	a)	Explain in detail the role of information technology and its usage in day to day life in rural community	8 Marks	L2	CO5
	b)	Analyze and comprehend various village adoption schemes in India.	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

DIGITAL LOGIC DESIGN

[Computer Science and Engineering (Artificial Intelligence and Machine Learning), Computer Science and Engineering (Data Science), Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Find the canonical SOP form for the Boolean function. $Y = AC + AB + BC$.	2 Marks	L3	CO1
	b)	How to convert a Boolean expression into multilevel NAND diagram?	2 Marks	L3	CO2
	c)	Give the simplified POS expression for $F(A,B,C,D) = \pi(0,2,3,4,8,9,10,14)$	2 Marks	L3	CO2
	d)	Show that (B+D) (A+D) (B+C) (A+C) = AB+CD.	2 Marks	L3	CO2
	e)	What is the difference between decoder and demultiplexer.	2 Marks	L2	CO3
	f)	What is meant by Magnitude comparator?	2 Marks	L1	CO3
	g)	Draw a T flip flop using JK flip flop.	2 Marks	L2	CO3
	h)	What is the difference between a ring counter and a Johnson counter?	2 Marks	L2	CO3
	i)	Draw the block diagram of a ROM.	2 Marks	L1	CO4
	j)	Compare PROM and PLA.	2 Marks	L2	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Find value of x in the following equations. i) $1110_x = 9B_{16}$ ii) $FADE_{16} = x_{11}$	8 Marks	L5	CO1
	b)	In a new number system, X and Y are successive digits such that $(XY)_r = (25)_{10}$ and $(YX)_r = (31)_{10}$. Find X, Y, r.	8 Marks	L5	CO1

(OR)

3.	a)	What is a grey code and what are its advantages. What are the steps to be taken for grey to binary conversion?	8 Marks	L2	CO1
	b)	Encode the following no's in excess-3 code i) 36 ii) 678 iii) 50124	8 Marks	L3	CO1

MODULE-II

4.	a)	Simplify the following Boolean function for minimal SOP form using K-map and implement using NAND gates. $F(W,X,Y,Z) = \Sigma(1,3,5,8,9,11,15) + D(2, 13)$.	8 Marks	L3	CO2
	b)	Obtain the simplified expressions in sum of products for the following Boolean functions. i) xy+x'y'z'+x'yz' ii) xy'z+xyz'+x'yz+xyz	8 Marks	L3	CO2

(OR)

5.	a)	Reduce the following function using K- map and implement it in NOR logic $F = \Sigma m(0, 1, 2, 3, 5, 7, 8,9,10, 12, 13)$.	10 Marks	L3	CO2
	b)	Realize XOR gate using minimum number of NAND gates	6 Marks	L3	CO2

MODULE-III

6.	a)	A combinational circuit is defined by the following three Boolean functions $F_1 = x'y'z'+xz$ $F_2= xy'z'+x'y$ $F_3= x'y'z+xy$ Design the circuit with a decoder and external gates.	8 Marks	L3	CO3
	b)	Design a combinational circuit that generates 10's complement of a BCD digit.	8 Marks	L6	CO3

(OR)

7.	a)	Implement the following Boolean function using 8X1 Multiplexer. $F(A,B,C,D)=\Sigma m(0,1,3,5,6,8,9,11,12,13)$.	8 Marks	L3	CO3
	b)	Design a combinational circuit with three inputs x, y and z and three outputs A,B and C when the binary input is 0,1,2 or 3, the binary output is one greater than the input.	8 Marks	L3	CO3

MODULE-IV

8.	a)	What is race around condition? How it is avoided in master-slave JK flip flop? Explain with necessary diagrams.	8 Marks	L2	CO3
	b)	With the help of a circuit diagram explain the operation of a bidirectional shift register.	8 Marks	L2	CO3

(OR)

9.	a)	Compare and contrast combinational and sequential logic circuits.	6 Marks	L2	CO3
	b)	Design a MOD-11 synchronous counter using JK flip flops.	10 Marks	L6	CO3

MODULE-V

10.	a)	Derive the PLA program table for a combinational circuit that squares a 3-bit number. Minimize the number of product terms.	10 Marks	L3	CO4
	b)	Explain with neat diagrams RAM architecture.	6 Marks	L2	CO4

(OR)

11.		Write short notes with examples on i) PLA ii)PAL	16 Marks	L2	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

DATA STRUCTURES

[Computer Science and Engineering (Artificial Intelligence and Machine Learning),
Computer Science and Engineering (Data Science),
Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Draw the abstract model of a queue.	2 Marks	L1	CO1
	b)	How do you test for an empty queue?	2 Marks	L2	CO1
	c)	What is the purpose of a header in a linked list?	2 Marks	L1	CO2
	d)	When does a single linked list be represented as a circular linked list?	2 Marks	L2	CO2
	e)	List various types of search techniques to identify a node in a binary tree.	2 Marks	L1	CO3
	f)	What is the purpose of quick sort?	2 Marks	L1	CO3
	g)	List any two applications of binary tree.	2 Marks	L1	CO4
	h)	What are expression trees?	2 Marks	L1	CO4
	i)	Define indegree and outdegree of a graph.	2 Marks	L1	CO5
	j)	What is an acyclic graph?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Evaluate the postfix expression 6 5 2 3 + 8 * + 3 + * and discuss its time complexity.	8 Marks	L5	CO1
	b)	How do you evaluate the efficiency of an algorithm?	8 Marks	L3	CO1
		(OR)			
3.	a)	Write the algorithm for converting infix expression to postfix (polish) expression with an example and discuss its complexity.	8 Marks	L3	CO1
	b)	Write an algorithm for polynomial addition using arrays.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain various operations on linked lists.	8 Marks	L2	CO2
	b)	Illustrate the polynomial representation along with ADT and discuss its complexity.	8 Marks	L3	CO2
		(OR)			
5.	a)	Explain various queue structures and discuss its advantages.	8 Marks	L2	CO2
	b)	Write the insertion and deletion routines to implement stacks using a linked list and discuss its complexity.	8 Marks	L3	CO2

MODULE-III

6.	a)	Sort the sequence 3,1,4,1,5,9,2,6,5 using insertion sort and discuss its complexity.	8 Marks	L3	CO2
	b)	Discuss the advantages of bubble sort over insertion sort with the example.	8 Marks	L2	CO2

(OR)

7.	a)	Write an algorithm to sort 'n' numbers using quick sort.	8 Marks	L2	CO2
	b)	Show how the following numbers can be sorted using quick sort : 42, 28, 90,2, 56. 39, 12, 87.	8 Marks	L3	CO2

MODULE-IV

8.	a)	Discuss the procedure of insertion of an element at a particular location in a binary search tree. Discuss the average, best and worst case complexities.	8 Marks	L3	CO3
	b)	Write an algorithm to check if a binary tree is BST or not.	8 Marks	L2	CO3

(OR)

9.	a)	Discuss the implementation of Binary Search Tree with an illustration..	8 Marks	L3	CO3
	b)	Discuss the advantages of Red black trees over Spay trees with illustration	8 Marks	L3	CO3

MODULE-V

10.	a)	What is minimum –cost spanning tree? Discuss its applications.	8 Marks	L2	CO4
	b)	Explain Prim's algorithm with example.	8 Marks	L2	CO4

(OR)

11.	a)	Formulate an algorithm to find the shortest path using Dijkstra's algorithm.	8 Marks	L5	CO5
	b)	Illustrate the procedure to find the shortest path using Kruskal's algorithm.	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

PROGRAMMING IN C AND DATA STRUCTURES

[Civil Engineering, Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define flowchart. Explain with an example.	2 Marks	L1	CO1
	b)	What is type conversion? Explain two types of conversion with examples.	2 Marks	L1	CO1
	c)	List out various Input & output statements in C.	2 Marks	L1	CO2
	d)	Explain usage of go to statement.	2 Marks	L2	CO2
	e)	Why is it necessary to give the size of an array in an array declaration?	2 Marks	L2	CO3
	f)	Define Array with syntax and example.	2 Marks	L1	CO3
	g)	What is external storage class?	2 Marks	L1	CO3
	h)	How to declare two-dimensional array with example.	2 Marks	L2	CO4
	i)	What are the functions that supports for dynamic memory allocation?	2 Marks	L1	CO4
	j)	Define sorting and list out sorting techniques.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	What is an Algorithm? Write an algorithm to find the largest of 3 numbers.	8 Marks	L1	CO1
	b)	Define and give the syntax for ternary operator. Write a C program to find the largest of three numbers using ternary operator.	8 Marks	L3	CO1

(OR)

3.	a)	Explain Arithmetic, Logical, Relational, and conditional operators with example.	8 Marks	L2	CO1
	b)	Define Type Conversion. Explain various forms type conversion with example.	8 Marks	L1	CO1

MODULE-II

4.	a)	Write a C Program to calculate the grade of the student based on specified marks.	8 Marks	L3	CO2
	b)	Explain for loop statement with syntax and example.	8 Marks	L2	CO2

(OR)

5.	a)	Explain switch statement with syntax and example.	8 Marks	L2	CO2
	b)	Distinguish between while..do and do..while statement in C with example.	8 Marks	L2	CO2

MODULE-III

6.	a)	Write a C program to determine whether the given string is palindrome or not.	8 Marks	L3	CO3
	b)	Write a C program for factorial using recursion function.	8 Marks	L3	CO3
		(OR)			
7.	a)	Differentiate call by value and call by reference with example.	8 Marks	L2	CO3
	b)	Write a C program to concatenate one string to another string without using library function.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain Binary Search with example.	8 Marks	L2	CO4
	b)	Write a C program to insert an element into singly linked list.	8 Marks	L3	CO4
		(OR)			
9.	a)	Differentiate Arrays and linked list with example.	8 Marks	L2	CO4
	b)	Explain selection sort with example.	8 Marks	L2	CO4

MODULE-V

10.	a)	What is the difference between structure and union with an example?	8 Marks	L2	CO5
	b)	Write a C program to implement file operations using various functions.	8 Marks	L3	CO5
		(OR)			
11.	a)	Explain how to declare, initialize and access the members in a structure.	8 Marks	L2	CO5
	b)	Explain Enumerated types with syntax and example.	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

SENSORS AND MEASURING INSTRUMENTS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Name any three dynamic characteristics of measurement system.	2 Marks	L1	CO1
	b)	Describe accuracy with example.	2 Marks	L2	CO1
	c)	Name the sensors based on change in inductance principle.	2 Marks	L1	CO2
	d)	Mention the applications of capacitive sensors.	2 Marks	L2	CO2
	e)	Write the balanced equation of wheat stone bridge.	2 Marks	L2	CO3
	f)	Formulate the unknown parameter of kelvin double bridge.	2 Marks	L2	CO3
	g)	What is the necessity of spectral displays?	2 Marks	L2	CO4
	h)	Differentiate analog and digital storage CRO.	2 Marks	L2	CO4
	i)	List the specifications of recorders.	2 Marks	L2	CO5
	j)	Describe the working principle of strip chart recorder.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Draw the basic measurement system and describe the necessity of each block in detail.	8 Marks	L2	CO1
	b)	Construct a DC voltmeter and derive the expression for series multiplier resistance.	8 Marks	L2	CO1

(OR)

3.	a)	Derive the statistical analysis parameters of measurement system.	8 Marks	L3	CO1
	b)	Classify the transducers and explain each classification with example.	8 Marks	L4	CO1

MODULE-II

4.	a)	Classify the stain gauges and explain working of basic strain gauge with neat sketch.	8 Marks	L2	CO2
	b)	Sketch the LVDT and explain the working principle with its characteristics.	8 Marks	L2	CO2

(OR)

5.	a)	Explain liquid level measurement with capacitive transducer and its working.	8 Marks	L2	CO2
	b)	Describe the applications of ultrasonic sensors with neat sketch.	8 Marks	L2	CO2

MODULE-III

6.	a)	Describe the theory and method of measurement of low resistance using Kelvin's double Bridge.	8 Marks	L2	CO3
	b)	Draw the circuit diagram of Schering Bridge. Derive the conditions for balancing the bridge.	8 Marks	L4	CO3

(OR)

7.	a)	Describe the theory and method of measurement of resistance using wheat stone Bridge.	8 Marks	L2	CO3
	b)	Draw the circuit diagram of Anderson Bridge. Derive the conditions for balancing the bridge.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Differentiate Frequency selective and Heterodyne wave analyzers with respect to working principle.	8 Marks	L4	CO4
	b)	Construct a harmonic distortion analyzer and explain each block in detail.	8 Marks	L3	CO4

(OR)

9.	a)	Draw the block diagram of Analog storage oscilloscope and describe its working principle.	8 Marks	L3	CO4
	b)	Elaborate the working of CRO probes in detail with neat diagrams.	8 Marks	L2	CO4

MODULE-V

10.	a)	Mention the block of strip chat recorder and explain procedure of recording in it.	8 Marks	L2	CO5
	b)	Write short notes on plasma display devices.	8 Marks	L2	CO5

(OR)

11.	a)	Explain the conversion technique of BCD to 7 segment display with neat circuit diagram.	8 Marks	L2	CO5
	b)	Explain the working of digital data recorder in detail.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

[Computer Science and Engineering (Artificial Intelligence and Machine Learning), Computer Science and Engineering(Data Science)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	If two capacitors C1=20μF and C2=50μF are connected in parallel across the voltage source, determine the equivalent capacitance.	2 Marks	L2	CO1
	b)	A 0.1Ω resistor has a power rating of 5 W. Is this resistor safe when conducting a current of 10 A, justify?	2 Marks	L2	CO1
	c)	Mention the applications of stepper motor	2 Marks	L1	CO2
	d)	A transformer has 100 turns in primary and 50 turns in secondary. With a primary supply voltage of 230V. What is the secondary voltage also find transformation ratio K.	2 Marks	L1	CO2
	e)	State Lambert's square law.	2 Marks	L1	CO3
	f)	Define Candle power.	2 Marks	L1	CO3
	g)	List the factors responsible in the selection of transducer.	2 Marks	L1	CO4
	h)	Mention the objectives of Data Acquisition system.	2 Marks	L1	CO4
	i)	Define breakdown voltage in a Zener diode.	2 Marks	L1	CO5
	j)	Draw the symbols for NPN and PNP transistor.	2 Marks	L1	CO5

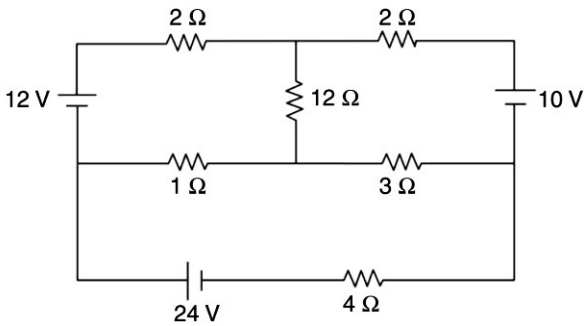
PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

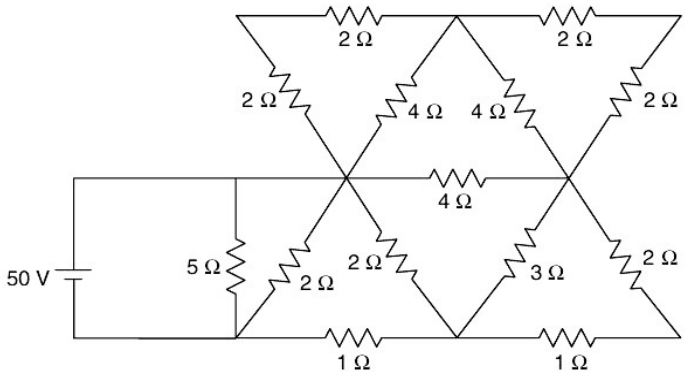
2.	a)	Determine the current through 4 ohm resistor using Mesh Analysis.	8 Marks	L3	CO1



	b)	With the help of neat sketch explain in detail the working of the single loop generator.	8 Marks	L2	CO1

(OR)

3.	a)	Find the current delivered by the source in the network shown below	10 marks	L3	CO1



	b)	For the AC circuit is having a v(t) = 250 sin (ωt+100°) in volts and i(t) = 15 sin (ωt+30°) in Amperes. Determine the power factor, active, reactive and apparent power.	6 marks	L2	CO1

MODULE-II

4.	a)	Derive the expression for the emf induced in the secondary of the transformer.	8 Marks	L2	CO2
	b)	Write a short note on the methods of electrical wiring systems.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the construction and working principle of stepper motor.	8 Marks	L2	CO2
	b)	Explain the operation of MCB with the help of relevant diagram.	8 Marks	L2	CO2

MODULE-III

6.	a)	Calculate space between two poles of street light having fixture watt as 250W, lamp output is 33200 lumens. Required lux is 5 lux. Width of the road is 11.8 feet. Height of the pole is 26.24 feet. CU=0.18, LLDF=0.8, LDDF=0.9.	6 Marks	L3	CO3
	b)	The following are the details of load on a circuit connected through a supply meter: i) Six lamps of 40 watts each working for 4 hours per day. ii) Two fluorescent tubes of 125 watts each working for 2 hours per day. iii) One 1000 watt heater working for 3 hours per day. If each unit of energy costs 70 Paisa, what will be the electricity bill for the month of June?	10 Marks	L3	CO3

(OR)

7.	a)	Prove that "Illuminance varies inversely as the square of the illuminated point from the source" using laws of Illumination.	6 Marks	L2	CO3
	b)	What are the main components of UPS systems? Explain.	10 Marks	L2	CO3

MODULE-IV

8.	a)	With neat diagram, explain the basic components and working principle of Wireless Bluetooth sensor.	8 Marks	L2	CO4
	b)	Suggest the suitable device to convert linear displacement to electrical voltage. With neat sketch, explain the principle of operation. Mention its Applications.	8 Marks	L3	CO4

(OR)

9.	a)	With neat sketch, explain the working principle of Temperature and Humidity Sensor. Mention its advantages and disadvantages.	10 Marks	L2	CO4
	b)	What is data acquisition system? With generalized block diagram, explain the functions of it.	6 Marks	L2	CO4

MODULE-V

10.	a)	Discuss the working of NPN and PNP transistor with a neat sketch.	8 Marks	L2	CO5
	b)	Examine and derive an expression for V_0 of the Integrator circuit by using Op-Amp.	8 Marks	L2	CO5

(OR)

11.	a)	With neat sketch, Explain the operation of R-2R type DAC with an example.	8 Marks	L2	CO5
	b)	Discuss the working of NPN and PNP transistor with a neat sketch.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

[Mechanical Engineering, Civil Engineering]

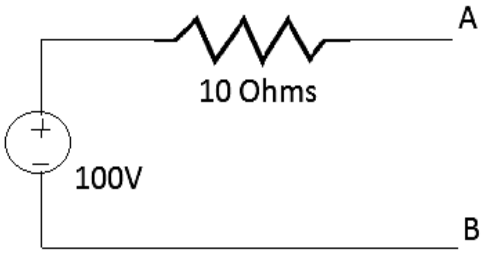
Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	State Kirchhoff's laws.	2 Marks	L2	CO1
	b)	Convert the following voltage source into its equivalent current source.	2 Marks	L3	CO1



	c)	What is the difference between fuse and MCB?	2 Marks	L2	CO2
	d)	List the application of stepper motor.	2 Marks	L2	CO2
	e)	What type of lamps recommended for interior lighting needs.	2 Marks	L2	CO3
	f)	What is the major difference between UPS and an inverter?	2 Marks	L2	CO3
	g)	List the uses and applications of temperature and humidity sensors.	2 Marks	L2	CO4
	h)	Draw the diagram of piezo electric transducer.	2 Marks	L2	CO4
	i)	Draw the circuit diagram of full wave bridge rectifier and wave forms.	2 Marks	L2	CO5
	j)	Draw the pin diagram of operational amplifier and indicate pin names.	2 Marks	L2	CO5

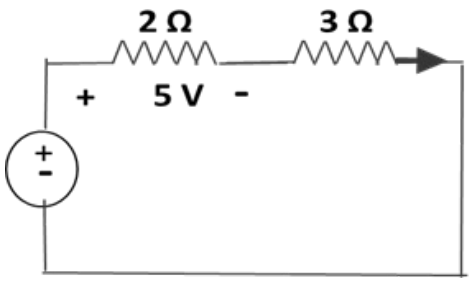
PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

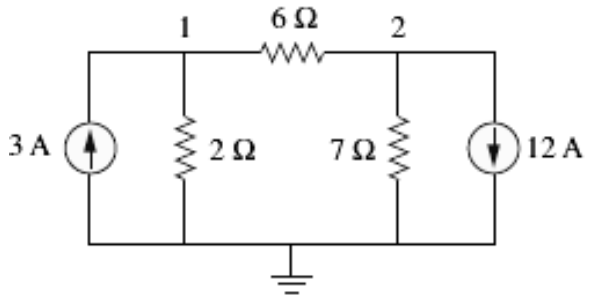
5 X 16 = 80 Marks

MODULE-I

2.	a)	Find the current through 3 Ω in the following network.	8 Marks	L3	CO1

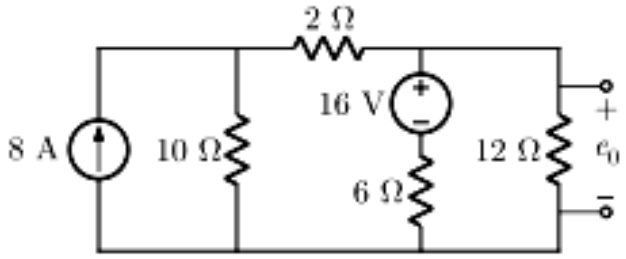


	b)	Find current through 6Ω resistor using nodal analysis.	8 Marks	L4	CO1

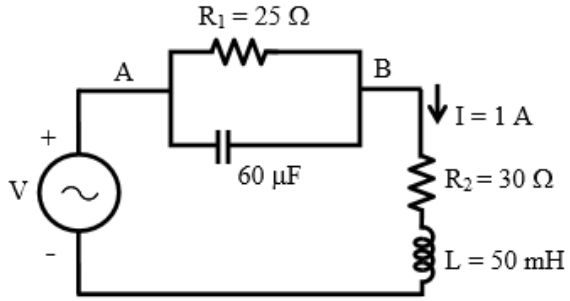


(OR)

3.	a)	Find voltage e_o using mesh analysis.	8 Marks	L4	CO1



	b)	A total current of 1A is drawn by the circuit fed from an ac voltage, V of 50 Hz. Find the input voltage, P-Active power, Q-Reactive power and S-Complex power. Draw the phasor diagram.	8 Marks	L4	CO1



MODULE-II

4.	a)	Explain the working of synchronous motor.	8 Marks	L2	CO2
	b)	Explain the earthing requirements and procedure for earthing.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the construction details of three-phase induction motor.	8 Marks	L2	CO2
	b)	Derive the emf equation of a single phase transformer.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the construction of lithium-ion battery and list its applications.	8 Marks	L2	CO3
	b)	Explain about the following factors used in illumination i) Space-height ratio ii) Depreciation factor iii) Color rendering Index	8 Marks	L2	CO3

(OR)

7.	a)	Define and the terms illumination and illumination intensity, and explain the laws of illumination with simple lighting calculations.	8 Marks	L2	CO3
	b)	Explain the process of calculating the rating of UPS for a specified loads and for emergency applications.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain the working of humidity sensor and light sensor.	8 Marks	L2	CO4
	b)	Describe the need for data acquisition systems and what is the role of sensors and transducers in data acquisition.	8 Marks	L2	CO4

(OR)

9.	a)	Describe the working and applications of motion detection sensors and wireless Bluetooth sensors.	8 Marks	L2	CO4
	b)	Explain strain gauge and LVDT transducers with neat diagrams.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain the characteristics of Zener diode and explain its application as voltage regulator.	8 Marks	L2	CO5
	b)	Illustrate the working of Bipolar Junction Transistor with schematic diagrams.	8 Marks	L2	CO5

(OR)

11.	a)	Explain: i) adder and ii) integrator	8 Marks	L2	CO5
	b)	Explain: i) Flash type analog to digital converter. ii) R-2R type digital to analog converter.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

TRANSFORMATION TECHNIQUES AND LINEAR ALGEBRA

[Electronics and Communication Engineering, Electrical and Electronics Engineering, Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Write the formula for Fourier series expansion of the function $f(x)$ in the interval $-\pi < x < \pi$.	2 Marks	L2	CO1
	b)	State Fourier Integral theorem.	2 Marks	L1	CO1
	c)	Find the Laplace transform of $\cos^2 2t$.	2 Marks	L2	CO2
	d)	Define unit impulse function.	2 Marks	L1	CO2
	e)	Evaluate $L^{-1}\left\{\frac{1-s}{s^3}\right\}$.	2 Marks	L3	CO3
	f)	State Convolution theorem.	2 Marks	L1	CO3
	g)	Find the rank of $\begin{bmatrix} 1 & 1 & 3 \\ 2 & 2 & 6 \\ 4 & 4 & 12 \end{bmatrix}$.	2 Marks	L2	CO4
	h)	Write the conditions for the system AX=B has i) a unique solution and ii) an infinite number of solutions.	2 Marks	L1	CO4
	i)	Give two examples for a vector space.	2 Marks	L2	CO5
	j)	Define a linear transformation.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Find the Fourier series to represent $x - x^2$ from $x = -\pi$ to $x = \pi$.	8 Marks	L2	CO1
	b)	Obtain Fourier transform of $f(x) = \begin{cases} 1, & \lvert x\rvert < 1, \\ 0, & \lvert x\rvert > 1. \end{cases}$	8 Marks	L2	CO1

(OR)

3.	a)	State Dirichlet's conditions for a Fourier expansion.	8 Marks	L1	CO1
	b)	Find the Fourier cosine transform of e^{-x2}.	8 Marks	L3	CO1

MODULE-II

4. a) Find the Laplace transform of 8 Marks L1 CO2

$$f(t) = \begin{cases} t^2, & 0 < t < 2, \\ t-1 & 2 < t < 3, \\ 7, & t > 3. \end{cases}$$

b) Evaluate $L\left\{ e^{-t} \int_0^t \frac{\sin t}{t} dt \right\}$. 8 Marks L3 CO2

(OR)

5. a) Find $L\left(\frac{e^{-at} - e^{-bt}}{t} \right)$. 8 Marks L2 CO2

b) Using unit step function, find the Laplace transform of 8 Marks L3 CO2

$$f(x) = \begin{cases} \sin t, & 0 \le t < \pi, \\ \sin 2t, & \pi \le t < 2\pi, \\ \sin 3t, & t \ge 2\pi. \end{cases}$$

MODULE-III

6. a) Find the inverse Laplace transform of $\frac{5s+3}{(s-1)(s^2+2s+5)}$. 8 Marks L2 CO3

b) Using Convolution theorem, evaluate $L^{-1}\left\{ \frac{s^2}{(s^2+a^2)(s^2+b^2)} \right\}$. 8 Marks L3 CO3

(OR)

7. a) Find the inverse Laplace transform of $Tan^{-1}\left(\frac{2}{s} \right)$. 8 Marks L2 CO3

b) Apply transforms method to solve the initial value problem 8 Marks L3 CO3

$x'' - 2x' + x = e^t$, $x(0) = 2$, $x'(0) = -1$

MODULE-IV

8. a) Find the rank of $\begin{bmatrix} 1 & 2 & 3 & -2 \\ 2 & -2 & 1 & 3 \\ 3 & 0 & 4 & 1 \end{bmatrix}$. 8 Marks L1 CO4

b) Solve the following equations 8 Marks L2 CO4

$x + 2y + 3z = 0$, $3x + 4y + 4z = 0$, $7x + 10y + 12z = 0$.

(OR)

9. a) Find the eigen values and eigen vectors of the matrix 8 Marks L2 CO4

$$\begin{bmatrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{bmatrix}.$$

b) Verify Cayley-Hamilton theorem for the matrix 8 Marks L1 CO4

$$A = \begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}.$$

MODULE-V

10.	a)	Show that the vectors $(1,1,2), (1,2,5), (5,3,4)$ in $R^3(R)$ do not form a basis of $R^3(R)$.	8 Marks	L1	CO5
	b)	Find $T(x,y,z)$, *where* $T: R^3 \to R$ is defined by $T(1,1,1) = 3,\ T(0,1,-2) = 1,\ T(0,0,1) = -2$	8 Marks	L2	CO5
		(OR)			
11.	a)	Let W be the subspace of R^4 given by $W = \{(a,b,c,d) : a = d,\ b = 2c\}$. Find the basis and dimension of W.	8 Marks	L2	CO5
	b)	Determine whether the map $T: R^2 \to R^2$ defined by $T(a,b) = (2a+b, 3a-4b)$ is a linear transformation or not?	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA II Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

NUMERICAL ANALYSIS, PROBABILITY AND STATISTICS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Find the interval for which the equation $x^3 - 4x - 9 = 0$ has a positive real root.	2 Marks	L1	CO1
	b)	Write the formula for finding the value of the cube root of N by Newton-Raphson method.	2 Marks	L3	CO1
	c)	Evaluate $\Delta^2(e^x)$.	2 Marks	L1	CO2
	d)	Write the formula for finding $f'(a)$ using backward difference formula.	2 Marks	L3	CO2
	e)	Define a continuous random variable.	2 Marks	L1	CO3
	f)	If $E(X) = 2$ then find $E(3X-3)$.	2 Marks	L2	CO3
	g)	An ordinary six faced die is thrown four times. What is the probability of obtaining a number 4 on the face?	2 Marks	L2	CO4
	h)	If X is a Poisson variate such that $2P(x = 0) = P(X = 2)$ then find mean.	2 Marks	L3	CO4
	i)	Define correlation.	2 Marks	L1	CO5
	j)	Write any two properties of correlation coefficient.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Find an approximate real root of $x^3 - x - 1 = 0$ using bisection method.	8 Marks	L1	CO1
	b)	Solve the following equations by Gauss elimination method. $2x + y + z = 10,\quad 3x + 2y + 3z = 18,\quad x + 4y + 9z = 16.$	8 Marks	L2	CO1

(OR)

3.	a)	Apply Newton-Raphson method to find an approximate real root of $3x = \cos x + 1$.	8 Marks	L2	CO1
	b)	Solve by Gauss-Seidel method, the equations $20x + y - 2z = 17,\quad 3x + 20y - z = -18,\quad 2x - 3y + 20z = 25.$	8 Marks	L3	CO1

MODULE-II

4. a) The table gives the distances in nautical miles of the visible horizon for the given heights in feet above the earth's surface. 8 Marks L1 CO2

Height (x)	100	150	200	250	300	350	400
Distance (y)	10.63	13.03	15.04	16.81	18.42	19.90	21.27

Find the value of y when x=218 ft.

b) Evaluate $\int_0^6 \frac{1}{1+x^2}dx$ by using Trapezoidal rule with h=1. 8 Marks L1 CO2

(OR)

5. a) Determine f(x) as a polynomial in x for the following data by Newton's divided difference formula 8 Marks L2 CO2

x	-4	-1	0	2	5
f(x)	1245	33	5	9	1335

b) A solid revolution is formed by rotating about the x-axis, the area between the x-axis, the lines x=0 and x=1and a curve through the points with the following coordinates: 8 Marks L3 CO2

x	0	0.25	0.50	0.75	1
y	1.0000	0.9896	0.9589	0.9089	0.8415

Estimate the volume of the solid formed using Simpson's rule.

MODULE-III

6. a) A random variable X has the following probability distribution: 8 Marks L1 CO3

X	-2	-1	0	1	2	3
$P(X=x)$	0.1	k	0.2	$2k$	0.3	$3k$

Find:

i) k ii) $P(X < 2)$ iii) $P(-2 < X < 3)$.

b) The probability function of a continuous random variable is given by $f(x) = y_0 e^{-|x|}$, $-\infty < x < \infty$. Find y_0, mean and variance of the distribution. 8 Marks L1 CO3

(OR)

7. a) If a probability density function $f(x) = kx^3, 1 \le x \le 3$ and $f(x) = 0$, else where, find 8 Marks L2 CO3

i) k ii) $P\left(\frac{1}{2} < X < \frac{3}{2}\right)$ iii) $P(X > 2)$.

b) Let X denotes the minimum of the two numbers that appear when a pair of fair dice is thrown once. Determine: 8 Marks L3 CO3

i) The discrete probability distribution
ii) The expectation
iii) The variance

MODULE-IV

8. a) The probability that a man hitting a target is 1/3. If he fires 6 times, what is the probability of hitting i) at most 5 times ii) at least 5 times iii) exactly once. 8 Marks L2 CO4

b) If X is normally distributed with the mean 12 and standard deviation 4 then find the probability of i) $X \ge 20$ ii) $X \le 20$ iii) $0 \le X \le 12$. 8 Marks L2 CO4

(OR)

9. a) Find the mean and variance of a Poisson distribution. 8 Marks L1 CO4

b) In a normal distribution, 31% of the items under 45 and 8% are over 64. Find the mean and standard deviation of the distribution. 8 Marks L3 CO4

MODULE-V

10. a) The marks obtained by 10 students in Mathematics (x) and Statistics (y) are given below. Find the coefficient of correlation between the two subjects. 8 Marks L1 CO5

x	75	30	60	80	53	35	15	40	38	48
y	85	45	54	91	58	63	35	43	45	44

b) The equations of two regression lines obtained in a correlation analysis are $3x + 12y = 19$, $3y + 9x + 46$. Find 8 Marks L2 CO5

i) coefficient of correlation ii) mean values of x and y.

(OR)

11. a) Calculate the Spearman rank correlation coefficient to the following data: 8 Marks L1 CO5

x	25	28	27	26	32	30	35
y	20	24	25	22	34	27	26

b) The following data was obtained based on 10 observations related to price x and supply y: 8 Marks L2 CO5

$\sum x = 130, \sum y = 220, \sum x^2 = 2288, \sum y^2 = 5506, \sum xy = 3467$

Find :

i) The coefficient of correlation

ii) The line of regression of y on x.

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA V Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

DISCRETE MATHEMATICS FOR COMPUTER SCIENCE

[Augmented Reality and Virtual Reality]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Recall Various logical connectives	2 Marks	L1	CO1
	b)	Explain Conditional and bi-conditional statements with examples.	2 Marks	L1	CO1
	c)	Define equal and equivalent sets.	2 Marks	L1	CO2
	d)	State the basic counting principle.	2 Marks	L1	CO2
	e)	Write the converse and contra positive of the statement: "If P is a square, then P is a rectangle".	2 Marks	L1	CO2
	f)	Define the composition of two functions f and g.	2 Marks	L1	CO2
	g)	How many cards must be selected from a standard deck of 52 cards to guarantee that at least thee cards of the same suit are chosen?	2 Marks	L1	CO3
	h)	Define isolated vertex, pendant vertex and a null graph.	2 Marks	L1	CO3
	i)	Define equivalence relation with example?.	2 Marks	L1	CO4
	j)	What is a Cycle Graph and Wheel Graph:	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Show that $((P \vee Q) \wedge (\neg (P \wedge (\neg Q \vee \neg R)) \vee (\neg P \wedge \neg Q) \vee (\neg P \wedge \neg R)$ is Tautology.	8 Marks	L3	CO1
	b)	Show that $\neg (P \vee (\neg P \wedge Q))$ and $(\neg P \wedge \neg Q)$ are logically equivalent.	8 Marks	L2	CO1

(OR)

3.	a)	Obtain the Principal Conjunctive Normal Form of $(P \wedge Q) \vee (\neg P \wedge R) \vee (Q \wedge R)$.	8 Marks	L2	CO1
	b)	Find a Disjunctive Normal Form of $[(P \wedge Q) \vee (P \wedge \neg Q)] \wedge [(P \wedge \neg Q) \vee (\neg P \wedge \neg Q]$.	8 Marks	L3	CO1

MODULE-II

4.	a)	Show that if n is a positive integer, then, $1 + 2 + 3 + \ldots\ldots + n = \frac{n(n+1)}{2}$	8 Marks	L3	CO2
	b)	At a certain college, housing office has decided to appoint, for each floor, one male and one female residential advisor. How many different pairs of advisors can be selected for a seven floor building from 12 male and 15 female candidates?	8 Marks	L4	CO2

(OR)

5.	a)	Find all partitions of S = {a, b, c, d}.	8 Marks	L3	CO2
	b)	Find the number of committees of 5 that can be selected from 7 men and 5 women, if the committee is to consists of at least one man and at least one women?	8 Marks	L4	CO2

MODULE-III

6.	a)	Consider the set A = {1,2,3,4,5} and the equivalence relation R = { (1,1), (2,2), (2,3), (3,2), (3,3), (4,4), (4,5), (5,4), (5,5)}defined on A. Find the partition of A induced by R.	8 Marks	L3	CO2
	b)	i) If you have 8 pairs of socks, how many socks must you take to ensure you have at least one matching pair? ii) Prove that in any set of 29 persons at least five persons must have been born on the same day of the week.	8 Marks	L4	CO2

(OR)

7.	a)	Find the number of ways in which 5 boys and 5 girls can be seated in a row so that i) No two girls may sit together. ii) All the girls sit together and all the boys sit together iii) All the girls are never together.	8 Marks	L3	CO2
	b)	A basketball coach must select two attackers and two defenders from among three attackers and five defenders. How many different combinations of attackers and defenders can he select?.	8 Marks	L4	CO2

MODULE-IV

8.	a)	In a sample of 200 logic chips, 46 have a defect D1, 52 have a defect D2, 60 have a defect D3, 14 have defects D1 and D2, 16 have defects D1 and D3, 20 have defects D2 and D3, and 3 have all the three defects. Find the number of chips having i) at least one defect, ii) No defective.	8 Marks	L4	CO3
	b)	i) In how many ways can we distribute 12 identical pencils to 5 children so that every child gets at least one pencil? ii) Prove that if any 30 peoples are selected, then we may chose a subset of 5 so that all 5 were born on the same day of the week.	8 Marks	L3	CO3

(OR)

9.	a)	Explain Principle of Inclusion-Exclusion for two sets and three sets.	8 Marks	L4	CO3
	b)	In group of 50 people , 35 can speak Hindi, 25 speak both English and Hindi and all the people speak at least one of the two languages. How many people speak only English and not Hindi? How many people speak English?	8 Marks	L4	CO3

MODULE-V

10.	a)	Give an example graph which is Hamiltonian but not Eulerian.	8 Marks	L3	CO4
	b)	If G is a simple graph with no cycles, prove that G has at least one pendent vertex.	8 Marks	L3	CO4

(OR)

11.	a)	How a graph can be represented using adjacency matrix and incidence matrix?	8 Marks	L4	CO4
	b)	Explain Handshaking property of graph.	8 Marks	L4	CO4

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

CALCULUS AND TRANSFORMATION TECHNIQUES

[Computer Science and Engineering (Artificial Intelligence and Machine Learning), Computer Science and Engineering (Data Science), Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	State Rolle's Mean Value theorem.	2 Marks	L1	CO1
	b)	State Taylor's theorem with Lagrange's form of remainder.	2 Marks	L1	CO1
	c)	Find $\frac{\partial f}{\partial x}+\frac{\partial f}{\partial y}$ for the function $f = x^2y + xy^2$.	2 Marks	L1	CO2
	d)	Identify the stationary points for the function $f(x,y) = x^2 + y^2 + 6x + 12$.	2 Marks	L3	CO2
	e)	State the necessary condition for the existence of the Laplace transform.	2 Marks	L1	CO3
	f)	Find the Laplace transform of $e^{2t} + 4t^3 - 2\sin 3t$.	2 Marks	L1	CO3
	g)	Find the Inverse Laplace transform of $\frac{2s+1}{s(s+1)}$	2 Marks	L1	CO4
	h)	Evaluate $L^{-1}\left[\frac{1}{s^2+2s+5}\right]$.	2 Marks	L5	CO4
	i)	Find a_0 in Fourier series for the function $f(x) = \|x\|$ in the interval $(-\pi,\pi)$	2 Marks	L1	CO5
	j)	Find a_0 in half range cosine series for the function $f(x) = x$ in the interval $0 < x < \pi$.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Use Rolles' theorem and verify for the function $f(x) = (x+2)^3(x-3)^4$ in the interval $[-2,3]$.	8 Marks	L3	CO1
	b)	Use Cauchy's Mean value theorem and verify for the function $f(x) = e^x, g(x) = e^{-x}$ in $[a,b]$.	8 Marks	L3	CO1

(OR)

3.	a)	Prove that if $0 < a < b < 1$, $\frac{b-a}{1+b^2} < \tan^{-1} b - \tan^{-1} a < \frac{b-a}{1+a^2}$, by using Lagrange's Mean value theorem.	8 Marks	L3	CO1
	b)	Find the Maclaurin's series for the function $f(x) = \cos x$ with Lagrange's form of remainder.	8 Marks	L1	CO1

MODULE-II

4.	a)	Find first and second order partial derivatives of $x^3 + y^3 - 3axy$ and verify $\frac{\partial^2 f}{\partial x \partial y} = \frac{\partial^2 f}{\partial y \partial x}$.	8 Marks	L1	CO2
	b)	Evaluate $\frac{\partial(x,y,z)}{\partial(u,v,w)}$ if $x+y+z = u, y+z+uv, z = uvw$.	8 Marks	L5	CO2

(OR)

5.	a)	A rectangular box open at the top is to have a volume of 32 cubic ft. Find the dimensions of the box requiring least material for its construction.	8 Marks	L1	CO2
	b)	By using Lagrange's undetermined multipliers, find the minimum value for $x^2 + y^2 + z^2$ subject to the condition $xyz = a^3$.	8 Marks	L3	CO2

MODULE-III

6.	a)	Determine the Laplace transform of $f(t) = e^{4t} \sin 2t \cos t$.	8 Marks	L3	CO3
	b)	Evaluate the Laplace transform of $\int_0^t \frac{1-e^{-2t}}{t} dt$.	8 Marks	L5	CO3

(OR)

7.	a)	Applying Laplace transform, evaluate $\int_0^\infty \frac{e^{-t} - e^{-2t}}{t} dt$.	8 Marks	L3	CO3
	b)	Evaluate $L\left\{ e^t \left(\cos 2t + \frac{1}{2} \sinh t \right) \right\}$.	8 Marks	L5	CO3

MODULE-IV

8.	a)	Find the inverse Laplace transform of $\frac{1}{s(s+1)(s+2)}$.	8 Marks	L1	CO4
	b)	Apply convolution theorem to evaluate $L^{-1}\left[\frac{1}{(s-2)(s+2)^2} \right]$	8 Marks	L3	CO4

(OR)

9.		Applying the technique of Laplace transforms, solve the differential equation $(D^2+1)y = t\cos 2t$, given that $y(0) = 0, y'(0) = 0$.	16 Marks	L3	CO4

MODULE-V

10.	a)	If $f(x) = \lvert\cos x\rvert$, expand $f(x)$ as a Fourier series in the interval $(-\pi, \pi)$.	8 Marks	L1	CO5
	b)	Find the Fourier sine transform of $f(x) = \dfrac{e^{-ax}}{x}$ and deduce that $\int_0^\infty \dfrac{e^{-ax} - e^{-bx}}{x} \sin sx\, dx = \tan^{-1}\left(\dfrac{s}{a}\right) - \tan^{-1}\left(\dfrac{s}{b}\right)$.	8 Marks	L1	CO5

(OR)

11.	a)	Find the Fourier cosine transform of $f(x) = e^{-ax}$, $a > 0$ and hence deduce the integral $\int_0^\infty \dfrac{\cos px}{a^2 + p^2} dp$.	8 Marks	L3	CO5
	b)	Express $f(x)$ as a Fourier series in $(-\pi, \pi)$, where $f(x) = \begin{cases} 0, -\pi < x < 0 \\ x^2, 0 < x < \pi \end{cases}$.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

PHYSICS FOR COMPUTING

[Computer Science and Engineering (Artificial Intelligence and Machine Learning)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define interference of light. List the conditions to get the interference of light.	2 Marks	L1	CO1
	b)	Recall the various methods to produce polarized light.	2 Marks	L1	CO1
	c)	Find the wavelength associated with an electron, which has been accelerated in the potential field of 400V.	2 Marks	L1	CO2
	d)	Recall the probability of occupancy of electrons at the finite temperature from the Fermi Dirac distribution function.	2 Marks	L1	CO2
	e)	Relate the wave function of the particle, which is moving in a 3D potential box.	2 Marks	L1	CO3
	f)	Predict the K values of the first Brillouin zone.	2 Marks	L3	CO3
	g)	Illustrate the indirect band gap of semiconductors.	2 Marks	L2	CO4
	h)	List any two applications of photodiode.	2 Marks	L1	CO4
	i)	Why electricity was not passing through the optical fiber?	2 Marks	L1	CO5
	j)	What is the sensor?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	What is a thin film? Describe the theory behind the interference formed by the thin film. Give the conditions for maxima and minima.	10 Marks	L2	CO1
	b)	Differentiate Interference and diffraction of light.	6 Marks	L2	CO1

(OR)

3.	a)	Describe the Fraunhofer diffraction at a single slit. Develop the conditions of principle maxima, minima and secondary maxima.	9 Marks	L2	CO1
	b)	Demonstrate the construction and working mechanism of Nicol Prism.	7 Marks	L2	CO1

MODULE-II

4.	a)	What are mater waves? Derive the expression for de Broglie's wavelength of an electron.	8 Marks	L3	CO2
	b)	Discuss Davison and Germer's experiment to verify the existence of matter waves.	8 Marks	L2	CO2

(OR)

5.	a)	Derive Schrödinger's time-independent wave equation. Give its physical significance of wave function.	9 Marks	L3	CO2
	b)	Summarize Fermi Dirac distribution function along with its temperature dependence.	7 Marks	L2	CO2

MODULE-III

6.	a)	Develop the eigenfunction and eigenvalues of an electron which is moves in an infinite depth of one -dimensional potential well of width 'L'.	12 Marks	L3	CO3
	b)	An electron is bound in a one-dimensional box of width 1.5×10^{-10} m. Find its lowest energy and first excited state energy.	4 Marks	L1	CO3

(OR)

7.	a)	Describe the Kronig-Penny model to understand the behavior of an electron in a periodic potential.	8 Marks	L2	CO3
	b)	Summarize the origin of band formation in solids.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain drift and diffusion processes in semiconductors and derive the expression for them.	8 Marks	L2	CO4
	b)	What is intrinsic semiconductor and explain the formation of extrinsic semiconductors through doping?	8 Marks	L2	CO4

(OR)

9.	a)	State Hall effect. Derive an expression for the Hall coefficient	8 Marks	L3	CO4
	b)	Describe the construction and working mechanism of the light-emitting diode.	8 Marks	L2	CO4

MODULE-V

10.	a)	Define acceptance angle and numerical aperture. Derive an expression for the acceptance angle and numerical aperture of an optical fiber.	10 Marks	L3	CO5
	b)	The refractive indices of the core and the cladding regions of an optical fiber are 1.543 and 1.495 respectively. Determine the following a) numerical aperture b) acceptance angle c) critical angle	6 Marks	L3	CO5

(OR)

11.	a)	Describe the various optical fibers on the basis of refractive index profile and modes of propagation with a neat diagram	10 Marks	L2	CO5
	b)	Outline the construction and working mechanism of a displacement sensor with a suitable diagram.	6 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA V Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

MACHINE LEARNING

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Version Space.	2 Marks	L1	CO1
	b)	List the traits of well-posed learning problem	2 Marks	L1	CO1
	c)	What is inductive bias in decision tree learning?	2 Marks	L2	CO2
	d)	What is the role of entropy in decision tree learning?	2 Marks	L2	CO2
	e)	Define Overfitting in the context of neural network learning.	2 Marks	L1	CO3
	f)	Describe the role of hidden layer representations in neural networks.	2 Marks	L2	CO3
	g)	What is the main idea of the Gibbs Algorithm?	2 Marks	L1	CO4
	h)	List any two advantages of using Bayesian learning methods.	2 Marks	L1	CO4
	i)	Define Reinforcement Learning.	2 Marks	L1	CO5
	j)	What is Instance-based learning?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Define concept learning and explain the task of concept learning with illustration.	8 Marks	L2	CO1
	b)	Explain the different perspectives and issues in machine learning.	8 Marks	L1	CO1

(OR)

3.	a)	Justify how concept learning can be viewed as a search problem.	8 Marks	L4	CO1
	b)	How do you choose an appropriate representation for the target function? Explain with examples.	8 Marks	L2	CO1

MODULE-II

4.	a)	Differentiate hypothesis space search in ID3 and candidate elimination algorithm.	8 Marks	L2	CO2
	b)	Describe the probabilistic interpretation of SVM.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the working of Support Vector Machines (SVMs) for regression.	8 Marks	L2	CO2
	b)	Discuss the role of kernels in SVMs with examples.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain how the hypothesis space can be visualized in neural network learning.	8 Marks	L2	CO3
	b)	Define a perceptron and explain its working with a neat diagram.	8 Marks	L2	CO3

(OR)

7.	a)	Sketch and explain multilayer neural networks with their working.	8 Marks	L2	CO3

	b)	Explain how hidden layers are represented and their role in ANN.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain the Expectation-Maximization (EM) Algorithm with suitable derivations.	8 Marks	L2	CO4
	b)	Discuss the applications of EM Algorithm in clustering problems.	8 Marks	L2	CO4

(OR)

9.	a)	Discuss the role of prior and posterior probabilities in Bayesian classification.	8 Marks	L2	CO4
	b)	What is conditional independence in Bayesian Belief networks?	8 Marks	L1	CO4

MODULE-V

10.	a)	Discuss the advantages and limitations of instance-based learning methods in real-world applications	8 Marks	L2	CO5
	b)	Differentiate between Case-Based Reasoning and k-NN learning.	8 Marks	L2	CO5

(OR)

11.	a)	Compare Q-Learning and Temporal Difference learning**.**	8 Marks	L2	CO5
	b)	Differentiate between deterministic and nondeterministic environments in RL.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA V Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

SOFTWARE TESTING AND AUTOMATION

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is the purpose of software testing?	2 Marks	L1	CO1
	b)	Define verification with an example	2 Marks	L1	CO1
	c)	What is the purpose of 'test execution report	2 Marks	L1	CO2
	d)	What is 'equivalence partitioning'?	2 Marks	L1	CO2
	e)	Write down any two test features of test design?	2 Marks	L1	CO3
	f)	Define boundary value testing?	2 Marks	L1	CO3
	g)	specify an example for stress testing?	2 Marks	L1	CO4
	h)	Define volume testing?	2 Marks	L1	CO4
	i)	What are the benefits of test automation?	2 Marks	L1	CO5
	j)	What is a 'test automation framework'?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss about the automation testing?	8 Marks	L2	CO1
	b)	Compare and contrast white-box testing and black-box testing.	8 Marks	L2	CO1

(OR)

3.	a)	What are the various levels of testing? Discuss them.	8 Marks	L2	CO1
	b)	Write down the various documented artifacts related to software testing.	8 Marks	L1	CO1

MODULE-II

4.	a)	Explain the importance of a Test Plan in the software development lifecycle. How does it contribute to the success of a project?	8 Marks	L2	CO2
	b)	What is the overall objective of the testing effort, and how does it align with the project goals?	8 Marks	L1	CO2

(OR)

5.	a)	What are the roles and responsibilities of different team members in the test planning phase?	8 Marks	L1	CO2
	b)	How does effective collaboration contribute to the planning process?	8 Marks	L1	CO2

MODULE-III

6.	a)	What is the significance of equivalence partitioning in test design?	8 Marks	L1	CO3
	b)	Provide an example of how equivalence partitioning can be applied to create test cases.	8 Marks	L1	CO3

(OR)

7.	a)	Explain Bug life cycle in detail	8 Marks	L2	CO3
	b)	Analyze the the test design process?	8 Marks	L4	CO3

MODULE-IV

8.	a)	Define agile testing?What are the different features of agile testing?	8 Marks	L1	CO4
	b)	Explain the various methodologies of agile testing?	8 Marks	L2	CO4
		(OR)			
9.	a)	Write down the principles of security testing?	8 Marks	L1	CO4
	b)	Discuss the various types of security testing?	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss the key factors to consider when selecting a test automation tool for a project.	8 Marks	L6	CO5
	b)	What criteria should be evaluated to ensure the tool meets the project's needs?	8 Marks	L1	CO5
		(OR)			
11.	a)	Explain the concept of a test automation framework.	8 Marks	L2	CO5
	b)	What are the different types of frameworks , and how do they benefit the test automation process?	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

[Information Technology, Computer Science and Engineering(AI&ML), Computer Science and Engineering(CS), Computer Science and Engineering(DS)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	If two capacitors C1=20μF and C2=50μF are connected in parallel across the voltage source, determine the equivalent capacitance.	2 Marks	L2	CO1
	b)	A 0.1Ω resistor has a power rating of 5 W. Is this resistor safe when conducting a current of 10 A, justify?	2 Marks	L2	CO1
	c)	Mention the applications of stepper motor	2 Marks	L1	CO2
	d)	A transformer has 100 turns in primary and 50 turns in secondary. With a primary supply voltage of 230V. What is the secondary voltage also find transformation ratio K.	2 Marks	L1	CO2
	e)	State Lambert's square law.	2 Marks	L1	CO3
	f)	Define Candle power.	2 Marks	L1	CO3
	g)	List the factors responsible in the selection of transducer.	2 Marks	L1	CO4
	h)	Mention the objectives of Data Acquisition system.	2 Marks	L1	CO4
	i)	Define breakdown voltage in a Zener diode.	2 Marks	L1	CO5
	j)	Draw the symbols for NPN and PNP transistor.	2 Marks	L1	CO5

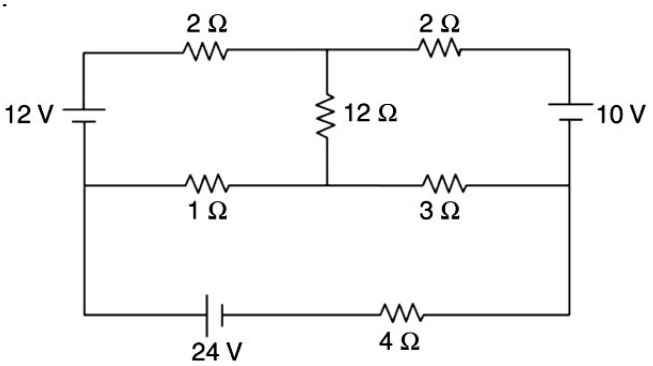
PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

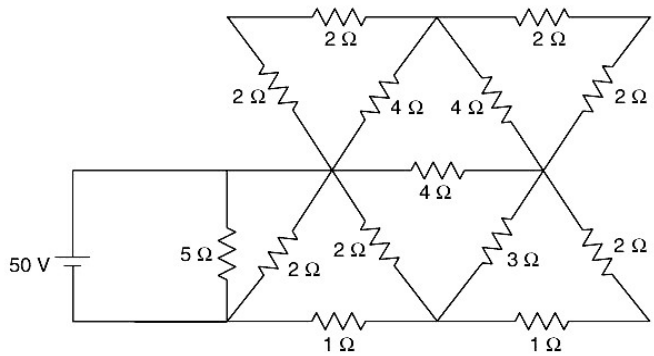
2. a) Determine the current through 4 ohm resistor using Mesh Analysis. 8 Marks L3 CO1



b) With the help of neat sketch explain in detail the working of the single loop generator. 8 Marks L2 CO1

(OR)

3.	a)	Find the current delivered by the source in the network shown below	10 Marks	L3	CO1



	b)	For the AC circuit is having a v(t) = 250 sin (ωt+100°) in volts and i(t) = 15 sin (ωt+30°) in Amperes. Determine the power factor, active, reactive and apparent power.	6 Marks	L2	CO1

MODULE-II

4.	a)	Derive the expression for the emf induced in the secondary of the transformer.	8 Marks	L2	CO2
	b)	Write a short note on the methods of electrical wiring systems.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the construction and working principle of stepper motor.	8 Marks	L2	CO2
	b)	Explain the operation of MCB with the help of relevant diagram.	8 Marks	L2	CO2

MODULE-III

6.	a)	Calculate space between two poles of street light having fixture watt as 250W, lamp output is 33200 lumens. Required lux is 5 lux. Width of the road is 11.8 feet. Height of the pole is 26.24 feet. CU=0.18, LLDF=0.8, LDDF=0.9.	6 Marks	L3	CO3
	b)	The following are the details of load on a circuit connected through a supply meter: a) Six lamps of 40 watts each working for 4 hours per day. b) Two fluorescent tubes of 125 watts each working for 2 hours per day. c) One 1000 watt heater working for 3 hours per day. If each unit of energy costs 70 Paisa, what will be the electricity bill for the month of June?	10 Marks	L3	CO3

(OR)

7.	a)	Prove that "Illuminance varies inversely as the square of the illuminated point from the source" using laws of Illumination.	6 Marks	L2	CO3
	b)	What are the main components of UPS systems? Explain.	10 Marks	L2	CO3

MODULE-IV

8.	a)	With neat diagram, explain the basic components and working principle of Wireless Bluetooth sensor.	8 Marks	L2	CO4
	b)	Suggest the suitable device to convert linear displacement to electrical voltage. With neat sketch, explain the principle of operation. Mention its Applications.	8 Marks	L3	CO4

(OR)

9.	a)	With neat sketch, explain the working principle of Temperature and Humidity Sensor. Mention its advantages and disadvantages.	10 Marks	L2	CO4
	b)	What is data acquisition system? With generalized block diagram, explain the functions of it.	6 Marks	L2	CO4

MODULE-V

10.	a)	Discuss the working of NPN and PNP transistor with a neat sketch.	8 Marks	L2	CO5
	b)	Examine and derive an expression for V_0 of the Integrator circuit by using Op-Amp.	8 Marks	L2	CO5

(OR)

11.	a)	With neat sketch, Explain the operation of R-2R type DAC with an example.	8 Marks	L2	CO5
	b)	Discuss the working of NPN and PNP transistor with a neat sketch.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

MATERIAL SCIENCE AND ENGINEERING

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Sketch FCC structure.	2 Marks	L2	CO1
	b)	Sketch CU-Ni phase diagram?	2 Marks	L3	CO1
	c)	What is cyaniding?	2 Marks	L2	CO2
	d)	What is plasma hardening?	2 Marks	L1	CO2
	e)	Elaborate the designation of 35C 10S 14 Steel.	2 Marks	L3	CO3
	f)	What are alloy steels?	2 Marks	L1	CO3
	g)	Write the chemical composition of Inconel and Nichrome?	2 Marks	L2	CO4
	h)	What is Hindalium?	2 Marks	L2	CO4
	i)	What are the applications of Glass-ceramics?	2 Marks	L2	CO5
	j)	State the industrial applications of composites.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Classify point defects and explain it with neat sketches.	8 Marks	L2	CO1
	b)	Draw Iron-Iron-Carbide diagram neatly and explain the critical temperatures, phases and boundaries existing in it.	8 Marks	L3	CO1

(OR)

3.	a)	Define solid solution. Differentiate between Substitutional and Interstitial solid solutions with neat sketches. Also write Hume-Rothery's rule for formation of solid solutions.	8 Marks	L1	CO1
	b)	Explain the concept of time temperature transformation with a neat sketch.	8 Marks	L3	CO1

MODULE-II

4.	a)	Classify the various types of hardening treatments. Explain flame and induction hardening treatment.	8 Marks	L2	CO2
	b)	"The normalized steel is found to be superior to that of annealed steel". Explain the reason behind this statement with suitable diagrams.	8 Marks	L2	CO2

(OR)

5.	a)	List the objectives of heat treatment of metals.	8 Marks	L2	CO2
	b)	Differentiate between Austempering and Martempering.	8 Marks	L1	CO2

MODULE-III

6.	a)	Give the composition, microstructure and applications of i)Grey cast iron ii) Malleable iron iii) White cast iron	8 Marks	L2	CO3
	b)	Describe the stainless steels with respect to composition, properties and applications.	8 Marks	L2	CO3

(OR)

7.	a)	Give the classifications and applications of low alloy steels. Also give the specifications of steels.	8 Marks	L2	CO3
	b)	Interpret the effect of alloying elements on properties of steels.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain the composition, properties and uses of Titanium alloys.	8 Marks	L2	CO4
	b)	State and describe some of the important properties of nonferrous metals and alloys.	8 Marks	L2	CO4

(OR)

9.	a)	Explain the types, properties and uses of magnesium and its alloys in detail.	8 Marks	L2	CO4
	b)	What alloys of copper are mainly used in engineering constructions? State their approximate compositions, properties and fields of use.	8 Marks	L2	CO4

MODULE-V

10.	a)	What are the ceramic materials? State their outstanding properties.	8 Marks	L2	CO5
	b)	Explain classification, properties and applications of polymer matrix composites.	8 Marks	L2	CO5

(OR)

11.	a)	Explain classification, properties and applications of ceramic matrix composites.	8 Marks	L2	CO5
	b)	Discuss the classification of polymers. Compare and contrast between polymers and metals.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA I Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

MATRIX THEORY AND LINEAR ALGEBRA

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Find rank of a matrix $A=\begin{bmatrix}3&0&0\\1&4&0\\2&8&4\end{bmatrix}$.	2 Marks	L1	CO1
	b)	Define Lower Triangular matrix with suitable examples.	2 Marks	L1	CO1
	c)	Find characteristic polynomial and eigen values of the matrix $A=\begin{bmatrix}3&6&0\\0&4&0\\0&0&5\end{bmatrix}$	2 Marks	L1	CO2
	d)	If the eigen values of a marix A are $\lambda = 2,4,6$ then determine the eigen values of matrices A^3, A^{-1}.	2 Marks	L1	CO2
	e)	Define basis of a vector space.	2 Marks	L1	CO3
	f)	Find the subspace and it's dimension of the vector space spanned by the row vectors as $\begin{bmatrix}1&-2&3\\0&3&4\\0&0&0\end{bmatrix}$.	2 Marks	L1	CO3
	g)	Define kernel of a linear transformation.	2 Marks	L1	CO3
	h)	If $T:R^2 \to R^2$ is defined by $T(x,y)=(y+x,2y)$ then find matrix of linear transformation T.	2 Marks	L1	CO3
	i)	Calculate the norm of the vector (1,2,4) .	2 Marks	L1	CO4
	j)	Define orthonormal set of a vector space.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Test for consistency and solve the following system of equations $2x+y+z=4,\ x+4y+8z=13$ *and* $x+3y+z=5$.	10 Marks	L3	CO1
	b)	Determine rank of the matrix, $A=\begin{bmatrix}2&3&1\\4&5&1\\1&1&3\end{bmatrix}$ by reducing into echelon form.	6 Marks	L1	CO1

(OR)

3. a) Expressing a matrix $A=\begin{bmatrix}1 & 4 & 9\\ 1 & 3 & 2\\ 2 & 4 & 3\end{bmatrix}$ as a product of elementary matrices. 8 Marks L2 CO1

b) Find the LDU decomposition of the matrix, $A=\begin{bmatrix}1 & 3 & 2\\ -2 & -6 & 1\\ 2 & 5 & 7\end{bmatrix}$ 8 Marks L1 CO1

MODULE-II

4. a) Determine the eigen values and eigen vectors of the matrix 8 Marks L3 CO2

$$A=\begin{bmatrix}8 & -6 & 2\\ -6 & 7 & -4\\ 2 & -4 & 3\end{bmatrix}$$

b) Apply Cayley–Hamilton theorem to find A^3 and A^{-2} of the matrix 8 Marks L2 CO2

$$A=\begin{bmatrix}7 & 2 & -2\\ -6 & -1 & 2\\ 6 & 2 & -1\end{bmatrix}$$

(OR)

5. Verify that the matrix $A=\begin{bmatrix}4 & -3 & -3\\ 3 & -2 & -3\\ -1 & 1 & 2\end{bmatrix}$ is diagonalizable or not. 16 Marks L3 CO2

MODULE-III

6. a) Show that the set $A=\left\{\begin{pmatrix}x & 0\\ 0 & y\end{pmatrix} / \ x, y \in R\right\}$ is a vector space over the field of real numbers R under usual addition and multiplication. 10 Marks L2 CO3

b) Verify that the set of vectors $\{(1,2,-3), (1,-3,2), (2,-1,5)\}$ are Linearly independent vectors or not by using linear span of the vectors. 6 marks L3 CO3

(OR)

7. a) Find the basis and dimension of the subspace spanned by the vectors $\{(2,-3,1), (3,0,1), (0,2,1), (1,1,1)\}$ of the vector space V_3 (R). 10 Marks L1 CO3

b) Show that the vectors $\{(1,0,-1), (1,2,1), (0,-3,2)\}$ form a basis of the vector space V_3 (R). 6 marks L3 CO3

MODULE-IV

8.	a)	Prove that $T: R^2 \to R^2$ defined by $T(x,y)\ T(x,y) = (x\cos\theta + y\sin\theta,\ x\tan\theta + \cos\theta)$ is a linear transformation.	8 Marks	L5	CO3
	b)	Determine the matrix of the transformation $T: R^2 \to R^3$ defined by $T(x,y) = (2y - x, y, 3y - 3x)$ w.r.t basis $B_1 = \{(1,1),(-1,1)\}$ *and* $B_2 = \{(1,1,1)(1,-1,1), (0,0,1)\}$	8 Marks	L3	CO3
		(OR)			
9.	a)	Find a Linear Transformation $T: R^2 \to R^3$ such that $T(-1,1) = (-1,0,2)$ *and* $T(2,1) = (1,2,1)$.	8 Marks	L1	CO3
	b)	Determine the range space, rank, and nullity of transformation $T: R^3 \to R^3$ defined by $T(x,y,z) = (x+y, x-y, 2x+z)$. Also, verify the rank-nullity theorem.	8 Marks	L3	CO3
		MODULE-V			
10.	a)	Find the angle θ between $p = x^2$ *and* $q = x + 1$ *if* $x_1 = -1,\ x_2 = 0, x_3 = 1$ using inner product.	8 marks	L1	CO4
	b)	Verify the Pythagorean theorem for the functions 1 and x in C[-1.1] using the inner product.	8 marks	L2	CO4
		(OR)			
11.		Apply Gram-Schmidt process to obtain an ortho normal basis of $R^3(R)$ from the basis $\{(1,2,2), (-1,0,2), (0,0,1)\}$.	16 marks	L1	CO4

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

MULTIVARIABLE CALCULUS AND DIFFERENTIAL EQUATIONS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Find $\frac{\partial(u,v)}{\partial(r,\theta)}$ when $u = r\cos\theta$; $v = r\sin\theta$.	2 Marks	L1	CO1
	b)	Identify the stationary points on the curve $f(x,y) = x^2 + y^2 + 6x + 12$.	2 Marks	L3	CO1
	c)	Evaluate $\int_0^2\int_0^3 dydx$.	2 Marks	L5	CO2
	d)	Identify the limits to cover the region R bounded by $y = x^2, y = x$.	2 Marks	L3	CO2
	e)	Find curl $\bar{f}$ for $\bar{f} = xy^2\bar{i} + 2x^2yz\,\bar{j} - 3yz^2\bar{k}$ at the point (1,-1,1)	2 Marks	L1	CO3
	f)	Define irrotational vector.	2 Marks	L1	CO3
	g)	Find the general solution of $(D^2 + 3D + 2)y = 0$	2 Marks	L1	CO4
	h)	Find the Particular integral of $\frac{1}{D^2 - 1}e^{3x}$.	2 Marks	L1	CO4
	i)	Construct a partial differential equation by eliminating the arbitrary constants a and b from $z = (x + a)(y + b)$.	2 Marks	L3	CO5
	j)	Construct a partial differential equation by eliminating the arbitrary function f from $z = f(x^2 - y^2)$.	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Find $\frac{\partial(u,v,w)}{\partial(x,y,z)}$, where $u = x + y + z$ $uv = y + z, uvw = z$.	8 Marks	L1	CO1
	b)	Examine the function for extreme values of the function $f(x,y) = x^3 + 3xy^2 - 3x^2 - 3y^2 + 4$.	8 Marks	L4	CO1

(OR)

3.	a)	Show that the functions $u = xy + yz + zx; v = x^2 + y^2 + z^2; w = x + y + z$ are functionally dependent and find the relation between them.	8 Marks	L2	CO1

	b)	Show that $\frac{\partial u}{\partial x}+\frac{\partial u}{\partial y}+\frac{\partial u}{\partial z}=0$, if $u=f(y-z,z-x,x-y)$	8 Marks	L2	CO1

MODULE-II

4.	a)	Evaluate $\int_{-1}^{1}\int_{0}^{z}\int_{x-z}^{x+z}(x+y+z)dxdydz$.	8 Marks	L5	CO2
	b)	By changing in to polar coordinates, evaluate $\int_{0}^{\infty}\int_{0}^{\infty}e^{-(x^2+y^2)}dx\,dy$.	8 Marks	L5	CO2

(OR)

5.	a)	Change the order of integration $\int_{0}^{1}\int_{0}^{\sqrt{1-x^2}}y^2\,dy\,dx$ and hence evaluate the double integral.	8 Marks	L5	CO2
	b)	Evaluate $\int_{-c}^{c}\int_{-b}^{b}\int_{-a}^{a}(x^2+y^2+z^2)dx\,dy\,dz$.	8 Marks	L5	CO2

MODULE-III

6.	a)	Find the directional derivative of $f=xy+yz+zx$ at (1,1,1) in the direction of $\bar{i}+\bar{j}+\bar{k}$.	8 Marks	L1	CO3
	b)	Show that the vector $(x^2-yz)\bar{i}+(y^2-zx)\bar{j}+(z^2-xy)\bar{k}$ is irrotational and find its scalar potential.	8 Marks	L2	CO3

(OR)

7.	a)	Evaluate $\oint_C \bar{F}.d\bar{r}$, where $\bar{F}=(5xy-6x^2)\bar{i}+(2y-4x)\bar{j}$ along the curve Cin xy-plane $y=x^3$ from (1,1) to (2,8).	8 Marks	L5	CO3
	b)	Using Green's theorem, evaluate $\oint_C (xy+y^2)dx+x^2dy$, where C is the closed curve of the region bounded by $y=x^2$ and $y=x$.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Solve the differential equation $(D^2+9)y=xe^x+\sin 2x$.	8 Marks	L3	CO4
	b)	Applying the method of variation of parameters to solve $(D^2+4)y=Tan2x$.	8 Marks	L3	CO4

(OR)

9.	a)	Solve the differential equation $x^2\frac{d^2y}{dx^2}-x\frac{dy}{dx}+y=\log x$.	8 Marks	L3	CO4
	b)	Solve the differential equation $(D^2-5D+6)y=e^x\sin x$.	8 Marks	L3	CO4

MODULE-V

10.	a)	Find the complete solution of the linear partial differential equation $(x^2-yz)p+(y^2-zx)q=z^2-xy$.	8 Marks	L1	CO5
	b)	Construct the PDE of eliminating arbitrary function f from the relation $f(x^2+y^2,z-xy)=0$	8 Marks	L3	CO5

(OR)

11.		Apply the method of separation variables, solve $3\frac{\partial u}{\partial x}+2\frac{\partial u}{\partial y}=0$ where $u(x,0)=4e^{-x}$	16 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Fasttrack Supplementary Examinations, March – 2026

CALCULUS AND TRANSFORMATION TECHNIQUES

[Computer Science and Engineering (Artificial Intelligence and Machine Learning),

Computer Science and Engineering (Data Science),

Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	State Cauchy's Mean value theorem.	2 Marks	L1	CO1
	b)	State Taylor's theorem with Lagrange's form of reminder.	2 Marks	L1	CO1
	c)	Find the first and second order partial derivatives of the function $f = ax^2 + by^2 + 3abxy$.	2 Marks	L1	CO2
	d)	Identify the stationary point of the function $x^2 y^2 (1 - x - y)$.	2 Marks	L1	CO2
	e)	Define exponential order in Laplace transforms.	2 Marks	L1	CO3
	f)	Find the Laplace transform of $\sin^2 t$.	2 Marks	L1	CO3
	g)	Find the Inverse Laplace transform of $\frac{1}{s^2 + 2x + 2}$.	2 Marks	L1	CO4
	h)	Find the Inverse Laplace transform of $\frac{1}{(s+1)(s+2)}$.	2 Marks	L1	CO4
	i)	Find a_0 in Fourier series for the function $f(x) = x^3$ in the interval $-\pi < x < \pi$.	2 Marks	L1	CO5
	j)	Find a_0 in Fourier series for the function $f(x) = \sin x$ in the interval $-\pi < x < \pi$.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Verify Rolles' theorem for the function $f(x) = 2x^3 + x^2 - 4x - 2$ $in \left[-\sqrt{3}, \sqrt{3}\right]$.	8 Marks	L4	CO1
	b)	Find c of the Lagrange's mean value theorem if $f(x) = x^2 - 3x - 1, x \in \left[\frac{-11}{7}, \frac{13}{7}\right]$.	8 Marks	L1	CO1

(OR)

3.	a)	Verify Cauchy's theorem for $f(x) = \sin x$, $g(x) = \cos x$ in $[a, b]$.	8 Marks	L4	CO1
	b)	Find the Maclaurin's series for the function $f(x) = \cos x$ with Lagrange's form of reminder.	8 Marks	L1	CO1

MODULE-II

4.	a)	Find the maximum and minimum values of the function $f(x,y) = x^3 + 3xy^2 - 3x^2 - 3y^2 + 4$.	8 Marks	L1	CO2
	b)	If $x = r\cos\theta$, $y = r\sin\theta$, then show that $\frac{\partial r}{\partial x} = \frac{\partial x}{\partial r}$ and $\frac{1}{r}\frac{\partial x}{\partial \theta} = r\frac{\partial \theta}{\partial x}$.	8 Marks	L2	CO2

(OR)

5.	a)	Find the maximum value of $u = x^2y^3z^4$ subject to the condition $2x + 3y + 4z = a$.	8 Marks	L1	CO2
	b)	Show that the functions $u = xy + yz + zx, v = x^2 + y^2 + z^2$ and $w = x + y + z$ are functionally related. Find the relation between them.	8 Marks	L2	CO2

MODULE-III

6.	a)	Find the Laplace transform of $f(t)$, *where* $f(t) = \left(\sqrt{t} + \frac{1}{\sqrt{t}}\right)^3$.	8 Marks	L1	CO3
	b)	Determine the Laplace transform of $\int_0^t te^{-t} \sin 4t$.	8 Marks	L3	CO3

(OR)

7.	a)	Find the Laplace transform of the saw-toothed wave of period T defined by $f(t) = \frac{k}{T}t$, *where* $0 < t < T$.	8 Marks	L1	CO3
	b)	Find the Laplace transform of $e^{-4t}\int_0^t \frac{\sin 3t}{t}dt$.	8 Marks	L1	CO3

MODULE-IV

8.		Find the inverse Laplace transform of $\cot^{-1}\left(\frac{s+2}{3}\right)$.	16 Marks	L1	CO4

(OR)

9.		Solve the differential equation $\frac{d^2x}{dt^2} + 2\frac{dx}{dt} + 2x = 5\sin t$, given that $x(0) = 0, x'(0) = 0$ using Laplace transforms.	16 Marks	L3	CO4

MODULE-V

10.	a)	Examine the given function is even or odd and hence obtain Fourier series for the function $f(x) = x^2$ *in* $-\pi < x, \pi$.	8 Marks	L4	CO5
	b)	Find the Fourier transform $f(x) = \begin{cases} 1 \text{ for } \lvert x\rvert < 1 \\ 0 \text{ for } \lvert x\rvert > 1 \end{cases}$. Hence evaluate $\int_0^\infty \frac{\sin x}{x}dx$.	8 Marks	L1	CO5

(OR)

11.	a)	Find the Fourier series for $f(x) = x - x^2$, *in* $-\pi < x < \pi$.	8 Marks	L1	CO5
	b)	Find the Fourier cosine transform of $f(x) = e^{-x^2}$.	8 Marks	L1	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T. IV Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

PHARMACOLOGY

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Write in brief about Anti cholinergic drugs.	2 Marks	L2	CO1
	b)	Give a summary on atypical antidepressants.	2 Marks	L2	CO1
	c)	List various drugs used in spasticity.	2 Marks	L1	CO2
	d)	Write the indications of Diuretics.	2 Marks	L2	CO2
	e)	List ACE inhibitors.	2 Marks	L1	CO4
	f)	Explain pharmacokinetics.	2 Marks	L2	CO4
	g)	Define NSAIDs.	2 Marks	L1	CO5
	h)	State two uses of calcium channel blockers.	2 Marks	L1	CO5
	i)	Make a brief note on indications of glucocorticoids.	2 Marks	L3	CO3
	j)	What is the postural hypotension?	2 Marks	L2	CO3

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Give an overview on mechanism of action, pharmacological actions and uses of directly acting sympathomimetics.	8 Marks	L2	CO1
	b)	Simplify the pharmacology of antipsychotic drugs.	8 Marks	L4	CO1

(OR)

3.	a)	Explain the factors modifying drug response.	8 Marks	L2	CO1
	b)	Summarize the phenomena of drug absorption and add a short note on factors affecting it.	8 Marks	L2	CO1

MODULE-II

4.	a)	Make a detail presentation on lipid lowering drugs.	8 Marks	L5	CO2
	b)	Outline the pharmacology of anticoagulants and thrombolytics in ischaemic heart disease.	8 Marks	L3	CO2

(OR)

5.	a)	Justify the pharmacological role of dopamine precursor levodopa in parkinson's disease.	8 Marks	L4	CO2
	b)	Demonstrate the role of antiarrhythmics in normalizing arrhythmia.	8 Marks	L3	CO2

MODULE-III

6.	a)	Discuss the mechanism of action, pharmacological actions, indications and side effects of glucocorticoids.	8 Marks	L2	CO3
	b)	Summarize the pharmacology of drugs used in dementia management.	8 Marks	L3	CO3

(OR)

7.	a)	Summarize the pharmacological management of systemic lupus erythematosus.	8 Marks	L3	CO3
	b)	Write in detail about non-opioid analgesics.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Compare cholinergic agonists and cholinergic antagonists.	8 Marks	L4	CO4
	b)	Explain the mechanism, actions and therapeutic uses of benzodiazepines.	8 Marks	L2	CO4

(OR)

9.	a)	Illustrate the mechanism and therapeutic uses of tricyclic antidepressants.	8 Marks	L4	CO4
	b)	Explain the pharmacology of calcium channel blockers in hypertension.	8 Marks	L2	CO4

MODULE-V

10.	a)	Describe the medical management and physiological action of drugs used in allergic rhinitis.	8 Marks	L2	CO5
	b)	Discuss the physiological mechanism of bronchodilators.	8 Marks	L3	CO5

(OR)

11.	a)	Explain the mechanism of action and therapeutic uses of drugs used in peptic ulcer disease	8 Marks	L2	CO5
	b)	Evaluate the pharmacological management of diabetes mellitus.	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. (Allied Sciences) IV Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

OPTOMETRIC INSTRUMENTS - I

[Optometry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Classify illumination types with examples.	2 Marks	L2	CO1
	b)	Define Scheimpflug imaging.	2 Marks	L1	CO2
	c)	State principle of Ishihara test.	2 Marks	L1	CO3
	d)	Name the structures seen in the anterior chamber angle during gonioscopy.	2 Marks	L1	CO4
	e)	Mention two clinical uses of indirect ophthalmoscopy.	2 Marks	L1	CO5
	f)	How Maddox rod is used in binocular testing?	2 Marks	L2	CO1
	g)	Classify corneal mapping techniques.	2 Marks	L2	CO2
	h)	How to measure exophthalmos with Hertel exophthalmometer?	2 Marks	L2	CO3
	i)	What is gonioscopy?	2 Marks	L2	CO4
	j)	List different methods of fundus examination.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Elaborate the concept of optical axis alignment and pantoscopic tilt in fitting a trial frame.	8 Marks	L2	CO1
	b)	Interpret how errors in vertex distance and PD setting influence refractive outcomes.	8 Marks	L4	CO1

(OR)

3.	a)	Describe digital innovations in test chart design.	8 Marks	L2	CO1
	b)	Differentiate digital test charts from projection charts with respect to calibration accuracy, contrast levels, and chart options.	8 Marks	L4	CO1

MODULE-II

4.	a)	Elaborate the procedure of using a specular microscope.	8 Marks	L3	CO2
	b)	Classify specular and confocal microscopes and evaluate their utility in diagnosing endothelial pathologies.	8 Marks	L4	CO2

(OR)

5.	a)	Summarize AS-OCT to evaluate the anterior chamber angle and corneal thickness.	8 Marks	L3	CO2
	b)	Analyze the advantages and disadvantages of AS-OCT vs. Scheimpflug imaging in corneal analysis.	8 Marks	L4	CO2

MODULE-III

6.	a)	Interpret the working and interpretation of the Potential Acuity Meter (PAM) for preoperative assessment.	8 Marks	L4	CO3
	b)	Evaluate the relevance of PAM in differentiating media opacity from retinal pathology in low vision cases.	8 Marks	L4	CO3

(OR)

7.	a)	Elaborate the early acquired dyschromatopsia in diabetic patients.	8Marks	L2	CO3
	b)	Interpret how cone-specific pathways are assessed using modern computer-based colour vision testing like Rabin CCT.	8Marks	L4	CO3

MODULE-IV

8.	a)	Elaborate testing pattern and reliability indices of perimetry.	8 Marks	L3	CO4
	b)	Write a note on patient preparation and instructions before perimetry.	8 Marks	L3	CO4

(OR)

9.	a)	Discuss the advantages, disadvantages, and limitations of gonioscopy techniques.	8 Marks	L2	CO4
	b)	Describe the grading systems of anterior chamber angle in gonioscopy.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain the specular reflection and sclerotic scatter illumination techniques in slit lamp.	8 Marks	L3	CO5
	b)	Elucidate Scotopic and photopic electroretinography.	8 Marks	L3	CO5

(OR)

11.	a)	Write note on Ultrasonography and its clinical application.	8 Marks	L3	CO5
	b)	Elaborate the procedure, pros and cons of OCT.	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

EQUIPMENT IN MEDICAL IMAGING

[Radiology and Imaging Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define Cephalometry.	2 Marks	L1	CO1
	b)	Explain in brief about principle of DBT.	2 Marks	L2	CO1
	c)	Write about Sir. Raymond V. Damadian in four lines.	2 Marks	L2	CO2
	d)	What is the CT number for CSF, Muscles, blood and air?	2 Marks	L1	CO2
	e)	State the application of C-ARM.	2 Marks	L1	CO3
	f)	Define angiogram and subtraction technique.	2 Marks	L1	CO3
	g)	Mention any four alternative methods of DEXA.	2 Marks	L1	CO4
	h)	State bone densitometry and equipment used to measure.	2 Marks	L1	CO4
	i)	Define hotspot and cold spot.	2 Marks	L1	CO5
	j)	Mention the components of gamma camera.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Summarize dental radiographic unit with diagrammatic representation.	8 Marks	L2	CO1
	b)	Define about mobile x-ray unit in detail.	8 Marks	L1	CO1
		(OR)			
3.	a)	Write about the following: i) Personal dorsimeter. ii) Pocket ionization chamber. iii) PRED's. Non alarming PRED's.	8 Marks	L2	CO1
	b)	Contrast features of portable x-ray cameras.	8 Marks	L2	CO1

MODULE-II

4.	a)	Apply your knowledge on introducing Computed tomography in your own words.	8 Marks	L3	CO2
	b)	Explain principle of MRI in detail.	8 Marks	L2	CO2
		(OR)			
5.	a)	Explain about pixels, voxels and matrix in detail.	8 Marks	L2	CO2
	b)	Elaborate on protium and how hydrogen nuclei act as a magnet.	8 Marks	L2	CO2

MODULE-III

6.	a)	Elaborate on C-Arm equipment detail along with different components of equipment.	8 Marks	L2	CO3
	b)	Describe about different subtraction techniques in detail.	8 Marks	L1	CO3

(OR)

7.	a)	Discuss about cine camera equipment and its components with an appropriate diagram.	8 Marks	L2	CO3
	b)	Present a sketch of digital fluoroscopy and explain it in detail.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Elaborate on DEXA in detail with suitable diagrams.	8 Marks	L2	CO4
	b)	Write a short note on: i) T-Score and Z-Score. ii) Vertebral fracture assessment.	8 Marks	L1	CO4

(OR)

9.	a)	Summarize equipment used for bone densitometry tests commonly used.	8 Marks	L2	CO4
	b)	Apply your knowledge about quantitative ultrasound and Quantitative peripheral CT as bone densitometry in your own words with appropriate diagrams.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain in detail about components of LINAC.	8 Marks	L2	CO5
	b)	Write a short note on: i) Technetium 99m ii) Thallium 201	8 Marks	L1	CO5

(OR)

11.	a)	Discuss in detail about components of gamma camera	8 Marks	L2	CO5
	b)	Elaborate in detail about SPECT, its working, and types of cameras used in SPECT with suitable diagrams.	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

SPECIAL INVESTIGATIONS IN RADIOLOGY

[Radiology & Imaging Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Write a brief note on additives used in contrast media.	2 Marks	L2	CO1
	b)	How much iodine particle ratio for ionic monomers?	2 Marks	L2	CO1
	c)	Write a brief note on properties of ideal barium preparation.	2 Marks	L1	CO2
	d)	Prepare a note on bowel wash.	2 Marks	L2	CO2
	e)	Write a brief note on contrast media used in RGU.	2 Marks	L2	CO3
	f)	How much time required for cortical nephrogram?	2 Marks	L2	CO3
	g)	List out any four equipment required for saiolgraphy.	2 Marks	L1	CO4
	h)	Mention two techniques for cannulating the salivary ducts.	2 Marks	L2	CO4
	i)	Explain brief note on ampulla of vater.	2 Marks	L2	CO5
	j)	What is the full form of PTC?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Give an outline on Biliary system with neat diagram.	8 Marks	L4	CO1
	b)	Add a long note on hysterosalpingography.	8 Marks	L2	CO1
		(OR)			
3.	a)	Describe the technique of percutaneous transhepatic cholangiography. What are the pitfalls of the procedure?	8 Marks	L2	CO1
	b)	Explain in detail on preoperative cholangigraphy.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain treatment for skin reactions and epilepsy due to injection of iodinated contrast media.	8 Marks	L2	CO2
	b)	Explain treatment for respiratory reactions and hypotension due to injection of iodinated contrast media.	8 Marks	L2	CO2
		(OR)			
5.	a)	Describe in detail about conventional high osmolar contrast media.	8 Marks	L2	CO2
	b)	Explain about physiology of contrast media.	8 Marks	L2	CO2

MODULE-III

6.	a)	Mention the advantages & disadvantages of D.C.B.E and S.C.B.E. What are the absolute contraindications for both?	8 Marks	L2	CO3
	b)	Discuss in detail about the Indications, contraindications, contrast media and procedure for double contrast BMFT	8 Marks	L3	CO3
		(OR)			
7.	a)	Explain in detail about patient preparation for barium enema.	8 Marks	L3	CO3

	b)	Prepare a long note on contrast media used in GIT.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Describe the Indications, contraindications, risk factors and contrast media for IVU.	8 Marks	L2	CO4
	b)	Explain about the RGU.	8 Marks	L2	CO4
		(OR)			
9.	a)	Summarize the indications, preparation, and procedure for percutaneous nephrostomy.	8 Marks	L4	CO4
	b)	Explain briefly about the filming technique of RGU & MCU.	8 Marks	L2	CO4

MODULE-V

10.	a)	Summarize sialography.	8 Marks	L4	CO5
	b)	Explain Ascending phlebography.	8 Marks	L2	CO5
		(OR)			
11.	a)	Summarize fistuloram.	8 Marks	L4	CO5
	b)	Summarize sinogram.	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

PHYSICS OF COMPUTERIZED TOMOGRAPHY

[Radiology & Imaging Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define windowing.	2 Marks	L1	CO1
	b)	What are pixels and voxels?	2 Marks	L2	CO1
	c)	Present any three functions of slip rings.	2 Marks	L3	CO2
	d)	Write in brief about the working of EBCT.	2 Marks	L2	CO2
	e)	Define curved planar reconstruction.	2 Marks	L1	CO3
	f)	List three uses of Multi planar reconstruction.	2 Marks	L1	CO3
	g)	Write in brief about noise and its causes.	2 Marks	L2	CO4
	h)	Classify artifacts.	2 Marks	L3	CO4
	i)	Define chromosomal aberration.	2 Marks	L1	CO5
	j)	State inverse square law, and its relation with distance.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Interpret with components of CT gantry.	8 Marks	L3	CO1
	b)	Elaborate on the history of CT scanner, advantages and limitations of CT.	8 Marks	L2	CO1

(OR)

3.	a)	Classify types of CT detectors based on their efficiency.	8 Marks	L3	CO1
	b)	Explain pixels, voxels and matrix.	8 Marks	L2	CO1

MODULE-II

4.	a)	Elaborate on pencil beam, and narrow fan beam CT scanners.	8 Marks	L2	CO2
	b)	Add a short note on: i) CVCT. ii) Wide beam CT scanner.	8 Marks	L1	CO2

(OR)

5.	a)	Summarize on MDCT and MSCT.	8 Marks	L2	CO2
	b)	Write a note on: i) Helical CT. ii) Seventh generation.	8 Marks	L1	CO2

MODULE-III

6.	a)	Discuss in detail about image acquisition in 6th and 7th generation CT scanners.	8 Marks	L2	CO3
	b)	Write a short note about: i) Importance of post processing ii) Image acquisition in 7th generation CT scanner.	8 Marks	L1	CO3

(OR)

7.	a)	Present the techniques of image acquisition in CT scanner with a suitable diagram.	8 Marks	L3	CO3
	b)	Apply your knowledge in representing image acquisition in various generations of CT scanner.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Write a note on: i) Patient motion and its remedies. ii) Coan beam artifacts and its remedies.	8 Marks	L1	CO4
	b)	Summarize on physics-based artifacts.	8 Marks	L2	CO4

(OR)

9.	a)	Describe patient-based artifacts.	8 Marks	L2	CO4
	b)	Explain scanner-based artifacts.	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss in detail about chromosomal aberration.	8 Marks	L3	CO5
	b)	Summarize CTDI and DLP, Elaborate radiation protective measures.	8 Marks	L3	CO5

(OR)

11.	a)	Explain increasing radiation burden on human life from medical imaging.	8 Marks	L3	CO5
	b)	Write a short note on: i) Stochastic effect. ii) KERM	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) IV Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

CLINICAL EXAMINATION OF VISUAL SYSTEM

[Optometry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	List the assumptions of geometrical optics.	2 Marks	L2	CO1
	b)	How is the critical angle related to refractive index?	2 Marks	L2	CO2
	c)	Define visual acuity.	2 Marks	L1	CO3
	d)	Give two symptoms of binocular vision anomalies.	2 Marks	L1	CO4
	e)	How does automated perimetry detect threshold sensitivity?	2 Marks	L2	CO5
	f)	State Huygens' Principle.	2 Marks	L1	CO1
	g)	State the lens makers' formula.	2 Marks	L1	CO2
	h)	Identify the test used to detect suppression in binocular vision.	2 Marks	L2	CO3
	i)	Where is the prism bar placed during prism cover testing?	2 Marks	L1	CO4
	j)	Mention a clinical condition that causes bitemporal hemianopia.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Outline the method of eliciting past ocular history and its diagnostic importance.	8 Marks	L2	CO1
	b)	Compare hereditary vs acquired ocular conditions identified via family history.	8 Marks	L4	CO1

(OR)

3.	a)	Demonstrate an organized approach to documenting patient history.	8 Marks	L3	CO1
	b)	Apply history-based decision making to choose appropriate clinical tests.	8 Marks	L3	CO1

MODULE-II

4.	a)	Analyze how refractive errors affect visual acuity outcomes.	8 Marks	L4	CO2
	b)	Demonstrate the correct procedure for retinoscopy in clinical practice.	8 Marks	L3	CO2

(OR)

5.	a)	Interpret the findings of pinhole test and their diagnostic value.	8 Marks	L4	CO2
	b)	Outline the steps involved in subjective refraction and justification for each step.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the principles of suppression and tests used to detect it.	8 Marks	L2	CO3
	b)	Outline the clinical protocol for diagnosing accommodative insufficiency.	8 Marks	L2	CO3

(OR)

7.	a)	Elaborate on the significance of vergence facility testing.	8Marks	L2	CO3
	b)	Summarize diagnostic indicators of decompensated heterophoria.	8Marks	L2	CO3

MODULE-IV

8.	a)	Explain the relevance of red reflex examination in clinical screening.	8 Marks	L2	CO4
	b)	Outline the technique of gonioscopy and its diagnostic importance.	8 Marks	L2	CO4

(OR)

9.	a)	Classify lens opacities based on location and type.	8 Marks	L4	CO4
	b)	Evaluate optic nerve head appearance to differentiate glaucomatous vs non-glaucomatous damage.	8 Marks	L4	CO4

MODULE-V

10.	a)	Compare applanation tonometry and non-contact tonometry.	8 Marks	L4	CO5
	b)	Summarize electrophysiological tests used in ocular examination.	8 Marks	L2	CO5

(OR)

11.	a)	Explain the relevance of gonioscopy findings in glaucoma classification.	8 Marks	L2	CO5
	b)	Outline the steps for conducting photo stress recovery test.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. IV Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

DISPENSING OPTICS

[Optometry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What are thermo-setting plastic lenses?	2 Marks	L2	CO1
	b)	Mention different shapes of bifocal.	2 Marks	L1	CO2
	c)	Mention any four different kind coating used in spectacle industry.	2 Marks	L1	CO3
	d)	Name the types of nose bridge.	2 Marks	L1	CO4
	e)	Add note on four points touch method.	2 Marks	L2	CO5
	f)	Mention plastic lens material.	2 Marks	L1	CO1
	g)	Define trifocal lens.	2 Marks	L1	CO2
	h)	Add note on polarized filters.	2 Marks	L2	CO3
	i)	Mention parts of spectacle frame.	2 Marks	L1	CO4
	j)	What is segment height?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	What is round lens? Explain geometrical shapes of lens.	8 Marks	L2	CO1
	b)	Elaborate eight spectacle lens properties.	8 Marks	L2	CO1
		(OR)			
3.	a)	Write note on ANSI.	8 Marks	L2	CO1
	b)	Elaborate labeling guidance for nonprescription sunglasses and its direction of use.	8 Marks	L3	CO1

MODULE-II

4.	a)	Write note on fitting philosophy of bifocal lens.	8 Marks	L2	CO2
	b)	Elaborate troubleshooting of progressive lens problems.	8 Marks	L3	CO2
		(OR)			
5.	a)	Compare bifocal and multifocal glasses.	8 Marks	L3	CO2
	b)	Clarify the process of eliminating visible markings and provide guidance to the wearer during the dispensing procedure.	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain different types of coating applied on spectacle lenses and its importance.	8 Marks	L2	CO3
	b)	Summarize the characteristic of tinted lens.	8 Marks	L3	CO3
		(OR)			
7.	a)	What are the pros and cons of wearing tinted eye lenses?	8Marks	L3	CO3
	b)	Outline the common causes of eye injuries and describe the different types of protective measures to prevent them.	8Marks	L3	CO3

MODULE-IV

8.	a)	Add note on different plastic material used in frame making with its advantages and disadvantages.	8 Marks	L3	CO4
	b)	Compare the availability and popularity of metal and plastic spectacle frames in the Indian market.	8 Marks	L3	CO4

(OR)

9.	a)	Describe four types of gold material used in metal frames.	8 Marks	L2	CO4
	b)	Elucidate four types of nylon and nylon-based materials.	8 Marks	L3	CO4

MODULE-V

10.	a)	How would you verify a finished lens power and axis tolerance and what is the tolerance for error in the sphere and cylindrical as per standards?	8 Marks	L3	CO5
	b)	Explain any four different methods for aligning misaligned spectacles frames.	8 Marks	L3	CO5

(OR)

11.	a)	Explain about riveting and soldering methods.	8 Marks	L2	CO5
	b)	Elaborate procedure binocular pupillary distance measurement and its common difficulties and their solutions.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc.(Allied Sciences) III Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

INSTRUMENTATION IN OPERATION THEATRE

[Anaesthesia & Operation Theatre Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define compressed gas cylinder.	2 Marks	L1	CO1
	b)	What is the purpose of color coding in medical gas cylinders?	2 Marks	L2	CO1
	c)	Define endotracheal tube.	2 Marks	L1	CO2
	d)	List two types of endotracheal tubes.	2 Marks	L1	CO2
	e)	Define the hanger and yoke system in an anesthesia machine.	2 Marks	L1	CO3
	f)	What is the function of a cylinder pressure gauge?	2 Marks	L2	CO3
	g)	Define ECG.	2 Marks	L1	CO4
	h)	What is the normal range for SpO2?	2 Marks	L1	CO4
	i)	Define CSSD.	2 Marks	L1	CO5
	j)	List two cleaning devices used in CSSD.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Define compressed gas cylinders and explain their construction and safety features.	8 Marks	L2	CO1
	b)	Describe the international standards for colour coding of medical gas cylinders with examples.	8 Marks	L2	CO1

(OR)

3.	a)	Explain the operational mechanisms of different types of cylinder valves.	8 Marks	L2	CO1
	b)	Describe the design of the pin index system and how it prevents misconnections.	8 Marks	L2	CO1

MODULE-II

4.	a)	Describe the types of endotracheal tubes used in anesthesia, including RAE and flexo-metallic tubes, and explain their specific applications.	8 Marks	L2	CO2
	b)	Explain the complications associated with endotracheal intubation and discuss preventive measures for each.	8 Marks	L2	CO2

(OR)

5.	a)	Describe the proper use, care, and maintenance procedures for endotracheal tubes in anesthesia practice.	8 Marks	L2	CO2
	b)	Explain the different types of laryngoscopes used in anesthesia, including blade designs and light sources.	8 Marks	L2	CO2

MODULE-III

6.	a)	Describe the components and function of the hanger and yoke system in an anesthesia machine.	8 Marks	L2	CO3
	b)	Explain the operation and importance of the cylinder pressure gauge and pressure regulator in anesthesia machines.	8 Marks	L2	CO3

(OR)

7.	a)	Describe the types of vaporizers used in anesthesia, including their hazards and maintenance requirements.	8 Marks	L2	CO3
	b)	Explain the flow meter assembly in an anesthesia machine and its role in gas delivery.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Describe the principles of ECG monitoring and explain the significance of the P wave, QRS complex, and T wave.	8 Marks	L2	CO4
	b)	Explain the principles of pulse oximetry and discuss the factors that can affect SpO2 readings.	8 Marks	L2	CO4

(OR)

9.	a)	Describe the methods for measuring central and peripheral temperature and explain the clinical significance of each.	8 Marks	L2	CO4
	b)	Explain the principles of end-tidal carbon dioxide (EtCO2) monitoring and its importance in anesthesia.	8 Marks	L2	CO4

MODULE-V

10.	a)	Describe the key instruments and equipment used in CSSD and explain their working principles.	8 Marks	L2	CO5
	b)	Explain the cleaning and decontamination process in CSSD, including devices and methods.	8 Marks	L2	CO5

(OR)

11.	a)	Describe the maintenance and repair procedures for sterilization equipment in CSSD.	8 Marks	L2	CO5
	b)	Explain the operation and applications of a hot air oven for drying and heat sterilization.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc(Allied Sciences) III Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

CONCEPTS OF DISEASE RELATED TO DIALYSIS TECHNOLOGY-I

[Dialysis Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define glomerulonephritis.	2 Marks	L1	CO1
	b)	List two primary glomerular diseases.	2 Marks	L1	CO1
	c)	Define Acute Renal Failure.	2 Marks	L1	CO2
	d)	What are the types of Acute Kidney Injury (AKI)?	2 Marks	L1	CO2
	e)	Define metabolic acidosis.	2 Marks	L1	CO3
	f)	Define respiratory alkalosis.	2 Marks	L1	CO3
	g)	Define balanced diet.	2 Marks	L1	CO4
	h)	What is congestive heart failure?	2 Marks	L1	CO4
	i)	Define polycystic kidney disease.	2 Marks	L1	CO5
	j)	Differentiate between ADPKD and ARPKD.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the pathophysiology of Acute Glomerulonephritis.	8 Marks	L2	CO1
	b)	Describe the clinical features and diagnosis of Rapidly Progressive Glomerulonephritis.	8 Marks	L2	CO1

(OR)

3.	a)	Compare Minimal Change Disease and Focal Segmental Glomerulosclerosis.	8 Marks	L2	CO1
	b)	Explain the etiopathogenesis and management of Membranous Glomerulonephritis.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the definition and etiology of Acute Renal Failure (ARF).	8 Marks	L2	CO2
	b)	Describe the pathophysiology of different types of Acute Renal Failure.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the classification of Acute Renal Failure based on causes.	8 Marks	L2	CO2
	b)	Describe the clinical features and diagnosis of Acute Renal Failure.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the causes and pathophysiology of metabolic acidosis.	8 Marks	L2	CO3
	b)	Describe the clinical features and management of metabolic acidosis.	8 Marks	L2	CO3

(OR)

7.	a)	Explain the causes and pathophysiology of metabolic alkalosis.	8 Marks	L2	CO3
	b)	Describe the clinical features and treatment of metabolic alkalosis.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain the renal function in congestive heart failure.	8 Marks	L2	CO4
	b)	Describe renal involvement in systemic vasculitis.	8 Marks	L2	CO4

(OR)

9.	a)	Explain the renal function changes in liver diseases.	8 Marks	L2	CO4
	b)	Describe the pathophysiology and clinical features of hepatorenal syndrome.	8 Marks	L2	CO4

MODULE-V

10.	a)	Describe the pathophysiology of polycystic kidney disease.	8 Marks	L2	CO5
	b)	Discuss the clinical features of Alport Syndrome.	8 Marks	L2	CO5

(OR)

11.	a)	Explain the congenital anomalies of the kidney.	8 Marks	L2	CO5
	b)	Discuss renal tumors and their management.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc.(Allied Sciences) III Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

CLINICAL PHARMACOLOGY RELATED AOTT- I

[Anaesthesia & Operation Theatre Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Discuss briefly about the concept of 'metabolism of drugs'.	2 Marks	L2	CO1
	b)	Define 'Teratogenicity'.	2 Marks	L1	CO1
	c)	Comment briefly on the 'Calcium channel blockers '.	2 Marks	L3	CO2
	d)	Mention any two agents used in local anesthesia.	2 Marks	L1	CO2
	e)	Define 'Hypertension'.	2 Marks	L3	CO3
	f)	Define 'Preload' discussed in cardiac system.	2 Marks	L1	CO3
	g)	Discuss briefly about the hormone 'Angiotensin-II'.	2 Marks	L2	CO4
	h)	Comment briefly about the contraindications of anticoagulant therapy.	2 Marks	L3	CO4
	i)	What are 'sedatives' and 'anxiolytics'?	2 Marks	L2	CO5
	j)	Prepare a brief note on the management of peri- operative vomiting.	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss in detail about the various 'Adverse effects of drugs'.	8 Marks	L2	CO1
	b)	Prepare a detailed note on the various factors that affect the elimination of a drug.	8 Marks	L3	CO1

(OR)

3.	a)	Prepare a detailed note on: i) Therapeutic Index (TI) ii) Antagonism of drugs.	8 Marks	L3	CO1
	b)	Comment in detail about the various aspects of genetic influence on pharmacological aspects of drugs.	8 Marks	L3	CO1

MODULE-II

4.	a)	Prepare a detailed note on the toxicity of Local anesthetics	8 Marks	L1	CO2
	b)	Prepare a detailed note on the systemic actions of surface anesthetics.	8 Marks	L3	CO2

(OR)

5.	a)	Discuss the drugs used in the management of 'Congestive heart failure'(CHF).	8 Marks	L3	CO2
	b)	Prepare a detailed note about various 'diuretic drugs.	8 Marks	L3	CO2

MODULE-III

6.	a)	Discuss the pharmacological aspects of Beta blockers in various cardiac disorders.	8 Marks	L2	CO3
	b)	Prepare a detailed note on the various neurotransmitters and their clinical implications in different disorders.	8 Marks	L3	CO3

(OR)

7.	a)	Prepare a detailed note on the 'Renin – Angiotensin – Aldosterone (RAA)' Axis.	8 Marks	L3	CO3
	b)	Prepare a detailed note on: i) adrenergic transmission ii) cardiac arrhythmias.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Illustrate the classification of 'anticoagulants' with examples.	8 Marks	L3	CO4
	b)	Comment in detail about the mechanism of action, clinical uses and adverse effects of 'Heparin'.	8 Marks	L3	CO4

(OR)

9.	a)	Illustrate the classification of 'Skeletal muscle relaxants'.	8 Marks	L3	CO4
	b)	Prepare a note on: i) GABA ii) Neuromuscular Junction.	8 Marks	L3	CO4

MODULE-V

10.	a)	Prepare a detailed note on the mechanism of action, therapeutic uses and adverse effects of various Benzodiazepines (BZDs).	8 Marks	L1	CO5
	b)	Prepare a detailed note on the various pharmacological aspects of Thiopentone'.	8 Marks	L3	CO5

(OR)

11.	a)	Comment in detail about the pharmacological profile of 'Propofol'.	8 Marks	L3	CO5
	b)	Prepare a detailed about: i) pre-anesthetic medication ii) Ketamine.	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) II Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

MEDICAL MICROBIOLOGY

[Medical Lab Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Give two differences between microbes and humans.	2 Marks	L1	CO1
	b)	State any two uses of autoclave in a microbiology laboratory.	2 Marks	L1	CO2
	c)	Name the different shapes of bacteria.	2 Marks	L1	CO3
	d)	Write any two uses of transport media.	2 Marks	L2	CO4
	e)	Mention two functions of IgG.	2 Marks	L2	CO5
	f)	What is the principle of a light microscope?	2 Marks	L1	CO1
	g)	Define antiseptic and give one example.	2 Marks	L1	CO2
	h)	Mention two functions of the bacterial capsule.	2 Marks	L2	CO3
	i)	What is anaerobic culture media? Give one example.	2 Marks	L1	CO4
	j)	Write any two ethical guidelines for using laboratory animals.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Demonstrate Pasteur's experiment with Swan necked flask.	8 Marks	L4	CO1
	b)	Discuss the applications, advantages and disadvantages of Phase contrast microscope.	8 Marks	L2	CO1

(OR)

3.	a)	Apply your knowledge of Louis Pasteur's contributions in the field of microbiology.	8 Marks	L3	CO1
	b)	Explain the transmission of infections through inhalation and inoculation.	8 Marks	L3	CO1

MODULE-II

4.	a)	Describe in detail dry heat sterilization with examples of hot air oven and incineration.	8 Marks	L2	CO2
	b)	Explain the types and properties of commonly used disinfectants in clinical microbiology.	8 Marks	L3	CO2

(OR)

5.	a)	Describe the various methods of moist heat sterilization.	8 Marks	L2	CO2
	b)	Discuss filtration as a method of sterilization. Add a note on types of filters and their uses.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the morphological classification of bacteria with neat, labeled diagrams.	8 Marks	L3	CO3
	b)	Compare and contrast Gram-positive and Gram-negative bacterial cell walls with suitable diagrams.	8 Marks	L3	CO3

(OR)

7.	a)	Summarize the acid-fast stain procedure.	8Marks	L2	CO3
	b)	Explain the structure and functions of flagella, pili, and capsules in bacteria.	8Marks	L3	CO3

MODULE-IV

8.	a)	Explain the lag phase, log phase, stationary phase, and phase of decline with suitable diagrams.	8 Marks	L3	CO4
	b)	Evaluate the role of basal, synthetic, and routine media in microbial growth and identification.	8 Marks	L4	CO4

(OR)

9.	a)	Describe enriched, enrichment, and selective media with examples.	8 Marks	L2	CO4
	b)	Explain aerobic culture methods with suitable examples.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain the structure of an antibody with a neat labeled diagram.	8 Marks	L3	CO5
	b)	Compare active and passive immunity with examples.	8 Marks	L3	CO5

(OR)

11.	a)	Explain the ethical principles and guidelines for the use of animals in research.	8 Marks	L3	CO5
	b)	Describe the general care and handling procedures for laboratory animals.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) II Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

CLINICAL MICROBIOLOGY

[Radiology & Imaging Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Name two gaseous disinfectants used for sterilization of operation theaters.	2 Marks	L1	CO1
	b)	Define total count & viable count.	2 Marks	L1	CO1
	c)	Name four methods of transmission of disease.	2 Marks	L1	CO2
	d)	What is enriched media give two example?	2 Marks	L2	CO2
	e)	List four Arboviruses in India.	2 Marks	L1	CO3
	f)	List the post exposure prophylaxis methods followed in Rabies.	2 Marks	L1	CO3
	g)	Name four types of fungal infections occurring in humans.	2 Marks	L1	CO4
	h)	List four antifungal drugs.	2 Marks	L1	CO4
	i)	Define definitive host with example.	2 Marks	L1	CO5
	j)	Write the Infective form & Mode of transmission of Malaria.	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Compare the differences between cell wall of gram positive bacteria & gram negative bacteria.	8 Marks	L4	CO1
	b)	Draw a neat labelled diagram of bacterial cell, add note on bacterial capsule & name the staining methods used for visualizing capsule.	8 Marks	L2	CO1

(OR)

3.	a)	Explain various phases occurring during bacterial growth curve with a diagram.	8 Marks	L2	CO1
	b)	Classify bacteria based on oxygen requirement.	8 Marks	L4	CO1

MODULE-II

4.	a)	Describe the morphology, cultural characteristics, diseases caused & laboratory diagnosis of Neisseria gonorrhoeae.	8 Marks	L1	CO2
	b)	Enumerate the morphology, cultural characteristics, diseases caused & laboratory diagnosis of Salmonella.	8 Marks	L2	CO2

(OR)

5.	a)	Describe Mycobacterium tuberculosis under following headings i) Morphology ii) cultural characteristics iii) diseases caused iv) laboratory diagnosis	8 Marks	L1	CO2

	b)	Describe Staphylococcus aureus under following headings i) Morphology, ii) Cultural characteristics iii) Diseases caused iv) Laboratory diagnosis	8 Marks	L1	CO2

MODULE-III

6.	a)	Define Virus, describe the characteristic features of viruses , name four medically important viruses and diseases caused by it.	8 Marks	L1	CO3
	b)	Enumerate the mode of transmission of HBV add note on risk groups of HBV and preventive measures.	8 Marks	L3	CO3

(OR)

7.	a)	Explain the mode of transmission of Rabies virus. Describe the post exposure prophylaxis to be taken following a dog bite	8 Marks	L2	CO3
	b)	Define opportunistic infections. Name four opportunistic infections occurring in HIV patients. Add note on ART and its uses.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Define subcutaneous mycoses. Explain chromomycosis under i) Agents causing ii) Pathogenesis iii) Lab diagnosis	8 Marks	L1	CO4
	b)	Define Dermatophytosis& Dermatomycosis Describe the fungal infections caused by dermatophytes based on the anatomical position of the body, add note on various samples collected in these diseases.	8 Marks	L1	CO4

(OR)

9.	a)	Define opportunistic infections. List four infections caused by candida, explain the laboratory diagnosis of candida.	8 Marks	L1	CO4
	b)	Explain the mode of transmission, life cycle & laboratory diagnosis of Cryptococcus neoformans.	8 Marks	L2	CO4

MODULE-V

10.	a)	Describe the difference between fertilized and unfertilized eggs of Ascaris, add note on prophylaxis.	8 Marks	L1	CO5
	b)	List the four species causing malaria, explain the life cycle of plasmodium.	8 Marks	L1	CO5

(OR)

11.	a)	Add note on Larva migrans, lifecycle and prophylaxis of Ancylostomaduodenale.	8 Marks	L1	CO5
	b)	Describe the causative agent, Laboratory diagnosis of ofAmoebiasis.	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) II Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

CLINICAL MICROBIOLOGY

[Anaesthesia & Operation Theatre Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	List the contributions of Robert Koch.	2 Marks	L1	CO1
	b)	Who is the father of antiseptic surgery & chemotherapy?	2 Marks	L1	CO1
	c)	Name four methods of transmission of disease.	2 Marks	L1	CO2
	d)	What is enriched media give two example?	2 Marks	L1	CO2
	e)	Discuss the mode of transmission of Hepatitis B virus.	2 Marks	L2	CO3
	f)	Name the vaccines used for Polio.	2 Marks	L1	CO3
	g)	Define Candidemia & Oral trush.	2 Marks	L1	CO4
	h)	List four antifungal drugs.	2 Marks	L1	CO4
	i)	What is Larva migrans?	2 Marks	L2	CO5
	j)	List two differences between male & female worms of Ascaris.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe the contributions of Robert koch? Add note on koch's postulates.	8 Marks	L2	CO1
	b)	Define and classify sterilization. List the chemical disinfectants used in the hospital and describe the disinfection methods followed in ICUs, OT complex, IP, wards.	8 Marks	L1	CO1

(OR)

3.	a)	Define antibody, draw a neat labelled diagram of antibody, add note on IgG.	8 Marks	L1	CO1
	b)	Differentiate cell wall of gram positive bacteria & gram negative bacteria.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the morphology, cultural characteristics, diseases caused & laboratory diagnosis of Streptococcus pneumonia.	8 Marks	L2	CO2
	b)	Name four bacteria causing meningitis, explain the laboratory diagnosis of Neisseria meningitides	8 Marks	L1	CO2

(OR)

5.	a)	Describe the morphology, cultural characteristics, diseases caused & laboratory diagnosis of Corynebacterium diptheriae.	8 Marks	L1	CO2
	b)	Name four sexually transmitted diseases, explain the morphology, diseases caused & prophylaxis of Treponema pallidum	8 Marks	L1	CO2

MODULE-III

6.	a)	Define Virus, describe the characteristic features of viruses , name four medically important viruses and diseases caused by it.	8 Marks	L1	CO3
	b)	Enumerate the mode of transmission of HBV add note on risk groups of HBV and preventive measures.	8 Marks	L2	CO3
		(OR)			
7.	a)	Explain the mode of transmission of Rabies virus. Describe the post exposure prophylaxis to be taken following a dog bite	8 Marks	L2	CO3
	b)	Define opportunistic infections. Name four opportunistic infections occurring in HIV patients. Add note on ART and its uses.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Describe the Laboratory diagnosis of fungal infection. Add note on Woodlamp examination.	8 Marks	L2	CO4
	b)	Explain mycetoma under following headings i) Agents causing ii) Pathogenesis iii) Lab diagnosis iv) Treatment	8 Marks	L2	CO4
		(OR)			
9.	a)	Describe the pathogenesis, diseases caused, treatment & prevention of candida infections.	8 Marks	L2	CO4
	b)	Define subcutaneous mycoses. List various subcutaneous mycoses. Explain mycetoma.	8 Marks	L1	CO4

MODULE-V

10.	a)	Describe the life cycle of Plasmodium in Humans, add note on lab diagnosis of malaria infection.	8 Marks	L2	CO5
	b)	Explain the morphology & lifecycle of Ascaris lumbricoides.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain the mode of transmission, route of entry & life cycle of Entamoeba histolytica.	8 Marks	L2	CO5
	b)	Describe the difference between fertilized and unfertilized eggs of Ascaris, add a note on prophylaxis.	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) II Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

PATHOLOGY

[Anaesthesia & Operation Theatre Technology, Radiology & Imaging Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What do you understand by the term Hypoxia?	2 Marks	L1	CO1
	b)	Identify any two features of hyperplasia.	2 Marks	L1	CO1
	c)	List out cytokines that present in inflammatory response.	2 Marks	L1	CO2
	d)	What is complement system?	2 Marks	L1	CO2
	e)	Define hypersensitivity. Name the four hypersensitivity reactions.	2 Marks	L1	CO3
	f)	What is contact dermatitis?	2 Marks	L1	CO3
	g)	What is syphilis? Write any two causes of it.	2 Marks	L2	CO4
	h)	List out any four environmental pollutants?	2 Marks	L1	CO4
	i)	Recall anisonucleosis.	2 Marks	L2	CO5
	j)	Write any two examples of epithelial tumors.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	What is atrophy? Discuss various causes and types of atrophy	8 Marks	L2	CO1
	b)	Define amyloid. Add brief note amyloidosis with suitable examples.	8 Marks	L3	CO1
		(OR)			
3.	a)	Explain the pathogenesis of ischemic cell injury.	8 Marks	L2	CO1
	b)	Discuss various types of morphology of reversible cell injury.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the pathophysiology of edema, and add a brief note on its different types.	8 Marks	L3	CO2
	b)	Enumerate the fate of acute inflammation.	8 Marks	L2	CO2
		(OR)			
5.	a)	Contrast the systemic effects of chronic inflammation.	8 Marks	L2	CO2
	b)	Elaborate the phages of wound healing.	8 Marks	L2	CO2

MODULE-III

6.	a)	What is AIDS? Explain about etiology, modes of transmission, and diagnosis of AIDS.	8 Marks	L3	CO3
	b)	What are type II hypersensitive reactions? explain its complications	8 Marks	L3	CO3
		(OR)			
7.	a)	What is an innate? Discuss the factors affecting innate immunity.	8 Marks	L2	CO3
	b)	Define immunodeficiency. Explain any two primary immunodeficiency disorders.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain pathogenesis and clinical manifestations of poliomyelitis. Add a note on vaccination.	8 Marks	L1	CO4
	b)	Elaborate the opportunistic pyogenic bacterial infections.	8 Marks	L2	CO4
		(OR)			
9.	a)	Write the difference between "Marasmus and Kwashiorkor".	8 Marks	L2	CO4
	b)	Explain the health hazards tobacco smoking, and its secondary complications.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain the molecular pathogenesis of cancer.	8 Marks	L3	CO5
	b)	Describe the clinical features of benign tumors.	8 Marks	L2	CO5
		(OR)			
11.	a)	What are the different grades of malignant neoplasia? Explain.	8 Marks	L3	CO5
	b)	Elaborate the cytomorphological changes of tumor cell when compared to normal cell.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T II Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

MEDICAL BIOCHEMISTRY - II

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	List out the vitamins involved in the PDH complex.	2 Marks	L1	CO1
	b)	Tabulate the energetics of the TCA cycle.	2 Marks	L2	CO1
	c)	List the ketone bodies.	2 Marks	L1	CO2
	d)	Name the common diagnostic methods used to detect ketosis?	2 Marks	L1	CO2
	e)	Define vitamins.	2 Marks	L1	CO3
	f)	Differentiate between water and fat soluble vitamins.	2 Marks	L2	CO3
	g)	Add a note on the functions of collagen.	2 Marks	L2	CO4
	h)	Name a hormone involved in water balance and where it is produced.	2 Marks	L1	CO4
	i)	Give the normal ranges of 1.Urea 2.Creatinine	2 Marks	L2	CO5
	j)	Name the electrolytes and mention their normal ranges.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Enumerate the steps of aerobic glycolysis.	8 Marks	L2	CO1
	b)	Outline the steps of the krebs cycle.	8 Marks	L4	CO1
		(OR)			
3.	a)	Describe a multienzyme complex with one example.	8 Marks	L2	CO1
	b)	Describe the symptoms of type 1 and type 2 diabetes mellitus.	8 Marks	L2	CO1

MODULE-II

4.	a)	Describe the steps involved in beta oxidation of fatty acids.	8 Marks	L2	CO2
	b)	Explain the disorders of hypercholesterolemia.	8 Marks	L2	CO2
		(OR)			
5.	a)	Summarize how LDL and HDL lipoproteins transport lipids in the body.	8 Marks	L2	CO2
	b)	Describe the role of carnitine in the oxidation of fatty acids.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the role of vitamin A in wald's visual cycle.	8 Marks	L2	CO3
	b)	Describe the deficiency manifestations of vitamin D.	8 Marks	L3	CO3
		(OR)			
7.	a)	Define coenzyme. List four coenzymes and describe their role in enzyme action.	8 Marks	L1	CO3
	b)	Enumerate the functions of ascorbic acid and add a note on scurvy.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Describe the structure of the collagen.	8 Marks	L3	CO4
	b)	Explain the role of proteoglycans in the extracellular matrix.	8 Marks	L3	CO4
		(OR)			
9.	a)	Explain the role of collagen in wound healing.	8 Marks	L2	CO4
	b)	Summarize how cyclic AMP serve as a second messenger in cellular signaling and what are the key steps involved in its activation.	8 Marks	L2	CO4

MODULE-V

10.	a)	Describe the hormonal mechanisms that regulate water and electrolyte balance within the body.	8 Marks	L2	CO5
	b)	Describe the role of gamma-glutamyl transferase (GGT) in LFT	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain the disorders associated with electrolyte balance	8 Marks	L2	CO5
	b)	Classify kidney function tests. Describe any three tests and their clinical importance	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T. II Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

GENERAL AND CLINICAL PHYCHOLOGY

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define 'Psychology'.	2 Marks	L1	CO1
	b)	Discuss briefly about 'Educational Psychology'.	2 Marks	L2	CO1
	c)	Define 'Development'.	2 Marks	L1	CO2
	d)	Discuss briefly about 'Growth'.	2 Marks	L2	CO2
	e)	Discuss briefly about the disorders of attention.	2 Marks	L2	CO3
	f)	Discuss briefly about 'reward' in relation to motivation.	2 Marks	L2	CO3
	g)	Prepare a brief note on the 'frustration-aggression principle'.	2 Marks	L3	CO4
	h)	Define 'Motivation'.	2 Marks	L1	CO4
	i)	Define 'Creativity'.	2 Marks	L1	CO5
	j)	Comment briefly on the 'punishment' according to the behavioral psychology (Operant conditioning).	2 Marks	L3	CO6

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Prepare a detailed note about the different branches of 'Psychology'.	8 Marks	L3	CO1
	b)	Describe the different research methods used in Psychology.	8 Marks	L2	CO1
		(OR)			
3.	a)	Describe the salient features of the 'School of Behaviorism'.	8 Marks	L2	CO1
	b)	Prepare a detailed note about the 'School of Psychoanalysis'.	8 Marks	L3	CO1

MODULE-II

4.	a)	Discuss the role heredity (genetics) on human development.	8 Marks	L2	CO2
	b)	Describe the young age changes in the perspective of development.	8 Marks	L2	CO2
		(OR)			
5.	a)	Prepare a note on the old age changes in the perspective of development.	8 Marks	L3	CO2
	b)	Comment on the 'Nature versus Nurture' debate on human development.	8 Marks	L3	CO2

MODULE-III

6.	a)	Define 'attention' and compare different types of attention.	8 Marks	L3	CO3
	b)	Describe emotional factors affecting the process of attention.	8 Marks	L2	CO3
		(OR)			
7.	a)	Prepare a detailed note about 'Hallucinations'.	8 Marks	L3	CO3
	b)	Prepare a detailed note on the 'gestalt psychology'.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Describe the management of frustration.	8 Marks	L2	CO4
	b)	Define 'frustration' and enumerate the sources of frustration.	8 Marks	L3	CO4
		(OR)			
9.	a)	Illustrate the Abraham Maslow's humanistic theory of "The Hierarchy of Needs".	8 Marks	L3	CO4
	b)	Discuss in detail about the different types of motives.	8 Marks	L2	CO4

MODULE-V

10.	a)	What is problem solving? Explain the concept of problem solving according to psychology.	8 Marks	L2	CO5
	b)	Prepare a detailed note on the 'IQ Testing' methods.	8 Marks	L3	CO5
		(OR)			
11.	a)	What is 'Stress'? Comment on various physical, psychological and social effects of stress.	8 Marks	L3	CO5
	b)	Write in detail on how to manage the stress.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T II Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

PHYSIOLOGY -II

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Draw a neat labelled diagram of synapse.	2 Marks	L3	CO4
	b)	What are ear ossicles?	2 Marks	L3	CO5
	c)	Define impedance matching.	2 Marks	L3	CO5
	d)	Write a few points about poly synaptic reflexes with examples.	2 Marks	L3	CO4
	e)	What are the functions of retina?	2 Marks	L2	CO5
	f)	Add a note on myopia.	2 Marks	L2	CO5
	g)	Mention the enzymes of Gastric juice.	2 Marks	L2	CO1
	h)	What are the various types of bile salts?	2 Marks	L2	CO1
	i)	Mention any two functions of GLUT.	2 Marks	L2	CO2
	j)	Draw a neat labeled diagram of nephron	2 Marks	L2	CO2

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss different types of movements in small intestine	8 Marks	L2	CO1
	b)	Explain the mechanism the HCl formation	8 Marks	L4	CO1
		(OR)			
3.	a)	Add a note on entero-hepatic circulation	8 Marks	L3	CO1
	b)	What is ulcer? Discuss different types of ulcers.	8 Marks	L3	CO1

MODULE-II

4.	a)	Draw a neat labelled diagram of nephron along with its functions.	8 Marks	L2	CO2
	b)	Add a note on renin-angiotensin system	8 Marks	L2	CO2
		(OR)			
5.	a)	Describe the role of kidney in maintain acid-base balance	8 Marks	L2	CO2
	b)	Add a note on renal failure	8 Marks	L1	CO2

MODULE-III

6.	a)	Discuss the functions of estrogen	8 Marks	L2	CO3
	b)	Explain the structure of ovum with a neat labelled diagram	8 Marks	L2	CO3
		(OR)			
7.	a)	Explain the functions of testosterone	8 Marks	L2	CO3
	b)	Discuss in detail about precocious puberty and its types	8 Marks	L2	CO3

MODULE-IV

8.	a)	Define memory and explain various types of memory	8 Marks	L3	CO4
	b)	Describe various types of memory loss	8 Marks	L3	CO4

(OR)

9.	a)	Explain Autonomic nervous system	8 Marks	L3	CO4
	b)	Describe pyramidal tracts with a neat labelled diagram	8 Marks	L3	CO4

MODULE-V

10.	a)	Trace olfactory pathway with a neat labeled diagram	8 Marks	L3	CO5
	b)	Explain various defects of olfactory sensation	8 Marks	L3	CO5

(OR)

11.	a)	Describe the structure of taste bud with a neat labelled diagram	8 Marks	L3	CO5
	b)	Explain the effect of lesions at different levels of visual pathway	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) II Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

HUMAN ANATOMY –II

[Anaesthesia & Operation Theatre Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Name the coverings of kidney.	2 Marks	L1	CO1
	b)	Predict the signs, and symptoms of nephritis.	2 Marks	L3	CO1
	c)	Write any two functions of seminal vesicles.	2 Marks	L2	CO2
	d)	Define ***"Parturition"***.	2 Marks	L1	CO2
	e)	What is a gland? Mention the types of glands with examples.	2 Marks	L2	CO3
	f)	Define exocrine gland, and give examples.	2 Marks	L1	CO3
	g)	List out the types of neuroglial cells.	2 Marks	L2	CO4
	h)	Write the functions of cerebrospinal fluid.	2 Marks	L3	CO4
	i)	Name the papilla present on the tongue.	2 Marks	L1	CO5
	j)	What are "**Brunner's glands"**?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks
5 X 16 = 80 Marks

MODULE-I

2.	a)	Demonstrate the parts of ureter, and its relations.	8 Marks	L2	CO1
	b)	Illustrate the internal features of kidney with a neat labeled diagram.	8 Marks	L3	CO1

(OR)

3.	a)	Discuss in detail about the ligaments of urinary bladder.	8 Marks	L2	CO1
	b)	Name the parts of urinary system, and draw a neat labeled diagram of kidney & nephron.	8 Marks	L1	CO1

MODULE-II

4.	a)	Write a note on blood supply, nerve supply, and applied anatomy of the "***testis***".	8 Marks	L2	CO2
	b)	Explain the structure, parts, and relations of "***vagina***".	8 Marks	L3	CO2

(OR)

5.	a)	Describe the structure of "***spermatozoa***", and "***ovum***" with a neat labeled diagram.	8 Marks	L2	CO2
	b)	Demonstrate the shapes of ***"male urethra"*** at different levels with a diagram.	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain the structure of testis, hormones, functions, and its applied anatomy.	8 Marks	L2	CO3
	b)	Classify types of glands with examples.	8 Marks	L3	CO3

(OR)

7.	a)	Write short notes on sub-mandibular, and sublingual salivary glands with its applied anatomy.	8 Marks	L2	CO3
	b)	What are exocrine glands? Write a short note on any one exocrine gland.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Describe taste pathway, and mention its defects.	8 Marks	L3	CO4
	b)	Name the parts of the brain, and list out the functions of cerebrum.	8 Marks	L1	CO4

(OR)

9.	a)	Write in detail about the ascending tracts of spinal cord.	8 Marks	L3	CO4
	b)	What are the parts of cerebrum? List out the functional areas of cerebrum.	8 Marks	L2	CO4

MODULE-V

10.	a)	Figure out the microscopic structure of cerebrum, and cerebellum.	8 Marks	L2	CO5
	b)	Illustrate the histology of submandibular gland, and sublingual gland with a neat labeled diagram.	8 Marks	L3	CO5

(OR)

11.	a)	Describe the microscopic structure of trachea, and lungs with a neat labeled diagram.	8 Marks	L2	CO5
	b)	Draw the histology of tongue, and parotid gland.	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) II Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

HUMAN PHYSIOLOGY –II

[Anaesthesia & Operation Theatre Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Draw a neatly labeled diagram of spermatozoa.	2 Marks	L3	CO3
	b)	Add a note on Tabes Dorsalis.	2 Marks	L1	CO4
	c)	Add a note on hydrocephalus.	2 Marks	L1	CO4
	d)	What are the functions of the retina?	2 Marks	L3	CO5
	e)	What are the cells present in the olfactory bulb?	2 Marks	L3	CO5
	f)	Draw a neat labeled diagram of ECG waves.	2 Marks	L2	CO1
	g)	Define heart rate and mention its normal value.	2 Marks	L1	CO1
	h)	Write in brief about Cushing's syndrome.	2 Marks	L3	CO2
	i)	Add a note on Myxedema madness.	2 Marks	L1	CO2
	j)	Write the composition of Semen.	2 Marks	L3	CO3

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe different phases of the cardiac cycle.	8 Marks	L1	CO1
	b)	Explain pressure-volume changes during the cardiac cycle.	8 Marks	L2	CO1
		(OR)			
3.	a)	Describe coronary circulation.	8 Marks	L1	CO1
	b)	Define shock and explain various types of shock.	8 Marks	L1	CO1

MODULE-II

4.	a)	Explain the actions and factors regulating parathyroid hormone secretion.	8 Marks	L2	CO2
	b)	Add a note on diabetes mellitus and its types.	8 Marks	L1	CO2
		(OR)			
5.	a)	Describe in detail the actions of cortisol.	8 Marks	L1	CO2
	b)	Add a note on Addison's disease.	8 Marks	L1	CO2

MODULE-III

6.	a)	Explain the development of secondary sexual characters in females.	8 Marks	L2	CO3
	b)	Discuss in detail about milk ejection reflex	8 Marks	L2	CO3
		(OR)			
7.	a)	Discuss the functions of estrogen	8 Marks	L2	CO3
	b)	Explain the structure of ovum with a neatly labeled diagram.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss the functions of the thalamus.	8 Marks	L2	CO4
	b)	Explain thalamic syndrome.	8 Marks	L2	CO4
		(OR)			
9.	a)	Define memory and explain various types of memory.	8 Marks	L1	CO4
	b)	Describe various types of memory loss.	8 Marks	L1	CO4

MODULE-V

10.	a)	Discuss the refractive errors.	8 Marks	L2	CO5
	b)	Add a note on various types of glaucoma's.	8 Marks	L3	CO5
		(OR)			
11.	a)	Trace taste pathway with a neat labeled diagram.	8 Marks	L3	CO5
	b)	Explain defects associated with taste sensation	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.P.T. II Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

ADVANCED PHYSIOTHERAPEUTIC - II

[Neurology, Cardiology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What are the advantages of free exercise?	2 Marks	L3	CO1
	b)	How the Ballistic stretching differ from static stretching?	2 Marks	L1	CO1
	c)	What is acute and chronic pain?	2 Marks	L2	CO2
	d)	Contrasting features of subluxation and dislocation.	2 Marks	L3	CO2
	e)	Assess homans sign.	2 Marks	L4	CO3
	f)	Differentiate pitting oedema and non-pitting oedema.	2 Marks	L3	CO3
	g)	Name the four theories of motor control.	2 Marks	L1	CO4
	h)	Add a note on variation in the center of gravity (COG) during the third trimester of pregnancy.	2 Marks	L2	CO4
	i)	What is taping, and write any two effects of taping?	2 Marks	L2	CO5
	j)	Discuss any two effects of deep friction massage.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss the progression of physiotherapy treatment at different stages of healing.	8 Marks	L2	CO1
	b)	Explain the types of movements in human beings with proper examples.	8 Marks	L2	CO1

(OR)

3.	a)	What is hydrotherapy ,and write about physical properties of water.	8Marks	L2	CO1
	b)	Define is repetitive maximum (RM). Explain Progressive resistance exercise protocols for strengthening.	8Marks	L1	CO1

MODULE-II

4.	a)	Sketch therapeutic approach towards a 25-year-old female tennis player complains of pain in the right lateral epicondyle from the last three months.	8Marks	L3	CO2
	b)	Relate is the therapeutic approach for sub-acute supraspinatus tendinitis.	8 Marks	L3	CO2

(OR)

5.	a)	What is physiotherapy? how physiotherapist can improve the quality-of-life post-surgery.	8Marks	L2	CO2
	b)	Difference between sprain and strain and add a note on physiotherapy treatment for both.	8 Marks	L3	CO2

MODULE-III

6.	a)	How can coughing technique help in the management of respiratory disorder.	8 Marks	L2	CO3
	b)	Interpret the different types of exercise that can improve lung function in obstructive lung disease.	8 Marks	L2	CO3

(OR)

7.	a)	What is postural drainage ,and how does it work?	8 Marks	L2	CO3
	b)	Memorize the respiratory muscles and add a note on strengthening of the respiratory muscles.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Describe the physiotherapy assistance in the management of postpartum depression, anxiety, and stress.	8 Marks	L2	CO4
	b)	Relate the goals and benefits of physiotherapy in common obstetric conditions that require physiotherapy intervention.	8 Marks	L3	CO4

(OR)

9.	a)	Define nerve flossing. explain the procedure, and effects of median nerve mobilization.	8 Marks	L2	CO4
	b)	Relate the concepts of feedback and feedforward to the different theories of motor control and learning?	8 Marks	L4	CO4

MODULE-V

10.	a)	How can taping be used to prevent, treat or manage plantar fasciitis?	8 Marks	L2	CO5
	b)	What are the pros and cons of taping compared to braces, splints or exercises?	8 Marks	L2	CO5

(OR)

11.	a)	Summarize the main principles and benefits of the mckenzie technique.	8 Marks	L2	CO5
	b)	Explain about Mulligan concept and how does it differ from other manual therapy approaches.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.P.T. II Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

PHYSIOTHERAPY DIAGNOSIS AND CLINICAL DECISION MAKING

[Neurology, Cardiology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Name the types of movements disorders.	2 Marks	L1	CO1
	b)	Write modified ashworth Scale.	2 Marks	L2	CO1
	c)	State strength and endurance.	2 Marks	L2	CO2
	d)	Name any four tests used for flexibility.	2 Marks	L1	CO2
	e)	Define dysphasia.	2 Marks	L1	CO3
	f)	Write any four complications of taping.	2 Marks	L3	CO3
	g)	Define cough.	2 Marks	L1	CO4
	h)	Write any four contraindications of pulmonary function test.	2 Marks	L3	CO4
	i)	Differentiate stride and step length.	2 Marks	L2	CO5
	j)	Name any four adaptive self help devices.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain types of imaging techniques used in musculoskeletal disorders?	8 Marks	L2	CO1
	b)	Outline the pathological and imaging techniques in cardiopulmonary disorders?	8 Marks	L1	CO1

(OR)

3.	a)	What is motor learning and explain various concepts and theories of motor learning?	8 Marks	L2	CO1
	b)	Define lumbar puncture and explain the procedure and complications involved in it.	8 Marks	L2	CO1

MODULE-II

4.	a)	Elaborate isokinetic analyzer.	8 Marks	L2	CO2
	b)	Explain briefly about anthropometric equipment.	8 Marks	L2	CO2

(OR)

5.	a)	Apply your knowledge on body composition assessment.	8 Marks	L3	CO2
	b)	Describe assessment on strength and endurance .	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain about theories of aging.	8 Marks	L2	CO3
	b)	Define dementia and, discuss about physiotherapy assessment.	8 Marks	L3	CO3

(OR)

7.	a)	Discuss about physiological effects, indications and	8 Marks	L3	CO3

		contraindications of taping.			
	b)	Explain determinants of gait and, discuss on gait analysis.	8 Marks	L2	CO3
		MODULE-IV			
8.	a)	Describe ECG and, discuss about electrocardiographic leads.	8 Marks	L2	CO4
	b)	Describe pulmonary function tests and, explain any tests used for evaluation.	8 Marks	L2	CO4
		(OR)			
9.	a)	Mention signs of respiratory distress and ,explain about abnormal breathing pattern.	8 Marks	L2	CO4
	b)	Explain any four Special tests used for cardiopulmonary assessment in physiotherapy.	8 Marks	L2	CO4
		MODULE-V			
10.	a)	Elaborate pulmonary circulation with neat labelled diagram.	8 Marks	L2	CO5
	b)	Illustrate treadmill test and, apply clinical implications of it.	8 Marks	L3	CO5
		(OR)			
11.	a)	Compare coughing and huffing techniques.	8 Marks	L2	CO5
	b)	Differentiate between pulmonary and alveolar ventilation.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) II Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

FUNDAMENTALS OF MEDICAL PHYSICS AND ELECTRONICS

[Anaesthesia & Operation Theatre Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define p-type and n-type semiconductors	2 Marks	L1	CO1
	b)	What is the Depletion region?	2 Marks	L2	CO1
	c)	Define Boolean'slaw.	2 Marks	L1	CO2
	d)	List the types of gates.	2 Marks	L2	CO2
	e)	Elaborate in brief on laser action.	2 Marks	L1	CO3
	f)	Write short note on semiconductor laser in brief.	2 Marks	L1	CO3
	g)	What is an electric field?	2 Marks	L2	CO4
	h)	State electromagnetic induction.	2 Marks	L1	CO4
	i)	Write briefly magnetic Field.	2 Marks	L1	CO5
	j)	State self-induction.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Classify of types Semiconductor .	8 Marks	L3	CO1
	b)	Discuss in detail on biasing of the transistor.	8 Marks	L2	CO1
		(OR)			
3.	a)	Draw a labelled diagram of half wave rectifier and explain its characteristics	8 Marks	L3	CO1
	b)	Illustrate 1and explain in detail aboutfull wave rectifier with efficiency.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain sum of products and product of sums.	8 Marks	L2	CO2
	b)	Elobarate on ideal characteristics of Op-Amp.	8 Marks	L2	CO2
		(OR)			
5.	a)	Describe the laws of Boolean algebra.	8 Marks	L2	CO2
	b)	Explain De Morgan's Theorem.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain types of laser.	8 Marks	L2	CO3
	b)	Elaborate on medical applications of Lasers.	8 Marks	L2	CO3
		(OR)			
7.	a)	Describe population and population inversion.	8 Marks	L2	CO3
	b)	Apply your knowledge onLaser pumping and Lasing action.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Describe electromotive force(emf).	8 Marks	L1	CO4
	b)	Explain about Ohms law.	8 Marks	L2	CO4
		(OR)			
9.	a)	Describe the electric field and electric lines of force.	8 Marks	L2	CO4
	b)	Explain the working principle of a capacitor.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain magnetic induction and magnetic flux.	8 Marks	L2	CO5
	b)	Elaborate on direction of magnetic field and current.	8 Marks	L1	CO5
		(OR)			
11.	a)	Describe electromagnetic induction	8 Marks	L1	CO5
	b)	Summarize onlaws of mutual induction	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) II Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

RADIOLOGICAL PHYSICS

[Radiology & Imaging Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	State Electromagnetic spectrum, and its components.	2 Marks	L1	CO1
	b)	Draw Bohr's atomic structure, and label.	2 Marks	L1	CO1
	c)	Write in brief about capacitor.	2 Marks	L1	CO2
	d)	Name any four advantages of capacitors.	2 Marks	L2	CO2
	e)	Elaborate in brief on forenhiet scale.	2 Marks	L1	CO3
	f)	State newtons law of cooling.	2 Marks	L1	CO3
	g)	State how heat dissipation in both stationary and rotating X-ray tubes.	2 Marks	L1	CO4
	h)	What is the line focus principle?	2 Marks	L2	CO4
	i)	Draw the neat diagram of X-ray tube?	2 Marks	L2	CO5
	j)	Why rotatory anode x ray tube used instead of stationary anode x ray tube?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Compare and elaborate ionizing and non-ionizing radiation.	8 Marks	L3	CO1
	b)	Describe electromagnetic spectrum with diagram.	8 Marks	L2	CO1
		(OR)			
3.	a)	Prepare notes on: i) Isotopes ii) Isobars iii) Isotones	8 Marks	L2	CO1
	b)	Elaborate t on: i) Cosmic radiation ii) Terrestrial radiation iii) Internal exposure iv) Radon and thoron	8 Marks	L2	CO1

MODULE-II

4.	a)	List the: i) Electrical charge ii) Coulomb's inverse square law	8 Marks	L2	CO2
	b)	Explain conductors, Insulators and semiconductors.	8 Marks	L2	CO2

(OR)

5.	a)	Elaborate on semiconductors.	8 Marks	L2	CO2
	b)	Add a note on: i) Electrical potential energy ii) Electric flux iii) Gauss's law	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain temperature, and its types of scales.	8 Marks	L2	CO3
	b)	Describe heat, and modes of transfer of heat.	8 Marks	L2	CO3

(OR)

7.	a)	Write in detail on: i) Conduction ii) Convection iii) Radiation	8 Marks	L2	CO3
	b)	Elaborate on following: i) Perfect black body. ii) Heat Radiation. iii) Stefan's law.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Apply your knowledge on Properties of X-rays.	8 Marks	L3	CO4
	b)	Elaborate on following X ray tube parts: i) Cathode ii) Anode	8 Marks	L1	CO4

(OR)

9.	a)	Describe characteristic radiation.	8 Marks	L2	CO4
	b)	Discuss in detail on Bremsstrahlung radiation.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain Crook's and Coolidge tube.	8 Marks	L2	CO5
	b)	Describe stationary anode X-ray tube.	8 Marks	L2	CO5

(OR)

11.	a)	Apply your knowledge on tube rating charts.	8 Marks	L3	CO5
	b)	Explain conventional X ray tubes.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) II Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

FUNDAMENTALS OF RADIOLOGY AND RADIATION PROTECTION

[Radiology & Imaging Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Write a brief note on BARC.	2 Marks	L2	CO1
	b)	What are the full forms of WHO and NCRP?	2 Marks	L2	CO1
	c)	Mention any four uses of GM counter.	2 Marks	L2	CO2
	d)	What is the full form of PMT?	2 Marks	L2	CO2
	e)	Prepare a note on LET.	2 Marks	L3	CO3
	f)	Mention any four points about mobile lead barrier.	2 Marks	L1	CO3
	g)	Which material used for making of back side of the cassette.	2 Marks	L2	CO4
	h)	List out any four functions of cassette.	2 Marks	L3	CO4
	i)	Which is the active layer of intensifying screen?	2 Marks	L2	CO5
	j)	List out accessories requires for good image quality in X-ray unit.	2 Marks	L3	CO6

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Define MPD and explain dose limits recommended by ICRP?	8 Marks	L2	CO1
	b)	Describe i) Radioactivity ii) LET	8 Marks	L3	CO1

(OR)

3.	a)	Explain in detail on Atomic energy regulatory board?	8 Marks	L2	CO1
	b)	Outline: i) Exposure ii) KERMA iii) Absorbed dose iv) 4. SIE	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain principles of Radiation monitoring devices?	8 Marks	L2	CO2
	b)	What are the advantages and disadvantages of Film badge, Pocket dosimeter & TLD badge?	8 Marks	L2	CO2

(OR)

5.	a)	Explain quartz fiber electroscope.	8 Marks	L2	CO2
	b)	Add a long note on radiation survey meters?	8 Marks	L2	CO2

MODULE-III

6.	a)	Add a long note on i) Lead apron ii) Thyroid collar iii) Gonad shield	8 Marks	L2	CO3
	b)	Summarize i) Lead vests ii) Mobile lead barrier iii) Lead curtains	8 Marks	L3	CO3

(OR)

7.	a)	As a Radiation technologist, in which way you protect from radiation?	8 Marks	L3	CO3
	b)	Demonstrate latent image formation in X-ray film.	8 Marks	L4	CO6

MODULE-IV

8.	a)	Apply your knowledge on exposure switching and timing systems.	8 Marks	L3	CO4
	b)	Write in detail on parameters used in different X-ray techniques.	8 Marks	L2	CO4

(OR)

9.	a)	Draw and explain the diagram of Automatic exposure control with high frequency X-ray generator.	8 Marks	L3	CO4
	b)	Draw the characteristic curve with a proper explanation.	8 Marks	L3	CO5

MODULE-V

10.	a)	What is the definition of Radiographic cassette and explain care & management of cassette during procedures?	8 Marks	L2	CO5
	b)	Mention the types of cassettes.	8 Marks	L2	CO5

(OR)

11.	a)	Discuss in detail on i) Quantum detection efficiency ii) Conversion efficiency iii) Speed of a screen.	8 Marks	L3	CO6
	b)	How the following characteristics influenced in Intensifying screen - i) Noise ii) Spatial resolution iii) Speed	8 Marks	L2	CO6

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc(Alled Sciences) III Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

X-RAY POSITIONING TECHNIQUES

[Respiratory Therapy Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define Centering. Add a note on centering of chest X-ray lateral view.	2 Marks	L2	CO1
	b)	What is the centering of vonrosen's view?	2 Marks	L2	CO2
	c)	Draw the diagram of pelvis AP view position.	2 Marks	L4	CO2
	d)	Identify the X-ray parameters of leg AP view of patient with age 26yrs, weight 55 Kgs, and height 159 cms.	2 Marks	L3	CO3
	e)	Name the X-ray parameters of right thigh lateral view of patient with age 45yrs, weight 76 Kgs, and height 162 cms.	2 Marks	L2	CO3
	f)	List out any two radiation monitoring devices used in O.T radiography.	2 Marks	L1	CO4
	g)	Identify the X-ray parameters of B/S chest lateral view of patient with age 25yrs, weight 50 Kgs, and height 170 cms.	2 Marks	L3	CO4
	h)	What is the wisdom tooth?	2 Marks	L2	CO5
	i)	Draw the diagram of teeth.	2 Marks	L2	CO5
	j)	Mention any four indications of lumbar spine lateral view?	2 Marks	L2	CO6

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Write in detail on the indications, contraindications, preparation, and positioning with a proper diagram, centering, and technique of neck lateral X-ray view?	8 Marks	L2	CO1
	b)	Differentiate chest X-ray PA and AP view positioning with a proper diagram?	8 Marks	L4	CO1

(OR)

3.	a)	Explain in detail about chest X-ray PA view.	8 Marks	L4	CO1
	b)	Discuss in detail the radiological anatomy of chest.	8 Marks	L4	CO1

MODULE-II

4.	a)	What is KUB X ray? Explain patient preparation of KUB X-ray.	8 Marks	L2	CO2
	b)	Explain the positioning of supine and lateral decubitus view of the abdomen with a properdiagram.	8 Marks	L2	CO2

(OR)

5.	a)	Summarize the indications, contraindications, preparation, and positioning with a proper diagram, centering, and techniqueof frog's view.	8 Marks	L4	CO2
	b)	Write in detail on K-wire, ORIFs and tension band wirings.	8 Marks	L2	CO6

MODULE-III

6.	a)	Explain the indications, contraindications, preparation, and positioning with a proper diagram, centering, and technique of leg AP X-ray view.	8 Marks	L2	CO3
	b)	Write long notes on the indications, contraindications, preparation, and positioning with a proper diagram, centering, and technique of ankle joint lateral X-ray view.	8 Marks	L2	CO3

(OR)

7.	a)	Explain the indications, contraindications, preparation, and positioning with a proper diagram, centering, and technique of hand oblique X-ray view.	8 Marks	L2	CO3
	b)	Write in detail on the trauma orthopedic surgery.	8 Marks	L2	CO6

MODULE-IV

8.	a)	Summarize the indications, contraindications, preparation, and positioning with a proper diagram, centering, and technique of Lumbar spine lateral extension X-ray view.	8 Marks	L4	CO4
	b)	Discuss the indications, contraindications, preparation, and positioning with a proper diagram, centering, technique of cervico-dorsal X-ray AP view.	8 Marks	L2	CO4

(OR)

9.	a)	Describe the indications, contraindications, preparation, and positioning with a proper diagram, centering, and technique of Submetovertical view of the skull.	8 Marks	L3	CO4
	b)	Summarize the indications, contraindications, preparation, and positioning with a proper diagram, centering, and technique of fractured femur lateral view.	8 Marks	L4	CO6

MODULE-V

10.	a)	Write in detail discussion on indications, positioning with a proper diagram, and technique of panoramic radiography.	8 Marks	L2	CO5
	b)	Summarize the indications, positioning with a proper diagram, and technique of cephalometry radiography.	8 Marks	L4	CO5

(OR)

11.	a)	Explain types of teeth with a proper diagram.	8 Marks	L2	CO5
	b)	Summarize the indications, contraindications, preparation, and positioning with a proper diagram, centering, and technique of fractured femur AP view.	8 Marks	L4	CO6

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) II Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

OCULAR BIOCHEMISTRY

[Optometry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Mention the thickness of the stomal bed and its clinical importance.	2 Marks	L1	CO1
	b)	Prepare note on chemical composition of tears.	2 Marks	L2	CO2
	c)	Mention the reason for galactitol accumulation in galactosemic Patients.	2 Marks	L1	CO3
	d)	Name the types of Photopigments present in cones.	2 Marks	L1	CO4
	e)	Mention the importance of IRBP.	2 Marks	L1	CO5
	f)	Add note on the oxygen supply in the cornea.	2 Marks	L2	CO1
	g)	Mention a specific component of the tear film that helps protect the ocular surface.	2 Marks	L1	CO2
	h)	What is the lenticular source and concentration of carbohydrates?	2 Marks	L2	CO3
	i)	Mention the types of Colorblindness.	2 Marks	L2	CO4
	j)	Define IPM.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the reason for corneal Hypoxia and related complications.	8 Marks	L2	CO1
	b)	Discuss about Stromal swelling pressure and its effect.	8 Marks	L2	CO1
		(OR)			
3.	a)	What are the products and the metabolic waste produced during glycolysis?	8 Marks	L2	CO1
	b)	What are Stromal proteoglycans and their role in the cornea?	8 Marks	L2	CO1

MODULE-II

4.	a)	Write note on any four causes non Sjogren's syndrome.	8 Marks	L2	CO2
	b)	Elaborate tear film breakup time, blink induction period, and maximum blink interval.	8 Marks	L3	CO2
		(OR)			
5.	a)	Write detailed notes on tear film proteins and their clinical relevance.	8 Marks	L2	CO2
	b)	Explain the Schirmer I and Schirmer II tests—procedure, interpretation, and limitations.	8 Marks	L3	CO2

MODULE-III

6.	a)	What is mean by lens transparency? And discuss the role of lens protein in maintaining lens transparency.	8 Marks	L2	CO3
	b)	Explain the role of environmental factors, such as UV radiation and dietary habits in the biochemical properties of the lens and cataract formation.	8 Marks	L3	CO3

(OR)

7.	a)	Summarize the soluble and non-soluble lens proteins.	8Marks	L2	CO3
	b)	Elaborate proteins and carbohydrates present in the Crystalline lens.	8Marks	L3	CO3

MODULE-IV

8.	a)	Discuss the differences in phototransduction mechanisms between rods and cones.	8 Marks	L3	CO4
	b)	Explain the chemical nature and molecular composition of iodopsin.	8 Marks	L4	CO4

(OR)

9.	a)	What are the two primary photopigments involved in the visual process and explain the process in detail?	8 Marks	L2	CO4
	b)	Explain the key stages in the visual cycle, specifically focusing on the bleaching of Rhodopsin.	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss retinal neurotransmitter recycling mechanisms and their function.	8 Marks	L2	CO5
	b)	Elaborate on the impact of oxidative stress and the role of antioxidants in retinal degeneration disorders.	8 Marks	L3	CO5

(OR)

11.	a)	Classify the types of neurotransmitters present in the retina.	8 Marks	L4	CO5
	b)	Describe the relationship between the metabolism of photoreceptor cells and their ability to respond to varying light conditions.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. III Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

GEOMETRICAL OPTICS - II

[Optometry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Give the SI unit of vergence.	2 Marks	L1	CO1
	b)	Define a schematic eye.	2 Marks	L1	CO2
	c)	How can spherical ametropia be corrected?	2 Marks	L2	CO3
	d)	When does the amplitude of accommodation decrease?	2 Marks	L2	CO4
	e)	State the function of aperture stop in an optical system.	2 Marks	L1	CO5
	f)	List the factors affecting vergence.	2 Marks	L1	CO1
	g)	Name the types of schematic eyes used in optics.	2 Marks	L1	CO2
	h)	Who introduced the concept of dioptric power?	2 Marks	L1	CO3
	i)	Where does the image form in an aphakic eye?	2 Marks	L2	CO4
	j)	What is the difference between entrance and exit pupils?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Interpret the relationship between vergence, object distance, and focal length.	8 Marks	L3	CO1
	b)	Calculate the vergence change when light passes through a convex lens.	8 Marks	L3	CO1

(OR)

3.	a)	Apply the mirror formula to find the image position for a concave mirror.	8 Marks	L3	CO1
	b)	Solve numerical examples based on lens maker's formula.	8 Marks	L3	CO1

MODULE-II

4.	a)	Describe the components of Gullstrand's schematic eye.	8 Marks	L2	CO2
	b)	Explain the optical importance of reduced eyes in vision study.	8 Marks	L2	CO2

(OR)

5.	a)	Contrast Listing's and Donder's reduced eyes.	8 Marks	L2	CO2
	b)	Summarize the clinical uses of schematic eyes.	8 Marks	L2	CO2

MODULE-III

6.	a)	Examine the optical causes of anisometropia.	8 Marks	L4	CO3
	b)	Classify refractive errors based on image formation.	8 Marks	L4	CO3

(OR)

7.	a)	Outline the method to compute angular magnification for aphakia.	8 Marks	L4	CO3
	b)	Analyze the relation between spectacle correction and retinal image size.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Diagram the accommodation mechanism of the eye.	8 Marks	L3	CO4
	b)	Assess the effectiveness of bifocals in restoring near vision.	8 Marks	L4	CO4
		(OR)			
9.	a)	Measure amplitude of accommodation using the push-up method.	8 Marks	L4	CO4
	b)	Evaluate the clinical significance of accommodation testing.	8 Marks	L4	CO4

MODULE-V

10.	a)	Illustrate spherical and chromatic aberrations with diagrams.	8 Marks	L3	CO5
	b)	Use ray tracing to identify coma and distortion.	8 Marks	L3	CO5
		(OR)			
11.	a)	Demonstrate how field curvature affects image formation.	8 Marks	L3	CO5
	b)	Determine the location of aperture stops in optical systems.	8 Marks	L3	CO5

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Reg. No.

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. III Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

OCULAR PHYSIOLOGY

[Optometry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	List the components of the near reflex triad.	2 Marks	L1	CO1
	b)	Write any two functions of the tear film.	2 Marks	L1	CO2
	c)	What is form sense?	2 Marks	L1	CO3
	d)	Add brief note on Nagal's anomaloscope.	2 Marks	L2	CO4
	e)	What is Arden ratio?	2 Marks	L2	CO5
	f)	Write any two physiological functions of the cornea.	2 Marks	L1	CO1
	g)	What are the extraocular muscles supplied by the third cranial nerve.	2 Marks	L1	CO2
	h)	Add note on Minimum separable resolution.	2 Marks	L1	CO3
	i)	List any four abnormal findings in an EOG.	2 Marks	L1	CO4
	j)	What is meant by amplitude and latency?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss how corneal hydration effects corneal transparency.	8 Marks	L2	CO1
	b)	Describe the anterior and posterior chambers of the eye with a diagram.	8 Marks	L2	CO1

(OR)

3.	a)	Name the layers of the retina from anterior to posterior, and write one function of each layer.	8 Marks	L2	CO1
	b)	Elaborate the functions of aqueous humor.	8 Marks	L3	CO1

MODULE-II

4.	a)	Enumerate the different types of binocular eye movements.	8 Marks	L2	CO2
	b)	Explain the functions of the tear film.	8 Marks	L2	CO2

(OR)

5.	a)	Summarize how extraocular muscles act as an agonists, antagonist, and synergists with two examples.	8 Marks	L2	CO2
	b)	Write in detail about the retention and redistribution of the tear film.	8 Marks	L3	CO2

MODULE-III

6.	a)	Illustrate the dorsal and ventral pathways using a flow chart.	8 Marks	L2	CO3
	b)	Explain the Physiological activities of given retinal cells: i) Bipolar cells ii) Horizontal cells	8 Marks	L2	CO3

(OR)

7.	a)	Describe different methods of visual acuity test and its clinical importance.	8Marks	L2	CO3
	b)	Illustrate the Vitamin A cycle in a schematic manner, with explanation.	8Marks	L2	CO3

MODULE-IV

8.	a)	Summarize four visual testing methods for infants aged three to six months.	8 Marks	L3	CO4
	b)	Elaborate on the three categories of contrast sensitivity impairment.	8 Marks	L2	CO4

(OR)

9.	a)	Outline the different plates utilized in the Ishihara chart.	8 Marks	L2	CO4
	b)	Explain procedure of D15 color vision test and its interpretation.	8 Marks	L3	CO4

MODULE-V

10.	a)	Prepare brief note on electro-diagnostics of eye.	8 Marks	L3	CO5
	b)	Elucidate concept of blind spot and physiological basis behind it.	8 Marks	L3	CO5

(OR)

11.	a)	Explain the principle and types of electroretinography.	8 Marks	L3	CO5
	b)	Illustrate the relationships among the retina, LGN, and visual cortex using a clear diagram.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc IV Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

MOLECULAR BIOLOGY

[Biotechnology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is DNA?	2 Marks	L1	CO1
	b)	List the major types of RNA.	2 Marks	L1	CO1
	c)	Define DNA replication.	2 Marks	L1	CO2
	d)	Define unidirectional replication.	2 Marks	L1	CO2
	e)	Define transcription	2 Marks	L1	CO3
	f)	Define the strength of a promoter.	2 Marks	L1	CO3
	g)	What is the genetic code?	2 Marks	L1	CO4
	h)	Define translation.	2 Marks	L1	CO4
	i)	Define mutation.	2 Marks	L1	CO5
	j)	Define chemical mutagens.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe the structure of DNA and the different forms it can take.	8 Marks	L2	CO1
	b)	Explain the importance of DNA in living organisms.	8 Marks	L2	CO1

(OR)

3.	a)	Describe the various types A-DNA, B-DNA, and Z-DNA.	9 Marks	L2	CO1
	b)	Describe the various types of RNA and their respective functions in the cell.	7 Marks	L2	CO1

MODULE-II

4.	a)	Write an account of the initiation stage of DNA replication at OriC.	10 Marks	L2	CO2
	b)	Discuss the mechanism of elongation in DNA replication.	6 Marks	L2	CO2

(OR)

5.	a)	Explain the function of DNA ligase in DNA replication	8 Marks	L2	CO2
	b)	Discuss the mechanism of DNA replication termination and the role of ter sequences.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the transcription machinery in prokaryotes..	10 Marks	L2	CO3
	b)	Describe the role of RNA polymerase I, II, and III in eukaryotic transcription.	6 Marks	L2	CO3

(OR)

7.	a)	Explain the structure of ribosomes in prokaryotic and eukaryotic cells.	8 Marks	L2	CO3
	b)	Explain the process of post-transcriptional modification in eukaryotes.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain the process of translation in protein synthesis.	8 Marks	L2	CO3
	b)	Explain post-translational modification of proteins with examples	8 Marks	L2	CO3
		(OR)			
9.	a)	Explain the Lac operon model of gene regulation.	10 Marks	L2	CO4
	b)	Explain the Trp operon model of gene regulation.	6 Marks	L2	CO4

MODULE-V

10.	a)	Describe physical and chemical mutagens.	8 Marks	L2	CO5
	b)	Explain gene mutation and chromosomal mutation with examples.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain spontaneous mutations and induced mutations with examples.	8 Marks	L2	CO5
	b)	Outline the mechanisms of DNA damage and repair.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc IV Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

ADVANCED CHEMISTRY-II

[Biotechnology, Microbiology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Mention any one preparation of hydrocarbon with equation.	2 Marks	L1	CO1
	b)	Write the molecular formula of maleic acid and state its applications.	2 Marks	L1	CO1
	c)	Write the main ore of Iron with formula.	2 Marks	L1	CO2
	d)	What is the process of producing metal powders using pulsed electrical discharge?	2 Marks	L1	CO2
	e)	Mention the Clausius-Clapeyron equation's few key points.	2 Marks	L1	CO3
	f)	Write the equation for the Gibbs Phase Rule.	2 Marks	L1	CO3
	g)	Explain the redox reaction with suitable reaction.	2 Marks	L1	CO4
	h)	What is reference electrode?	2 Marks	L1	CO4
	i)	Write a note on the Metal Organic Frameworks shortly.	2 Marks	L1	CO5
	j)	List out the few benefits of saponification aided by microwaves.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Write about each of the following in detail: i) Ethanamine and ii) propanone	8 Marks	L2	CO1
	b)	Comment on the following of ethanoic acid and ethyl alcohol.	8 Marks	L2	CO1

(OR)

3.	a)	Write a thorough essay about keto-enol tautomerism that includes tautomerism-affecting elements.	8 Marks	L2	CO1
	b)	Explain about the ozonolysis process for alkene conversion.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the processes used to produce metal particles.	8 Marks	L2	CO2
	b)	Discuss the process of turning wolframite into tungsten powder.	8 Marks	L2	CO2

(OR)

5.		State the Ellingham diagram definition, principle, graphical representation and salient features with suitable notations.	16 Marks	L2	CO2

MODULE-III

6.	a)	State the phase equilibrium study of one component system with water as example.	8 Marks	L2	CO3
	b)	Explain phase equilibrium study of one component system with	8 Marks	L2	CO3

sulphur as example

(OR)

7.	a)	Analyze your understanding on phase equilibria and its application in industrial processes with suitable illustration.	8 Marks	L2	CO3
	b)	Explain the thermodynamic derivation of Gibbs phase rule.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss your understanding on theory of potentiometric titrations. Write the Nernst equation and mention its terminology.	8 Marks	L2	CO4
	b)	Enumerate the acid-base titration in detail using an appropriate example.	8 Marks	L2	CO4

(OR)

9.	a)	Give a thorough explanation of the redox titration using an appropriate example.	8 Marks	L2	CO4
	b)	Write about complexometric titration and include an appropriate example.	8 Marks	L2	CO4

MODULE-V

10.		Discuss the sonochemistry and write ultrasonic alternative to iodine of smith reaction.	16 Marks	L2	CO5

(OR)

11.	a)	Discuss steps involved in the methyl benzoate to benzoic acid microwave-assisted reaction in the context of organic chemistry.	8 Marks	L2	CO5
	b)	Explain each of the Water-Hoffmann Elimination's microwave-assisted reactions in the context of organic chemistry.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc IV Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

CLOUD COMPUTING

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is meant by a guest operating system in virtualization?	2 Marks	L2	CO1
	b)	List two benefits of virtualization technology.	2 Marks	L2	CO1
	c)	What is the cloud computing stack?	2 Marks	L2	CO2
	d)	Define hybrid cloud.	2 Marks	L2	CO2
	e)	Explain the term "aggregation" in cloud computing.	2 Marks	L2	CO3
	f)	Define silos in IaaS architecture.	2 Marks	L2	CO3
	g)	What is the role of system images and software play in cloud computing?	2 Marks	L2	CO4
	h)	What is Elastic Compute Cloud (EC2) in AWS?	2 Marks	L2	CO4
	i)	Explain the concept of "security mapping" in a cloud environment.	2 Marks	L2	CO5
	j)	What is the main difference between single-tenant and multi-tenant storage models in cloud computing?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain Microsoft Hyper-V and its features.	8 Marks	L2	CO1
	b)	Describe the steps involved in installing and adding a guest operating system.	8 Marks	L4	CO1

(OR)

3.	a)	Compare and contrast the virtualization technologies Ubuntu, VMware, and Microsoft Hyper-V.	8 Marks	L2	CO1
	b)	Discuss about the architecture and features of Ubuntu's virtualization technology.	8 Marks	L4	CO1

MODULE-II

4.	a)	Compare the different deployment models of cloud computing with examples.	8 Marks	L2	CO2
	b)	Elaborate on the various service models of cloud computing: IaaS, PaaS, and SaaS.	8 Marks	L4	CO2

(OR)

5.	a)	Analyze the role of open standards in cloud computing and their importance in achieving interoperability and portability.	8 Marks	L2	CO2
	b)	What is Saas ?Explain its uses and application with examples?	8 Marks	L4	CO2

MODULE-III

6.	a)	Explore the concept of virtual machine types and Assess the advantages and disadvantages of each approach.	8 Marks	L2	CO3
	b)	Describe the Platform as a Service (PaaS) model. How does it differ from IaaS and SaaS in terms of use cases and benefits?	8 Marks	L4	CO3

(OR)

7.	a)	Define Software as a Service (SaaS) and explain its characteristics. Provide examples to illustrate its real-world applications?	8 Marks	L2	CO3
	b)	Compare and contrast IaaS, PaaS, and SaaS with respect to features, responsibilities, and use cases?	8 Marks	L4	CO3

MODULE-IV

8.	a)	Discuss the process of creating an AWS account and launching an EC2 instance. Explain the role of system images and software configurations.	8 Marks	L2	CO4
	b)	Analyze the advantages and challenges of using AWS for enterprise applications.	8 Marks	L4	CO4

(OR)

9.	a)	Describe the use of system images and software in AWS. How do they simplify instance management?	8 Marks	L2	CO4
	b)	How does AWS ensure scalability and elasticity for cloud-based applications? Provide examples of services that support these features.	8 Marks	L4	CO4

MODULE-V

10.	a)	Explain the concept of "brokered cloud storage access." How does it enhance data security in cloud storage environments?	8 Marks	L2	CO5
	b)	Discuss the challenges associated with securing cloud environments. How can organizations mitigate these risks.	8 Marks	L2	CO5

(OR)

11.	a)	Explain the importance of auditing and compliance in cloud environments. Discuss tools and strategies used for effective auditing.	8 Marks	L2	CO5
	b)	What are identity protocol standards? Discuss their role in establishing identity and presence in cloud computing.	8 Marks	L4	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc (Allied Sciences) II Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

INSTRUMENTATION IN RESPIRATORY TECHNOLOGY

[Respiratory Therapy Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Give a brief note on oxygen concentrater.	2 Marks	L1	CO1
	b)	Define liquid O2.	2 Marks	L1	CO1
	c)	Mention the color coding for medical air and vaccum.	2 Marks	L2	CO2
	d)	What is H type of O2 cylinder?	2 Marks	L1	CO2
	e)	Write a brief note on artificial airway.	2 Marks	L2	CO3
	f)	What is an ET cuff fixation?	2 Marks	L2	CO3
	g)	Write any two advantage of a manual resuscitator.	2 Marks	L2	CO4
	h)	Calculate tidal volume for 58 kgs of a patients weight?	2 Marks	L2	CO4
	i)	List out all the sizes of a CPAP face mask.	2 Marks	L1	CO5
	j)	Mention the PH value for respiratory acidosis.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe "Alarms", list out the various alarm system in a hospital.	8 Marks	L2	CO1
	b)	Explain the pipeline system in medical ICU,and give its color coding.	8 Marks	L2	CO1

(OR)

3.	a)	What is a compressed gas?.Mention its uses.	8 Marks	L2	CO1
	b)	Enumerate O2 delivery system.	8 Marks	L2	CO1

MODULE-II

4.	a)	Table down the hazards and precautions, for CO in a pulmonary diagnostic lab .	8 Marks	L3	CO2
	b)	Paraphrase the protocol based on O2 delivery practices.	8 Marks	L2	CO2

(OR)

5.	a)	Illustrate the color coding system, for different type of gases used, while doing pulmonary function testing.	8 Marks	L3	CO2
	b)	List out the types of diagnostic test done in pulmonary lab,and why?	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the importance of taking care of nebulizer devices.	8 Marks	L2	CO3
	b)	Draw a diagram of a spacer, and mention its uses.	8 Marks	L3	CO3

(OR)

7.	a)	Discuss airway management.	8 Marks	L2	CO3
	b)	Draw the mallampati diagram, and explain the importance of its scoring.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain the advantages of an intubation.	8 Marks	L2	CO4
	b)	What is aspiration? Write down the causes of aspiration, with example.	8 Marks	L2	CO4

(OR)

9.	a)	Differentiate the advantages and disadvantages of "AMBU".	8 Marks	L2	CO4
	b)	Write down the various O2 devices used in emergency for O2 delivery.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain in brief about the inspiratory and expiratory limb in a mechanical ventilator.	8 Marks	L2	CO5
	b)	What is a Suction machine? Give its uses in a mechanically intubated patient.	8 Marks	L2	CO5

(OR)

11.	a)	Case study :Case study: A 58 years old male heavy smoker, came with complaints of severe cough , breathlessness, dyspnea on exertion, on examination patient has high fever, Spo2 :80%, PR: 72 RR :20, HR: 130 bpm, BP: 142/98mmhg. ABG report was Ph:7.25 , PaCO2 : 62, PaO2:80%, HCO3 :22 i) Do a patient assessment and interpret ABG. ii) How do you manage the desaturation and oxygen titration for the patient.	8 Marks	L4	CO5
	b)	Differentiate invasive and non -invasive mechanical ventilator.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T.& B.Sc (Allied Sciences) II Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

ENVIRONMENTAL SCEINCES

[Bachelor of Physiotherapy, Optometry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What do you mean by eutrophication?	2 Marks	L2	CO1
	b)	Distinguish between metallic and non-metallic minerals.	2 Marks	L4	CO1
	c)	Define biological magnification.	2 Marks	L1	CO2
	d)	What are the major threats to biodiversity?	2 Marks	L2	CO2
	e)	Give an account of soil pollution.	2 Marks	L2	CO3
	f)	List out the various sources of air pollution.	2 Marks	L1	CO3
	g)	What is meant by acid rain?	2 Marks	L1	CO4
	h)	Which are the agents responsible for ozone depletion?	2 Marks	L1	CO4
	i)	What do you mean by 'Birth rate'?	2 Marks	L2	CO5
	j)	Explain the term 'zero population growth'.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Write a long note on multidisciplinary nature of Environment.	8 Marks	L1	CO1
	b)	How does the overgrazing contribute to environmental degradation?	8 Marks	L2	CO1

(OR)

3.	a)	Give an account of non-renewable energy resources.	8 Marks	L1	CO1
	b)	How can you as an individual conserve different natural resources?	8 Marks	L2	CO1

MODULE-II

4.	a)	Classify and explain the aquatic ecosystem.	8 Marks	L4	CO2
	b)	Explain the food chains and food webs, and their significance.	8 Marks	L2	CO2

(OR)

5.	a)	What are hotspots of biodiversity? Where these hotspots found in India? Discuss their salient features.	8 Marks	L1	CO2
	b)	Explain the in-situ and ex-situ conservation of biodiversity.	8 Marks	L2	CO2

MODULE-III

6.	a)	Give an account of the adverse effects of air pollution.	8 Marks	L1	CO3
	b)	Discuss adverse effects and control measures for water pollution.	8 Marks	L1	CO3

(OR)

7.	a)	Discuss various effects and control measures of thermal pollution.	8 Marks	L1	CO3
	b)	Write down the functions of National Disaster Management Authority.	8 Marks	L3	CO3

MODULE-IV

8.	a)	What is rainwater harvesting? What are the purposes served by it?	8 Marks	L1	CO4
	b)	Discuss in detail on various measures for wasteland reclamation and analyze its merits.	8 Marks	L2	CO4

(OR)

9.	a)	Explain the major impacts of acid rain. List and brief the measures to be taken to control it?	8 Marks	L2	CO4
	b)	What are the different methods to propagate environmental awareness in the society?	8 Marks	L3	CO4

MODULE-V

10.	a)	What is meant by 'Population Explosion'? Discuss the Indian scenario.	8 Marks	L1	CO5
	b)	Discuss the family welfare and family planning programs in Indian context.	8 Marks	L2	CO5

(OR)

11.	a)	Discuss about HIV/AIDS, mode of its spread and its effects on environment.	8 Marks	L2	CO5
	b)	What is the role of NMIS, ENVIS and GIS in dissemination of environmental information and environmental management?	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T &B.Sc (Allied Sciences) II Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

BASIC COMPUTERS AND INFORMATION SCIENCES

[Bachelor of Physiotherapy,
Radiology & Imaging Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Explain the need for RAM and differentiate it from ROM.	2 Marks	L1	CO1
	b)	Define a computer.	2 Marks	L2	CO1
	c)	What does the title bar contain?	2 Marks	L2	CO2
	d)	Define mail merge.	2 Marks	L1	CO2
	e)	What is meant by slide transition?	2 Marks	L2	CO3
	f)	What is meant by slide design?	2 Marks	L2	CO3
	g)	Define the Internet.	2 Marks	L2	CO4
	h)	Define a protocol.	2 Marks	L2	CO4
	i)	What is a real-time operating system?	2 Marks	L2	CO5
	j)	List some uses of real-time operating systems.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the role of input devices and describe any three input devices in detail.	8 Marks	L2	CO1
	b)	Explain the concept of memory in a computer system.	8 Marks	L2	CO1

(OR)

3.	a)	Explain the fundamental units of a computer with a block diagram.	8 Marks	L2	CO1
	b)	Elaborate the various input and output devices.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the purpose of mail merge and describe the step-by-step procedure to use it.	8 Marks	L2	CO2
	b)	Describe any four options of the formatting toolbar in detail.	8 Marks	L2	CO2

(OR)

5.	a)	Explain the Word window in detail and describe each of its components.	8 Marks	L2	CO2
	b)	Discuss the different types of indentation.	8 Marks	L2	CO2

MODULE-III

6.	a)	Define conditional formatting and explain it in detail.	8 Marks	L2	CO3
	b)	With a suitable example, explain the uses of any two inbuilt mathematical functions in Excel.	8 Marks	L3	CO3

(OR)

7.	a)	Describe in detail the different components of the PowerPoint window interface.	8 Marks	L2	CO3
	b)	Analyze the significance of transitions and animations in enhancing an electronic presentation.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Define topology and explain the commonly used network topologies.	8 Marks	L2	CO4
	b)	Distinguish between LAN and WAN.	8 Marks	L3	CO4

(OR)

9.	a)	Describe in detail the procedure for creating and accessing an email account.	8 Marks	L1	CO4
	b)	Define the Internet and explain its various applications.	8 Marks	L3	CO4

MODULE-V

10.	a)	Outline the steps involved in installing the Windows operating system.	8 Marks	L2	CO5
	b)	Explain the various functions of an operating system.	8 Marks	L2	CO5

(OR)

11.	a)	Explain the components of an operating system with the help of a neat block diagram.	8 Marks	L2	CO5
	b)	Describe the various operations performed by an operating system.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. I Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

BASIC CLINICAL BIOCHEMISTRY AND ANALYTICS

[Medical Lab Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define medical laboratory technology.	2 Marks	L1	CO1
	b)	Write the SI units for mass, length, and time.	2 Marks	L2	CO2
	c)	What is pH?	2 Marks	L1	CO3
	d)	State Beer's Law and Lambert's Law.	2 Marks	L1	CO4
	e)	Write the principle of paper chromatography.	2 Marks	L2	CO5
	f)	State two ethical responsibilities of a medical laboratory technologist.	2 Marks	L1	CO1
	g)	Define SI unit with one example.	2 Marks	L1	CO2
	h)	Write the Henderson-Hasselbalch equation.	2 Marks	L2	CO3
	i)	Define Colorimetry.	2 Marks	L1	CO4
	j)	List any four types of chromatography.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss in detail the role and scope of medical laboratory technology in modern healthcare.	8 Marks	L2	CO1
	b)	Explain the professional ethics and responsibilities of a laboratory technologist.	8 Marks	L3	CO1

(OR)

3.	a)	Illustrate safety measures in a clinical laboratory with suitable examples.	8 Marks	L3	CO1
	b)	Describe first aid measures for common laboratory accidents such as burns and chemical splashes.	8 Marks	L2	CO1

MODULE-II

4.	a)	Classify the different types of Unit of Measurement used in clinical laboratory.	8 Marks	L4	CO2
	b)	How does an analytical balance work, and what maintenance does it require?	8 Marks	L2	CO2

(OR)

5.	a)	Explain in detail the calibration procedure for a volumetric flask and pipette.	8 Marks	L3	CO2

	b)	Calculate the normality of a solution prepared by dissolving 9.8 g of H_2SO_4 in 250 ml of water. (Equivalent weight of H_2SO_4= 49 g/mol)	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain the principle and working of a pH meter.	8 Marks	L3	CO3
	b)	Define osmosis and describe its types with examples.	8 Marks	L2	CO3
		(OR)			
7.	a)	Write the factors affecting osmotic pressure.	8 Marks	L2	CO3
	b)	Explain Vant Hoff's equation and its application in osmosis.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain the principle and instrumentation of spectrophotometry in detail.	8 Marks	L3	CO4
	b)	Explain the working principle, components, and applications of a colorimeter.	8 Marks	L3	CO4
		(OR)			
9.	a)	Define electrophoresis. Explain its principle and the factors affecting separation of molecules.	8 Marks	L3	CO4
	b)	Describe agarose gel electrophoresis in detail with a labeled diagram and applications.	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss in detail the principle, procedure, and applications of paper chromatography.	8 Marks	L2	CO5
	b)	Describe thin layer chromatography. Write about its principle, procedure, and applications.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain qualitative and quantitative analysis using paper chromatography with illustrations.	8 Marks	L3	CO5
	b)	Describe gas chromatography in detail with neat diagram, working, and applications.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T. I Semester Fasttrack (MBU-22) Regular Examinations April – 2026

MEDICAL BIOCHEMISTRY - I

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Name the key components of the cell membrane.	2 Marks	L1	CO1
	b)	Identify the organelles present in both plant and animal cells.	2 Marks	L1	CO1
	c)	Define aminoacids.	2 Marks	L1	CO2
	d)	Differentiate between fibrous and globular proteins.	2 Marks	L2	CO2
	e)	Tabulate purines and pyramidines.	2 Marks	L1	CO3
	f)	Mention the isoenzyme forms of lactate dehydrogenase.	2 Marks	L2	CO3
	g)	Define calorific value.	2 Marks	L1	CO4
	h)	Mention the normal range for basal metabolic rate in adults.	2 Marks	L2	CO4
	i)	List the enzymes involved in the digestion of carbohydrates.	2 Marks	L1	CO5
	j)	Mention the defects caused by protein absorption.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the fluid mosaic model of the cell membrane.	8 Marks	L2	CO1
	b)	Distinguish between active and passive transport across cell membrane.	8 Marks	L2	CO1

(OR)

3.	a)	Describe the role of ion channels in generating action potentials in neurons.	8 Marks	L2	CO1
	b)	Explain the difference between structural isomers and stereoisomers.	8 Marks	L2	CO1

MODULE-II

4.	a)	Classify aminoacids based on nutritional requirements.	8 Marks	L4	CO2
	b)	Discuss the structure and function of biologically active peptides.	8 Marks	L2	CO2

(OR)

5.	a)	Explain transdeamination and how does it affect aminoacid metabolism?	8 Marks	L2	CO2
	b)	Classify lipoproteins and what are their functions in lipid transport?	8 Marks	L4	CO2

MODULE-III

6.	a)	Describe the factors affecting enzyme activity.	8 Marks	L2	CO3
	b)	Compare and contrast competitive and non-competitive enzyme inhibition.	8 Marks	L5	CO3

(OR)

7.	a)	Describe the effect of enzyme and substrate concentration.	8 Marks	L2	CO3
	b)	Describe the key features of the Watson and Crick model of DNA.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Describe the factors affecting basal metabolic rate.	8 Marks	L2	CO4
	b)	Calculate the energy requirement for a 55 kg person engaging in moderate work.	8 Marks	L3	CO4

(OR)

9.	a)	Tabulate the limiting aminoacids in proteins.	8 Marks	L1	CO4
	b)	Analyze the factors that influence basal metabolic rate and explain how these factors affect individuals.	8 Marks	L4	CO4

MODULE-V

10.	a)	Explain the mechanism of digestion of carbohydrates.	8 Marks	L2	CO5
	b)	Tabulate the main types of glucose transporters in the body.	8 Marks	L1	CO5

(OR)

11.	a)	Summarize the digestion of triacylglycerols.	8 Marks	L2	CO5
	b)	Describe meister cycle.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc IV Semester (MBU-22) (Fasttrack) Regular Examinations, April -2026

ENGLISH FOR PROFESSIONAL

[Bioinformatics, Biotechnology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Frame a Yes/No question for this statement: *"Iron Man created his first suit in a cave."*	2 Marks	L2	CO1
	b)	Mention two ways of identifying main points while listening to a lecture.	2 Marks	L2	CO5
	c)	Fill in the blank with the correct article and justify your answer: The Martians landed on ___ earth in the story.	2 Marks	L2	CO2
	d)	Write two examples of one-word substitutes related to "fear."	2 Marks	L2	CO4
	e)	Write the past tense forms of: discover, understand.	2 Marks	L1	CO2
	f)	What does "information transfer" mean in writing tasks?	2 Marks	L2	CO1
	g)	Mention two technology-based modes of communication used in healthcare and give examples.	2 Marks	L2	CO5
	h)	Correct the pronunciation of the word and indicate the stressed syllable: nutrition /nju:ˈtrɪʃ.ən/.	2 Marks	L2	CO3
	i)	Correct the usage of the modal in the sentence and explain your correction: "Employees can to finish the project on time."	2 Marks	L2	CO2
	j)	What is the purpose of a technical description? Give one example.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Add suitable question tags to the following sentences: i) She is coming to the party, _____? ii) You don't like coffee, _____? iii) They have finished their homework, _____? iv) He can swim very well, _____? v) I am late, _____?	8 Marks	L3	CO1
	b)	Compare and contrast two superhero gadgets and their real-life scientific possibilities.	8 Marks	L2	CO5

(OR)

3.	a)	"Superheroes encourage creativity and imagination." – Write a paragraph expressing your views.	8 Marks	L2	CO5
	b)	Illustrate the importance of non-verbal communication (gestures, expressions, costumes) in superhero films.	8 Marks	L3	CO1

MODULE-II

4.	a)	Describe in detail any fictional alien gadget or technology.	8 Marks	L2	CO5
	b)	Explain how listening for main points is useful in classroom communication.	8 Marks	L3	CO1

(OR)

5.	a)	Write a description of a scientific experiment involving outer space.	8 Marks	L2	CO5
	b)	Prepare a comparative note on written, oral, and visual communication channels.	8 Marks	L2	CO1

MODULE-III

6.	a)	Convert the following passage in present tense into simple past : Ravi goes to the market every morning. He buys fresh vegetables and fruits. He meets his friends there and talks to them. After shopping, he returns home and cooks breakfast for his family	8 Marks	L2	CO2
	b)	Write about any three barriers to communication with examples.	8 Marks	L2	CO1

(OR)

7.	a)	Analyze the trend of major inventions in the 20th century and evaluate their impact on society. Write a paragraph describing your analysis."	8 Marks	L2	CO5
	b)	Explain the significance of polite disagreement in academic and professional settings.	8 Marks	L2	CO5

MODULE-IV

8.	a)	Prepare a mind map from reading a passage on food groups and fill in main/secondary points. Food is divided into different groups based on the nutrients they provide. **Carbohydrates** give the body energy and are found in rice, bread, and cereals. **Proteins** help build muscles and repair tissues; examples include eggs, fish, beans, and nuts. **Fats** provide energy and help in absorbing vitamins; they are present in butter, oils, and nuts. **Vitamins** and **minerals** are essential for good health—vitamin C from oranges boosts immunity, while calcium from milk strengthens bones. **Water** is important for hydration, digestion, and overall body function. Eating a balanced diet from all these groups ensures proper growth, energy, and well-being.	8 Marks	L2	CO5
	b)	Write a process description of preparing a healthy meal or drink (e.g., fruit salad, green tea).	8 Marks	L2	CO1

(OR)

9.	a)	Write a descriptive note on pronunciation problems faced by learners of English words related to health.	8 Marks	L2	CO3
	b)	Write five suggestions to improve the eating habits of college students.	8 Marks	L2	CO1

MODULE-V

10.	a)	Compare the functions of must, should, may, and might in business communication.	8 Marks	L2	CO2
	b)	Write a technical description of a business tool (e.g., projector, accounting software, POS machine).	8 Marks	L2	CO5

(OR)

11.	a)	Write an essay on the significance of women entrepreneurs in modern society.	8 Marks	L2	CO5
	b)	Frame any ten sentences using modal verbs in a business context.	8 Marks	L2	CO2

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. III Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

COMPUTER NETWORK

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List the layers of OSI model.	2 Marks	L1	CO1
	b)	Define multiplexing.	2 Marks	L1	CO1
	c)	What is data link layer?	2 Marks	L1	CO2
	d)	What is Bluetooth?	2 Marks	L1	CO2
	e)	What is IP address?	2 Marks	L2	CO3
	f)	Define routing.	2 Marks	L1	CO3
	g)	What is transport layer?	2 Marks	L1	CO4
	h)	What is email security?	2 Marks	L2	CO4
	i)	What is HTTP?	2 Marks	L1	CO5
	j)	Define URL.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Compare OSI model Vs Internet model.	8 Marks	L3	CO1
	b)	Describe guided and unguided transmission media.	8 Marks	L2	CO1
		(OR)			
3.	a)	Discuss about multiplexing and its types (FDM, TDM, WDM)	8 Marks	L3	CO1
	b)	Explain sampling and it's types of Sampling in Networks.	8 Marks	L2	CO1

MODULE-II

4.	a)	Describe Stop-and-Wait protocol with diagram.	8 Marks	L3	CO2
	b)	Write a short note on backbone networks and VLANs.	8 Marks	L2	CO2
		(OR)			
5.	a)	Explain IEEE 802.11 wireless LANs.	8 Marks	L2	CO2
	b)	Discuss Selective Repeat protocol.	8 Marks	L2	CO2

MODULE-III

6.	a)	What is IP addressing? Compare IPv4 Vs IPv6.	8 Marks	L3	CO3
	b)	Explain Open Shortest Path First(OSPF) routing protocol.	8 Marks	L2	CO3
		(OR)			
7.	a)	Explain in detail about Address Resolution Protocol (ARP) protocol.	8 Marks	L2	CO3
	b)	Describe in detail about Distance Vector Multicast Routing Protocol (DVMRP) protocol.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain about congestion control techniques.	8 Marks	L3	CO4
	b)	Discuss in detail about authentication protocols.	8 Marks	L2	CO4
		(OR)			
9.	a)	Explain briefly about Quality of Service (QoS).	8 Marks	L2	CO4
	b)	Discuss web security techniques.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain client-server architecture.	8 Marks	L3	CO5
	b)	Write a short note on HTTP protocol.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain about DNS and its working with a neat diagram.	8 Marks	L2	CO5
	b)	What is file transfer and access mechanisms? Explain in detail.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc IV Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

INTEGRAL TRANSFORMS

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define a periodic function.	2 Marks	L1	CO1
	b)	Determine the constant term $\frac{a_0}{2}$ in the half-range cosine series of $f(x) = x^2$ in (0,2).	2 Marks	L1	CO1
	c)	State the Fourier integral formula for a function $f(x)$.	2 Marks	L1	CO2
	d)	Write the formula for Fourier Sine and Cosine integral.	2 Marks	L2	CO2
	e)	State Convolution theorem for Fourier Transforms.	2 Marks	L1	CO2
	f)	Define Fourier cosine transform.	2 Marks	L1	CO2
	g)	Find the Laplace transform of $t^2 + 3t + 5$	2 Marks	L1	CO3
	h)	Find the Laplace transforms of $e^{at}\cos(bt)$	2 Marks	L1	CO3
	i)	State the linearity property of the inverse Laplace transform.	2 Marks	L1	CO4
	j)	Find the Inverse Laplace transform of $\frac{1}{s^2 + 2s + 1}$.	2 Marks	L2	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Examine the given function is even or odd and hence obtain Fourier series for the function $f(x) = x^2$ in $(-\pi,\pi)$	8 Marks	L3	CO1
	b)	Find the half range sine series $f(x) = x(\pi - x)$ in $0 < x < \pi$	8 Marks	L3	CO1

(OR)

3.	a)	Find the half range cosine series $f(x) = \sin x$ in $0 < x < \pi$.	8 Marks	L3	CO1
	b)	Find the Fourier series for $f(x) = x - x^2$ in $(-\pi,\pi)$.	8 Marks	L3	CO1

MODULE-II

4.	a)	Find the Fourier sine transform of $f(x) = \frac{e^{-ax}}{x}$	8 Marks	L3	CO2
	b)	Using the Fourier Integral formula, prove that $e^{-x}\cos x = \frac{2}{\pi}\int_0^\infty \frac{\lambda^2 + 2}{\lambda^4 + 4}\cos\lambda x d\lambda$.	8 Marks	L3	CO2

(OR)

5.		Find the Fourier cosine transform of $f(x) = e^{-ax}, a > 0$ and hence deduce the integral $\int_0^\infty \frac{\cos px}{a^2 + p^2}dp$.	16 Marks	L3	CO2

MODULE-III

6.	a)	Find the Fourier transform of $f(x) = e^{\|x\|}$.	8 Marks	L3	CO2
	b)	Find the Fourier transform of $f(x) = \begin{cases} a^2 - x^2, & \|x\| \le a \\ 0, & \|x\| > a \end{cases}$.	8 Marks	L3	CO2

(OR)

7.	a)	Find the Fourier sine transform of $f(x)$ is defined as $f(x) = \begin{cases} \sin x, & 0 < x < a \\ 0, & x \ge a \end{cases}$	8 Marks	L3	CO2
	b)	Find Fourier sine transform for the function $e^{-\|x\|}$.	8 Marks	L3	CO2

MODULE-IV

8.	a)	Evaluate $L[te^{2t}\sin 3t]$	8 Marks	L3	CO3
	b)	Evaluate $L\left[\dfrac{e^{-4t}\sin 3t}{t}\right]$.	8 Marks	L3	CO3

(OR)

9.	a)	Find (i) $L[\sin 2t \cos t]$, (ii) $L[2\sin 2 \sin 3t]$.	8 Marks	L3	CO3
	b)	Evaluate $f(t) = \begin{cases} 0, & 0 < t < 1 \\ (t-1)^2, & t > 1 \end{cases}$	8 Marks	L3	CO3

MODULE-V

10.	a)	Find Inverse Laplace transforms of the following i) $L^{-1}\left[\log\left(\dfrac{s+1}{s-1}\right)\right]$ ii) $L^{-1}\left[\log\left(\dfrac{s+3}{s+4}\right)\right]$	8 Marks	L3	CO4
	b)	By using convolution theorem, find $L^{-1}\left[\dfrac{1}{(s+2)(s+1)}\right]$.	8 Marks	L3	CO4

(OR)

11.	a)	Find the following i) $L^{-1}\left[\dfrac{2}{s} + \dfrac{1}{s^3} + \dfrac{1}{s^4}\right]$ ii) $L^{-1}\left[\dfrac{3s+4}{s^2+16}\right]$.	8 Marks	L3	CO4
	b)	Find the Inverse Laplace transform of the following i) $L^{-1}\left[\dfrac{s-2}{(s-2)^2+8}\right]$ ii) $L^{-1}\left[\dfrac{s^2-3s+4}{s^3}\right]$	8 Marks	L3	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. II Semester Fasttrack (MBU-22) Regular Examinations April – 2026

SOFTWARE ENGINEERING

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is a Software Process?	2 Marks	L1	CO1
	b)	List the difference between process and product?	2 Marks	L2	CO1
	c)	What are Functional Requirements?	2 Marks	L1	CO2
	d)	What is Feasibility Study?	2 Marks	L1	CO2
	e)	What is Design Model?	2 Marks	L1	CO3
	f)	What is UI Design?	2 Marks	L1	CO3
	g)	What is Black Box Testing?	2 Marks	L1	CO4
	h)	Define Software Maintenance.	2 Marks	L1	CO4
	i)	What is LOC estimation?	2 Marks	L1	CO5
	j)	Define RMMM Plan.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain different Software Process Models with examples.	8 Marks	L2	CO1
	b)	Discuss advantages and disadvantages of Agile methodology.	8 Marks	L2	CO1

(OR)

3.	a)	Explain iterative and incremental development approaches.	8 Marks	L2	CO1
	b)	Explain customer collaboration in Agile development.	8 Marks	L2	CO1

MODULE-II

4.	a)	Describe the structure of SRS document.	8 Marks	L2	CO2
	b)	Explain challenges in requirement gathering.	8 Marks	L3	CO2

(OR)

5.	a)	Explain Requirement Validation techniques.	8 Marks	L3	CO2
	b)	Discuss Requirement Management process.	8 Marks	L2	CO2

MODULE-III

6.	a)	Discuss different Architectural Styles.	8 Marks	L3	CO3
	b)	Explain Class-based component design.	8 Marks	L2	CO3

(OR)

7.	a)	Explain Architectural Design and its importance.	8 Marks	L2	CO3
	b)	Explain User Interface Design principles.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain Software Testing fundamentals.	8 Marks	L2	CO4
	b)	Discuss BPR (Business Process Reengineering) model.	8 Marks	L2	CO4

(OR)

9.	a)	Describe Unit Testing and its importance.	8 Marks	L2	CO4
	b)	Discuss Validation and System Testing.	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss role of CASE tools in project management.	8 Marks	L3	CO5
	b)	Describe Risk Management process.	8 Marks	L2	CO5

(OR)

11.	a)	Write a short note on COCOMO I and II models.	8 Marks	L2	CO5
	b)	Explain RMMM Plan with example.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

M.Sc. I Semester Fasttrack (MBU-22) Regular Examinations, April - 2026

INORGANIC CHEMISTRY-I

[Organic Chemistry]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List the strong field and weak field ligands.	2 Marks	L1	CO1
	b)	In an octahedral field how d-orbitals split into two sets.	2 Marks	L1	CO1
	c)	List the factors influence the lability or inertness of a metal complex.	2 Marks	L1	CO2
	d)	Define an anation reaction.	2 Marks	L1	CO2
	e)	Define π bond.	2 Marks	L1	CO3
	f)	Calculate the effective atomic number (EAN) for $Ni(CO)_4$.	2 Marks	L1	CO3
	g)	Discuss the unique position of hydrogen in the periodic table.	2 Marks	L1	CO4
	h)	List the allotropic forms of Carbon.	2 Marks	L1	CO4
	i)	State the bonding in ferrocene.	2 Marks	L1	CO5
	j)	List the examples of alkyl compounds in organometallic chemistry.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	What is the spectrochemical series? Give examples of strong and weak field ligands.	7 Marks	L2	CO1
	b)	What is the nephelauxetic effect? How does it affect the color of complexes?	9 Marks	L2	CO1

(OR)

3.	a)	Draw the MO diagram for an octahedral complex.	10 Marks	L2	CO1
	b)	Explain the Jahn-Teller distortion. When does it occur?	6 Marks	L2	CO1

MODULE-II

4.	a)	Explain the inner sphere and outer sphere mechanisms of electron transfer in coordination complexes.	8 Marks	L2	CO2
	b)	Explain the relationship between the free energy change (ΔG°), reorganization energy, and the rate of electron transfer.	8 Marks	L2	CO2

(OR)

5.	a)	How do Valence Bond Theory and Crystal Field Theory explain the difference between inert and labile metal complexes?	9 Marks	L2	CO2
	b)	What are electron transfer reactions in coordination complexes?	7 Marks	L2	CO2

MODULE-III

6.	a)	Classify π ligands based on their donor and acceptor properties.	8 Marks	L2	CO3
	b)	Discuss the different methods for the synthesis of metal carbonyls.	8 Marks	L2	CO3

(OR)

7.	a)	Describe the role of π ligands in determining the reactivity and	10 Marks	L2	CO3

		stability of metal complexes.			
	b)	Explain the concept of π donor ligands with examples.	6 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss the different allotropes of sulfur and their structures.	7 Marks	L2	CO4
	b)	Discuss the structure and bonding in carbides and their properties.	9 Marks	L2	CO4
		(OR)			
9.	a)	Discuss the structure and bonding in silicates and explain the different types of silicates.	8 Marks	L2	CO4
	b)	Discuss the synthesis, properties, and structures of oxides of non-transition elements.	8 Marks	L2	CO4

MODULE-V

10.	a)	Describe the use of alkyl metal compounds in organic synthesis.	8 Marks	L2	CO5
	b)	Explain the backbonding phenomenon in metal carbonyls.	8 Marks	L2	CO5
		(OR)			
11.	a)	Discuss the applications of metal carbonyls in industrial processes.	8 Marks	L2	CO5
	b)	Compare the isolobal relationship between CO and CH_3^+.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. II Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

FOOD AND NUTRITION

[Biotechnology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is the definition of food?	2 Marks	L1	CO1
	b)	Define nutrition.	2 Marks	L1	CO1
	c)	What is the SI units of energy?	2 Marks	L1	CO2
	d)	Abbreviate BMR.	2 Marks	L1	CO2
	e)	Define nutrients with examples.	2 Marks	L1	CO3
	f)	What are micronutrients give one example?	2 Marks	L1	CO3
	g)	What are macronutrients give one example?	2 Marks	L1	CO4
	h)	What are essential proteins?	2 Marks	L1	CO4
	i)	What are the different food sources of vitamin A?	2 Marks	L1	CO5
	j)	What are the different food sources of vitamin D?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Define food and nutrition. Explain different functions of food.	8 Marks	L2	CO1
	b)	Explain how food helps you psychologically.	8 Marks	L2	CO1
		(OR)			
3.	a)	Write note on food pyramid.	8 Marks	L1	CO1
	b)	What are the five basic food components and its uses?	8 Marks	L1	CO1

MODULE-II

4.	a)	Explain about carbohydrates and its importance.	8 Marks	L2	CO2
	b)	Explain the steps involved in carbohydrates digestion.	8 Marks	L2	CO2
		(OR)			
5.	a)	Explain classification of carbohydrates.	8 Marks	L2	CO2
	b)	Explain how proteins helps in body building.	8 Marks	L2	CO2

MODULE-III

6.	a)	List out four food reach in fats and its uses in digestive system.	8 Marks	L1	CO3
	b)	Name food sources rich in thiamine.	8 Marks	L1	CO3
		(OR)			
7.	a)	Elaborate on the process of protein digestion in the stomach.	8 Marks	L2	CO3
	b)	What are the recommended daily intakes for vitamin B1?	8 Marks	L2	CO3

MODULE-IV

8.	a)	What are the recommended daily intakes fat soluble vitamin?	8 Marks	L1	CO4
	b)	Explain about water soluble vitamin.	8 Marks	L2	CO4
		(OR)			
9.	a)	What are the importance BIM and BMR?	8 Marks	L1	CO4
	b)	What are factors effecting the BMI in pregnant lady?	8 Marks	L1	CO4

MODULE-V

10.	a)	What are essential Fatty acids how does it helps in health?	8 Marks	L1	CO5
	b)	Give a detailed note on lipid profile.	8 Marks	L1	CO5
		(OR)			
11.	a)	Prepare a diet chart for the Athlete.	8 Marks	L2	CO5
	b)	What are the factors effecting BMR?	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. I Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

FUNDAMENTALS OF CRIME, CRIMINOLOGY AND POLICE

[Forensic Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define crime.	2 Marks	L1	CO1
	b)	What is meant by deviance?	2 Marks	L1	CO1
	c)	What is pre-classical school of criminology?	2 Marks	L1	CO2
	d)	Who is considered the founder of classical school?	2 Marks	L1	CO2
	e)	What is organized crime?	2 Marks	L1	CO3
	f)	Define white collar crime.	2 Marks	L1	CO3
	g)	Who introduced the modern police system in India?	2 Marks	L1	CO4
	h)	Define C.I.D.	2 Marks	L1	CO4
	i)	Define investigation.	2 Marks	L1	CO5
	j)	What is an FIR?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the scope and nature of criminology.	6 Marks	L2	CO1
	b)	Compare and contrast crime and deviance in social context.	10 Marks	L2	CO1
		(OR)			
3.	a)	Discuss the historical development of crime definitions.	6 Marks	L2	CO1
	b)	Analyze the evolution of criminological thought across history.	10 Marks	L4	CO1

MODULE-II

4.	a)	Explain the main principles of the pre-classical and classical schools.	6 Marks	L2	CO2
	b)	Analyze the differences between biological and sociological theories of crime.	10 Marks	L4	CO2
		(OR)			
5.	a)	Discuss the contribution of biological positivism to criminology.	6 Marks	L2	CO2
	b)	Evaluate the continuing relevance of the classical school in modern criminology.	10 Marks	L2	CO2

MODULE-III

6.	a)	Explain various types of crimes against persons.	6 Marks	L2	CO3
	b)	Classify crimes based on victim profile and motive.	10 Marks	L2	CO3
		(OR)			
7.	a)	Differentiate between property crime and white-collar crime.	6 Marks	L2	CO3
	b)	Analyze the causes and trends of organized crime in India.	10 Marks	L4	CO3

MODULE-IV

8.	a)	Explain the historical development of police in ancient and medieval India.	6 Marks	L3	CO4
	b)	Analyze the evolution of modern policing in India.	10 Marks	L4	CO4
		(OR)			
9.	a)	Describe the organizational structure of State Police.	6 Marks	L2	CO4
	b)	Compare the roles and responsibilities of line units and staff units.	10 Marks	L2	CO4

MODULE-V

10.	a)	Explain the scope and importance of police investigation.	6 Marks	L2	CO5
	b)	Analyze the legal and ethical dimensions of police investigations.	10 Marks	L4	CO5
		(OR)			
11.	a)	Describe the steps involved in investigating a cognizable offence.	6 Marks	L2	CO5
	b)	Evaluate challenges in maintaining fairness and objectivity during interrogation.	10 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. III Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

BASICS IN DIALYSIS TECHNOLOGY

[Dialysis Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Enlist the emergency indications to start dialysis in a patient with Stage 5 chronic kidneydisease?	2 Marks	L2	CO1
	b)	Define Dialysis Team and the importance of effective relationship.	2 Marks	L2	CO1
	c)	List out all the common veins used for central venous catheters in hemodialysis patients.	2 Marks	L1	CO2
	d)	Name any four complications of permanent vascular access.	2 Marks	L1	CO2
	e)	List the hazards of dialyzer reprocessing.	2 Marks	L1	CO3
	f)	Define High flux dialysis.	2 Marks	L1	CO3
	g)	Define Single pool Kt/V and eKt/V.	2 Marks	L1	CO4
	h)	What modifications can be made to dialysis prescription in order to increase Kt/V?	2 Marks	L2	CO4
	i)	Describe the layers in the Peritoneal dialysis membrane.	2 Marks	L2	CO5
	j)	Mention few advantages of CAPD when compared to HD.	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe detail about the clinical features,pathogenesis and management of AVF stenosis.	8 Marks	L2	CO1
	b)	Explain the principles of peritoneal dialysis.	8 Marks	L2	CO1
		(OR)			
3.	a)	Discuss in detail about the peritoneal cavity.	8 Marks	L2	CO1
	b)	Explain in detail about Home dialysis and its types.	8 Marks	L2	CO1

MODULE-II

4.	a)	List the principles of hemodialysis and explain it.	8 Marks	L2	CO2
	b)	Illustrate various types of Hemodialysis.	8 Marks	L3	CO2
		(OR)			
5.	a)	Summarize the types of disinfection methods of HD machine.	8 Marks	L3	CO2
	b)	Describe the advantages and disadvantages of hemodialysis in detail	8 Marks	L2	CO2

MODULE-III

6.	a)	Discuss elaborately on high flux and high efficiency dialyzers.	8 Marks	L2	CO3
	b)	Demonstrate the process of reuse of dialyzer.	8 Marks	L3	CO3
		(OR)			
7.	a)	Define low flux dialysis. and explain how is it different from low efficiency dialysis?	8 Marks	L3	CO3
	b)	Discuss about the chemicals used in reuse process.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Describe the factors favoring clotting of the extra-corporeal circuit, and signs of clotting in the extra-corporeal circuit.	8 Marks	L3	CO4
	b)	Write in detail on the various heparin based anticoagulation protocols for hemodialysis.	8 Marks	L3	CO4

(OR)

9.	a)	Illustrate Regional Citrate anticoagulation.	8 Marks	L3	CO4
	b)	Discuss about heparin anticoagulation and the monitoring techniques for bleeding tendencies.	8 Marks	L2	CO4

MODULE-V

10.	a)	Analyse the Composition of PD solution.	8 Marks	L3	CO5
	b)	What are the Newer Peritoneal dialysis solutions? Describe their advantages and disadvantages.	8 Marks	L3	CO5

(OR)

11.	a)	Describe the Physiological principles of Peritoneal Dialysis (PD)?	8 Marks	L3	CO5
	b)	Demonstrate in detail about the Exit site care performed?	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. I Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

PERSONALITY DEVELOPMENT

[Biotechnology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define personality analysis.	2 Marks	L1	CO1
	b)	Define decision making in leadership.	2 Marks	L1	CO1
	c)	Explain innate vs. acquired personality traits.	2 Marks	L1	CO2
	d)	State any two benefits of positive self-esteem.	2 Marks	L1	CO2
	e)	Explain action plans.	2 Marks	L1	CO3
	f)	Explain internship benefits.	2 Marks	L1	CO3
	g)	Explain attitude impact on others.	2 Marks	L1	CO3
	h)	Explain e-mail structure.	2 Marks	L1	CO4
	i)	List out the decision-making steps.	2 Marks	L1	CO4
	j)	Define brainstorming.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe Freud's id, ego, and superego with their functions and interactions in personality development.	8 Marks	L2	CO1
	b)	Analyze how positive and negative personality traits can be modified through reinforcement techniques and conditioning.	8 Marks	L3	CO3

(OR)

3.	a)	Compare Freud's psychoanalytic structure with Swamy Vivekananda's Vedantic self-realization approach to personality.	8 Marks	L4	CO3
	b)	Assess the effectiveness of different personality types in diverse team compositions and productivity	8 Marks	L4	CO3

MODULE-II

4.	a)	Discuss the process of building positive self-esteem through self-image enhancement and constructive feedback mechanisms.	8 Marks	L2	CO1
	b)	Illustrate the step-by-step mentoring process with practical examples for self-confidence and goal achievement.	8 Marks	L3	CO3

(OR)

5.	a)	Examine ethical considerations in aptitude testing including fairness, privacy, and misuse prevention in career guidance.	8 Marks	L2	CO2
	b)	Evaluate how repeated failures hinder or catalyse self-actualization with psychological and motivational perspectives.	8 Marks	L4	CO2

MODULE-III

6.	a)	Clarify the conceptual differences between attitudes and behaviors with influencing factors.	8 Marks	L2	CO2
	b)	Show how ethical principles shape workplace attitudes through real-life application scenarios and outcomes.	8 Marks	L3	CO2

(OR)

7.	a)	Explain systematic behavior modification techniques for attitude change.	8 Marks	L2	CO3
	b)	Assess the importance of feedback sensitivity for leadership growth and relationship building in professional contexts.	8 Marks	L4	CO1

MODULE-IV

8.	a)	Describe how informal grapevine communication impacts organizational morale, information flow, and decision-making.	8 Marks	L2	CO3
	b)	Illustrate appropriate selection and use of electronic communication tools.	8 Marks	L3	CO2

(OR)

9.	a)	Discuss structured performance feedback methods that enhance open communication and team player development.	8 Marks	L2	CO4
	b)	Examine how self-righteous attitudes perpetuate destructive grapevine communication patterns in teams.	8 Marks	L2	CO4

MODULE-V

10.	a)	Describe time management techniques for work-life balance.	8 Marks	L2	CO4
	b)	Design a comprehensive personal stress management plan incorporating relaxation, time management, and support systems.	8 Marks	L4	CO4

(OR)

11.	a)	Assess critical work skillseffectiveness in developing ethical leadership capabilities.	8 Marks	L4	CO1
	b)	Evaluate how uncontrolled anger impacts leadership effectiveness and propose anger management strategies for leaders.	8 Marks	L4	CO1

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. I Semester (MBU-22) (Fasttrack) Regular Examinations April – 2026

GENERAL ENGLISH

[Biotechnology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	List the plural forms to the following: i) Company ii) Loaf iii) Delay iv) Quiz	2 Marks	L1	CO3
	b)	Find the vowel sound in the given words. i) Key ii) Odd iii) Whole iv) Light	2 Marks	L1	CO3
	c)	State the meanings to the following words. i) Equilibrium ii) Slur iii) Brooding over iv) Ordeal	2 Marks	L1	CO2
	d)	Recall the content words in the given sentences. i)She has lived in America for three years.ii)They are swimming now.	2 Marks	L1	CO3
	e)	List any two examples for finite verbs.	2 Marks	L1	CO3
	f)	Find verb conjugations for the following words. i) Bear ii) Arise	2 Marks	L1	CO3
	g)	State the passive voice for the give sentences. i) We made wine from grapes. ii) She doesn't like insects.	2 Marks	L1	CO3
	h)	Use the following conjunctions in a sentence. i) Although ii) Either …. or	2 Marks	L3	CO1
	i)	Find the suitable article to fill the blank. i) People with pets often lead …… (A, An, The) healthier life. ii) I want to join ……. (A, An, The) university for higher studies.	2 Marks	L1	CO3
	j)	Find the number of syllables in the given words. i) Week ii) Fundamentality	2 Marks	L1	CO3

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.		Analyze the story 'A Snake in the Grass'.	16 Marks	L2	CO4
		(OR)			
3.	a)	How does the family try to catch a cobra in 'A Snake in the Grass'?	8 Marks	L1	CO1
	b)	What superstitions or rituals are indicated in the story?	8 Marks	L1	CO1

MODULE-II

4.		"Small courtesies play a major role in creating an impression on other people." Explain the statement with reference to the lesson 'On Saying Please'.	16 Marks	L2	CO1
		(OR)			

5.	a)	Discuss the bus conductor's behavior with the passengers.	8 Marks	L2	CO1
	b)	Convert the following sentences into exclamatory sentences. i) He bowls very fast. ii) Sumitra sings melodiously. iii) Srinagar is a very cool place. iv) He brought a surprising gift.	8 Marks	L1	CO3

MODULE-III

6.		Interpret the poem "If You Forget Me" in your own words.	16 Marks	L2	CO4

(OR)

7.	a)	"The poem 'If You Forget Me' describes the nature of unrequited love". Explain.	8 Marks	L2	CO1
	b)	Use appropriate tense form to fill the blanks given. i) She …… in college. (Play) ii) …….. is a great form of exercise. (Run) iii) They …… the seminar scheduled tomorrow. (Attend) iv) I …….. my presentation tomorrow. (Finish)	8 Marks	L2	CO3

MODULE-IV

8.		The activities of terrorists disrupt the regular lives of common people. Explain in the context of 'After the Sunset'.	16 Marks	L2	CO1

(OR)

9.	a)	How do the rich and powerful people treat the poor in the story?	8 Marks	L1	CO1
	b)	Change the given sentences into passive voice. i) He is cleaning the room. ii) I had prepared tea. iii) My father will have bought three pencils. iv) She brought her mother a costly saree.	8 Marks	L1	CO3

MODULE-V

10.		Analyze the significance of the title 'Man's Peril' with reference to the text you read.	16 Marks	L4	CO4

(OR)

11.	a)	Develop a conversation between two friends on advantages and disadvantages of social media.	8 Marks	L3	CO5
	b)	Rewrite the sentences with necessary corrections. i) The idea of having many colleges are nice. ii) The structure of buildings are good. iii) Dal and rice are her regular diet. iv) Neither you nor your sister have seen it.	8 Marks	L3	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. II Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

FUNDAMENTALS OF DIGITAL ELECTRONICS AND LOGIC DESIGN

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Translate $(41.6875)_{10}$ into Binary.	2 Marks	L1	CO1
	b)	Write about 2's complement with examples.	2 Marks	L1	CO1
	c)	Write the Identities applicable to Exclusive–OR function.	2 Marks	L1	CO2
	d)	In four variable K-map, eight adjacent squares represent a term with how many literals	2 Marks	L2	CO2
	e)	Draw the symbol for Multiplexer.	2 Marks	L1	CO3
	f)	Design a 1-bit magnitude comparator circuit.	2 Marks	L3	CO3
	g)	Distinguish Combinational and Sequential Circuits.	2 Marks	L1	CO3
	h)	Tabulate the Excitation Table for JK-Flip-Flop.	2 Marks	L2	CO3
	i)	Contrast PAL and PLA.	2 Marks	L2	CO4
	j)	Explain EPROM.	2 Marks	L2	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Convert the following numbers i) $(61.85)_{10}$ to binary ii) $(1011001)_2$ to decimal iii) Find the 9's Complement of number $(38)_{10}$	8 Marks	L1	CO1
	b)	Use 2's complement to perform M - N with the given number M=1010100 N=1010100.	8 Marks	L1	CO1

(OR)

3.	a)	Convert the following to binary and then to Gray code $(AB23)_{16}$.	8 Marks	L1	CO1
	b)	Explain the Binary codes with examples.	8 Marks	L2	CO1

MODULE-II

4.	Minimize the following function F(A,B,C,D) = ABC'+A'B'C+ABC+AB'C and also realize using NAND logic	16 Marks	L3	CO2

(OR)

5.	Simplify the Boolean function using K-map i) F (A.B, C, D) = A'B'C'+ B'CD'+ A'BCD'+AB'C' ii) F (W,X,Y,Z) = Σm (0,6,9,11,14) + Σd (2,5,10)	16 Marks	L3	CO2

MODULE-III

6.	Design a 4-bit adder and 4-bit subtractor circuit individually and combine them to operate for both Addition and Subtraction operations in a single circuit.	16 Marks	L3	CO3

(OR)

7.	a)	Draw the block schematic of Magnitude comparator and explain its operation.	8 Marks	L2	CO3
	b)	Implement the following function suitable multiplexer F(A,B,C,D)=∑(1,3,5,11,13,14,15).	8 Marks	L2	CO3

MODULE-IV

8.	a)	Draw the truth and excitation tables for SR, T & D flip flops	8 Marks	L1	CO3
	b)	What is race-around problem in JK Flip-Flop? Explain how it is eliminated in Master Slave Flip-Flop with its neat logic diagram.	8 Marks	L2	CO3

(OR)

9.	a)	Design a cyclic Mod-8 synchronous binary counter using JK flip-flop. Give state diagram, transition table and excitation table.	8 Marks	L3	CO3
	b)	Explain synchronous and ripple counters. Compare their merits and demerits.	8 Marks	L2	CO3

MODULE-V

10.	a)	Explain in detail about ROM & RAM.	8 Marks	L1	CO4
	b)	Implement the following Boolean functions using PAL AND-OR structure. F2 (A,B,C,D)=∑m(7,8,9,10,11,12,13,14,15) F4 (A,B,C,D)=∑m(1,2,8,12,13)	8 Marks	L2	CO4

(OR)

11.		Implement Boolean function using PLA Y(w,x,y,z)=∑m(0,1,2,3,5,9,12,14,15)+ ∑d(1,4,8,11)	16 Marks	L3	CO4

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. II Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

SINGLE VARIABLE CALCULUS

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Write the sequence whose nth term is($\frac{12+5n}{11n+12}$)	2 Marks	L1	CO1
	b)	Define a Subsequence with an example.	2 Marks	L1	CO1
	c)	State p- series test.	2 Marks	L2	CO2
	d)	Write the statement of Auxillary Test Theorem.	2 Marks	L1	CO2
	e)	Define Removable Discontinuity and mention with an example,	2 Marks	L1	CO3
	f)	Define Jump Discontinuity with an example.	2 Marks	L1	CO3
	g)	Verify rolle's theorem for $f(x) = \|x\|$ in $[-2,2]$	2 Marks	L2	CO4
	h)	State Cauchy's Mean value Theorem.	2 Marks	L2	CO4
	i)	Define Upper and Lower Riemann Integrals.	2 Marks	L3	CO5
	j)	Write any two properties of integrable functions.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Prove that the sequence $\{S_n\}$ where $S_n = \frac{1}{1.2}+\frac{1}{2.3}+\frac{1}{3.4}+....+\frac{1}{n(n+1)}$ is convergent.	8 Marks	L2	CO1
	b)	Prove that the Sequence $\{S_m\}$ given by $S_m = (\frac{2n-7}{3n+2})$ is monotonically increasing and Bounded.	8 Marks	L2	CO1

(OR)

3	State and prove Cauchy's general principle of convergence..	16 Marks	L2	CO1

MODULE-II

4.	a)	Test for convergence $\sum_{n=1}^{\infty}\frac{1}{n}Sin\frac{1}{n}$	8 Marks	L2	CO2
	b)	Show that the series $1+2+3+4+...$ is divergent.	8 Marks	L2	CO2

(OR)

5.	a)	Show that an infinite series $1+\frac{1}{2}+\frac{1}{2^2}+\frac{1}{2^3}+....$ is convergent.	8 Marks	L2	CO2
	b)	Examine the convergence of $\sum_{n=2}^{\infty}(-1)^n\frac{1}{n}\left(1+\frac{1}{2}+.....+\frac{1}{n}\right)$	8 Marks	L4	CO2

MODULE-III

6		Examine for continuity the function 'f' defined $f(x) = \|x\| + \|x-1\|$ at $x = 0,1$.	16 Marks	L4	CO3

(OR)

7.	a)	Prove that $\lim_{n\to\infty} (x+\frac{1}{x})^{x} = e$	8 Marks	L2	CO3
	b)	If $f(x) = \frac{e^{1/x}}{1+e^{1/x}}$, find whether $\lim_{x\to 0} f(x)$ exists or not.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Prove that $f(x) = x\left(\frac{e^{x}-1}{e^{x}+1}\right)$ for $x \neq 0$, $f(x) = 0$, for $x = 0$, and is continuous at $x = 0$ but not derivable at $x = 0$.	8 Marks	L2	CO4
	b)	Evaluate $\lim_{x\to 0} \cot x \log\left(\frac{1+x}{1-x}\right)$	8 Marks	L5	CO4

(OR)

9.	a)	Discuss the applicability of Lagrange's mean value theorem for $f(x) = (x(x-1)(x-2))$ in $[0,\frac{1}{2}]$.	8 Marks	L1	CO4
	b)	Expand the polynomial $P(x) = x^5 - 2x^4 + x^3 - x^2 + 2x - 1$ in powers of binomial $(x-1)$.	8 Marks	L2	CO4

MODULE-V

10.	a)	Show that $f(x) = 3x+1$ is integrable on $[1,2]$.	8 Marks	L2	CO5
	b)	If $f:[a,b]\to R$ is a bounded function then show that $\underline{\int_a^b} f(x)\,dx = \overline{\int_a^b} f(x)\,dx$.	8 Marks	L1	CO5

(OR)

11.	a)	By considering the integral $\int_0^1 \frac{1}{1+x}\,dx$, show that $\log 2 = \lim_{n\to 8}\left[\frac{1}{n+1} + \frac{1}{n+2} + \ldots + \frac{1}{2n}\right]$	8 Marks	L2	CO5
	b)	Show that $\frac{\sqrt{3}}{8} \le \int_{\frac{\pi}{4}}^{\frac{\pi}{3}} \sin x\,dx \le \frac{\sqrt{2}}{6}$	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. I Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

DESCRIPTIVE STATISTICS AND PROBABILITY

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define qualitative and quantitative data.	2 Marks	L1	CO1
	b)	What is tabulation?	2 Marks	L1	CO1
	c)	Define median.	2 Marks	L2	CO2
	d)	Define harmonic mean.	2 Marks	L2	CO2
	e)	Define dispersion.	2 Marks	L1	CO3
	f)	What is variance??	2 Marks	L2	CO3
	g)	Define event.	2 Marks	L2	CO4
	h)	What is a random experiment?	2 Marks	L1	CO4
	i)	Define probability mass function.	2 Marks	L1	CO5
	j)	Define continuous random variable.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe the importance and limitations of statistical methods in social sciences	8 Marks	L2	CO1
	b)	Describe different methods of collecting secondary data and their advantages.	8 Marks	L3	CO1

(OR)

3.	a)	Explain graphical representation of data	8 Marks	L2	CO1
	b)	Explain the difference between diagrams and graphs with illustrations	8 Marks	L3	CO1

MODULE-II

4. a) Find mean using step deviation method to the following data: 8 Marks L3 CO2

Class Interval	15-25	25-35	35-45	45-55	55-65	65-75	75-85	15-25
Frequency	5	7	10	18	20	12	8	2

b) Prove the relationship between mean, median and mode. 8 Marks L4 CO2

(OR)

5. a) Calculate Median for the following frequency distribution. 8 Marks L3 CO2

Class Interval	0-5	5-10	10-15	15-20	20-25	25-30	30-35
Frequency	8	12	20	38	25	17	7

b) Calculate mode for the following frequency distribution. 8 Marks L3 CO2

Class Interval	15-25	25-35	35-45	45-55	55-65	65-75	75-85
Frequency	5	15	20	35	25	18	8

MODULE-III

6. a) Explain the concept of skewness and describe different types of skewness with diagrams 8 Marks L4 CO3

b) Define kurtosis and explain their types 8 Marks L3 CO3

(OR)

7. a) Calculate mean deviation from the data: 8 Marks L4 CO3
5, 7, 8, 10, 12, 15, 18, 20.

b) Calculate variance and standard deviation for: 8 Marks L3 CO3
5, 7, 9, 11, 13.,15

MODULE-IV

8. a) A box contains 6 white and 4 black balls. Two balls are drawn without replacement. Find probability both are white. 8 Marks L2 CO4

b) State and prove multiplication theorem pf probability. 8 Marks L3 CO4

(OR)

9. a) Two dice are thrown. Find probability that (i)sum is 7 (ii)sum is 10 8 Marks L2 CO4

b) Explain axiomatic approach to probability. 8 Marks L3 CO4

MODULE-V

10. a) Find the expected value for the following distribution: 8 Marks L2 CO5

X	0	1	2	3
P(X)	0.2	0.3	0.3	0.2

b) Explain expectation of random variable with properties. 8 Marks L4 CO5

(OR)

11. a) Define and explain probability distribution. 8 Marks L2 CO5

b) If X is a random variable with distribution 8 Marks L2 CO5

X	0	1	2	3
P(X)	0.3	0.5	0.2	0.7

Find E(X) and Var(X).

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. II Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

DATA STRUCTURES

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is Data Representation?	2 Marks	L1	CO1
	b)	Define Abstract Data Type (ADT).	2 Marks	L1	CO1
	c)	Give the definition of Two-Dimensional Array.	2 Marks	L1	CO2
	d)	Mention the types of Multidimensional Arrays.	2 Marks	L1	CO2
	e)	Identify the purpose of Circular Queue.	2 Marks	L1	CO3
	f)	Recall the concept of Deque (Double Ended Queue).	2 Marks	L1	CO3
	g)	Write the definition of Tree Traversal.	2 Marks	L1	CO4
	h)	Name the different tree traversals.	2 Marks	L1	CO4
	i)	What is Sorting?	2 Marks	L1	CO5
	j)	Define Searching.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain various stages involved in Data Structure Refinement.	8 Marks	L2	CO1
	b)	Describe different methods of Data Representation with examples.	8 Marks	L2	CO1

(OR)

3.	a)	Write a recursive algorithm to find factorial of a number and trace its execution.	8 Marks	L3	CO1
	b)	Explain different tips and techniques for writing programs in C.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the concept of Pointers and their types in C.	8 Marks	L2	CO2
	b)	Discuss the relationship between Pointers and Arrays with examples.	8 Marks	L3	CO2

(OR)

5.	a)	Describe Circular Linked List and its applications.	8 Marks	L2	CO2
	b)	Explain Doubly Linked List with its advantages and disadvantages.	8 Marks	L2	CO2

MODULE-III

6.	a)	Describe the representation of Stacks using Arrays.	8 Marks	L2	CO3
	b)	Evaluate the efficiency of Queue implementations.	8 Marks	L4	CO3

(OR)

7.	a)	Interpret the working of Double Ended Queue (Deque).	8 Marks	L2	CO3
	b)	Demonstrate the working of Circular Queue with suitable examples.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Construct a Binary Search Tree for a given set of elements and analyze its structure.	8 Marks	L3	CO4
	b)	Apply Binary Tree traversal techniques to solve a problem.	8 Marks	L3	CO4
		(OR)			
9.	a)	Explain the concept of Non-Linear Data Structures and Binary Trees.	8 Marks	L2	CO4
	b)	Illustrate the structure and properties of a Binary Tree.	8 Marks	L2	CO4

MODULE-V

10.	a)	Compare Linear Search and Binary Search.	8 Marks	L2	CO5
	b)	Outline the Linear Search algorithm with example.	8 Marks	L2	CO5
		(OR)			
11.	a)	Apply graph traversal techniques (BFS/DFS) with an example.	8 Marks	L3	CO5
	b)	Demonstrate Binary Search with a step-by-step example.	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. II Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

STATISTICAL METHODS AND INFERENCES

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define zero correlation.	2 Marks	L1	CO1
	b)	Write the formula of Karl Pearson's coefficient of correlation.	2 Marks	L1	CO1
	c)	State the equation of regression line of Y on X.	2 Marks	L1	CO2
	d)	Define least squares method.	2 Marks	L1	CO2
	e)	What is a type I error?	2 Marks	L1	CO3
	f)	Define p-value.	2 Marks	L1	CO3
	g)	When do we use Student's t-test?	2 Marks	L1	CO4
	h)	What is degrees of freedom?	2 Marks	L1	CO4
	i)	State uses of Chi-square test.	2 Marks	L1	CO5
	j)	When are non-parametric tests preferred?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2. a) Explain Spearman rank correlation coefficient. 8 Marks L2 CO1

b) From the following data Calculate the Karl Pearson's coefficient of correlation. 8 Marks L3 CO1

X	18	28	35	44	35	26	37	48
Y	83	51	34	34	34	28	46	47

(OR)

3. a) List the properties of Karl Pearson's coefficient of correlation. Show that the Karl Pearson's coefficient of correlation is always lie between -1 and +1. 8 Marks L2 CO1

b) Find Spearman's coefficient of correlation for the following data: 8 Marks L3 CO1

Marks in English	45	70	65	30	90	40	50	75
Marks in Maths	35	90	70	40	95	40	60	80

MODULE-II

4. a) Derive the regression line of y on x. 8 Marks L2 CO2

b) The following table shows the sales and advertisement expenditure of a form 8 Marks L3 CO2

	Sales	Advertisement Expenditure
Mean	40	6
SD	10	1.5

Coefficient of correlation r= 0.9. Estimate the likely sales for a proposed advertisement expenditure of Rs. 10 crores.

(OR)

5.	a)	Explain linear regression and curvilinear regression	8 Marks	L2	CO2
	b)	For 5 pairs of observations the following results are obtained $\sum X=15$, $\sum Y=25$, $\sum X^2=55$, $\sum Y^2=135$, $\sum XY=83$ Find the equation of the lines of regression and estimate the value of X on the first line when Y=12 and value of Y on the second line if X=8.	8 Marks	L3	CO2

MODULE-III

6		State and prove Neyman and Pearson lemma.	16 Marks	L2	CO3

(OR)

7.	a)	Explain one tail test and two tail tests.	8 Marks	L2	CO3
	b)	Explain level of significance, Critical region and power of test.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain the large sample test for two different proportions.	8 Marks	L2	CO4
	b)	Two samples of sizes 400 and 500 have the means 56.5 and 56 respectively. Is the two samples drawn from the populations whose variance is 10.24?	8 Marks	L3	CO4

(OR)

9.	a)	Explain t-test for single mean.	8 Marks	L2	CO4
	b)	The following data gives the marks obtained by 8 students, before and after coaching.	8 Marks	L3	CO4

Before Coaching	20	16	17	18	22	12	18	16
Before Coaching	24	19	16	16	24	16	15	18

Check whether the coaching is successful ?

MODULE-V

10.	a)	Explain median test.	8 Marks	L2	CO5
	b)	Explain two-sample Wald-Wolfowitz runs test.	8 Marks	L2	CO5

(OR)

11.	a)	Explain Wilcoxon-Mann-Whitney U-test	8 Marks	L2	CO5
	b)	We have two sets of data, A and B, each with 30 observations. We want to test whether the two sets of data are randomly distributed. The data for sets A and B are randomly generated as: Set A: 5, 6, 2, 1, 8, 10, 7, 3, 9, 4, 3, 1, 7, 8, 6, 2, 9, 10, 4, 5, 1, 2, 6, 10, 8, 7, 4, 9, 5, 3 Set B: 9, 4, 7, 6, 10, 1, 3, 5, 2, 8, 10, 5, 2, 4, 6, 1, 3, 9, 7, 8, 5, 3, 6, 4, 2, 8, 1, 9, 7, 10 Perform the two-sample Wald-Wolfowitz runs test.	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. II Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

OBJECT ORIENTED PROGRAMMING WITH C++

[Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define OOP.	2 Marks	L1	CO1
	b)	What is the use of cin?	2 Marks	L2	CO1
	c)	What is switch statement?	2 Marks	L1	CO2
	d)	Write about inline function.	2 Marks	L2	CO2
	e)	What is a constructor?	2 Marks	L1	CO3
	f)	What is scope resolution operator?	2 Marks	L2	CO3
	g)	Write syntax for binary operator.	2 Marks	L2	CO4
	h)	What is relational operator?	2 Marks	L2	CO4
	i)	Define output stream.	2 Marks	L1	CO5
	j)	What is file opening mode?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain OOP concepts with suitable examples.	8 Marks	L1	CO1
	b)	Describe the structure of a C++ program.	8 Marks	L2	CO1

(OR)

3.	a)	Discuss tokens in C++ with examples.	8 Marks	L2	CO1
	b)	Explain input/output operations using cin and cout.	8 Marks	L1	CO1

MODULE-II

4.	a)	Describe default arguments and inline functions.	8 Marks	L2	CO2
	b)	Explain function overloading with examples.	8 Marks	L3	CO2

(OR)

5.	a)	Discuss reference variables with examples.	8 Marks	L3	CO2
	b)	Compare for, while, and do-while loops.	8 Marks	L2	CO2

MODULE-III

6.	a)	Describe defining a class and member functions.	8 Marks	L3	CO3
	b)	Explain array of objects with examples.	8 Marks	L2	CO3

(OR)

7.	a)	Explain constructor overloading.	8 Marks	L2	CO3
	b)	Describe dynamic constructors.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Write programs for operator overloading.	8 Marks	L3	CO4
	b)	Explain compile-time vs runtime polymorphism.	8 Marks	L2	CO4

(OR)

9.	a)	Discuss relational operator overloading.	8 Marks	L2	CO4
	b)	Explain inheritance with examples.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain file handling in C++.	8 Marks	L3	CO5
	b)	Discuss formatted I/O operations.	8 Marks	L2	CO5

(OR)

11.	a)	Explain ios class functions and flags.	8 Marks	L2	CO5
	b)	Describe manipulators with examples.	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) (Fasttrack) Regular Examinations April – 2026

ARTIFICIAL NEURAL NETWORKS

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define the difference between classification and regression tasks.	2 Marks	L1	CO1
	b)	Why is data pre-processing important in machine learning?	2 Marks	L1	CO1
	c)	What is the purpose of a linear discriminant function in classification?	2 Marks	L1	CO2
	d)	Define linear separability and give an example of a linearly separable dataset.	2 Marks	L1	CO2
	e)	What is the primary difference between a single-layer perceptron and a multi-layer perceptron (MLP)?	2 Marks	L1	CO3
	f)	What is the role of threshold units in a neural network?	2 Marks	L1	CO3
	g)	What is the formula for the sum-of-squares error function, and what is it typically used for?	2 Marks	L1	CO4
	h)	How does Minkowski error generalize different error functions?	2 Marks	L2	CO4
	i)	What is the trade-off between bias and variance in machine learning?	2 Marks	L1	CO5
	j)	What is the role of regularization in machine learning models?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Compare and contrast classification and regression tasks with examples.	8 Marks	L4	CO1
	b)	Discuss different techniques for data pre-processing and their importance in building effective machine learning models.	8 Marks	L2	CO1

(OR)

3.	a)	Explain feature extraction methods and how they help reduce dimensionality.	8 Marks	L2	CO1
	b)	Describe the curse of dimensionality and its impact on machine learning models. Provide examples.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the role of linear discriminant functions in classification and describe how they define decision boundaries.	8 Marks	L2	CO2
	b)	Discuss linear separability with examples. What happens when data is not linearly separable?	8 Marks	L2	CO2

(OR)

5.	a)	Explain generalized linear discriminants and their applications in machine learning.	8 Marks	L2	CO2
	b)	Derive the least-squares solution for linear regression and discuss its applications in classification.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain how a feed-forward network maps inputs to outputs. Provide examples of architectures.	8 Marks	L2	CO3
	b)	Describe the purpose and functioning of threshold units in neural networks. Provide a mathematical representation.	8 Marks	L2	CO3

(OR)

7.	a)	Discuss the properties of sigmoid functions and their impact on the learning process in MLPs.	8 Marks	L2	CO3
	b)	Explain weight-space symmetry in MLPs. Why can it make training neural networks challenging?	8 Marks	L2	CO3

MODULE-IV

8.	a)	Derive the formula for the sum-of-squares error and explain how it is used in regression tasks.	8 Marks	L4	CO4
	b)	Explain the Minkowski error function and its role in generalizing different loss functions (e.g., L1 and L2).	8 Marks	L2	CO4

(OR)

9.	a)	Discuss the concept of input-dependent variance and how it affects the performance of machine learning models.	8 Marks	L2	CO4
	b)	Explain the importance of modeling conditional distributions in supervised learning. Provide examples.	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss the bias-variance trade-off in machine learning. Provide examples of high-bias and high-variance models.	8 Marks	L2	CO5
	b)	Explain L1 and L2 regularization techniques. How do they impact model complexity?	8 Marks	L2	CO5

(OR)

11.	a)	Discuss the role of regularization in reducing overfitting. Provide examples of how it is applied in linear regression and neural networks.	8 Marks	L2	CO5
	b)	Describe how introducing noise into the training data or during the training process improves generalization. Provide examples.	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA V Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

DATA ANALYTICS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is Big Data Analytics?	2 Marks	L1	CO1
	b)	Define Data Science?	2 Marks	L1	CO1
	c)	What are the three main "Vs" of Big Data?	2 Marks	L1	CO2
	d)	What is the primary function of data ingestion in Big Data architecture?	2 Marks	L1	CO2
	e)	List one key advantage of Big Data for businesses?	2 Marks	L1	CO3
	f)	What is one challenge faced by Big Data systems?	2 Marks	L1	CO3
	g)	What is Hadoop's parallel processing, and why is it important?	2 Marks	L1	CO4
	h)	Define data discovery in the context of Big Data analytics?	2 Marks	L1	CO4
	i)	List the open Source Technology for Big Data Analytics.	2 Marks	L1	CO5
	j)	What are the benefits of using cloud computing for Big Data?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	What is Big Data Analytics? List its primary objectives and uses?	8 Marks	L2	CO1
	b)	Explain the difference between Big Data Analytics and traditional data analysis methods. Why is Big Data Analytics important in today's data-driven world?	8 Marks	L2	CO1

(OR)

3.	a)	How would you use Big Data Analytics to improve customer satisfaction in an online retail business? Provide a general outline of the process?	8 Marks	L3	CO1
	b)	Analyze the role of Big Data Analytics in healthcare. What are the potential benefits and challenges when implementing it in patient care?	8 Marks	L2	CO1

MODULE-II

4.	a)	Analyze the role of parallel processing in Hadoop's architecture. How does Hadoop's approach to parallelism differ from traditional data processing methods? Discuss the advantages and potential limitations of Hadoop's parallel processing capabilities in managing large-scale data operations?	8 Marks	L2	CO2
	b)	Explanation of parallel processing in Hadoop (MapReduce framework, HDFS)?	8 Marks	L2	CO2

(OR)

5.	a)	Critically evaluate the process of data discovery in Big Data analytics. Discuss the tools and techniques involved and how they contribute to uncovering hidden patterns and insights. What are the main challenges faced during the data discovery process, and how can these be mitigated?	8 Marks	L2	CO2
	b)	Assess the impact of open-source technologies on the evolution of Big Data analytics. Discuss the benefits and drawbacks of using open-source tools for data analytics. Provide examples of popular open-source tools and analyze their contributions to the field?	8 Marks	L2	CO2

MODULE-III

6.	a)	Analyze the characteristics and challenges of Big Data. Discuss how the 5Vs (Volume, Velocity, Variety, Veracity, and Value) influence Big Data management and analytics. Provide examples to illustrate how these characteristics impact real-world applications?	8 Marks	L2	CO3
	b)	Definition of Big Data and its significance?	8 Marks	L2	CO3

(OR)

7.	a)	Evaluate the components of the Apache Hadoop ecosystem and their roles in Big Data processing. Discuss the advantages and limitations of using Hadoop and its ecosystem.	8 Marks	L3	CO3
	b)	Discuss the various methods and tools for moving data into and out of Hadoop. Analyze the factors that influence the choice of data ingestion and export techniques. Evaluate the challenges associated with data transfer in Hadoop environments and suggest strategies to overcome them?	8 Marks	L2	CO3

MODULE-IV

8.	a)	What is Hadoop, and what are its primary components?	8 Marks	L2	CO4
	b)	What are the key differences between RDBMS (Relational Database Management Systems) and Hadoop?	8 Marks	L2	CO4

(OR)

9.	a)	What are the main features of Hadoop that make it suitable for big data applications?	8 Marks	L2	CO4
	b)	What are some popular Hadoop distributors, and how do they differ from each other?	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain the key components of the HDFS architecture?	8 Marks	L2	CO5
	b)	Elaborate the primary configuration files in Hadoop, and what do they control?	8 Marks	L2	CO5

(OR)

11.	a)	Explain the two main phases of the MapReduce framework.	8 Marks	L2	CO5
	b)	Analyze the advantages and disadvantages of using the MapReduce framework for processing large-scale data. How does it compare to other parallel processing frameworks?	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

WEB APPLICATION SECURITY

[Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What are the primary benefits of using web applications compared to traditional desktop applications?	2 Marks	L1	CO1
	b)	Describe one major drawback of web applications that can impact user experience.	2 Marks	L2	CO1
	c)	Define authentication and explain its significance in web application security.	2 Marks	L2	CO2
	d)	What is the difference between authentication and authorization? Provide examples to illustrate your answer.	2 Marks	L4	CO2
	e)	What is the Same-Origin Policy?	2 Marks	L2	CO3
	f)	What are the key components used to determine "origin"?	2 Marks	L1	CO3
	g)	What is SQL Injection?	2 Marks	L1	CO4
	h)	How can setting database permissions enhance security?	2 Marks	L2	CO4
	i)	What is an HTTP request?	2 Marks	L1	CO5
	j)	What are HTTP status codes?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss the historical evolution of web applications, highlighting key technological advancements that have influenced their development.	8 Marks	L2	CO1
	b)	Compare the benefits and drawbacks of web applications. Provide specific examples to illustrate how these factors affect user experience and development.	8 Marks	L4	CO1

(OR)

3.	a)	Explain the differences between web applications and cloud applications in terms of architecture, deployment models, and user accessibility.	8 Marks	L1	CO1
	b)	Define input validation and discuss its importance in web application security. Provide examples of common input validation techniques and their effectiveness.	8 Marks	L4	CO1

MODULE-II

4.	a)	Discuss the role of content security policies (CSP) in protecting web applications from attacks. How can CSP be effectively implemented?	8 Marks	L2	CO2
	b)	Evaluate the importance of user education and awareness in maintaining web application security. What strategies can organizations employ to educate users about security best practices?	8 Marks	L4	CO2

(OR)

5.	a)	Explain the concept of access control in web applications. What are the different types of access control models, and how do they function?	8 Marks	L1	CO2
	b)	Discuss the fundamentals of authentication. What are the key processes involved in verifying a user's identity in a web application?	8 Marks	L4	CO2

MODULE-III

6.	a)	Analyze the role of encryption in securing authentication credentials. How does encryption protect sensitive information during transmission and storage?	8 Marks	L2	CO3
	b)	Discuss the importance of regular security audits for authentication and authorization mechanisms in web applications. What should these audits focus on?	8 Marks	L5	CO3

(OR)

7.	a)	Explain the concept of access control lists (ACLs) and how they are used to manage user permissions in web applications.	8 Marks	L5	CO3
	b)	Discuss the potential security risks associated with session fixation attacks. How can developers protect against such attacks in their web applications?	8 Marks	L3	CO3

MODULE-IV

8.	a)	Examine the role of user input in Cross-Site Scripting vulnerabilities.	8 Marks	L2	CO4
	b)	Analyze a real-world example of an XSS attack and its consequences.	8 Marks	L2	CO4

(OR)

9.	a)	Discuss how Cross-Origin Resource Sharing (CORS) allows for secure cross-origin requests.	8 Marks	L4	CO4
	b)	Assess the implications of XSS and CSRF for user trust in web applications.	8 Marks	L1	CO4

MODULE-V

10.	a)	Describe the strategies for setting and managing file permissions to protect sensitive information.	8 Marks	L2	CO5
	b)	Discuss the risks associated with leaving sensitive files unprotected and the potential consequences for organizations.	8 Marks	L4	CO5

(OR)

11.	a)	Explain how firewalls can help secure file systems from unauthorized access and attacks.	8 Marks	L5	CO5
	b)	Discuss the measures that should be taken to protect configuration files from unauthorized access and modifications.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

SOFTWARE TESTING AND QUALITY ASSURANCE

[Computer Science and Engineering (Data Science)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define agile testing and explain its significance in software development.	2 Marks	L1	CO1
	b)	Mention two key differences between traditional testing and agile testing	2 Marks	L2	CO1
	c)	Define the role of independent QA teams in software testing.	2 Marks	L2	CO2
	d)	What is the importance of integrating testers into an Agile project team?	2 Marks	L4	CO2
	e)	What are lightweight processes, and why are they preferred in Agile methodologies?	2 Marks	L2	CO3
	f)	Differentiate between test strategy and test planning.	2 Marks	L1	CO3
	g)	What is the purpose of using tools to elicit examples and requirements in software testing?	2 Marks	L1	CO4
	h)	How can mind maps be used effectively in test planning and design?	2 Marks	L2	CO4
	i)	What is the purpose of Quadrant 3 in Agile testing?	2 Marks	L1	CO5
	j)	How does scenario testing help in evaluating a product's functionality?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the differences between traditional testing and agile testing, focusing on processes and team collaboration.	8 Marks	L2	CO1
	b)	What are the core principles of agile testing, and how do they ensure quality in software development?	8 Marks	L4	CO1

(OR)

3.	a)	Discuss the role of continuous feedback in agile testing and its impact on product quality.	8 Marks	L1	CO1
	b)	How does agile testing align with the Agile Manifesto values and principles? Provide examples.	8 Marks	L4	CO1

MODULE-II

4.	a)	Explain the importance of maintaining independent QA teams in software testing. What are the benefits and challenges?	8 Marks	L2	CO2
	b)	Discuss how testers can be effectively integrated into Agile project teams. Provide examples of their roles and responsibilities	8 Marks	L4	CO2

(OR)

5.	a)	How does collaboration between testers and developers improve the quality of deliverables in Agile projects?	8 Marks	L1	CO2
	b)	Describe the role of physical logistics and resource management in ensuring the success of Agile testing teams.	8 Marks	L4	CO2

MODULE-III

6.	a)	Explain the concept of lightweight processes in software testing and their advantages over traditional methods.	8 Marks	L2	CO3
	b)	Discuss the role of defect tracking in improving software quality. How do defect tracking tools contribute to this process?	8 Marks	L5	CO3

(OR)

7.	a)	Differentiate between test strategy and test planning. Provide examples to illustrate their unique roles.	8 Marks	L5	CO3
	b)	What is traceability in software testing? Explain its significance and how it impacts the testing lifecycle.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain the importance of tools in eliciting examples and requirements during the software testing process. Provide suitable examples.	8 Marks	L2	CO4
	b)	Discuss how checklists and mind maps can be used to improve the efficiency of test planning and execution.	8 Marks	L2	CO4

(OR)

9.	a)	Illustrate the role of spreadsheets and mock-ups in test documentation and requirement analysis.	8 Marks	L4	CO4
	b)	How can flow diagrams aid in understanding and validating test scenarios? Provide examples	8 Marks	L1	CO4

MODULE-V

10.	a)	Explain the concept of Quadrant 3 in Agile testing and its role in critiquing the product.	8 Marks	L2	CO5
	b)	Discuss the importance of demonstrations in evaluating the quality of a software product.	8 Marks	L4	CO5

(OR)

11.	a)	What is scenario testing, and how does it help in critiquing the product? Provide relevant examples.	8 Marks	L5	CO5
	b)	Explain the process of exploratory testing and its advantages over traditional testing methods.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

OBJECT ORIENTED MODELING AND DESIGN

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define abstraction in UML modeling	2 Marks	L1	CO1
	b)	What is object-oriented modeling?	2 Marks	L1	CO1
	c)	What is the role of interfaces in UML?	2 Marks	L1	CO2
	d)	Differentiate aggregation and composition	2 Marks	L1	CO2
	e)	What is the purpose of a use case diagram?	2 Marks	L1	CO3
	f)	Name one difference between sequence diagram and collaboration diagram.	2 Marks	L2	CO3
	g)	Define state chart diagram.	2 Marks	L1	CO4
	h)	What role do states and transitions play in UML?	2 Marks	L2	CO4
	i)	Define component in UML.	2 Marks	L1	CO5
	j)	What is the purpose of dependency relationship between components?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss importance of modeling in software development.	8 Marks	L3	CO1
	b)	Explain principles of modeling.	8 Marks	L3	CO1
		(OR)			
3.	a)	Explain object-oriented modeling.	8 Marks	L3	CO1
	b)	Explain UML overview and components.	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain UML class diagram concepts.	8 Marks	L3	CO2
	b)	Design class diagram for Restaurant System.	8 Marks	L3	CO2
		(OR)			
5.	a)	Explain advanced relationships in UML.	8 Marks	L3	CO2
	b)	Explain object diagram.	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain sequence diagram with example	8 Marks	L3	CO3
	b)	Explain modeling requirements using UML.	8 Marks	L3	CO3
		(OR)			
7.	a)	Draw use case diagram for library system.	8 Marks	L3	CO3
	b)	Explain activity diagram.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain state machine diagram.	8 Marks	L2	CO4
	b)	Explain modeling reactive objects.	8 Marks	L3	CO4
		(OR)			
9.	a)	Explain processes and threads.	8 Marks	L3	CO4
	b)	Explain state chart diagram techniques.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain component diagram.	8 Marks	L4	CO5
	b)	Explain interface in component modeling.	8 Marks	L3	CO5
		(OR)			
11.	a)	Explain deployment diagram.	8 Marks	L4	CO5
	b)	Explain modeling APIs.	8 Marks	L5	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

MOBILE APPLICATION DEVELOPMENT

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is Mobile Web Presence?	2 Marks	L1	CO1
	b)	What are the required tools for Android application development?	2 Marks	L1	CO1
	c)	What is an Activity in Android?	2 Marks	L1	CO2
	d)	What is meant by listening for UI events or notifications in Android?	2 Marks	L1	CO2
	e)	Define Basic Views in Android.	2 Marks	L1	CO3
	f)	Enumerate the steps involved in persisting data to files.	2 Marks	L2	CO3
	g)	Define SMS messaging in Android applications.	2 Marks	L1	CO4
	h)	Enumerate the steps involved in consuming web services using HTTP in Android.	2 Marks	L2	CO4
	i)	Define Services in Android.	2 Marks	L1	CO5
	j)	State the steps involved in debugging iOS applications.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the concept of Mobile Web Presence. Discuss its importance for businesses.	8 Marks	L3	CO1
	b)	Differentiate between Mobile Web Applications and Native Mobile Applications.	8 Marks	L3	CO1

(OR)

3.	a)	Describe the challenges faced in mobile user interface design.	8 Marks	L3	CO1
	b)	Explain how mobile platforms support application development and deployment.	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain the concept of Activities in Android and describe the Activity life cycle.	8 Marks	L3	CO2
	b)	Discuss the role of Intents in Android with suitable examples.	8 Marks	L3	CO2

(OR)

5.	a)	Explain the importance of user interface components in Android application development.	8 Marks	L3	CO2
	b)	Discuss the challenges involved in designing effective Android user interfaces.	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain the different Views used in Android with examples.	8 Marks	L3	CO3
	b)	Describe Picker Views in Android and explain their types.	8 Marks	L3	CO3

(OR)

7.	a)	Explain the purpose and working of WebView in Android applications.	8 Marks	L3	CO3
	b)	Discuss the steps involved in inserting, updating, and deleting records in SQLite database.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain the concept of SMS messaging in Android applications.	8 Marks	L2	CO4
	b)	Describe the steps involved in sending SMS messages programmatically in Android.	8 Marks	L3	CO4

(OR)

9.	a)	Explain the challenges involved in implementing messaging and networking in Android applications.	8 Marks	L3	CO4
	b)	Describe the importance of integrating messaging, location, and networking services in mobile applications.	8 Marks	L3	CO4

MODULE-V

10.	a)	Illustrate how Android Services are used to perform background operations in mobile applications.	8 Marks	L4	CO5
	b)	Demonstrate the process of communication between an Activity and a Service in Android.	8 Marks	L3	CO5

(OR)

11.	a)	Analyze the process involved in building the Derby App in iOS.	8 Marks	L4	CO5
	b)	Evaluate the differences between Android and iOS application development environments.	8 Marks	L5	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) (Fasttrack) Regular Examinations April – 2026

COMPUTER ARCHITECTURE AND ORGANIZATION

[Computer Science and Engineering (Data Science)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define instruction sequencing.	2 Marks	L1	CO1
	b)	How is system performance measured?	2 Marks	L4	CO1
	c)	What is the function of the ALU in a CPU?	2 Marks	L2	CO2
	d)	Define hardwired control.	2 Marks	L1	CO2
	e)	What is a page fault in virtual memory?	2 Marks	L2	CO3
	f)	List two examples of secondary storage devices.	2 Marks	L1	CO3
	g)	List two examples of processor-based I/O devices.	2 Marks	L1	CO4
	h)	What is a hash table?	2 Marks	L2	CO4
	i)	What is an instruction set architecture?	2 Marks	L2	CO5
	j)	Mention one example of a general-purpose multiprocessor.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the bus structure and its importance in computer systems.	8 Marks	L2	CO1
	b)	Discuss the role of functional units in computer operations.	8 Marks	L2	CO1

(OR)

3.	a)	Compare multiprocessors and multicomputers with suitable examples.	8 Marks	L4	CO1
	b)	Describe the different addressing modes with examples.	8 Marks	L2	CO1

MODULE-II

4.	a)	Solve: Add 123.45+67.89 using floating-point arithmetic.	8 Marks	L3	CO2
	b)	Perform signed operand multiplication using booth algorithm with following values 01101_2 and 01011_2	8 Marks	L3	CO2

(OR)

5.	a)	Perform the binary division of 101101_2 by 11_2.	8 Marks	L3	CO2
	b)	State the differences between half adders and full adders.	8 Marks	L4	CO2

MODULE-III

6.	a)	Explain the characteristics of semiconductor RAM and ROM with examples.	8 Marks	L2	CO3
	b)	Discuss the trade-off between speed, size, and cost in memory design.	8 Marks	L4	CO3

(OR)

7.	a)	Explain the working principle of cache memory and its mapping techniques.	8 Marks	L2	CO3
	b)	Compare static and dynamic RAM in terms of construction, speed, and usage.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Explain the concept of direct memory access (DMA) with a suitable diagram.	8 Marks	L2	CO4
	b)	Discuss the different methods of accessing I/O devices.	8 Marks	L4	CO4
		(OR)			
9.	a)	Explain the role of interrupts in I/O operations and their importance.	8 Marks	L2	CO4
	b)	Write a detailed note on bus arbitration and its types.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain the concept of parallel processing with examples.	8 Marks	L2	CO5
	b)	Discuss the different types of data hazards.	8 Marks	L4	CO5
		(OR)			
11.	a)	Write a note on instruction hazards and their resolution.	8 Marks	L2	CO5
	b)	Explain the structure of a general-purpose multiprocessor.	8 Marks	L2	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

SATELLITE COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define satellite communication.	2 Marks	L1	CO1
	b)	What is the historical significance of satellite communications?	2 Marks	L1	CO1
	c)	What is the role of the attitude and orbital control system in a satellite?	2 Marks	L1	CO2
	d)	Define telemetry in satellite communication.	2 Marks	L1	CO2
	e)	What is an Earth station in satellite communication?	2 Marks	L1	CO3
	f)	Define FDMA (Frequency Division Multiple Access).	2 Marks	L1	CO3
	g)	What are Low Earth Orbit (LEO) satellites?	2 Marks	L1	CO4
	h)	Explain the concept of Non-Geostationary Orbit (NGSO).	2 Marks	L1	CO4
	i)	What is the Global Positioning System (GPS)?	2 Marks	L1	CO5
	j)	Define GPS position location principles.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Examine the different types of launch vehicles and their impact on satellite performance.	8 Marks	L2	CO1
	b)	Describe the look angle determination process and its impact on satellite communication	8 Marks	L2	CO1

(OR)

3.	a)	Evaluate the role of orbital effects in satellite communication systems, providing examples from real-world applications.	8 Marks	L3	CO1
	b)	Outline the concept of sidereal day and solar day.	8 Marks	L2	CO1

MODULE-II

4.	a)	Evaluate the different satellite communication subsystems and their contribution to overall satellite functionality.	8 Marks	L3	CO2
	b)	Analyze the design and components involved in the uplink and downlink communication system for satellites	8 Marks	L3	CO2

(OR)

5.		Analyze the role of power systems in satellite design and their impact on the efficiency and longevity of communication systems.	16 Marks	L3	CO2

MODULE-III

6.	a)	Analyze the inter modulation problem in satellite communication and propose methods for its mitigation.	8 Marks	L4	CO3
	b)	Interpret various types of antennas used in satellite Earth Station design.	8 Marks	L4	CO3

(OR)

7.		Discuss the frame structure in TDMA and its impact on system performance and efficiency.	16 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss the advantages of LEO satellites in providing global coverage, and their limitations in terms of communication delays.	8 Marks	L2	CO4
	b)	Discuss Delay and Throughput considerations in a satellite system	8 Marks	L2	CO4

(OR)

9.		Evaluate the system design considerations for Non-Geostationary Satellite Systems and their impact on satellite performance.	16 Marks	L2	CO4

MODULE-V

10.		Compare and contrast the GPS system with other global satellite navigation systems, highlighting key advantages and limitations.	16 Marks	L2	CO5

(OR)

11.	a)	Analyze the use of satellite navigation systems in modern technology and their application in everyday life.	8 Marks	L2	CO5
	b)	Explain briefly about IRNSS system, its necessity and sustainability in India.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) (Fasttrack) Regular Examinations April – 2026

PROGRAMMABLE LOGIC CONTROLLERS

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define PLC.	2 Marks	L1	CO1
	b)	Compare the PLC and PC.	2 Marks	L1	CO1
	c)	Point out the applications of PLC.	2 Marks	L1	CO3
	d)	Draw the PLC ladder diagram for NAND gate.	2 Marks	L1	CO3
	e)	What is the use of MCR instruction?	2 Marks	L1	CO2
	f)	Point out the advantages of jump instruction.	2 Marks	L1	CO2
	g)	List basic math functions that can be performed on PLC's.	2 Marks	L1	CO3
	h)	Convert $(327)_{10}$ to octal.	2 Marks	L1	CO3
	i)	Sketch Token Ring Topology.	2 Marks	L1	CO4
	j)	Summarize PLC Comparison functions	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Draw a block diagram of a PLC showing the main functional items and how buses link them, explaining the functions of each block.	8 Marks	L2	CO1
	b)	State the characteristics of the Relay, Transistor and Triac types of PLC output terminals.	8 Marks	L2	CO1

(OR)

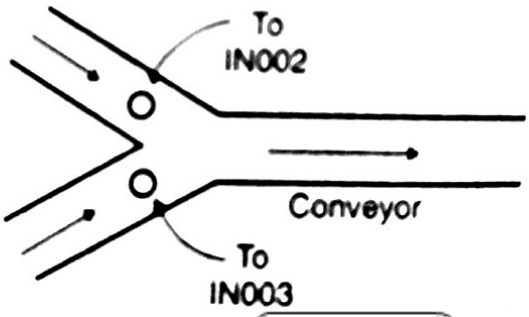
3.	a)	Describe the PLC CPU Power Supply with suitable sketches.	8 Marks	L2	CO1
	b)	Develop a ladder logic diagram for an alarm system. There are four hazard inputs to the alarm system that go on some operational malfunction occurs. The system operates as follows If one input is on, nothing happens If any two inputs are on, a red pilot light goes on If any three inputs are on, an alarm siren sounds If all four are on, the fire department is notified.	8 Marks	L3	CO1

MODULE-II

4.	a)	Create a ladder diagram for a motor control circuit that utilizes two push buttons.	8 Marks	L3	CO2
	b)	Explain the following i) AND gate and relay and PLC equivalents. ii) NOR gate and Relay and PLC equivalents.	8 Marks	L2	CO2

(OR)

5.	a)	Develop a ladder logic diagram for the following Boolean expression (61*62)+(63)+(64)+(65*66)=15	8 Marks	L2	CO3
	b)	Develop ladder logic for counting the net number of parts on a conveyor. The number of parts going on the conveyor is counted by one proximity device's count. The number leaving the conveyor is counted by a second proximity's device's count. The indicator will be ON when at least 6 of Part A and 8 of Part B have entered the conveyor.	8 Marks	L3	CO3



MODULE-III

6.		Explain the Jump with Non-Return with an application.	16 Marks	L2	CO4

(OR)

7.		Evaluate the significance of these comparison functions in the automation industry, focusing on process control applications.	16 Marks	L3	CO4

MODULE-IV

8.		Explain how Bit patterns in registers can be used in machine control?	16 Marks	L3	CO4

(OR)

9.		Discuss in detail shift register function and its applications.	16 Marks	L3	CO4

MODULE-V

10.	a)	Describe about open system interconnection model for network architecture in PLC.	8 Marks	L2	CO5
	b)	Explain the different levels of industrial control systems and illustrate how each level interacts with one another in a typical manufacturing environment	8 Marks	L2	CO5

(OR)

11.	a)	Discuss in detail about Networking of PLC.	8 Marks	L2	CO5
	b)	Generally, describe the PID function in PLC	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) (Fasttrack) Regular Examinations April – 2026

DIGITAL SIGNAL PROCESSING

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Find the period of Discrete time periodic signal $x(n) = cos(\pi n/3)$.	2 Marks	L1	CO1
	b)	What is the mathematical equation for time-shifting property with initial conditions in Z-Transforms?	2 Marks	L1	CO1
	c)	Find number of complex multiplications in 8-point FFT.	2 Marks	L1	CO2
	d)	What are the advantages of Fast Fourier Transform (FFT)?	2 Marks	L1	CO2
	e)	How does an IIR filter differ from a Finite Impulse Response (FIR) filter?	2 Marks	L2	CO3
	f)	Find the denominator polynomial in the transfer function of Butterworth filter with order N=2.	2 Marks	L1	CO3
	g)	Why are FIR filters inherently stable?	2 Marks	L2	CO3
	h)	Expain the significance of windowing technique in the design of FIR Filters.	2 Marks	L1	CO3
	i)	List the common structures used to realization of FIR filters?	2 Marks	L1	CO4
	j)	What are the digital elements in realization structures of IIR and FIR filters?	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2. A signal x[n]={1,1,1,1} is zero-padded to length N=8. — 16 Marks, L4, CO1
   i) Compute the DTFT of the original sequence.
   ii) Compute the DTFT of the zero-padded sequence.
   iii) Explain the effect of zero-padding on the DTFT in terms of frequency resolution.

(OR)

3. a) Compare Energy and power density spectrums. — 6 Marks, L2, CO1
   b) Determine the impulse response of the system using Z- Transform. — 10 Marks, L3, CO1

$$y(n) = (n) + \frac{5}{6}y(n-1) - \frac{1}{6}y(n-2)$$

MODULE-II

4. a) A finite duration sequence is given as — 10 Marks, L3, CO2

$$x(n) = \begin{cases} 1 & 0 \le n \le 7 \\ 0 & otherwise \end{cases}$$

Determine DFT of the sequence using DIFFFT algorithm.

	b)	State and prove the following properties. i) Periodicity property ii) Time-reversal property.	6 Marks	L2	CO2

(OR)

5.	a)	Compute the 8-point DFT of the sequence using DIT-FFT radix 2 algorithm for x(n) = {1, 1, 1, 1, 1, 1, 1, 1}.	11 Marks	L3	CO2
	b)	What are the twiddle factors? Explain with example.	5 Marks	L2	CO2

MODULE-III

6.	a)	Design an analog butterworth filter that has -2dB passband attenuation at a frequency of 20rad/sec and atleast -10dB stopband attenuation at a frequency of 30rad/sec.	12 Marks	L4	CO3
	b)	Derive the denominator polynomial of Butterworth transfer function for order 3.	4 Marks	L2	CO3

(OR)

7.		Design a Digital Chebyshev Type-I Low pass filter using bilinear transformation with the specifications α_p=1 dB ripple in the pass band $0 \le \omega \le 0.2\pi$ α_s=15 dB ripple in the stop band $0.3\pi \le \omega \le \pi$	16 Marks	L4	CO3

MODULE-IV

8.	a)	Determine the filter coefficients h(n) using frequency sampling method for N=7 $H_d(e^{jw}) = \begin{cases} e^{-j(N-1)\omega/2} & 0 \le \omega \le \pi/2 \\ 0 & \pi/2 \le \lvert\omega\rvert \le \pi \end{cases}$	12 Marks	L4	CO3
	b)	Distinguish the window functions used in the design of FIR filters.	4 Marks	L2	CO3

(OR)

9.		Design FIR high pass filter with the frequency response for N=11 using hamming window. $H_d(e^{jw}) = \begin{cases} 1 & \pi/4 \le \omega \le \pi \\ 0 & \lvert\omega\rvert < \pi/4 \end{cases}$	16 Marks	L4	CO3

MODULE-V

10.		Develop the Cascade and parallel form structures of the LTI system having $H(z) = \dfrac{\left(1+\frac{3}{2}z^{-1}+\frac{1}{2}z^{-2}\right)\left(1-\frac{3}{2}z^{-1}+z^{-2}\right)}{\left(1+z^{-1}+\frac{1}{4}z^{-2}\right)\left(1+\frac{1}{4}z^{-1}+\frac{1}{2}z^{-2}\right)}$.	16 Marks	L3	CO4

(OR)

11.	a)	Explain the various structures used for the realization of FIR filters, including direct form, transposed form, and lattice structure. Discuss the advantages and disadvantages of each structure.	10 Marks	L2	CO4
	b)	Realize the FIR filter having transfer function $H(z)=z^5+2z^4+0.5z^3+0.5z^2+2z+1$ using direct form.	6 Marks	L3	CO4

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Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) (Fasttrack) Regular Examinations April – 2026

OPERATIONS RESEARCH

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is the significance of OR?	2 Marks	L1	CO1
	b)	Define Artificial Variable.	2 Marks	L1	CO1
	c)	Define an assignment Problem.	2 Marks	L1	CO2
	d)	Define the term "optimal assignment" in the assignment problem.	2 Marks	L1	CO2
	e)	What is Game theory?	2 Marks	L1	CO3
	f)	Define an Inventory Control in Operations Research.	2 Marks	L1	CO3
	g)	What is a node in a network?	2 Marks	L2	CO4
	h)	What is the activity-on-node (AON) representation?	2 Marks	L3	CO4
	i)	What is the Infinite Queue Length Model in queuing theory?	2 Marks	L1	CO5
	j)	Define Exponential service time.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2. Use two-phase simplex method to solve the following LPP — 16 Marks L1 CO1

$MinZ = 4x_1 + 2x_2 + 3x_3$

Subjected to $x_1+4x_3 \geq 5,\ 2x_1+3x_2+x_3 \geq 4,\ x_1,x_2 \geq 0$

(OR)

3. Solve LP problem by Big-M method — 16 Marks L3 CO1

$Minz = 2x_1 + x_2$

Subjected to $3x_1 + x_2 = 3$

$4x_1 + 3x_2 \geq 6$

$x_1 + 2x_2 \leq 4$

x_1, x_2 and $x_3 \geq 0$

MODULE-II

4. Consider the transportation problem in which two factories supply three stores with a commodity. The number of supply units available at sources 1 and 2 is 200 and 300; those demanded at stores 1, 2 and 3 are 100, 200 and 50 respectively. Units may be transshipped among the factories and the stores before reaching their final destination. Find the optimal shipping schedule based on the unit costs (Rs.) given below: — 16 Marks L3 CO2

	F_1	F_2	S_1	S_2	S_3
F_1	0	6	7	8	9
F_2	6	0	5	4	3
S_1	7	2	0	5	1
S_2	1	5	1	0	4
S_3	8	9	7	6	0

(OR)

5. Find the optimal solution for following Travelling salesman problem: 16 Marks L3 CO2

		To City			
		1	2	3	4
From city	1	∞	4	9	5
	2	6	∞	4	8
	3	9	4	∞	9
	4	5	8	9	∞

MODULE-III

6. Solve the game given below: 16 Marks L2 CO3

Player B

Player A		B_1	B_2	B_3	B_4
	A_1	1	-6	8	4
	A_2	3	-7	2	-8
	A_3	5	-5	-1	0
	A_4	3	-4	5	7

(OR)

7. Find the optimal order quantity of a product for which the price breaks are as follows: 16 Marks L3 CO3

Quantity (Units)	Price per Unit (Rs)
$0 < Q_1 < 500$	25.00
$500 \leq Q_2 < 1500$	24.80
$1500 \leq Q_3 < 3000$	24.60
$3000 \leq Q_4$	24.40

The annual demand of the product is 500 units. The storage cost is 10 % of the unit cost and the cost of ordering is Rs 180.

MODULE-IV

8. The following table gives the activities and other relevant data for a project. 16 Marks L3 CO4

Activity	A	B	C	D	E	F	G	H	I	J	K
Immediate Processor	-	-	-	A	B	B	C	D	E	F,G	H,I
Duration(weeks)	3	2	2	4	4	7	4	2	5	6	3

i) Draw the network diagram
ii) Find the project duration and the critical path
iii) Find the floats of all activities

(OR)

9. Consider the following data of the project. 16 Marks L3 CO4

Activity	Predecessor	Duration (Weeks)		
		Optimistic	Most likely	Pessimistic
A	-	3	5	8
B	-	6	7	9
C	A	4	5	9
D	B	3	5	8
E	A	4	6	9
F	C, D	5	8	11
G	C, D, E	3	6	9
H	F	1	2	9

i) Construct the project network
ii) Find the expected duration & variance of the each activity.
iii) Find the critical path and expected project completion time.

What is the probability of completing the project on or before 30weeks

MODULE-V

10. A fertilizer company distributes its products by trucks that are loaded at its only loading station. Both, company trucks and contractor's trucks are used for this purpose. It was found that on an average, every 5 minutes one truck arrived and the average loading time was 3 minutes. Out of these trucks 40 per cent being to the contractor's. Determine: 16 Marks L3 CO5

i) The probability that a truck has to wait.
ii) The waiting time of a truck that waits.

The expected waiting time of the contractor's trucks per day.

(OR)

11. A dentist schedules all her patients for 30 minutes appointments. Some of the patients take more or less than 30 minutes depending on the type of dental work to be done. The following summary shows the various categories of work, their probabilities and time needed to complete the work. 16 Marks L3 CO5

Category	Time required (Minutes)	Probability of category
Filling	45	0.4
Crown	60	0.15
Cleaning	15	0.15
Extraction	45	0.1
Checkup	15	0.2

Simulate the dentist's clinic for four hours and determine the average waiting time for the patients as well as the idleness of the doctor. Assume that all the patients show up at the clinic at exactly their scheduled arrival times, starting at 8 A.M. Use the following random numbers for handling the above problem: 40, 82, 11, 34, 25, 66, 17, 79.

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech VI Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

HEAT TRANSFER

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	State Fourier's Law of conduction.	2 Marks	L1	CO1
	b)	Define Thermal Conductivity.	2 Marks	L1	CO1
	c)	Define fins (or) extended surfaces.	2 Marks	L1	CO2
	d)	State the applications of fins.	2 Marks	L1	CO2
	e)	Define convection.	2 Marks	L1	CO3
	f)	Define thermal boundary layer.	2 Marks	L1	CO3
	g)	What is heat exchanger?	2 Marks	L1	CO4
	h)	What are the types of heat exchangers?	2 Marks	L1	CO4
	i)	Define emissive power [E] and monochromatic emissive power. [$E_{b\lambda}$]	2 Marks	L1	CO5
	j)	What is meant by absorptivity, reflectivity and transmissivity?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the different modes of Heat Transfer with suitable examples	8 Marks	L2	CO1
	b)	A Plane wall is 150mm thick and its wall area is 4.5m^2. If its conductivity is 9.35 W/m^{0}C and surface temperatures are steady at 150°C and 45°C, determine i) Heat flow across the plane wall ii) Temperature gradient in the flow direction	8 Marks	L3	CO1
		(OR)			
3.		Derive the general heat conduction equation in Cartesian coordinates	16 Marks	L3	CO1

MODULE-II

4.	a)	List out various types of fins and its applications	8 Marks	L4	CO2
	b)	Define and write equation for Efficiency and Effectiveness of Fin.	8 Marks	L3	CO2
		(OR)			
5.		A bar of square cross section connects two metallic structures. One structure is maintained at a temperature 200° C and the other is maintained at 50° C. The bar, 20 mm × 20 mm, is 100 mm long and is made of mild steel (k = 0.06 kW/m . K). The surroundings are at 20° C and the heat transfer coefficient between the bar and the surroundings is 0.01 kW/m^2 . K. Derive an expression for the temperature distribution along the bar and hence calculate the total heat flow rate from the bar to the surroundings.	16 Marks	L3	CO2

MODULE-III

6.	a)	Explain the development of boundary layer over a cylinder.	6 Marks	L2	CO3
	b)	Air at 20°C and atmospheric pressure flows at a velocity of 4.5 m/s past a flat plate with a sharp leading edge. The entire plate surface is maintained at a temperature of 60°C. Assuming that the transition occurs at a critical Reynolds number of $5x10^5$, find the distance from the leading edge at which the boundary layer changes from laminar to turbulent. At the location, calculate the followings: i) Thickness of hydrodynamic boundary layer ii) Thickness of thermal boundary layer	10 Marks	L3	CO3

(OR)

7.	a)	Develop a relationship between Nusselt, Prandtl and Reynolds Numbers in forced convection using dimensional analysis	8 Marks	L2	CO3
	b)	Estimate the heat transfer from a 40 W incandescent bulb at 127°C to 27°C quiescent air. Approximate the bulb as a 50mm diameter sphere. What percentage of the power is lost by free convection?	8 Marks	L3	CO3

MODULE-IV

8.	a)	A 4cm outer diameter, 1 m long tube is to be used to condense steam at atmospheric pressure. The water flows inside the tube maintaining the wall surface at 60^0C. Estimate the mass of condensate for the tube in horizontal position.	8 Marks	L3	CO4
	b)	In a counter flow double pipe heat exchanger with Water (Cp=4186) enters at 15°C, flowing at the rate of 1300kg/h. It is heated by oil (Cp=2000J/ kg K) flowing at the rate of 550kg/h from the inlet temperature of 94 °C. For an area of 1m2 and an overall heat transfer co-efficient of 1075 w/m^2K, determine the total heat transfer and the out let temperatures of water and oil.	8 Marks	L3	CO4

(OR)

9.	a)	Water at atmospheric pressure is to be boiled in polished copper pan. The diameter of the pan is 350 mm and is kept at 115^0C. Calculate: i) power of the burner, ii) rate of evaporation in kg/h and iii) critical heat flux	8 Marks	L3	CO4
	b)	Oil with a specific heat of 2 KJ/ kg K is cooled from 110^0C to 70^0C by a flow of water flow in a counter flow heat exchanger. Water flows at the rate of 2 kg/sec and is heated from 35^0C to 65^0C. The overall heat transfer coefficient is estimated to be 0.37 KW/ m2K. Determine the exit temperatures of oil and water, if the water flow rate drops to 1.5 kg / sec at the same oil flow rate.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain the terms absorptivity, reflectivity and transmissivity.	8 Marks	L2	CO5
	b)	The net radiation from the surfaces of two parallel plates maintained at temperatures, T1 and T2 is to be reduced by79 times. Calculate the number screens to placed between the two surfaces to achieve this reduction in heat exchange, assuming the emissivity of the screens as 0.05 and that of the surfaces as 0.8.	8 Marks	L2	CO5

(OR)

11.	a)	Define the following: i) Irradiation ii) Radiosity iii) radiation shape factor.	8 Marks	L2	CO5
	b)	Two parallel black plates 0.5m × 1.0m are separated by 0.5m distance. One plate is at 11000C and the other at 6000C. Compute the net radiant heat exchange between the two plates.	8 Marks	L3	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech V Semester (MBU-22) (Fasttrack) Regular Examinations April – 2026

MACHINE LEARNING

[Computer Science and Engineering , Computer Science and Engineering (Data Science), Information Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What are different objectives of machine learning? How are these related with human learning?	2 Marks	L1	CO1
	b)	Explain the concept of penalty and reward in reinforcement learning.	2 Marks	L1	CO1
	c)	Explain the process of clustering in details.	2 Marks	L2	CO2
	d)	Differentiate between Predictive model and descriptive model	2 Marks	L2	CO2
	e)	Differentiate between Cross-validation and bootstrapping	2 Marks	L1	CO3
	f)	Write any two features of Bayesian learning methods.	2 Marks	L2	CO4
	g)	Describe one problem that is suitable for decision tree learning.	2 Marks	L2	CO4
	h)	What is unsupervised learning?	2 Marks	L1	CO5
	i)	What is hierarchical clustering?	2 Marks	L1	CO5
	j)	What is the difference between bagging and boosting in ensemble learning?	2 Marks	L3	CO6

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain, in details, the process of machine learning.	8 Marks	L2	CO1
	b)	Compare the different types of machine learning.	8 Marks	L2	CO1
		(OR)			
3.	a)	Explain, in details, the process of evaluating the performance of a classification model. Explain the different parameters of measurement.	8 Marks	L2	CO1
	b)	What is underfitting in context of machine learning models? What is the major cause of underfitting?	8 Marks	L3	CO1

MODULE-II

4.	a)	Explain the concept of Prior, Posterior, and Likelihood with an example.	6 Marks	L3	CO2
	b)	How Bayes' theorem supports the concept learning principle?	10 Marks	L2	CO2
		(OR)			
5.	a)	What is feature engineering? Explain, in details, the different aspects of feature engineering?	8 Marks	L2	CO2
	b)	What is feature selection? Why is it needed? What are the different approaches of feature selection?	8 Marks	L1	CO2

MODULE-III

6.	a)	Analyze the decision tree learning algorithm.	8 Marks	L4	CO3
	b)	How does Decision Tree search the hypothesis space, and what role does inductive bias play in this process?	8 Marks	L2	CO3

(OR)

7.	a)	Describe the assumptions underlying linear regression analysis.	8 Marks	L4	CO3
	b)	How do these assumptions impact the validity of the regression model?	8 Marks	L3	CO4

MODULE-IV

8.	a)	Discuss the main applications of unsupervised learning. Provide examples of real-world problems where unsupervised learning has been successfully applied.	8 Marks	L4	CO4
	b)	Explain clustering as a machine learning task. What are the key objectives of clustering, and why is it important in unsupervised learning?	8 Marks	L1	CO4

(OR)

9.	a)	What is DBSCAN, and how does it perform density-based clustering? Discuss its algorithm, including how it handles noise and identifies core, border, and outlier points.	8 Marks	L1	CO4
	b)	Compare DBSCAN with hierarchical and partitioning methods. In what scenarios would DBSCAN be the preferred choice for clustering?	8 Marks	L4	CO4

MODULE-V

10.	a)	Discuss the architecture of Multilayer Neural Networks.	8 Marks	L2	CO5
	b)	Write and Explain Back-Propagation Algorithm.	8 Marks	L3	CO5

(OR)

11.	a)	Examine the role of neural networks in solving real-world problems.	6 Marks	L2	CO6
	b)	Provide examples where neural networks have been successfully applied, highlighting the challenges and solutions.	10 Marks	L4	CO6

Reg. No. | | | | | | | | | | | | |

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SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA IV Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

FUNDAMENTALS OF DATA SCIENCE

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Data Science.	2 Marks	L1	CO1
	b)	Write any two methods to create ndarrays with example	2 Marks	L1	CO1
	c)	Create a Data Frame from dict where Roll Number, Name, Age, Marks as columns of 5 students.	2 Marks	L1	CO2
	d)	How to drop entries from an axis	2 Marks	L1	CO2
	e)	Define Data Transformation and mention any two methods used for Data Transformation.	2 Marks	L1	CO3
	f)	Write suitable examples for join and split methods.	2 Marks	L1	CO3
	g)	Write the syntax to create multiple subplots using matplotlib.	2 Marks	L1	CO4
	h)	Generate a solid line plot with title, xlabel and ylabel.	2 Marks	L1	CO4
	i)	List the Types in date time modules in Python	2 Marks	L1	CO5
	j)	Convert annual period into a monthly period using PeriodIndex method.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	What is a universal function? Write about binary ufuncs.	8 Marks	L2	CO1
	b)	Write a Python code to perform matrix operations such as multiplication, determinant, sum of diagonal elements and inverse	8 Marks	L2	CO1

(OR)

3.	a)	Illustrate the importance of performing arithmetic computations using NumPy with suitable examples.	8 Marks	L2	CO1
	b)	Write a Python code to perform descriptive statistical operations to compute arithmetic mean, standard deviation, variance, percentile, minimum and maximum, cumulative sum and product using statistical functions in NumPy.	8 Marks	L2	CO1

MODULE-II

4.	a)	Create a Data Frame using List of Dictionaries and perform column selection, addition, column deletion and row selection for student data	8 Marks	L3	CO2
	b)	Create a DataFrame to perform descriptive statistics functions such as median, mode, standard deviation, skewness and kurtosis using pandas.	8 Marks	L3	CO2

(OR)

5.	a)	Illustrate the process of computing correlation and covariance with	8 Marks	L2	CO2

		example.			
	b)	Write a Python code to perform reading and writing data in text format.	8 Marks	L2	CO2

MODULE-III

6.	a)	What is missing data? Illustrate how missing data is handled during data analysis?	8 Marks	L2	CO3
	b)	Define regular expression. Demonstrate extracting white space characters from a string using regular expression methods.	8 Marks	L2	CO3

(OR)

7.	a)	Explain vectorized string functions with relevant examples.	8 Marks	L2	CO3
	b)	Describe the process of data transformation using function with relevant examples.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Create a Line Plot by setting the title, axis labels, ticks, tick labels , annotations on subplots and save to a file using Python.	8 Marks	L3	CO4
	b)	Create Histogram to display the value frequency and Density Plot to generate continuous probability distribution function for observed data.	8 Marks	L3	CO4

(OR)

9.	a)	Write a Python program for plotting bar plot and box plot with suitable example.	8 Marks	L2	CO4
	b)	Describe pandas.crosstab() function and pandas.pivot_table() function with suitable examples.	8 Marks	L2	CO4

MODULE-V

10.	a)	Using pandas, distinguish indexing, selection and subsetting of Time Series data.	8 Marks	L2	CO5
	b)	Write about ‘resampling’ with respect to Time Series data in pandas, with relevant example.	8 Marks	L2	CO5

(OR)

11.	a)	What are timestamps? Given an example of converting timestamps into periods and vice versa.	8 Marks	L2	CO5
	b)	Illustrate the various mechanisms of date and time conversion into string and vice versa with an example in Python code snippets.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA IV Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

UNIX SHELL PROGRAMMING

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Differentiate between internal and external commands.	2 Marks	L1	CO1
	b)	What is command structure in UNIX?	2 Marks	L1	CO1
	c)	What is the use of bc command?	2 Marks	L1	CO2
	d)	Define process in UNIX.	2 Marks	L1	CO2
	e)	What is the purpose of chown command?	2 Marks	L1	CO3
	f)	Define inode.	2 Marks	L1	CO3
	g)	Write command to quit without saving.	2 Marks	L1	CO4
	h)	How do you undo the last change in vi?	2 Marks	L1	CO4
	i)	Explain command substitution.	2 Marks	L1	CO5
	j)	What is meant by positional parameters?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the role of the shell as a command interpreter.	8 Marks	L3	CO1
	b)	Discuss different types of UNIX commands.	8 Marks	L2	CO1
		(OR)			
3.	a)	Explain the process of locating commands in UNIX system.	8 Marks	L2	CO1
	b)	Discuss the importance of UNIX documentation tools.	8 Marks	L2	CO1

MODULE-II

4.	a)	Describe running jobs in background and foreground.	8 Marks	L3	CO2
	b)	Explain nice command and process priority management.	8 Marks	L3	CO2
		(OR)			
5.	a)	Discuss signals in UNIX and killing processes using kill command.	8 Marks	L2	CO2
	b)	Explain cron command and scheduling jobs in UNIX.	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain hard links and symbolic links with examples.	8 Marks	L2	CO3
	b)	Differentiate between hard link and soft link.	8 Marks	L3	CO3
		(OR)			
7.	a)	Discuss locating files using find and locate commands.	8 Marks	L3	CO3
	b)	Explain modification time, access time and change time.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain substitution and search-replace operations in vi.	8 Marks	L2	CO4
	b)	Write detailed notes on ex-mode commands.	8 Marks	L2	CO4
		(OR)			
9.	a)	Explain file handling commands in vi editor.	8 Marks	L3	CO4
	b)	Discuss advanced editing features of vi editor.	8 Marks	L3	CO4

MODULE-V

10.	a)	Explain read command and input methods in shell scripts.	8 Marks	L2	CO5
	b)	Discuss flow control statements in shell scripting.	8 Marks	L3	CO5
		(OR)			
11.	a)	Explain if-else statement with syntax and examples.	8 Marks	L3	CO5
	b)	Describe case statement with examples.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA IV Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

CLOUD PRACTITIONER

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Explain the virtual private cloud in cloud computing	2 Marks	L1	CO1
	b)	Describe the any two Resources in cloud computing	2 Marks	L1	CO1
	c)	Illustrate the cloud watch services	2 Marks	L1	CO2
	d)	Describe the any two Resources Give any two scenarios	2 Marks	L1	CO2
	e)	What are the benefits of Elastic block store in the context of Aws	2 Marks	L3	CO3
	f)	Define the General-Purpose Instances	2 Marks	L1	CO3
	g)	illustrate the Amazon Relational Database services	2 Marks	L4	CO3
	h)	Explain the s3 storage services in Aws	2 Marks	L4	CO3
	i)	Explain in detail Memory Optimized	2 Marks	L5	CO3
	j)	Criticize the importance's of Relational Database	2 Marks	L5	CO3

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Illustrate characters of software as service?	8 Marks	L2	CO2
	b)	Discuss Disadvantages of private cloud with Examples	8 Marks	L1	CO1
		(OR)			
3.	a)	Illustrate the Advantages of Service model with Diagram?	8 Marks	L1	CO1
	b)	Define the Benefits of Amazon web services?	8 Marks	L1	C01

MODULE-II

4.		Describe the Availability Zone Network services & Explain With real time scenarios.	16 Marks	L1	C01
		(OR)			
5.	a)	Describe about software Development kit in Aws?	8 Marks	L1	C01
	b)	Differentiate Availability zone Networking resources and Data center resources?	8 Marks	L2	C02

MODULE-III

6.	a)	Describe Different Types of Ec2 instances in Amazon web services?	10 Marks	L2	CO3
	b)	Explain the Amazon Machine Image	6 Marks	L1	CO4
		(OR)			
7.		Create an EC2 instance and invoke Linux operating system with a set of configurations on amazon web services under IaaS	16 Marks	L5	CO3

MODULE-IV

8.	a)	Design the Aws Storage Gateway	8 Marks	L6	CO3
	b)	Define the Database Model in Amazon Web Service S3?	8 Marks	L1	CO3
		(OR)			
9.	a)	Evaluate about the architectural design of compute and storage clouds	8 Marks	L5	CO3
	b)	Explain with neat diagram about the Cloud Storage Providers and Amazon Simple Storage Service S3	8 Marks	L6	CO3

MODULE-V

10.	a)	Define the Relational Data base services in Amazon Web Services	8 Marks	L1	CO4
	b)	Illustrate Characters of General – purpose SSD	8 Marks	L3	CO4
		(OR)			
11.		Amazon Elastic File System: Amazon Elastic File System (Amazon EFS) provides simple, scalable file storage for use with Amazon EC2. With Amazon EFS, storage capacity is elastic, growing and shrinking automatically as to add and remove files, to applications to store as they require, when they need it.	16 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech V Semester (MBU-22) (Fasttrack) Regular Examinations April – 2026

LINUX PROGRAMMING

[Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is GNU Project?	2 Marks	L1	CO1
	b)	Define Linux distribution.	2 Marks	L1	CO1
	c)	What is shell scripting?	2 Marks	L1	CO2
	d)	Define pipes in Linux.	2 Marks	L1	CO2
	e)	What is a file descriptor?	2 Marks	L1	CO3
	f)	Define system call.	2 Marks	L1	CO3
	g)	What is a process?	2 Marks	L1	CO4
	h)	Define process scheduling.	2 Marks	L1	CO4
	i)	What is Inter-Process Communication (IPC)?	2 Marks	L1	CO5
	j)	Define pipe.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the GNU Project and the role of the Free Software Foundation.	8 Marks	L2	CO1
	b)	Describe different types of Linux distributions with examples.	8 Marks	L2	CO1
		(OR)			
3.	a)	Explain the architecture of Linux operating system.	8 Marks	L2	CO1
	b)	Discuss various Linux programs and utilities.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the necessity of shell programming.	8 Marks	L2	CO2
	b)	Describe pipes and redirection with suitable examples.	8 Marks	L3	CO2
		(OR)			
5.	a)	Explain input and output redirection in detail.	8 Marks	L3	CO2
	b)	Discuss the shell as a programming language.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain Linux file system structure in detail.	8 Marks	L2	CO3
	b)	Describe file types in Linux (regular, directory, device files).	8 Marks	L2	CO3
		(OR)			
7.	a)	Explain system calls and their importance.	8 Marks	L2	CO3
	b)	Discuss open(), read(), write(), and close() system calls.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain process structure and process table.	8 Marks	L2	CO4
	b)	Describe process states and transitions.	8 Marks	L2	CO4
		(OR)			
9.	a)	Explain process scheduling algorithms.	8 Marks	L3	CO4
	b)	Discuss system processes and user processes.	8 Marks	L4	CO4

MODULE-V

10.	a)	Explain Inter-Process Communication (IPC) mechanisms.	8 Marks	L2	CO5
	b)	Describe pipes and their implementation.	8 Marks	L3	CO5
		(OR)			
11.	a)	Explain parent-child communication using pipes.	8 Marks	L3	CO5
	b)	Discuss named pipes (FIFOs) with examples.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech V Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

DIGITAL IC DESIGN

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define static CMOS inverter.	2 Marks	L1	CO1
	b)	What is robustness in the context of CMOS inverters?	2 Marks	L2	CO1
	c)	What is the difference between a latch and a register?	2 Marks	L2	CO1
	d)	Define "setup time" in the context of sequential circuits.	2 Marks	L1	CO1
	e)	What is clock skew?	2 Marks	L2	CO2
	f)	Define "static timing analysis."	2 Marks	L1	CO2
	g)	What is an Arithmetic Logic Unit (ALU)?	2 Marks	L1	CO3
	h)	Define the term "shifter" in digital circuits	2 Marks	L1	CO3
	i)	What is structured design in digital circuits?	2 Marks	L2	CO4
	j)	Define the term "design flow" in VLSI design.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Analyze the static behavior of a CMOS inverter.	8 Marks	L3	CO1
	b)	Discuss about Complementary CMOS with examples.	8 Marks	L2	CO1

(OR)

3.	a)	Discuss the role of ratioed logic in combinational circuit design.	8 Marks	L3	CO1
	b)	Analyze the trade-offs between speed and power dissipation in CMOS inverters	8 Marks	L4	CO1

MODULE-II

4.	a)	Explain the importance of timing metrics for sequential circuits. How do these metrics influence circuit design and performance?	8 Marks	L2	CO1
	b)	Describe the bistability principle and its application in static latches and registers. Why is it fundamental to their operation?	8 Marks	L3	CO1

(OR)

5.	a)	What is C^2MOS, and how does it address clock-skew issues in dynamic registers?	8 Marks	L3	CO1
	b)	Discuss the function and importance of the Schmitt Trigger in non-bistable sequential circuits.	8 Marks	L3	CO1

MODULE-III

6.	a)	Define mesochronous interconnect and explain how it differs from synchronous interconnect.	8 Marks	L2	CO2
	b)	Discuss how setup time and hold time constraints impact synchronous circuit design.	8 Marks	L4	CO2

(OR)

7.	a)	Define clock skew and jitter. How do they affect the timing of digital circuits?	8 Marks	L2	CO2
	b)	What is an arbiter, and why is it important in digital circuits?	8 Marks	L2	CO2

MODULE-IV

8.	a)	Describe the architecture of a 4-bit Arithmetic Processor. Provide a block diagram and explain its components.	8 Marks	L2	CO3
	b)	Explain the process of designing a 4-bit shifter. What types of shifts can it perform?	8 Marks	L4	CO3

(OR)

9.	a)	What is the modified Booth's algorithm? Explain its steps and advantages.	8 Marks	L2	CO3
	b)	Design a 4-bit multiplier using an array-based approach.	8 Marks	L6	CO3

MODULE-V

10.	a)	Articulate the concept of Economics in VLSI System Design.	8 Marks	L2	CO4
	b)	Illustrate the concept Design Strategies using in VLSI System Design.	8 Marks	L3	CO4

(OR)

11.	a)	Appraise the parameters represented in data sheets	8 Marks	L5	CO4
	b)	Summarize the method used to assess Design Economics.	8 Marks	L2	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech V Semester (MBU-22) (Fasttrack) Regular Examinations April – 2026

WEB TECHNOLOGIES

[Computer Science and Engineering, Information Technology
Computer Science and Engineering (Artificial Intelligence and Machine Learning),
Computer Science and Engineering (Data Science),
Computer Science and Engineering (Cyber Security),]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Differentiate between HTML and HTML5.	2 Marks	L1	CO1
	b)	List any two tags in HTML.	2 Marks	L2	CO1
	c)	What are the advantages of CSS	2 Marks	L1	CO2
	d)	Write any two uses of AJAX.	2 Marks	L1	CO2
	e)	What is the use of badges in Bootstrap?	2 Marks	L2	CO3
	f)	Why Bootstrap is preferred for website development over any other platform?	2 Marks	L2	CO3
	g)	List any four data types used in PHP.	2 Marks	L1	CO4
	h)	What is String Interpolation in PHP?	2 Marks	L1	CO4
	i)	What are cookies?	2 Marks	L1	CO5
	j)	How can you modify session variables?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the components of HTML5 document structure	8 Marks	L1	CO1
	b)	Explain the tags used to create editable content, check spelling mistakes with syntax and examples	8 Marks	L1	CO1

(OR)

3.	a)	Explain the process of creating a table in HTML and discuss its attributes and their significance with a sample HTML code.	8 Marks	L2	CO1
	b)	Discuss the drag & drop features.	8 Marks	L2	CO1

MODULE-II

4.	a)	Discuss about different types of CSS Selectors.	8 Marks	L2	CO2
	b)	Enlist the various fonts, attributes with examples used in the style sheet.	8 Marks	L2	CO2

(OR)

5.	a)	Discuss the Document Object Model? Explain getElementById() method with an example	8 Marks	L2	CO2
	b)	Discuss the JQuery Selectors, Events, Methods to access HTML elements and attributes.	8 Marks	L2	CO2

MODULE-III

6.	a)	What is Bootstrap Grid System? Give an example of a basic grid structure in Bootstrap.	8 Marks	L3	CO3
	b)	Discuss various packaged components in Bootstrap	8 Marks	L2	CO3
		(OR)			
7.	a)	What are glyphicons? Discuss its uses.	8 Marks	L2	CO3
	b)	Discuss the steps to create a progress bar, Alerts and panels using bootstrap? List their advantages.	8 Marks	L3	CO3

MODULE-IV

8.	a)	What is PHP? Explain its syntax with example.	8 Marks	L2	CO4
	b)	Explain the various types of arrays in PHP with an illustration.	8 Marks	L2	CO4
		(OR)			
9.	a)	Discuss the procedure to create a database using PHP and MySQL.	8 Marks	L3	CO4
	b)	Write a note on Control Structures in PHP. Discuss different Data types of PHP.	8 Marks	L3	CO4

MODULE-V

10.	a)	What are cookies? Explain how cookies are Set, View, and Deleted?	8 Marks	L2	CO5
	b)	Discuss the procedure of creating a database in SQL console.	8 Marks	L3	CO5
		(OR)			
11.	a)	What are session variables? Explain how they are handled.	8 Marks	L2	CO5
	b)	Discuss different ways to retrieve the data in the result set of MYSQL using PHP.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

DYNAMICS OF MACHINERY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define a single plate clutch and state one application.	2 Marks	L1	CO1
	b)	Differentiate between a brake and a dynamometer.	2 Marks	L1	CO1
	c)	Define gyroscopic couple.	2 Marks	L1	CO2
	d)	Explain the effect of gyroscopic action on a motor cycle while taking a turn.	2 Marks	L1	CO2
	e)	Define sensitiveness of a governor.	2 Marks	L1	CO3
	f)	State why hunting is undesirable in a governor.	2 Marks	L1	CO3
	g)	Define primary unbalanced force.	2 Marks	L1	CO4
	h)	What is meant by complete balancing of reciprocating masses?	2 Marks	L1	CO4
	i)	Define natural frequency of a vibrating system.	2 Marks	L1	CO5
	j)	Why is resonance considered dangerous for mechanical systems?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Describe with a neat sketch a cone clutch and deduce an equation for the total torque transmitted.	6 Marks	L2	CO1
	b)	A conical friction clutch is used to transmit 90 kW at 1500 r.p.m. The semicone angle is 20º and the coefficient of friction is 0.2. If the mean diameter of the bearing surface is 375 mm and the intensity of normal pressure is not to exceed 0.25 N/mm^2, find the dimensions of the conical bearing surface and the axial load required.	10 Marks	L3	CO1

(OR)

3.	a)	Distinguish between brakes and dynamometers	6 Marks	L2	CO1
	b)	A simple band brake is operated by a lever of length 500 mm. The brake drum has a diameter of 500 mm and the brake band embraces 5/8 of the circumference. One end of the band is attached to the fulcrum of the lever while the other end is attached to a pin on the lever 100 mm from the fulcrum. If the effort applied to the end of the lever is 2 kN and the coefficient of friction is 0.25, find the maximum braking torque on the drum.	10 Marks	L3	CO1

MODULE-II

4.	a)	Write a short note on gyroscope.	6 Marks	L1	CO2
	b)	The turbine rotor of a ship has a mass of 3500 kg. It has a radius of gyration of 0.45 m and a speed of 3000 r.p.m. clockwise when looking from stern. Determine the gyroscopic couple and its effect upon the ship: i) when the ship is steering to the left on a curve of 100 m radius at a speed of 36 km/h. ii) when the ship is pitching in a simple harmonic motion, the bow falling with its maximum velocity. The period of pitching is 40 seconds and the total angular displacement between the two extreme positions of pitching is 12 degrees.	10 Marks	L3	CO2

(OR)

5.	a)	Differentiate between fly wheel and governor	6 Marks	L1	CO2
	b)	The turning moment diagram for a multicylinder engine has been drawn to a scale 1 mm = 600 N-m vertically and 1 mm = 3° horizontally. The intercepted areas between the output torque curve and the mean resistance line, taken in order from one end, are as follows : + 52, – 124, + 92, – 140, + 85, – 72 and + 107 mm2 , when the engine is running at a speed of 600 r.p.m. If the total fluctuation of speed is not to exceed ± 1.5% of the mean, find the necessary mass of the flywheel of radius 0.5 m	10 Marks	L3	CO2

MODULE-III

6.	a)	What are the functions of a governor? Classify mechanical governors?	6 Marks	L1	CO3
	b)	The lengths of the upper and lower arms of a Porter governor are 200mm and 250mm respectively. Both the arms are pivoted on the axis of the rotation. The central load is 150N, the weight of each ball is 20N and the friction of the sleeve together with the resistance of the operating gears is equivalent to a force of 30N at the sleeve. If the limiting inclinations of the upper arms to the vertical are 30^0 and 40^0, determine the range of speed of the governor.	10 Marks	L3	CO3

(OR)

7.	The arms of a Hartnell governor are of equal length. When the sleeve is in the midposition, the masses rotate in a circle of diameter 200mm (the arms are vertical in the mid-position). Neglecting friction, the equilibrium speed for this position is 300 rpm. Maximum variation of speed, taking friction into account, is to be ± 5% of the mid-position speed for a maximum sleeve / movement of 25 mm. The sleeve mass is 5 kg and the friction at the sleeve is 30 N.Assuming that the power of the governor is sufficient to overcome the friction by 1 % change of speed on each side of the mid-position, find (neglecting obliquity effect of arms). i) The mass of each rotating ball ii) The spring stiffness iii) The initial compression of the spring.	16 Marks	L3	CO3

MODULE-IV

8.	A,B,C and D are four masses carried by a rotating shaft at radii 100mm, 150mm, 150mm and 200mm respectively. The planes in which masses rotate are spaced at 500mm apart and the magnitude of the masses, B, C and D are 9Kg, 5Kg and 4Kg respectively. Find the required mass A and the relative angular settings of the 4 masses so that the shaft shall be in complete balance.	16 Marks	L3	CO4

(OR)

9.	A single cylinder horizontal engine runs at 120 r.p.m. The length of stroke is 400 mm. The mass of the revolving parts assumed concentrated at the crank pin is 100 kg and mass of reciprocating parts is 150 kg. Determine the magnitude of the balancing mass required to be placed opposite to the crank at a radius of 150mm which is equivalent to all the revolving and 2/3 rd of the reciprocating masses. If the crank turns 300 from the inner dead centre, find the magnitude of the unbalanced force due to the balancing mass.	16Marks	L4	CO4

MODULE-V

10.	A shaft 1.5 m long, supported in flexible bearings at the ends carries two wheels each of 50 kg mass. One wheel is situated at the center of the shaft and the other at a distance of 375 mm from the center towards left. The shaft is hollow of external diameter 75 mm and internal diameter 40 mm. The density of the shaft material is 7700 kg/m3 and its modulus of elasticity is 200 GN/m2. Find the lowest whirling speed of the shaft, taking into account the mass of the shaft.	16 Marks	L3	CO5

(OR)

11.	A machine has a mass of 100 kg and unbalanced reciprocating parts of mass 2 kg which move through a vertical stroke of 80 mm with simple harmonic motion. The machine is mounted on four springs, symmetrically arranged with respect to center of mass, in such a way that the machine has one degree of freedom and can undergo vertical displacements only. Neglecting damping, calculate the combined stiffness of the spring in order that the force transmitted to the foundation is 1 / 25 th of the applied force, when the speed of rotation of machine crank shaft is 1000 r.p.m. When the machine is actually supported on the springs, it is found that the damping reduces the amplitude of successive free vibrations by 25%. Find: 1. the force transmitted to foundation at 1000 r.p.m., 2. the force transmitted to the foundation at resonance, and 3. the amplitude of the forced vibration of the machine at resonance.	16 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

MACHINE LEARNING USING PYTHON

[Computer Science and Engineering (Artificial Intelligence and Machine Learning)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define human learning.	2 Marks	L1	CO1
	b)	List any two key characteristics of human learning.	2 Marks	L2	CO1
	c)	Define model selection in machine learning.	2 Marks	L1	CO2
	d)	State the purpose of training a model.	2 Marks	L2	CO2
	e)	Define a classification model in machine learning.	2 Marks	L1	CO3
	f)	List the main steps involved in classification learning.	2 Marks	L2	CO3
	g)	Define unsupervised learning.	2 Marks	L1	CO5
	h)	Differentiate between supervised and unsupervised learning.	2 Marks	L1	CO5
	i)	Define neural network representation.	2 Marks	L1	CO4
	j)	Mention two examples of problems suitable for neural network learning.	2 Marks	L2	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the concept of human learning and describe its connection to machine learning.	8 Marks	L2	CO1
	b)	Classify the types of human learning and provide examples for each.	8 Marks	L3	CO1

(OR)

3.	a)	Explain the difference between supervised, unsupervised, and reinforcement learning with examples.	8 Marks	L2	CO1
	b)	Describe the key applications of machine learning in healthcare and discuss their impact.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the process of selecting a model in machine learning and discuss the factors that influence model selection with examples.	8 Marks	L2	CO2
	b)	Describe the steps involved in training a machine learning model and explain the importance of the training process in achieving accurate predictions.	8 Marks	L3	CO2

(OR)

5.	a)	Define model representation and interpretability in machine learning and explain why model interpretability is important for practical applications.	8 Marks	L2	CO2
	b)	List and describe at least three metrics for evaluating model performance and explain how choosing the right evaluation metric affects model improvement.	8 Marks	L4	CO2

MODULE-III

6.	a)	Explain the concept of a classification model and describe the main steps involved in classification learning.	8 Marks	L2	CO3
	b)	Define the K-Nearest Neighbor (KNN) algorithm and explain its working principle with an example.	8 Marks	L3	CO3

(OR)

7.	a)	Explain support vector machines (SVM) and discuss how they separate data using a hyperplane.	8 Marks	L4	CO3
	b)	Define a decision tree and describe its representation, including the structure of nodes, branches, and leaves.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Define unsupervised learning and describe its key characteristics.	8 Marks	L2	CO6
	b)	Differentiate between supervised and unsupervised learning with examples.	8 Marks	L2	CO6

(OR)

9.	a)	Discuss density-based clustering method in detail	8 Marks	L2	CO5
	b)	Explain the concept of clustering as a machine learning task.	8 Marks	L2	CO5

MODULE-V

10.	a)	Define neural network representations and explain their role in solving machine learning problems.	8 Marks	L2	CO4
	b)	Describe the types of problems where neural network learning is most appropriate.	8 Marks	L3	CO4

(OR)

11.	a)	Illustrate the working of a perceptron with a suitable diagram and example.	8 Marks	L3	CO4
	b)	Compare single-layer and multilayer network architectures.	8 Marks	L2	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA III Semester (MBU-22) (Fasttrack) Regular Examinations April – 2026

SOFTWARE ENGINEERING

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is meant by Software Process?	2 Marks	L1	CO1
	b)	List the layers of Software Engineering.	2 Marks	L1	CO1
	c)	What are Functional Requirements?	2 Marks	L1	CO2
	d)	Define Requirements Engineering.	2 Marks	L1	CO2
	e)	What is a Class Diagram?	2 Marks	L2	CO3
	f)	Define UML.	2 Marks	L1	CO3
	g)	Define Software Testing.	2 Marks	L1	CO4
	h)	What is White Box Testing?	2 Marks	L1	CO4
	i)	What is Software Quality Assurance (SQA)?	2 Marks	L1	CO5
	j)	What is Reverse Engineering?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the Software Engineering Layers with diagram.	8 Marks	L2	CO1
	b)	Describe the Generic Software Process Model.	8 Marks	L2	CO1
		(OR)			
3.	a)	Write in detail about Incremental Process Model.	8 Marks	L2	CO1
	b)	Compare Waterfall Model and Agile Model.	8 Marks	L4	CO1

MODULE-II

4.	a)	Explain requirements elicitation, validation, and management.	8 Marks	L2	CO2
	b)	Describe the Requirements Engineering process in detail.	8 Marks	L2	CO2
		(OR)			
5.	a)	Explain Data Modeling Concepts in Software Engineering.	8 Marks	L2	CO2
	b)	Describe the Structure of Software Requirements Specification (SRS).	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain Class Diagram with example.	8 Marks	L2	CO3
	b)	Explain Software Quality Metrics.	8 Marks	L2	CO3
		(OR)			
7.	a)	Discuss Process and Project Metrics in Software Engineering.	8 Marks	L2	CO3
	b)	Explain Use Case Diagram and its components.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss Black Box Testing Methods.	8 Marks	L2	CO4
	b)	Describe Testing Strategies for Object-Oriented Software.	8 Marks	L2	CO4
		(OR)			
9.	a)	Explain White Box Testing Techniques.	8 Marks	L2	CO4
	b)	Explain the Process of Debugging in Software Testing.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain Risk Management in Software Engineering.	8 Marks	L2	CO5
	b)	Discuss Reactive and Proactive Risk Strategies.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain Software Reengineering process.	8 Marks	L2	CO5
	b)	Describe Software Quality Assurance (SQA) activities.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA III Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

ADVANCED DATABASES

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define Vertical Partitioning.	2 Marks	L1	CO1
	b)	List out the categories of Skew.	2 Marks	L1	CO1
	c)	Define multiset.	2 Marks	L1	CO2
	d)	List out large object types.	2 Marks	L1	CO2
	e)	List two features of DDBMS.	2 Marks	L1	CO3
	f)	What is Vertical Fragmentation.	2 Marks	L1	CO3
	g)	Define hybrid fragmentation.	2 Marks	L1	CO4
	h)	Define XML attributes.	2 Marks	L1	CO4
	i)	Identify two advantages of mobile databases.	2 Marks	L2	CO5
	j)	Define GIS.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2. a) Apply Range Partition Technique, for all employees who left before 1991, the rows are stored in partition **p0**; for those who left in the years 1991 through 1995, in **p1**; for those who left in the years 1996 through 2000, in **p2**; and for any workers who left after the year 2000, in **p3** and the corresponding disk associated with D0, D1, D2, D3 respectively. Identify the tuples based on the range partition sort technique and illustrate the steps neatly. — 8 Marks, L2, CO1
   i) Now suppose, the employee **"Manish"** left in 2004 and the corresponding tuple exist in which disk number.
   ii) If the employee "Ashish" left in 1997, then the tuple exists in which disk number.

   Apply Round Robin Technique, if there are 100 tuples in the employee database, it has 4 partitions partitioned into 4 available disks named as D0, D1, D2, D3. 64th employee record stored on which disk number.

   b) Explain pipeline parallelism and independent parallelism with neat diagram. — 8 Marks, L2, CO1

(OR)

3. Summarize the following Concepts — 16 Marks, L2, CO1
   i) Partitioned Parallel Hash Join
   ii) Parallel Nested Loop Join
   iii) Query optimization
   iv) Design of parallel systems

MODULE-II

4.	a)	Construct the query with the following application. Create Structured super type **person** with the attributes name varchar 20, address varchar(20), create a structured sub type **Student** with the attributes department varchar(20), degree varchar(20), and also create the structured type Teacher with the attributes department varchar (20) and salary integer(10). Implement the following concepts, i) Structured Types ii) Arrays iii) Inheritance and Multiple Inheritance.	8 Marks	L3	CO2
	b)	Explain user generated identifier with suitable example.	8 Marks	L2	CO2

(OR)

5.	a)	Summarize persistent Programming languages and compare object oriented and object relational databases.	8 Marks	L2	CO2
	b)	Compare Persistent objects and transient objects.	8 Marks	L4	CO2

MODULE-III

6.	a)	Explain Reference Architecture for Distributed Databases.	8 Marks	L2	CO3
	b)	Explain the advantages & disadvantages of distributed databases	8 Marks	L2	CO3

(OR)

7.	a)	Elaborate the challenges associated with maintaining integrity constraints in a distributed database environment.	8 Marks	L2	CO3
	b)	Explain briefly about Fragmentation with suitable examples.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Explain the structure of XML.	8 Marks	L2	CO4
	b)	Explain DTD for XML Schemas.	8 Marks	L2	CO4

(OR)

9.	a)	Elaborate storage of XML data.	8 Marks	L2	CO4
	b)	Discuss Query and Transformation in XML.	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss the key components of a Geographic Information System (GIS).	8 Marks	L2	CO5
	b)	Discuss different techniques used for extracting and indexing multimedia content for efficient retrieval.	8 Marks	L2	CO5

(OR)

11.	a)	Discuss overview of NoSQL databases	8 Marks	L2	CO5
	b)	Discuss the key features and requirements of a multimedia database system.	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

DESIGN AND ANALYSIS OF ALGORITHMS

[Computer Science and Engineering, Information Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Algorithm	2 Marks	L1	CO1
	b)	What are the characteristics of Algorithm	2 Marks	L2	CO1
	c)	Define Divide & Conquer	2 Marks	L1	CO2
	d)	Define Strassen's Formula's.	2 Marks	L1	CO2
	e)	Define Dynamic Programming Concept.	2 Marks	L1	CO3
	f)	Define Travelling Salesman Problem.	2 Marks	L1	CO3
	g)	List out the properties of Minimum spanning tree.	2 Marks	L2	CO4
	h)	Define General Method for Backtracking.	2 Marks	L1	CO4
	i)	Differentiate NP Complete and NP Hard Problem	2 Marks	L1	CO5
	j)	Explain the difference between NP hard and NP Complete problem	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe asymptotic notations: big 'Oh', omega and theta?	8 Marks	L2	CO1
	b)	Explain the Time Complexity and Space Complexity with examples	8 Marks	L2	CO1

(OR)

3.	a)	Solve T(n)=T(n)-1 using Substitution method.	8 Marks	L2	CO1
	b)	Prove T(n)=3T(n/2)+n^2 falls in O(n^2) using Masters theorem?	8 Marks	L2	CO1

MODULE-II

4.	a)	Describe Binary Search Algorithm using Divide and Conquer strategy?	8 Marks	L2	CO2
	b)	Construct an algorithm to Sort the given elements {5,10,3,6,32,41,12,57,82,24} in an Average running time using Quick Sort?	8 Marks	L3	CO2

(OR)

5.	a)	Solve the maximum and minimum problem using the DAC approach	8 Marks	L2	CO2
	b)	Solve the Time complexity for Strassen's Matrix Multiplication using DAC?	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain 8 queen problem in detail	8 Marks	L2	CO3
	b)	Explain Travelling sales person problem for any graph using dynamic programming	8 Marks	L2	CO3

(OR)

7.	a)	Solve 0/1 Knapsack problem for the given weights w={2,4,5,3} and profits p={1,2,4,6} with bag of capacity=10 by analyzing the objects with maximum profit.	8 Marks	L2	CO3
	b)	Explain Matrix chain multiplication problem in detail	8 Marks	L2	CO3
		MODULE-IV			
8.	a)	Describe minimum cost spanning tree using Krushkals Algorithm.	8 Marks	L2	CO4
	b)	Explain sum of subsets problem using backtracking.	8 Marks	L2	CO4
		(OR)			
9.	a)	Explain Job sequencing problem with deadlines	8 Marks	L2	CO4
	b)	Design an algorithm for n-Queens problem using back tracing.	8 Marks	L2	CO4
		MODULE-V			
10.	a)	Describe the characteristics of Branch and Bound Algorithm.	8 Marks	L2	CO5
	b)	Explain Travelling sales person problem using branch and bound technique.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain NP Hard and NP Complete classes.	8 Marks	L2	CO5
	b)	Illustrate Cook's Theorem with example.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) (Fasttrack) Regular Examinations April – 2026

VLSI SYSTEM DESIGN

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Differentiate between static and dynamic power dissipation in CMOS	2 Marks	L1	CO1
	b)	Explain the concept of Moore's law?	2 Marks	L4	CO1
	c)	Define the threshold voltage (VT) of a MOSFET.	2 Marks	L2	CO1
	d)	Calculate the trans-conductance (gm) if Ids=1 mA and Vgs changes by 100 mV.	2 Marks	L1	CO2
	e)	What are the key steps in the VLSI design flow?	2 Marks	L2	CO2
	f)	Draw a simple stick diagram for a two-input NAND gate using NMOS technology.	2 Marks	L1	CO3
	g)	What is the function of a barrel shifter in digital systems?	2 Marks	L1	CO3
	h)	How does the carry propagation delay affect the performance of ripple carry adders?	2 Marks	L1	CO4
	i)	What is the main difference between synchronous and asynchronous counters?	2 Marks	L2	CO4
	j)	Name two key differences between CPLDs and FPGAs.	2 Marks	L3	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Interpret a TTL three state NAND gate and explain the operation with the help of a functional table	8 Marks	L2	CO1
	b)	Explain in detail about CMOS steady state electrical behaviour.	8 Marks	L2	CO1

(OR)

3.	a)	Draw the resistive model of a CMOS inverter and explain its behavior for LOW and HIGH outputs.	8 Marks	L1	CO1
	b)	Draw the circuit diagram, functional table and logic symbol of CMOS NOR gate and explain its operation	8 Marks	L2	CO1

MODULE-II

4.	a)	Outline the steps involved in the NMOS fabrication process with a neat diagram.	8 Marks	L1	CO2
	b)	Derive the pull-up to pull-down ratio for an NMOS inverter.	8 Marks	L3	CO2

(OR)

5.	a)	Analyze the voltage transfer characteristics (VTC) of a CMOS inverter.	8 Marks	L4	CO2
	b)	Estimate gm of the device for NMOS transistor operating saturation region with the following parameters: VGS = 5V, Vtn = 1.0V, W/L = 3μm/0.18μm and μnCox = 95μA/V2.	8 Marks	L4	CO2

MODULE-III

6.	a)	Draw the schematic, stick diagram and layout for CMOS NAND gate.	8 Marks	L1	CO3
	b)	Estimate CMOS inverter delay using rise-time and fall-time estimation	8 Marks	L2	CO3
		(OR)			
7.	a)	Design a symbolic layout for a complementary CMOS circuit that implements Y= ((A+B).(C+D))'.	8 Marks	L3	CO3
	b)	Draw the schematic, stick diagram and layout for CMOS NOR gate.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Describe the steps involved in Booth's multiplication algorithm.	8 Marks	L2	CO4
	b)	Explain the general arrangement of a 4 bit ALU.	8 Marks	L1	CO4
		(OR)			
9.	a)	Outline the features of 4-by-4 barrel shifter using complementary transmission gates. Sketch its circuit diagram and explain its shifting operation.	8 Marks	L3	CO4
	b)	Describe the operation of 4 bit carry look ahead adder.	8 Marks	L1	CO4

MODULE-V

10.	a)	Explain the working of a 4-bit synchronous counter with a circuit diagram.	8 Marks	L1	CO4
	b)	Design a 6 transistor SRAM cell in CMOS logic and Explain.	8 Marks	L3	CO4
		(OR)			
11.	a)	Demonstrate the working of a DRAM cell with a circuit diagram.	8 Marks	L2	CO4
	b)	Show how a simple combinational circuit can be implemented using LUTs and programmable interconnects.	8 Marks	L3	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

TRANSMISSION AND DISTRIBUTION

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is meant by overhead line insulators?	2 Marks	L2	CO1
	b)	What are line supports? Give one example.	2 Marks	L1	CO1
	c)	How is the inductance of an overhead line different from that of an underground cable?	2 Marks	L2	CO2
	d)	What insulating materials are commonly used in power cables?	2 Marks	L1	CO2
	e)	What happens when a transmission line is terminated with a resistor?	2 Marks	L2	CO3
	f)	What factors affect signal transmission when a transmission line is connected to a cable?	2 Marks	L1	CO3
	g)	What factors cause voltage drop in AC distribution systems?	2 Marks	L2	CO4
	h)	Why do we refer power factor to the receiving end voltage?	2 Marks	L1	CO4
	i)	What safety precautions are required in gas insulated substations?	2 Marks	L2	CO5
	j)	Why must substations follow environmental regulations?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the types of overhead transmission lines and underground cables.	8 Marks	L2	CO1
	b)	Derive the expression for resistance of a transmission line conductor.	8 Marks	L3	CO1

(OR)

3.	a)	Explain insulation resistance and capacitance of single	8 Marks	L1	CO1
	b)	Why is grading necessary in underground cables? Explain capacitance grading and inter	8 Marks	L3	CO1

MODULE-II

4.	a)	Classify transmission lines into short, medium and long lines. Explain their features.	8 Marks	L2	CO2
	b)	Explain the short transmission line model and its performance analysis.	8 Marks	L3	CO2

(OR)

5.	a)	Explain reflection and refraction of travelling waves when the line is terminated with a resistor.	8 Marks	L2	CO2
	b)	Explain travelling waves on open-end and short-circuited lines.	8 Marks	L4	CO2

MODULE-III

6.	a)	Explain different types of overhead line insulators with applications.	8 Marks	L2	CO3
	b)	Explain line supports and their types.	8 Marks	L4	CO3
		(OR)			
7.	a)	Derive the expression for critical disruptive voltage.	8 Marks	L3	CO3
	b)	Discuss advantages and disadvantages of corona.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Classify distribution systems and explain their characteristics.	8 Marks	L2	CO4
	b)	Explain residential, commercial, agricultural and industrial loads.	8 Marks	L3	CO4
		(OR)			
9.	a)	Explain advantages and disadvantages of ring main distribution system.	8 Marks	L2	CO4
	b)	Discuss factors affecting voltage drop in distribution systems.	8 Marks	L3	CO4

MODULE-V

10.	a)	Classify substations based on construction and service requirements.	8 Marks	L3	CO5
	b)	Explain indoor and outdoor substations.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain radial and loop types of primary feeders.	8 Marks	L2	CO5
	b)	Discuss basic design practices of secondary distribution systems.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

ELECTRICAL MACHINES-II

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Explain the concept of rotor EMF in a 3-phase Induction Motor.	2 Marks	L2	CO1
	b)	List the losses of 3-phase Induction Motor.	2 Marks	L1	CO1
	c)	In what way does an auto-transformer starter reduce starting current in an induction motor?	2 Marks	L2	CO2
	d)	Define induction generator.	2 Marks	L1	CO2
	e)	Explain the concept of winding factor in synchronous generators.	2 Marks	L2	CO3
	f)	What is the effect of armature reaction at different power factors in a synchronous generator?	2 Marks	L2	CO3
	g)	What are the necessary conditions for synchronization of alternators?	2 Marks	L2	CO4
	h)	Define synchronizing power.	2 Marks	L1	CO4
	i)	How does a synchronous motor work?	2 Marks	L2	CO5
	j)	Explain the concept of rotor EMF in a 3-phase Induction Motor.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.		Explain the production of rotating magnetic field in a 3-phase induction motor and derive the expression for its speed.	16 Marks	L2	CO1

(OR)

3.	a)	Obtain the relation between rotor input, rotor copper losses and rotor output in terms of slip(s)	8 Marks	L2	CO1
	b)	What are the advantages of deep-bar rotor over conventional squirrel cage induction motor?	8 Marks	L1	CO1

MODULE-II

4.		Discuss the different speed control methods of induction motors. Explain frequency control and rotor resistance control in detail.	16 Marks	L3	CO2

(OR)

5.	a)	Pole changing method is employed for obtaining the desired speeds of operation with 3-phase squirrel cage induction motor. Explain the method with suitable illustrations. Also, bring out the reason why the slip ring induction motor is not preferred for this method.	8 Marks	L2	CO2
	b)	A 4-pole, 20kW, 50Hz, 400V squirrel cage induction motor has a starting torque of 160 Nm and a full-load torque of 120Nm. Calculate starting torque for a stator	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the principle of operation of a synchronous generator.	8 Marks	L1	CO3
	b)	A 4-pole, 50 Hz star connected alternator has 6 slots per pole per phase and a two layer winding with 4 conductors per slot. If the coil span is 1500, find the no –load terminal emf if the flux per pole is 300 mWb.	8 Marks	L3	CO3

(OR)

7.	Derive the EMF equation of a synchronous generator and explain the factors affecting it.	16 Marks	L3	CO3

MODULE-IV

8.	Explain the conditions and methods of synchronization of alternators. Describe the lamp method and synchroscope method.	16 Marks	L2	CO4

(OR)

9.	a)	Explain the conditions that must be fulfilled for parallel operation of two synchronous generators.	8 Marks	L1	CO4
	b)	A 12 kVA, 440V, 50 Hz, star connected synchronous generator supplies rated load at 0.8 power factor lagging. The armature resistance and synchronous reactance are 0.3 Ω and 8 Ω respectively. Determine the torque angle and the voltage regulation.	8 Marks	L3	CO4

MODULE-V

10.	a)	Draw the phasor diagrams of synchronous motor for unity, leading and lagging power factor conditions.	8 Marks	L2	CO5
	b)	A three-phase, 11000V, star-connected synchronous motor is taking 60A current at 0.8 p.f. lead. Its impedance is Z=1+j30. Calculate i) power input ii) back emf iii) Mechanical power developed	8 Marks	L4	CO5

(OR)

11.	Explain the principle of operation of a synchronous motor. Describe various starting methods with suitable diagrams.	16 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech IV Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

CONTROL SYSTEMS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define closed loop system.	2 Marks	L1	CO1
	b)	Define transfer function.	2 Marks	L1	CO1
	c)	What is the importance of time constant in time response.	2 Marks	L1	CO2
	d)	How the system is classified based in the value of damping?	2 Marks	L2	CO2
	e)	Define steady state error.	2 Marks	L1	CO2
	f)	What are frequency domain specifications?	2 Marks	L1	CO3
	g)	What is the need for compensation in feedback control system?	2 Marks	L1	CO4
	h)	Draw the electrical lag compensator network.	2 Marks	L1	CO4
	i)	List the properties of State transition matrix.	2 Marks	L1	CO5
	j)	What is the composite matrix to test controllability and observability?	2 Marks	L1	CO5

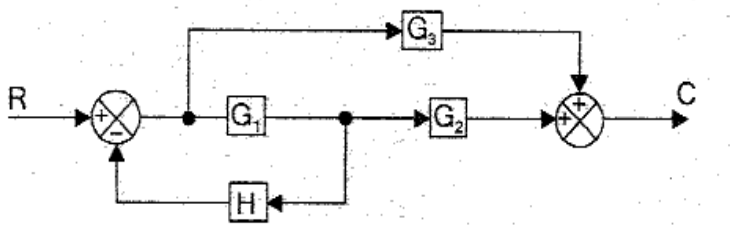
PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

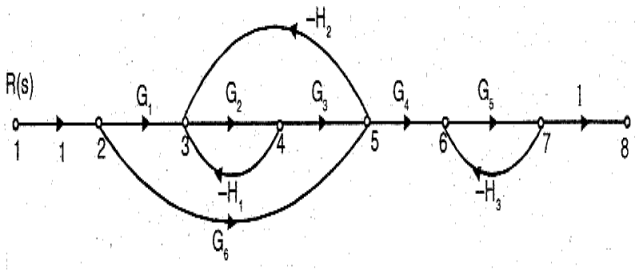
MODULE-I

2.	a)	Derive the transfer function of a field-controlled DC servomotor	8 Marks	L2	CO1
	b)	Find the transfer function for the given block diagram.	8 Marks	L3	CO1

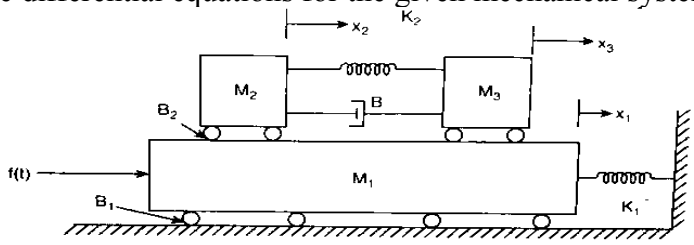


(OR)

3.	a)	Using Mason's gain formula find the transfer function of the given signal flow graph.	8 Marks	L3	CO1



b) Write the differential equations for the given mechanical system 8 Marks L3 CO1



MODULE-II

4. a) Determine the undamped natural frequency and damping ratio of the system response $c(t) = 1 + 0.2e^{-60t} - 1.2e^{-10t}$ 8 Marks L3 CO2

b) Determine the Rise time, peak time, Settling time and peak overshoot for $\varsigma = 0.5$ w_n=6 rad/sec for a typical second order system 8 Marks L3 CO2

(OR)

5. a) Derive the system response for a second order system with unit step input for an under damped case. 8 Marks L3 CO2

b) Find the static error coefficients of the system forward path transfer function $G(s) = \dfrac{10}{S(0.1S + 1)}$ and find the steady-state error for step input 8 Marks L3 CO2

MODULE-III

6. a) Determine the stability of the system characterized by the polynomial $s^4 + 8s^3 + 18s^2 + 16s + 5 = 0$ using Routh criterion. 8 Marks L2 CO3

b) Explain various rules used to plot the root locus 8 Marks L3 CO3

(OR)

7. a) Explain the stability in terms of the location of the poles with relevant characteristics. 8 Marks L2 CO3

b) Sketch the root locus for a system whose open-loop transfer function 8 Marks L3 CO3

MODULE-IV

8. a) Write the steps to design a lag compensator using bode plot in frequency domain. 8 Marks L2 CO4

b) Realaize the Lead and lag compensator with suitable electrical circuits. 8 Marks L2 CO4

(OR)

9. a) Sketch the Bode plot and find GM and PM. for the open loop transfer function $G(s) = \dfrac{2}{s(s+1)(1+0.2s)}$ 8 Marks L3 CO4

b) Discuss Nyquist stability criteria to determine stability. 8 Marks L2 CO4

MODULE-V

10. a) Test the controllability and observability of the given state model, 8 Marks L3 CO5

$$x = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -1 & -5 & -1 \end{bmatrix} x + \begin{bmatrix} 0 \\ 5 \\ -24 \end{bmatrix} u; \quad y = [1 \quad 0 \quad 0]x + [0]u$$

b) Define controllability and observability. 8 Marks L3 CO5

(OR)

11. a) Derive the state model for the Armature controlled DC servomotor. 8 Marks L3 CO5

b) Derive the state model for a RLC series circuit, assume relevant parameters. 8 Marks L3 CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA III Semester (MBU-22) (Fasttrack) Regular Examinations April – 2026

BUSINESS COMMUNICATION

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define communication.	2 Marks	L1	CO1
	b)	What is the process of communication?	2 Marks	L1	CO1
	c)	What is a quotation letter?	2 Marks	L1	CO2
	d)	What is a tender?	2 Marks	L1	CO2
	e)	What is APA style?	2 Marks	L1	CO3
	f)	What is citation?	2 Marks	L1	CO3
	g)	Define visual aids.	2 Marks	L1	CO4
	h)	What is PowerPoint presentation?	2 Marks	L1	CO4
	i)	Define instant messaging.	2 Marks	L1	CO5
	j)	What is video conferencing?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the nature and importance of communication.	8 Marks	L2	CO1
	b)	Describe the communication process with a diagram.	8 Marks	L2	CO1
		(OR)			
3.	a)	Discuss the types of communication in detail.	8 Marks	L2	CO1
	b)	Explain verbal and non-verbal communication with examples.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the structure of a business letter.	8 Marks	L2	CO2
	b)	Write a letter inviting quotations.	8 Marks	L3	CO2
		(OR)			
5.	a)	Discuss inviting tenders and its importance.	8 Marks	L2	CO2
	b)	Explain sales letters with examples.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain types of reports in detail.	8 Marks	L2	CO3
	b)	Describe the format of a report.	8 Marks	L2	CO3
		(OR)			
7.	a)	Explain tables, charts, and diagrams in reports.	8 Marks	L2	CO3
	b)	Describe APA citation style with examples.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain common spelling mistakes in English.	8 Marks	L2	CO4
	b)	Discuss common grammatical errors.	8 Marks	L2	CO4
		(OR)			

9.	a)	Explain steps in presentation planning.	8 Marks	L2	CO4
	b)	Discuss PowerPoint presentation techniques.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain the effects of technology on communication.	8 Marks	L2	CO5
	b)	Describe email communication in business.	8 Marks	L2	CO5

(OR)

11.	a)	Explain modern communication techniques.	8 Marks	L2	CO5
	b)	Analyze the importance of digital communication.	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

STRENGTH OF MATERIALS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define thermal stress and thermal strain.	2 Marks	L1	CO1
	b)	Define the terms Factor of Safety and Poisson's ratio?	2 Marks	L2	CO1
	c)	What are the assumptions considered in the theory of pure bending?	2 Marks	L1	CO1
	d)	Explain the different types of loads with diagrams	2 Marks	L2	CO2
	e)	Define the term pure torsion.	2 Marks	L1	CO2
	f)	Draw Shear stress distribution for rectangular section	2 Marks	L1	CO3
	g)	Sketch the Mohr Circle diagram for a Pure Torsion in a bi-axial system.	2 Marks	L1	CO3
	h)	What is the expression for the power transmitted by a circular shaft?	2 Marks	L2	CO4
	i)	Write the generalized equations for Slope and Deflection of Simply Supported Beam with a Uniformly Distributed Load.	2 Marks	L1	CO4
	j)	How do you control beam deflection?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain clearly the different types of stresses and strains.	8 Marks	L1	CO1
	b)	A brass bar having a cross-sectional area of 1000 mm2 is subjected to axial forces as shown in fig 1. Find the total change in length of the bar. Take E = 1.05 x 105 N/mm2.	8 Marks	L4	CO1

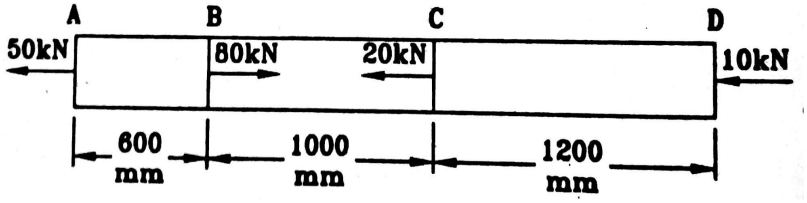

Fig.1

(OR)

3.		A compound tube consists of a steel tube 140 mm internal diameter and 160 mm external diameter and an outer brass tube 160 mm internal diameter and 180 mm external diameter. The two tubes are of the same length. The compound tube carries an axial load of 900 kN. Find the stresses and the load carried by each tube and the amount it shortens. Length of each tube is 140 mm. Take E for steel as $2x10^5$ N/mm^2 and for brass as 1 x 10^5 N/mm^2.	16Marks	L4	CO1

MODULE-II

4. Draw BM and SF diagrams for the beam shown in fig 2, indicating the values at all salient points. 16Marks L4 CO2

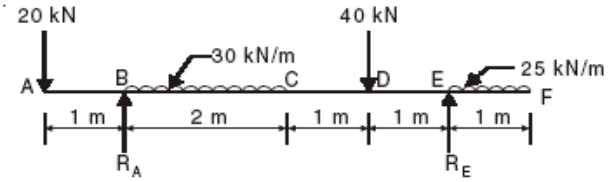

Fig.2

(OR)

5. a) What are sagging and hogging bending moments? Explain. 8 Marks L1 CO2

b) A beam AB 10 m long is simply supported at its ends A and B. It carries a uniformly distributed load of 20 kN/m for a distance of 5 m from the left end A and a concentrated load of 40 kN at a distance of 2 m from the right end B. Draw S.F. and B.M. diagram for the beam. Also find the position and magnitude of maximum bending moment. 8 Marks L3 CO2

MODULE-III

6. A steel shaft ABCD having a total of 2400 mm is contributed by three different sections as follows. The portion AB is hollow having outside and inside diameters 80 mm and 50 mm respectively. BC is solid and 80 mm diameter. CD is also solid and 70 mm diameter. If the angle of twist is same for each section, determine the length of each portion and the total angle of twist. Maximum permissible shear stress is 50 MPa and shear modulus 0.82 x 10^5 MPa. 16 Marks L2 CO3

(OR)

7. An 'I' section beam consists of two flanges 150 x 20 mm and a web of 310 x 10 mm. Find the magnitude of maximum shear stress when it is subjected to a shear force of 40 kN and draw the shear stress distribution diagram over the depth of the section. 16 Marks L2 CO3

MODULE-IV

8. A flexible shaft consists of a 5 cm indiameter steel wire encased in a stationary tube that fits closely enough to impose a frictional torque of 5 N-m. Determine the maximum length of the shaft if the shearing stress is not to exceed 20 MPa. What will be the angular deformation of one end relative to the other end? G = 12 × 10^9 Pa. 16 Marks L3 CO4

(OR)

9. A rectangular block of material is subjected to a tensile stress of 100 MN/m2 on one plane and a tensile stress of 50 MN/m2 on a plane at right angles, together with the shear stresses of 60 MN/m2 on the same planes. Find:
The magnitude of the principal stresses
The directions of the principal planes
The magnitude of greatest shear stress 16 Marks L3 CO4

MODULE-V

10. For the simply supported beam shown in Fig 3. Find the slope at each end, (ii) deflection at C and D, and Maximum deflection. Take E= 200 kN/mm^2 and I = 6.50 x10^8 mm4 16 Marks L4 CO5

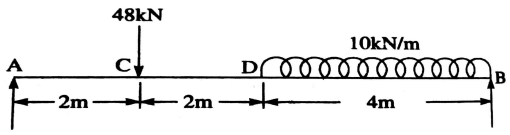

Fig.3

(OR)

11.	a)	Formulate the expressions for slope and deflection at end and mid points of a simply supported beam subjected to uniformly distributed load over entire span.	8 Marks	L3	CO5
	b)	A beam of length 6 m is simply supported at the ends and carries two point loads of 48 kN and 40 kN at a distance of 1 m and 3 m respectively from the left support. Compute the slope and deflection under each load. Assume EI = 17000 kN–m^2.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

MACHINE TOOLS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define machining.	2 Marks	L1	CO1
	b)	Mention any two cutting parameters.	2 Marks	L1	CO1
	c)	What is meant by shear angle?	2 Marks	L1	CO2
	d)	List the different types of chips produced during machining.	2 Marks	L1	CO2
	e)	State any two specifications of an engine lathe.	2 Marks	L1	CO3
	f)	Name any two methods of taper turning.	2 Marks	L2	CO3
	g)	Mention any two operations carried out on a slotting machine.	2 Marks	L1	CO4
	h)	What is a jig boring machine?	2 Marks	L1	CO4
	i)	List any two types of milling cutters.	2 Marks	L1	CO5
	j)	What is meant by dressing of a grinding wheel?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe the geometry of a single-point cutting tool with a neat sketch.	8 Marks	L2	CO1
	b)	Write short notes on the ASA, ORS, and NRS tool nomenclature systems.	8 Marks	L2	CO1

(OR)

3.		Explain cutting speed, feed, and depth of cut with suitable examples.	16 Marks	L2	CO1

MODULE-II

4.	a)	With a neat sketch, explain the Merchant's circle diagram and derive the cutting force relationships.	8 Marks	L3	CO2
	b)	Describe the different types of chips formed during machining with sketches.	8 Marks	L2	CO2

(OR)

5.		Explain the mechanism of chip formation in both ductile and brittle materials.	16 Marks	L2	CO2

MODULE-III

6.		Explain the principle, construction, and specifications of an engine lathe.	16 Marks	L2	CO3

(OR)

7.	a)	Describe the various taper turning methods with neat sketches.	8 Marks	L2	CO3
	b)	Explain the different work holding devices used in a lathe.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain the principle, construction, and operations of a shaping machine with a neat sketch.	8 Marks	L2	CO4
	b)	Describe the different operations performed on a drilling machine with sketches.	8 Marks	L2	CO4

(OR)

9.		Compare shaping, slotting, and planing machines with respect to their working principles, components, and operations.	16 Marks	L3	CO4

MODULE-V

10.	a)	Explain the different types of milling cutters with neat sketches.	8 Marks	L3	CO5
	b)	Describe truing, dressing, and balancing of a grinding wheel.	8 Marks	L3	CO5

(OR)

11.		Compare up milling and down milling with neat diagrams and highlight their differences.	16 Marks	L4	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

OPERATING SYSTEMS

[Computer Science and Engineering,
Computer Science and Engineering (Artificial Intelligence and Machine Learning)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Definition of thread?	2 Marks	L1	CO1
	b)	What are the scheduling Criteria?	2 Marks	L1	CO1
	c)	Define semaphore and binary semaphores?	2 Marks	L1	CO2
	d)	What is hold and wait?	2 Marks	L1	CO2
	e)	Define virtual memory?	2 Marks	L1	CO3
	f)	Different between virtual memory paging and virtual memory segmentation?	2 Marks	L1	CO3
	g)	What are the different types of file access methods?	2 Marks	L1	CO4
	h)	What is the role of a directory in file systems?	2 Marks	L1	CO4
	i)	What is the purpose of user authentication?	2 Marks	L1	CO5
	j)	What is the cryptography algorithms?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss about different types of scheduling?	8 Marks	L2	CO1
	b)	Differentiate FCFS and priority CPU scheduling with example?	8 Marks	L2	CO1

(OR)

3.	a)	Differentiate the SJF and Round Robin CPU scheduling with an example?	8 Marks	L2	CO1
	b)	Compare the multilevel queue and multilevel feedback queue CPU scheduling algorithms?	8 Marks	L2	CO1

MODULE-II

4.	a)	Discuss the role of semaphores in process synchronization. How are they used?	8 Marks	L2	CO2
	b)	Explain the concept of critical regions in process synchronization?	8 Marks	L2	CO2

(OR)

5.	a)	Explain the solutions of recovery from deadlock?	8 Marks	L2	CO2
	b)	How does deadlock avoidance differ from deadlock prevention?	8 Marks	L2	CO2

MODULE-III

6.	a)	Discuss about inverted and hashed page table with suitable example.	8 Marks	L2	CO3
	b)	Discuss about paging hardware with neat diagram?	8 Marks	L2	CO3

(OR)

7.	a)	Elaborate the memory protection?	8 Marks	L2	CO3
	b)	Discuss about swapping and its purpose?	8 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss about indexed sequential and indexed file in access methods?	8 Marks	L2	CO4
	b)	Describe the file system architecture with a diagram?	8 Marks	L2	CO4

(OR)

9.	a)	Describe the various directory implementation techniques used in file systems.	8 Marks	L2	CO4
	b)	Describe how recovery is managed in file systems and the importance of implementing recovery mechanisms.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain the cryptography? How it enhances the security?	8 Marks	L2	CO5
	b)	Discuss the main components of the security in OS?	8 Marks	L2	CO5

(OR)

11.	a)	Compare the various methods of user authentication.	8 Marks	L2	CO5
	b)	Discuss how access control lists (ACLs) are used in operating systems.	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B C A II Semester (MBU-22) (Fasttrack) Regular Examinations April - 2026

COMPUTER COMMUNICATIONS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What are the five components involved in data communication?	2 Marks	L1	CO1
	b)	For n devices in a network, what is the number of cable links required for a mesh and ring topology?	2 Marks	L1	CO1
	c)	Label the concept of protocols in networking.	2 Marks	L1	CO1
	d)	Recall the responsibilities of data link layer.	2 Marks	L1	CO1
	e)	What is a sine wave?	2 Marks	L1	CO2
	f)	How can you convert a digital signal into an analog signal?	2 Marks	L1	CO2
	g)	List the different techniques in serial transmission.	2 Marks	L1	CO3
	h)	Define delta modulation.	2 Marks	L1	CO3
	i)	Differentiate TDM and FDM.	2 Marks	L2	CO4
	j)	Show the analog hierarchy used by telephone companies and list different levels of the hierarchy.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Analyse the layers of TCP/IP protocol suit and explain briefly about layers and protocols in each layers.	8 Marks	L4	CO1
	b)	Illustrate the Key aspects of fundamental characteristics of data communication and provide clear examples to each characteristic.	8 Marks	L3	CO1

(OR)

3.		Describe the purpose of ARP (Address Resolution Protocol) in mapping IP addresses to MAC addresses.	16 Marks	L2	CO1

MODULE-II

4.	a)	Compare and contrast the characteristics of physical addresses and port addresses in networking	8 Marks	L3	CO1
	b)	Differentiate between specific addresses and generic addresses in the context of network communication	8 Marks	L2	CO1

(OR)

5.		Examine the OSI model's layered architecture and its impact on network communication, highlighting the functions of each layer and their interdependencies. Discuss how the model facilitates effective data transmission in complex networks.	16 Marks	L4	CO1

MODULE-III

6.	a)	Compare and contrast analog and digital data. Give an example of each	8 Marks	L2	CO2
	b)	Interpret the strategies and techniques for reducing or compensating for transmission impairment? Give examples of transmission impairment in different types of media and channels.	8 Marks	L2	CO2

(OR)

7.	a)	What are the two methods of sending a digital signal over a bandpass channel? Explain it.	8 Marks	L2	CO2
	b)	How can you determine the frequency of a periodic signal? Illustrate it.	8 Marks	L2	CO2

MODULE-IV

8.	a)	Explain what line coding is and how it helps in converting digital data into digital signals.	8 Marks	L2	CO3
	b)	Enumerate the advantages of serial transmission.	8 Marks	L2	CO3

(OR)

9.		Summarize common line coding schemes (e.g., Unipolar, Polar, Bipolar, Manchester, Differential Manchester).	16 Marks	L2	CO3

MODULE-V

10.	a)	Compare and contrast thick and thin Ethernet technologies. How do they differ in terms of cable types, data transmission speeds, and network scalability?	8 Marks	L3	CO4
	b)	Analyze the differences between twisted pair and fiber Ethernet technologies in terms of their transmission mediums, bandwidth capabilities, and susceptibility to interference .	8 Marks	L2	CO4

(OR)

11.	a)	Explain interleaving in bandwidth utilization. How does it improve reliability and error correction? Evaluate its effectiveness with examples	8 Marks	L2	CO4
	b)	Examine the role of the MAC sublayer in standard Ethernet networks. How does it manage data access and transmission? Provide examples to illustrate its functions.	8 Marks	L4	CO4

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

PYTHON PROGRAMMING

[Computer Science and Engineering, Information Technology, Computer Science and Engineering (Artificial Intelligence and Machine Learning), Computer Science and Engineering (Data Science)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is Python? What are features of Python?	2 Marks	L2	CO1
	b)	Define type conversion in python Programming?	2 Marks	L1	CO1
	c)	Differentiate between break and continue statements?	2 Marks	L1	CO2
	d)	What is the role of the else clause in a Python loop?	2 Marks	L1	CO2
	e)	What is mean set creation	2 Marks	L2	CO3
	f)	How will you declare a class in python?	2 Marks	L2	CO3
	g)	What is purpose of range() function??	2 Marks	L1	CO4
	h)	What is a Lambda function?	2 Marks	L1	CO4
	i)	Describe the file object properties.	2 Marks	L1	CO5
	j)	Define method overriding.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Discuss the int(), float(), str(), chr() and complex() type conversion functions with examples	8 Marks	L2	CO1
	b)	Explain the basic data types available in Python with examples..	8 Marks	L3	CO1
		(OR)			
3.	a)	Write a Python code to check if a given year is a leap year or not.	8 Marks	L2	CO1
	b)	Explain various types of operators in python with suitable example.	8 Marks	L2	CO1

MODULE-II

4.	a)	Write Python code to determine whether the given string is a Palindrome or not using slicing.	8 Marks	L2	CO2
	b)	Difference between while and for loop? Explain with example.	8 Marks	L3	CO2
		(OR)			
5.	a)	Write Python program to count the total number of vowels, consonants and blanks in a String.	8 Marks	L2	CO2
	b)	Write Python code to multiply two matrices using nested loops and also perform transpose of the resultant matrix	8 Marks	L2	CO2

MODULE-III

6.	a)	Discuss the relation between tuples and lists, tuples and dictionaries in detail.	8 Marks	L2	CO3
	b)	Write Python program to sort words in a sentence in decreasing order of their length. Display the sorted words along with their length	8 Marks	L4	CO3

(OR)

7.	a)	Write Python code to create a function called most frequent that takes a string and prints the letters in decreasing order of frequency. Use dictionaries	8 Marks	L3	CO3
	b)	Write a function which receives a variable number of strings as arguments. Find unique characters in each string	8 Marks	L3	CO3

MODULE-IV

8.	a)	Write Python Program to Find the Longest Word in a File. Get the File Name from User	8 Marks	L2	CO4
	b)	Discuss about recursive functions with suitable example.	8 Marks	L4	CO4

(OR)

9.	a)	Discuss the following methods associated with the file object a) read() b) readline() c) readlines() d) tell() e) seek() f) write()	8 Marks	L4	CO4
	b)	Discuss about positional arguments with suitable example?	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss inheritance in Python programming language. Write a Python program to demonstrate the use of super() function	8 Marks	L3	CO5
	b)	Discuss about different types of Exception handing with suitable example.	8 Marks	L3	CO5

(OR)

11.	a)	Write Python program to demonstrate Multiple Inheritance	8 Marks	L3	CO5
	b)	Write a Program to demonstrate the Overriding of the Base Class method in the Derived Class	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

DATA STRUCTURES

[Computer Science and Engineering, Information Technology, Computer Science and Engineering (Artificial Intelligence and Machine Learning), Computer Science and Engineering (Data Science), Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define a stack.	2 Marks	L1	CO2
	b)	What is the difference between Enqueue & Dequeue.	2 Marks	L2	CO2
	c)	List out any three asymptotic notations?	2 Marks	L2	CO1
	d)	Write the syntax for creating a node in double linked list.	2 Marks	L1	CO2
	e)	Write the purpose of header in linked list?	2 Marks	L1	CO2
	f)	What is the various representation of a binary tree?	2 Marks	L1	CO3
	g)	Define sorting and list out various Sorting Techniques.	2 Marks	L2	CO4
	h)	Define Hashing.	2 Marks	L1	CO4
	i)	Define out degree of a graph?	2 Marks	L2	CO3
	j)	List out various connected components of graph.	2 Marks	L1	CO3

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Write short notes on the following asymptotic notations with proper examples i) Omega Notation ii) Big Oh Notation iii) Theta Notation	8 Marks	L2	CO2
	b)	Write a recursive procedure to compute the nth Fibonacci number.	8 Marks	L2	CO2
		(OR)			
3.	a)	Define priority queue? Explain with an example.	8 Marks	L2	CO1
	b)	Write an algorithm to implement Stack using arrays that perform insertion, deletion and display operations.	8 Marks	L3	CO1

MODULE-II

4.	a)	Demonstrate how insertion and deletion operations are performed on a double linked list with proper examples.	8 Marks	L2	CO2
	b)	List out the Applications of Linked List. Explain any one application of Linked list.	8 Marks	L3	CO2
		(OR)			
5.	a)	Demonstrate how insertion and deletion operations are performed on a stack using Pointers, with proper examples.	8 Marks	L2	CO2
	b)	Write a program to implementation of Queue using pointer.	8 Marks	L2	CO2

MODULE-III

6.	a)	Sorting the following list of elements using Selection sort. 64 25 12 22 11	8 Marks	L4	CO4
	b)	Write an algorithm of Fibonacci Search.	8 Marks	L2	CO4

(OR)

7.	a)	Explain the Quick sort with an example.	8 Marks	L2	CO4
	b)	Apply Merge sort on the following elements: {21, 11, 5, 78, 49, 54, 72, 88}	8 Marks	L2	CO4

MODULE-IV

8.	a)	Define binary tree. Explain the binary tree representations with an example.	8 Marks	L3	CO3
	b)	Explain the following terms with illustrations: i) Path ii) Degree iii) Level iv) Leaf node v) Height of the tree.	8 Marks	L2	CO3

(OR)

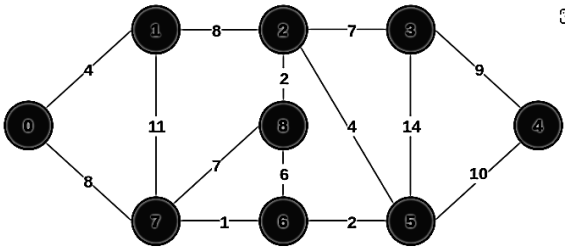
9.	a)	Construct a binary tree having the following traversal sequences: Preorder traversal: A B C D E F G H I Inorder traversal: B C A E D G H F I	8 Marks	L3	CO3
	b)	Build an AVL tree with the following values: {15, 20, 24, 10, 13, 7, 30, 36, 25, 42, 29}	8 Marks	L2	CO3

MODULE-V

10.	a)	What is a graph? Explain various representations of graphs.	8 Marks	L3	CO4
	b)	Discuss Floyd-Warshall Algorithm with an example.	8 Marks	L4	CO4

(OR)

11.	a)	Explain the DFS Graph Traversals With suitable example.	8 Marks	L2	CO3
	b)	Illustrate the algorithm of Kruskal and consider the following graph as an example for which we need to find the MST.	8 Marks	L2	CO3



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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

DATABASE MANAGEMENT SYSTEMS

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define a Database Management System.	2 Marks	L1	CO1
	b)	What are the steps in designing a database?	2 Marks	L1	CO1
	c)	Write a create table command for creating a student table with fields sid, sname, age.	2 Marks	L1	CO2
	d)	Define integrity constraint.	2 Marks	L1	CO2
	e)	Write the basic form of SQL query	2 Marks	L2	CO3
	f)	Write a PL/SQL function for adding two integers.	2 Marks	L1	CO3
	g)	Explain problems caused by redundancy.	2 Marks	L1	CO4
	h)	Explain a transacton by taking one example.	2 Marks	L2	CO4
	i)	Explain muliple-granularity in transcation management.	2 Marks	L1	CO5
	j)	What are important properties of indexes?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain different data models in database management systems	8 Marks	L2	CO1
	b)	Discuss about data definition language and data manipulation language?	8 Marks	L2	CO1

(OR)

3.	a)	Illustrate database system application architecture diagrammatically.	8 Marks	L2	CO1
	b)	Explain the functions of DBA	8 Marks	L2	CO1

MODULE-II

4.	a)	How do we obtain a relational database design from an ER diagram.	8 Marks	L2	CO2
	b)	Explain how to implement integrity constraints over relations.	8 Marks	L4	CO2

(OR)

5.	a)	What are the basic relational algebra operators, and how are they combined to write complex queries?	8 Marks	L2	CO2
	b)	What is relational calculus, and why is it important?	8 Marks	L4	CO2

MODULE-III

6.	a)	Give some examples of basic SQL queries.	8 Marks	L4	CO3
	b)	Write a correlated sub query for finding highest salary getting employees from the EMPLOYEE (empno, empname, sal,deptno)relation.	8 Marks	L4	CO3

(OR)

7.	a)	Explain PL/SQL datatypes and their usage.	8 Marks	L2	CO4
	b)	Illustrate control structures in PL/SQL.	8 Marks	L4	CO4

MODULE-IV

8.	a)	Define BCNF and 4NF through examples	8 Marks	L2	CO4
	b)	What is join dependency? Explain in 5NF.	8 Marks	L4	CO4

(OR)

9.	a)	Define and explain ACID properties of a transaction	8 Marks	L2	CO5
	b)	Define serializability, schedule, differentiate between serial and serializability.	8 Marks	L4	CO5

MODULE-V

10.	a)	Explain timestamp based protocols.	8 Marks	L2	CO5
	b)	Discuss validation based protocols.	8 Marks	L4	CO5

(OR)

11.	a)	What are important properties of indexes?	8 Marks	L2	CO5
	b)	How does a hash-based index work, and when is it most effective?	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

ADVANCED JAVA PROGRAMMING

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define lambda expression.	2 Marks	L1	CO1
	b)	What is a functional interface?	2 Marks	L1	CO1
	c)	What is method reference?	2 Marks	L1	CO2
	d)	What is JDBC driver?	2 Marks	L1	CO2
	e)	Define ResultSet.	2 Marks	L1	CO3
	f)	What is servlet?	2 Marks	L1	CO3
	g)	What are cookies?	2 Marks	L1	CO4
	h)	What is Pattern class?	2 Marks	L1	CO4
	i)	Define RMI.	2 Marks	L1	CO5
	j)	What is Executor framework?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain lambda expressions and functional interfaces with examples.	8 Marks	L2	CO1
	b)	Explain variable capture and passing lambda expressions as arguments.	8 Marks	L2	CO1

(OR)

3.	a)	Explain block lambda expressions and generic functional interfaces.	8 Marks	L2	CO1
	b)	Explain method references (static and instance) with examples.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain JDBC architecture with neat diagram.	8 Marks	L2	CO2
	b)	Explain steps to establish database connection and execute SQL queries.	8 Marks	L2	CO2

(OR)

5.	a)	Explain JDBC drivers and JDBC interfaces.	8 Marks	L2	CO2
	b)	Explain scrollable and updatable ResultSet with example.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain servlet architecture and life cycle.	8 Marks	L2	CO3
	b)	Explain Generic Servlet and Http Servlet.	8 Marks	L2	CO3

(OR)

7.	a)	Explain passing parameters and retrieving parameters in servlets.	8 Marks	L2	CO3
	b)	Explain cookies and problems with servlets	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain Pattern and Matcher classes with syntax.	8 Marks	L2	CO4
	b)	b) Explain regular expression matching options with examples.	8 Marks	L2	CO4
		(OR)			
9.	a)	Explain RMI architecture with a simple client-server application.	8 Marks	L2	CO4
	b)	Explain TCP/IP client and server sockets with example.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain Executor framework and synchronization objects.	8 Marks	L2	CO5
	b)	Explain concurrent collections and atomic operations	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain locks and thread synchronization in Java.	8 Marks	L2	CO5
	b)	Explain parallel programming in Java with examples.	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

ELECTROMAGNETIC FIELDS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Explain the relationship between electric potential and electric field intensity.	2 Marks	L1	CO1
	b)	Write the expression for the electric field intensity due to a uniformly charged infinite line using Gauss's law and symmetry considerations.	2 Marks	L2	CO1
	c)	Explain the law of refraction in the context of electromagnetic waves passing from one dielectric material to another.	2 Marks	L1	CO2
	d)	Define capacitance and how does the capacitance of a capacitor change if the distance between the plates is increased?	2 Marks	L1	CO2
	e)	Write Maxwell's third equation in both point and integral form	2 Marks	L1	CO3
	f)	Explain the factors affecting the magnetic field intensity produced by a straight current-carrying conductor.	2 Marks	L1	CO3
	g)	How is the energy density related to the magnetic flux density in a magnetic field?	2 Marks	L1	CO4
	h)	How do magnetic boundary conditions ensure the conservation of magnetic flux?	2 Marks	L1	CO4
	i)	Analyze the modifications made to Ampere's law to include displacement current.	2 Marks	L2	CO5
	j)	Assess the significance of studying time varying fields in the context of real-world applications.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Derive an expression for electric field intensity due to an infinite sheet ofcharge.	8 Marks	L2	CO1
	b)	Q1 and Q2 are the point charges located at (0,-4,3) and (0,1,1). If Q1 is 2nC, find Q2 such that the force on a test charge at (0,-3, 4) has no Z-components.	8 Marks	L3	CO1

(OR)

3.	a)	Derive the expression for electric field intensity due to an infinite line charge.	8 Marks	L2	CO1
	b)	State and prove Gauss Law in point form.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain in detail about polarization effects induced in dielectric due to electric field.	8 Marks	L2	CO2

	b)	A parallel plate capacitor has a plate area of 1.5 m^2 and a plate separation of 5 mm. there are two dielectrics in between the plates. The first dielectric has a thickness of 3 mm with a relative permittivity of 6 and second has a thickness of 2 mm with a relative permittivity of 4. Determine the capacitance.	8 Marks	L3	CO2
		(OR)			
5.	a)	Explain the boundary conditions between conductor and free space for electric fields.	8 Marks	L2	CO2
	b)	A capacitor consists of square shape metal plates of each 80 cm side placed parallel and 3 mm apart. The space between the plates is filled with a dielectric having a relative permittivity of 3. A potential difference of 300 V is maintained between the plates. Calculate i) the capacitance ii) charge on the capacitoriii) the electric flux density iv) energy stored in the capacitor.	8 Marks	L3	CO2
		MODULE-III			
6.	a)	Using Ampere's circuital Law, obtain an expression for magnetic field intensity due to an infinite sheet of current carrying conductor.	8 Marks	L3	CO3
	b)	Obtain the expression for Magnetic field strength in all the regions if a cylindrical conductor carries a DC current of I and its radius is R m and also plot the variation of Magnetic field strength against the distance r from the Centre of the conductor.	8 Marks	L3	CO3
		(OR)			
7.	a)	State and explain Biot-Savart's Law.	8 Marks	L3	CO3
	b)	A steady current of 1.5 A is flowing through a conductor made to form a circular coil of radius 1.5cm. Find the Magnetic Field Intensity at the center of the circular coil having 25 turns.	8 Marks	L3	CO3
		MODULE-IV			
8.	a)	Obtain the expression for self-inductance of Solenoid, using Ampere's Circuital law.	8 Marks	L2	CO4
	b)	A solenoid of 500 turns has a length of 50 cm and the radius of 10 cm. A steel rod of circular cross-section is fitted in the solenoid coaxially. Relative permeability of steel is 3000. A DC current of 10 A is passed through solenoid, compute inductance of the system, energy stored in the system and mean flux density inside the solenoid	8 Marks	L3	CO4
		(OR)			
9.	a)	Derive an expression for energy stored in a magnetic field.	8 Marks	L2	CO4
	b)	Derive an expression for force between two straight long parallel current carrying conductors. What will be the nature of force if the current is carrying in the same direction and opposite directions?	8 Marks	L3	CO4
		MODULE-V			
10.	a)	Show that, in a capacitor the conduction current and displacement currents are equal	8 Marks	L2	CO5
	b)	Differentiate between statically induced EMF and dynamically induced EMF and discuss their applications in electrical machines.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain Maxwell's equations in their integral form. Derive the corresponding equations for fields varying harmonically with time.	8 Marks	L2	CO5
	b)	Explain the significance and applications of Maxwell's equations in electromagnetic fields	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

PROFESSIONAL ETHICS AND HUMAN VALUES

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is meant by moral autonomy?	2 Marks	L1	CO1
	b)	Mention the various types of inquiries.	2 Marks	L1	CO1
	c)	Define professionalism.	2 Marks	L2	CO2
	d)	Define integrity.	2 Marks	L1	CO2
	e)	What is the importance of experimentation?	2 Marks	L2	CO3
	f)	List some of the importance of learning from the past topic of experimentation.	2 Marks	L1	CO3
	g)	What is meant by whistle blowing?	2 Marks	L1	CO4
	h)	Define collegiality.	2 Marks	L1	CO4
	i)	How does realization and understanding lead to definiteness of human conduct?	2 Marks	L1	CO5
	j)	Recite the transition from the present state to Universal Human Order	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain in detail about engineering ethics and its philosophy?	8 Marks	L2	CO1
	b)	Where and how do moral problems arise in engineering?	8 Marks	L1	CO1
		(OR)			
3.	a)	What are the different levels of moral development suggested by Kohlberg?.	8 Marks	L1	CO1
	b)	Describe the professional roles played by an engineer?	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the importance of self confidence in ethics.	8 Marks	L2	CO2
	b)	Discuss in detail the various ethical theories and their uses.	8 Marks	L2	CO2
		(OR)			
5.	a)	Engineering is an important and learned profession. Discuss the code of ethics for Engineers.	8 Marks	L2	CO2
	b)	What is self-respect? How is it important for professionals?	8 Marks	L1	CO2

MODULE-III

6.	a)	How can an engineer become a responsible experimenter? Explain in detail?	8 Marks	L1	CO3
	b)	Compare engineering experiments with standard scientific experiments in terms of objectives, methodology, and analysis.	8 Marks	L1	CO3
		(OR)			

7.	a)	Discuss on the roles played by the codes of ethics set by professional societies.	8 Marks	L1	CO3
	b)	What are the moral and ethical lessons we can be learned from spaces shuttle challenger tragedy and how the principal actors behave as responsible experiments	8 Marks	L1	CO3

MODULE-IV

8.	a)	Discuss in detail about the occupational crimes.	8 Marks	L2	CO4
	b)	Explain the difference between raising concerns through company channels versus approaching external bodies.	8 Marks	L2	CO4

(OR)

9.	a)	Discuss in detail about the employee Rights and its role in the organizations.	8 Marks	L2	CO4
	b)	What are intellectual property rights? Explain the elements of intellectual property rights in details and benefits of IPRS.	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss universal human order and its importance.	8 Marks	L2	CO5
	b)	Engineers are responsible for sustaining ecology. Discuss.	8 Marks	L2	CO5

(OR)

11.	a)	Discuss the role of engineers in promoting public awareness for the safe use of technology and equipment.	8 Marks	L1	CO5
	b)	How can engineers balance loyalty to their organization with their professional responsibility to public safety and welfare?	8 Marks	L1	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) (Fasttrack) Regular Examinations April – 2026

ENGINEERING THERMODYNAMICS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define control volume.	2 Marks	L1	CO1
	b)	Differentiate between intensive and extensive properties.	2 Marks	L2	CO1
	c)	State Clausius statement of second law.	2 Marks	L2	CO2
	d)	Differentiate between refrigerator and heat pump.	2 Marks	L2	CO2
	e)	Define entropy.	2 Marks	L1	CO3
	f)	Describe the concept of dead state.	2 Marks	L2	CO3
	g)	Define pure substance.	2 Marks	L1	CO4
	h)	Analyze a given P–T diagram and distinguish between triple point and critical point based on slopes and phase regions.	2 Marks	L3	CO4
	i)	What is cut of ratio? Name the engine where cur ratio is significant.	2 Marks	L2	CO5
	j)	Analyze role of pressure ratio in Joule cycle.	2 Marks	L4	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Define a Thermodynamic System. Distinguish between closed, open, and isolated systems with practical examples. Explain the concept of a Control Volume and how it differs from a closed system.	8 Marks	L2	CO1
	b)	Differentiate between the Microscopic and Macroscopic points of view in thermodynamics. What is the "continuum approach" and why is it important in macroscopic analysis?	8 Marks	L3	CO1

(OR)

3.	a)	Gas from a bottle of compressed helium is used to inflate an inelastic flexible balloon, originally folded completely flat to a volume of $0.5m^3$. If the barometer reads 760 mm Hg, what is the amount of work done upon the atmosphere by the balloon? Sketch the system before and after the process.	8 Marks	L3	CO1
	b)	A mass of 1.5kg of air is compressed in a quasi-static process from 0.1MPa to 0.7 MPa for which pv = constant. The initial density of air is 1.16kg/m3. Find the work done by the piston to compress the air.	8 Marks	L3	CO1

MODULE-II

4.	a)	State the Kelvin-Planck and Clausius statements of the second law of thermodynamics. Prove that the violation of the Kelvin-Planck statement leads to a violation of the Clausius statement.	8 Marks	L3	CO2
	b)	Describe the working principle of a refrigerator and a heat pump. Define their Coefficients of Performance (COP) and establish the relationship between them.	8 Marks	L3	CO2

(OR)

5.		A reversible heat engine operates between two reservoirs at temperatures 700°C and 50°C. The engine drives a reversible refrigerator which operates between reservoirs at temperatures of 50°C and – 25°C. The heat transfer to the engine is 2500 kJ and the network output of the combined engine refrigerator plant is 400 kJ. i) Determine the heat transfer to the refrigerant and the net heat transfer to the reservoir at 50°C; ii) Reconsider (i) given that the efficiency of the heat engine and the C.O.P. of the refrigerator are each 45 per cent of their maximum possible values.	16 Marks	L3	CO2

MODULE-III

6.	a)	State and prove the Clausius theorem for a reversible cycle.	8 Marks	L3	CO3
	b)	Explain the principle of the increase of entropy. Prove that the entropy of an isolated system always increases or remains constant.	8 Marks	L3	CO3

(OR)

7.	a)	An industrial furnace acts as a heat source at 1500 K. It transfers heat at a rate of 500 kW to a working fluid. If the ambient temperature is 300 K, calculate the (a) Available energy rate, (b) Unavailable energy rate, and (c) The maximum work possible from this heat transfer.	8 Marks	L3	CO3
	b)	1 kg of water at 300 K is mixed with 1 kg of water at 400 K in an insulated tank. Assuming Cp of water is 4.18 kJ/kgK, calculate the change in entropy of the universe and the loss of available energy, assuming the surroundings are at 300 K.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Draw and explain a P-T (pressure-temperature) diagram for a pure substance.	8 Marks	L2	CO4
	b)	Explain with a neat diagram P-V-T surface.	8 Marks	L2	CO4

(OR)

9.	a)	Explain the following terms : i) Partial pressure ii) Mole fraction iii) Volume fraction of a gas constituent in a mixture. iv) Mass fraction	8 Marks	L2	CO4
	b)	A vessel of 0.35 m3 capacity contains 0.4 kg of carbon monoxide (molecular weight = 28) and 1 kg of air at 20°C. Calculate: i) The partial pressure of each constituent, ii) The total pressure in the vessel, and The gravimetric analysis of air is to be taken as 23.3% oxygen (molecular weight = 32) and 76.7% nitrogen (molecular weight = 28).	8 Marks	L3	CO4

MODULE-V

10.	a)	Derive the expression for the air-standard efficiency of an Otto cycle in terms of compression ratio. State the assumptions made in air-standard analysis.	8 Marks	L3	CO5
	b)	Describe the working of a Joule cycle used in gas turbines. Represent it on P-V and T-S diagrams and derive its efficiency in terms of pressure ratio	8 Marks	L3	CO5

(OR)

11.	a)	A diesel engine has a compression ratio of 15 and heat addition at constant pressure takes place at 6% of stroke. Find the air standard efficiency of the engine. Take γ for air as 1.4.	8 Marks	L3	CO5
	b)	The stroke and cylinder diameter of a compression ignition engine are 250 mm and 150 mm respectively. If the clearance volume is 0.0004 m3 and fuel injection takes place at constant pressure for 5 per cent of the stroke determine the efficiency of the engine. Assume the engine working on the diesel cycle.	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech III Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

KINEMATICS OF MACHINERY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Differentiate between lower pair and higher pair.	2 Marks	L2	CO1
	b)	Write Kutzbach criterion formula for mobility.	2 Marks	L2	CO1
	c)	Define instantaneous center method.	2 Marks	L1	CO2
	d)	What is an acceleration diagram for slider-crank mechanism?	2 Marks	L2	CO2
	e)	Name the steering mechanisms used in automobiles.	2 Marks	L1	CO3
	f)	Define double Hooke's joint.	2 Marks	L1	CO3
	g)	What is meant by cycloidal tooth profile?	2 Marks	L1	CO4
	h)	Define differential gear box.	2 Marks	L2	CO4
	i)	State two types of cams.	2 Marks	L1	CO5
	j)	What is meant by cycloidal motion of a cam follower?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	With neat sketches, explain the inversions of single slider crank chain.	8 Marks	L3	CO1
	b)	Explain the inversions of double slider crank chain with neat sketches.	8 Marks	L3	CO1

(OR)

3.	a)	Explain the classification of kinematic pairs with neat sketches.	8 Marks	L2	CO1
	b)	Distinguish between closed pair and open pair with examples.	8 Marks	L2	CO1

MODULE-II

4.	A four-bar mechanism ABCD is made of four links. AD is fixed link which is 180 mm long. The links AB, BC and CD are 90 mm, 120 mm and 120 mm respectively. At a certain instant, the link AB makes 690 with link AD. If link AB rotates at uniform speed of 120 rpm, find: i) Angular velocities of links BC and CD ii) Velocity of B and C	16 Marks	L3	CO2

(OR)

5.	In a four-bar mechanism, the crank AB rotates at 36 rad/sec. The lengths of the links are: AB=200mm, BC=400mm, CD=450mm and AD=600mm. AD is the fixed link. At the instant when AB is at right angle to AD, determine the velocities and angular acceleration of the mid-point of link BC.	16 Marks	L3	CO2

MODULE-III

6.		With neat sketches, explain Hart and Scott Russell's straight-line motion mechanisms.	16 Marks	L3	CO3

(OR)

7.	a)	Derive the condition for correct steering mechanism and explain its application in Davis steering gear.	8 Marks	L4	CO3
	b)	Explain the construction and working of a single and double Hooke's joint.	8 Marks	L3	CO3

MODULE-IV

8.		The following data relate to a pair of 20° involute gears in mesh: Module = 6 mm, Number of teeth on pinion = 17, Number of teeth on gear = 49; Addendum on pinion and gear wheel = 1 module. Find : 1. The number of pairs of teeth in contact ; 2. The angle turned through by the pinion and the gear wheel when one pair of teeth is in contact, and 3. The ratio of sliding to rolling motion when the tip of a tooth on the larger wheel (i) is just making contact, (ii) is just leaving contact with its mating tooth, and (iii) is at the pitch point.	16 Marks	L3	CO4

(OR)

9.		In a reverted epicyclic gear train, the arm A carries two gears B and C and a compound gear D - E. The gear B meshes with gear E and the gear C meshes with gear D. The number of teeth on gears B, C and D are 80, 35 and 95 respectively. Find the speed and direction of gear C when gear B is fixed and the arm A makes 200 r.p.m. clockwise.	16 Marks	L3	CO4

MODULE-V

10.		A cam, with a minimum radius of 25 mm, rotating clockwise at a uniform speed is to be designed to give a roller follower, at the end of a valve rod, motion described below : 1. To raise the valve through 50 mm during 120° rotation of the cam ; 2. To keep the valve fully raised through next 30°; 3. To lower the valve during next 60°; and 4. To keep the valve closed during rest of the revolution i.e. 150° ; The diameter of the roller is 20 mm and the diameter of the cam shaft is 25 mm. Draw the profile of the cam when (a) the line of the stroke is offset 15 mm from the axis of the cam shaft. The displacement of the valve, while being raised and lowered, is to take place with simple harmonic motion.	16 Marks	L4	CO4

(OR)

11		Construct the profile of a cam to suit the following specifications: Cam shaft diameter = 50 mm; Least radius of cam = 30 mm; Diameter of roller = 20 mm; Angle of lift = 120°; Angle of fall = 150°; Lift of the follower = 40 mm; Number of pauses are two of equal interval between motions. During the lift, the motion is S.H.M. During the fall the motion is uniform acceleration and deceleration. The speed of the cam shaft is uniform. The line of stroke of the follower is off-set 13 mm from the centre of the cam.	16 Marks	L4	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) (Fasttrack) Regular Examinations April – 2026

BASIC CIVIL AND MECHANICAL ENGINEERING

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	List different equipment used for the land surveying	2 Marks	L2	CO1
	b)	Distinguish between English bond and Flemish bond.	2 Marks	L4	CO1
	c)	List different types of highways	2 Marks	L1	CO2
	d)	Write the types of gauges in railways	2 Marks	L2	CO2
	e)	What is reaction turbine? Give example.	2 Marks	L2	CO3
	f)	What is meant by charge in an internal combustion engine?	2 Marks	L1	CO3
	g)	List the types of belts used for the transmission of power.	2 Marks	L1	CO4
	h)	What are the advantages and disadvantages of gear drive?	2 Marks	L1	CO4
	i)	Write in brief about the need for rapid prototyping.	2 Marks	L2	CO5
	j)	Is 3D printing and additive manufacturing are same? Write a reason.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss different types of stone masonry	8 Marks	L4	CO1
	b)	Explain the types of bonds in brick masonry with neat sketches.	8 Marks	L2	CO1
		(OR)			
3.	a)	Differentiate between prismatic compass and surveyors compass	8 Marks	L2	CO1
	b)	Discuss various tests performed on bricks to check their quality	8 Marks	L2	CO1

MODULE-II

4.	a)	Define Beam. Explain types of beams.	8 Marks	L2	CO2
	b)	Explain the components of a Permanent way	8 Marks	L2	CO2
		(OR)			
5.	a)	Explain the comfort ability factor in considering the rise and tread of a step in stair case	8 Marks	L2	CO2
	b)	Explain different types of pitched roofs	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain the working principle of 4 stroke spark ignition engine with neat sketch.	6 Marks	L2	CO3
	b)	Write short notes on specialized sub-disciplines in Mechanical Engineering.	10 Marks	L2	CO3
		(OR)			

7.		Define turbine. With the help of a neat sketch explain the working principle of impulse turbine.	16 Marks	L2	CO3
		MODULE-IV			
8.	a)	Derive an expression for maximum power transmitted in flat belt drive.	8 Marks	L2	CO4
	b)	Explain centrifugal tension and Initial tension in belt drives.	8 Marks	L2	CO4
		(OR)			
9.		Define a gear train. Draw a neat sketch of gear tooth and explain its terminologies.	16 Marks	L2	CO4
		MODULE-V			
10.		What are the three phases of rapid proto typing. Contrasting these with those of geometric modelling, what similarities can be drawn.	16 Marks	L2	CO5
		(OR)			
11.		i) List the advantages and disadvantages of powder based rapid prototyping system. ii) Compare powder based rapid prototyping systems with liquid based and solid based rapid prototyping systems.	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B C A II Semester (MBU-22) (Fasttrack) Regular Examinations April – 2026

NUMERICAL ANALYSIS, PROBABILITY AND STATISTICS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is the Difference between Interpolation and Extrapolation?	2 Marks	L1	CO1
	b)	Construct backward difference table.	2 Marks	L1	CO1
	c)	Write augmented matrix for the following system of equation: $10x+y+z=12;\ 12x+10y+z=13;\ 2x+2y+10z=14.$	2 Marks	L1	CO1
	d)	Give the formula of Newton's Backward difference formula.	2 Marks	L1	CO1
	e)	Define Mathematical expectation of a random variable.	2 Marks	L1	CO2
	f)	Write the formula for Trapezoidal rule.	2 Marks	L1	CO2
	g)	Write Mean and variance of a Normal distribution.	2 Marks	L1	CO3
	h)	Define Poisson distribution.	2 Marks	L1	CO3
	i)	Write about types of correlation..	2 Marks	L1	CO4
	j)	Write two lines of Regression.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Find a real root of $x^3-5x+1=0$ using Bisection method in 5 stages.	8 Marks	L3	CO1
	b)	Solve the equations $2x_1+x_2+x_3=10;\ 3x_1+2x_2+3x_3=18$ $x_1+4x_2+9x_3=16$, using Guass-Elimination method.	8 Marks	L4	CO1

(OR)

3.	a)	Use Regula- Falsi method to find a root of the equation $x^3-2x-5=0$.	8 Marks	L3	CO1
	b)	Use Gauss- Seidel iteration method to solve the system $10x+2y+z=9\ ;\ 2x+20y-2z=-44\ ;\ -2x+3y+10z=22$	8 Marks	L4	CO1

MODULE-II

Use Lagrange formula and estimate f(x) when x =16

x	2	5	9	15	22	30
f(x)	8	14	22	34	48	64

8 Marks L3 CO1

	b)	Find third divided differences of *f(x)* with arguments x = 2, 4, 9, 10, where $f(x)=x^3-2x$	8 Marks	L4	CO1

(OR)

5. a) The population of a certain town (as obtained from census data) is shown in the following table: 8 Marks L3 CO1

Year(x)	1951	1961	1971	1981	1991
Population(in thousands)(Y)	19.96	39.65	58.81	77.21	94.61

Estimate the rate of growth of the population in the year 1981.

b) Evaluate $\int_0^1 \frac{1}{1+x}dx$ by Trapezoidal rule . 8 Marks L4 CO1

MODULE-III

6. a) Explain the following with examples:
   i) Mutually exclusive events
   ii) Equally likely events
   iii) Independent events
   iv) Exhaustive events. 8 Marks L3 CO2

b) A random variable X has the following probability distribution.

X	1	2	3	4	5	6	7	8
P(X)	K	2K	3K	4K	5K	6K	7K	8K

8 Marks L3 CO2

Find the value of (i) K (ii) Mean (iii) variance

(OR)

7. a) The cumulative distribution function for a continuous random variable X is $F(x) = \begin{cases} 1-e^{-2x} & ; x \geq 0 \\ 0 & ; x \leq 0 \end{cases}$. Find 8 Marks L3 CO2
   i) the density function *f(x)*
   ii) mean and
   iii) variance of the density function.

b) State and prove addition theorem of mathematical expectation. 8 Marks L3 CO2

MODULE-IV

8. a) If X is a normal variate with mean 30 and standard deviation 5. Find the probabilities that 8 Marks L3 CO3
   i) $26 \leq X \leq 40$ ii) $X \geq 45$

b) Ten coins are thrown simultaneously. Find the probability of getting at least i) seven heads ii) six heads. iii) Exactly 5 tails. 8 Marks L3 CO3

(OR)

9. a) Derive mean and variance of Binomial Distribution. 8 Marks L2 CO3

b) In a Poisson distribution $P(X=2) = \frac{1}{4}P(X=4)$. 8 Marks L3 CO3

Fit a Poisson distribution and hence Calculate
   i) $P(3 \leq X \leq 6)$ ii) $P(X \leq 5)$ iii) $P(4 < X \leq 7)$.

MODULE-V

10. a) Find the rank correlation for the following data. 8 Marks L3 CO4

X	65	63	67	64	68	62	70	66	68	67	69	71
Y	68	66	68	65	69	66	68	65	71	67	68	70

b) The equations of two regression lines obtained in a correlation 8 Marks L3 CO4

analysis are: $3X + 12Y = 19$, $3Y + 9X = 46$
Find:

i) Coefficient of correlation ii) Mean values of X and Y .

(OR)

11.	a)	The sales of a company (in million dollars) for each year are shown in the table below. X (year) : 2005 2006 2007 2008 2009 Y (sales) : 12 19 29 37 45 i) Find the least square regression line $y = ax + b$. ii) Use the least squares regression line as a model to estimate the sales of the company in 2012.	8 Marks	L3	CO4
	b)	A machine is designed to produce insulating washers for electrical devices of an average thickness of 0.025*cm*. A random sample of 10 washers was found to have an average thickness of 0.024 *cm* with a standard deviation of 0.002 *cm*. Test the significance of the deviation.	8 Marks	L4	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

DISCRETE MATHEMATICAL STRUCTURES

[Computer Science and Engineering(Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Find the negation of the following statements in symbolic form i) 3 is a prime number ii) All triangles are equilateral	2 Marks	L1	CO1
	b)	Define tautology and contradiction.	2 Marks	L1	CO1
	c)	Define partial ordering relation.	2 Marks	L1	CO2
	d)	Define Lattice and give one example which is not Lattice.	2 Marks	L1	CO2
	e)	Three persons enter into car, where there are 5 seats. In how many ways can they take up their seats.	2 Marks	L1	CO3
	f)	Define Monoid and give one example.	2 Marks	L1	CO3
	g)	Find generating function for the sequence $< a_r >$	2 Marks	L1	CO4
	h)	Find the sequence for the function $2x^2(1-x)^{-1}$.	2 Marks	L1	CO4
	i)	Let G be a connected planar simple graph with 30 vertices and 60 edges.Find the number of regions in G.	2 Marks	L1	CO5
	j)	Define Eulerian circuit and Eulerian graph	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Show that the proposition $p \to (p \vee q)$ is a tautology.	8 Marks	L2	CO1
	b)	Show that $\sim(p \wedge q) \to (\sim p \vee (\sim p \vee q)) \Leftrightarrow (\sim p \vee q)$ without using truth table.	8 Marks	L2	CO1

(OR)

3.	a)	Construct disjunctive normal form for $p \to ((p \to q) \wedge \neg(\neg q \vee \neg p))$.	8 Marks	L3	CO1
	b)	Determine whether the proposition $\neg(p \to q) \Leftrightarrow (\neg p \to \neg q)$ is tautology or contradiction or contingency.	8 Marks	L5	CO1

MODULE-II

4.	a)	Determine the relation R and draw its diagraph from a set A to a set B as described by the following matrix $\begin{bmatrix} 1 & 0 & 1 \\ 1 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{bmatrix}$.	8 Marks	L5	CO2
	b)	Let $A = \{1,2,3,4,5,6,7,8,9,10,11,12\}$. On this set define the relation R by $R = \{(x,y)/(x-y) \text{ is a multiple of } 5\}$. Show that R is an equivalence relation.	8 Marks	L2	CO2

(OR)

5.	a)	Show that the relation "Congruent modulo n" is an equivalence relation on the set of all integers Z.	8 Marks	L2	CO2
	b)	Show that a mapping $f: R \to R$ defined by $f(x) = 2x + 1$ for $x \in R$ is a bijective map from R to R.	8 Marks	L2	CO2

MODULE-III

6.	a)	By using mathematical induction, prove that $1^2 + 2^2 + 3^2 + ... + n^2 = \frac{n(n+1)(2n+1)}{6}, n \geq 1$.	8 Marks	L3	CO3
	b)	Show that the set $G = \{1, 2, 3, 4\}$ is an Abelian group with respect to multiplication modulo 5.	8 Marks	L2	CO3

(OR)

7.	a)	Examine the relation $a * b = \frac{ab}{3}$ for all $a, b \in G$ is a group or not.	8 Marks	L4	CO3
	b)	Examine the relation $a * b = a + b + 1$ for all $a, b \in G$ is a group or not.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Determine the Coefficient of x^{12} in $x^3(1 - 2x)^{10}$.	8 Marks	L5	CO4
	b)	Solve the recurrence relation $a_n = a_{n-1} + n,\ n \geq 1$ where $a_0 = 2$ by substitution method.	8 Marks	L3	CO4

(OR)

9.	a)	Find the sequence generated by the function $(3 + x)^3$.	8 Marks	L1	CO4
	b)	Solve the recurrence relation $a_n - 5a_{n-1} + 6a_{n-2} = 0$ for $n \geq 2$.	8 Marks	L3	CO4

MODULE-V

10.	Define Minimum Spanning Tree. Explain Prim's algorithm with an example.	16 Marks	L1	CO5

(OR)

11	Define DFS and BFS with examples.	16 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

[Computer Science and Engineering, Computer Science and Engineering (Cyber Security), Information Technology, Computer Science and Engineering (Artificial Intelligence and Machine Learning), Computer Science and Engineering (Data Science)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Java bytecode.	2 Marks	L1	CO1
	b)	What is JVM?	2 Marks	L1	CO1
	c)	What is method overloading?	2 Marks	L1	CO2
	d)	Explain the use of this keyword?	2 Marks	L2	CO2
	e)	Compare single and multiple inheritance.	2 Marks	L2	CO3
	f)	What is an interface?	2 Marks	L1	CO3
	g)	What is exception handling?	2 Marks	L1	CO4
	h)	Define multithreading.	2 Marks	L1	CO4
	i)	What is a Collection framework?	2 Marks	L1	CO5
	j)	Explain an event in Java GUI.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the history of Java and Java buzzwords.	8 Marks	L2	CO1
	b)	Explain data types, variables, scope and lifetime of variables in Java.	8 Marks	L2	CO1
		(OR)			
3.	a)	Explain constructors and constructor overloading with examples.	8 Marks	L2	CO1
	b)	Explain arrays and control statements in Java with examples	8 Marks	L2	CO1

MODULE-II

4.	a)	Analyze the different types of inheritance in Java and examine the member access rules applicable to each type with examples.	8 Marks	L4	CO2
	b)	Explain method overriding and usage of super keyword	8 Marks	L2	CO2
		(OR)			
5.	a)	Explain abstract classes and interfaces. Highlight differences between them.	8 Marks	L2	CO2
	b)	Explain packages in Java: creation, importing, and access control.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain exception handling concepts and keywords (try, catch, throw, throws, finally)	8 Marks	L2	CO2
	b)	Explain built-in exceptions and user-defined exceptions with examples.	8 Marks	L2	CO2
		(OR)			
7.	a)	Explain the thread life cycle with a diagram.	8 Marks	L2	CO2

	b)	Design and develop a Java program that demonstrates multithreading by creating threads using both the Thread class and the Runnable interface.	8 Marks	L6	CO2

MODULE-IV

8.	a)	Explain the Collection framework and its interfaces (List, Set, Map).	8 Marks	L3	CO3
	b)	Compare ArrayList, LinkedList, and Vector with examples.	8 Marks	L4	CO3
		(OR)			
9.	a)	Explain HashSet, TreeSet, HashMap, and Hashtable with examples.	8 Marks	L2	CO3
	b)	Explain Iterator, Comparator, and Comparable interfaces.	8 Marks	L2	CO3

MODULE-V

10.	a)	Explain Applets and write a simple applet program.	8 Marks	L2	CO4
	b)	Explain delegation event model and event handling in Java	8 Marks	L2	CO4
		(OR)			
11.	a)	Develop a Java GUI application that utilizes JCheckBox, JRadioButton, JTabbedPane, JList, and JComboBox to perform user interactions..	8 Marks	L3	CO5
	b)	Analyze the functionality and interaction of Swing components like JLabel, JTextField, and JButton within a GUI application	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | |

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SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BCA I Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

COMPUTER FUNDAMENTALS AND ORGANIZATION

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define algorithm.	2 Marks	L1	CO1
	b)	What is a flowchart?	2 Marks	L2	CO1
	c)	What is a flat panel display?	2 Marks	L2	CO2
	d)	Define E-ink display.	2 Marks	L1	CO2
	e)	Define binary multiplication.	2 Marks	L1	CO3
	f)	Define floating point representation	2 Marks	L1	CO3
	g)	What is an addressing mode?	2 Marks	L2	CO4
	h)	Expand CISC.	2 Marks	L2	CO4
	i)	Define semiconductor memory.	2 Marks	L1	CO5
	j)	What is memory interleaving?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain characteristics of computers in detail	8 Marks	L2	CO1
	b)	Describe the stored program concept with diagram	8 Marks	L2	CO1
		(OR)			
3.	a)	Explain problem solving using computers with flowchart example.	8 Marks	L2	CO1
	b)	Explain the simple model of a computer system with diagram.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain different computer output devices.	8 Marks	L2	CO2
	b)	Describe flat panel display technology.	8 Marks	L2	CO2
		(OR)			
5.	a)	Explain memory organization with diagram.	8 Marks	L2	CO2
	b)	Explain structure of instructions in processor.	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain binary addition and subtraction with examples	8 Marks	L2	CO3
	b)	Discuss parallel adder and serial adder with diagrams.	8 Marks	L3	CO3
		(OR)			
7.	a)	Describe floating point representation of numbers	8 Marks	L2	CO3
	b)	Explain basic logic gates (AND, OR, NOT) with truth tables.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Discuss instruction codes and formats in detail.	8 Marks	L3	CO4
	b)	Describe timing and control unit operations.	8 Marks	L2	CO4
		(OR)			

9.	a)	Explain input-output and interrupt operations in detail.	8 Marks	L2	CO4
	b)	Explain various addressing modes with examples.	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss cache write policies and auxiliary memory organization	8 Marks	L3	CO5
	b)	Explain cache replacement algorithms in detail.	8 Marks	L2	CO5

(OR)

11.	a)	Describe associative memory hardware organization	8 Marks	L2	CO5
	b)	Explain address mapping in memory in detail.	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B C A I Semester (MBU-22) (Fasttrack) Regular Examinations April – 2026

PROGRAMMING FOR PROBLEM SOLVING

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define the structure of a C program.	2 Marks	L1	CO1
	b)	Define a variable in C.	2 Marks	L1	CO1
	c)	Write the syntax of an if–else statement.	2 Marks	L1	CO1
	d)	What is an algorithm?	2 Marks	L1	CO1
	e)	Define an array.	2 Marks	L1	CO2
	f)	What is meant by an array of strings?	2 Marks	L1	CO2
	g)	Define a null pointer.	2 Marks	L1	CO3
	h)	What is a dangling pointer?	2 Marks	L1	CO3
	i)	How do you initialize a structure?	2 Marks	L2	CO4
	j)	Define random access in files.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Describe basic data types available in C with examples.	8 Marks	L2	CO1
	b)	Write a C program to find simple interest.	8 Marks	L3	CO3

(OR)

3.	a)	Discuss the use of formatted input/output functions in C with examples.	8 Marks	L3	CO1
	b)	Write a C program to find roots of quadratic equations.	8 Marks	L4	CO3

MODULE-II

4.	a)	Explain different types of conditional control statements with suitable examples	8 Marks	L4	CO2
	b)	Draw and explain a flowchart for finding the largest of three numbers	8 Marks	L2	CO1

(OR)

5.	a)	Compare and contrast while, do-while, and for loops with examples.	8 Marks	L3	CO1
	b)	Define program efficiency. Explain how efficiency can be improved in a program.	8 Marks	L4	CO1

MODULE-III

6.	a)	Explain in detail the declaration, initialization, and operations of a one-dimensional array with examples.	8 Marks	L4	CO2
	b)	Write a C program for matrix addition.	8 Marks	L2	CO3

(OR)

7.	a)	Define a function. Explain the general form of a function definition,	8 Marks	L3	CO2

		declaration, and call.			
	b)	Discuss how modular programming is achieved using functions.	8 Marks	L4	CO2

MODULE-IV

8.	a)	Define Pointer. Explain the concept of pointer declaration and initialization with examples.	8 Marks	L4	CO3
	b)	Explain the concept of function pointers.	8 Marks	L3	CO3
		(OR)			
9.	a)	Explain how pointers can be used to pass arrays to functions with an example.	8 Marks	L4	CO3
	b)	Write a C program demonstrating the use of pointer to pointer.	8 Marks	L3	CO3

MODULE-V

10.	a)	Explain the declaration, initialization, and usage of structures with an example.	8 Marks	L4	CO4
	b)	Write a program to pass a structure to a function and modify its members.	8 Marks	L3	CO4
		(OR)			
11.	a)	Explain the importance of file modes in fopen() with examples.	8 Marks	L4	CO4
	b)	Discuss how to use bitfields to represent flags in a structure.	8 Marks	L3	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B C A I Semester (MBU-22) (Fasttrack) Regular Examinations April – 2026

DATABASE MANAGEMENT SYSTEMS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define a Database Management System (DBMS)	2 Marks	L1	CO1
	b)	What is metadata?	2 Marks	L2	CO2
	c)	What is a weak entity?	2 Marks	L1	CO1
	d)	What is total participation?	2 Marks	L1	CO2
	e)	What is referential integrity?	2 Marks	L1	CO2
	f)	Mention any two database security measures.	2 Marks	L1	CO3
	g)	What are views in SQL?	2 Marks	L1	CO4
	h)	Define a cursor in PL/SQL.	2 Marks	L1	CO4
	i)	Define relational algebra.	2 Marks	L1	CO5
	j)	What is a concurrency?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the architecture of a DBMS with a neat diagram.	8 Marks	L2	CO1
	b)	Discuss the advantages and disadvantages of using a DBMS compared to a traditional file system.	8 Marks	L4	CO1

(OR)

3.	a)	What is DDL? Explain each command with syntax?	8 Marks	L3	CO3
	b)	Explain the usage of scheme in database.	8 Marks	L4	CO2

MODULE-II

4.	a)	Explain the components of an ER model with examples.	8 Marks	L2	CO1
	b)	Discuss various types of attributes in an ER diagram with examples.	8 Marks	L3	CO1

(OR)

5.	a)	Design an ER diagram for a Hospital Management System and explain its components.	8 Marks	L3	CO2
	b)	Explain how an E-R schema is reduced to a relational schema.	8 Marks	L4	CO2

MODULE-III

6.	a)	Explain the structure of a relational database with suitable examples.	8 Marks	L3	CO2
	b)	Explain how schemas and instances define the structure of a relational database.	8 Marks	L4	CO2

(OR)

7.	a)	Discuss the concept of referential integrity constraints with examples.	8 Marks	L4	CO3
	b)	Describe the methods used for user authentication.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain Data Definition Language (DDL) and Data Manipulation Language (DML) commands with examples.	8 Marks	L3	CO3
	b)	Demonstrate SUM, AVG, MAX, MIN, and COUNT with a suitable dataset.	8 Marks	L4	CO3

(OR)

9.	a)	Write and explain various SQL queries for creating and deleting records.	8 Marks	L3	CO3
	b)	Write a PL/SQL to find the maximum salary from an EMPLOYEE table.	8 Marks	L4	CO4

MODULE-V

10.	a)	Explain various relational algebra operations with examples.	8 Marks	L4	CO5
	b)	What is tuple relational calculus? How does it differ from relational algebra?	8 Marks	L3	CO5

(OR)

11.	a)	Discuss recovery techniques in transaction management.	8 Marks	L3	CO5
	b)	Differentiate between 1NF, 2NF, and 3NF. Illustrate each with examples	8 Marks	L4	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

SURVEYING

[Civil Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1	a)	What was the first form of surveying in the field of civil Engineering?	2 Marks	L1	CO1
	b)	Define bearing in compass	2 Marks	L1	CO1
	c)	What is the size of plane table?	2 Marks	L1	CO2
	d)	Define contouring.	2 Marks	L1	CO2
	e)	How does vertical angles are divided in determining the height of any object?	2 Marks	L2	CO3
	f)	List any two uses of contour maps.	2 Marks	L1	CO3
	g)	Write the formula for solid cube with a semi-circular on the above.	2 Marks	L1	CO4
	h)	Write the formula for Simpsons rule.	2 Marks	L1	CO4
	i)	Define EDM	2 Marks	L1	CO6
	j)	Write any two application of drone surveying.	2 Marks	L1	CO6

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2	a)	Explain the need for surveying in the field of Civil Engineering.	8 Marks	L2	CO1
	b)	Describe in detail about the following: i) Chain Survey ii) Cross-staff Survey	8 Marks	L4	CO1

(OR)

3	a)	Solve the following: i) $N60^0 12'W$ ii) $S19^0 50'E$ iii) $178^0 34'$ iv) $31^0 18'$	8 Marks	L4	CO1
	b)	Describe the procedure for calculating the area of plot using compass surveying.	8 Marks	L4	CO1

MODULE-II

4		Describe the functioning of plain table survey with an example of plot area.	16 Marks	L4	CO2

(OR)

5	a)	Discuss the types of leveling instruments.	8 Marks	L4	CO2
	b)	Define contour. List the different applications of contour surveying.	8 Marks	L2	CO2

MODULE-III

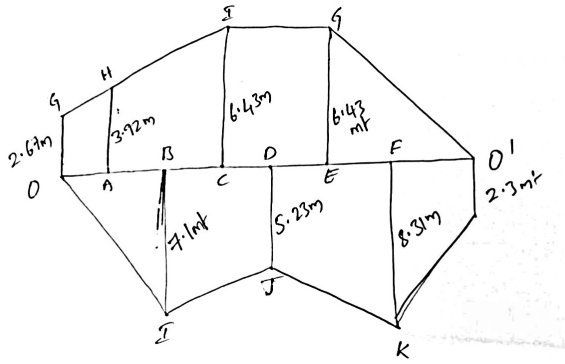
6	a)	How one can calculate the horizontal distance between two inaccessible points? Explain with a neat sketch.	8 Marks	L4	CO3
	b)	Determine the height of a electrical pole which is above ground level making an angle of elevation of $31^0 57'$ and angle of depression is $11^0 24'$. The distance from the equipment station to the electrical pole is 13.96mts.	8 Marks	L3	CO3

(OR)

7	Describe the parts of theodolite with neat sketch.	16 Marks	L4	CO3

MODULE-IV

8	Determine the area of a plot divided by possible regular shapes where. Each ordinate is divided with 30mt each.	16 Marks	L4	CO4



(OR)

9	a)	Discuss the use of mathematical approach in determining areas and volumes of different plots.	8 Marks	L4	CO4
	b)	Describe the road cross section with a neat sketch.	8 Marks	L2	CO4

MODULE-V

10	a)	Explain the working principal of total station with an example.	8 Marks	L2	CO5
	b)	Describe the applications of drone surveying.	8 Marks	L4	CO5

(OR)

11	a)	Describe the how data is collected in total station.	8 Marks	L4	CO5
	b)	Explain the functioning process of drone.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) (Fasttrack) Regular Examinations, April– 2026

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

[Computer Science and Engineering ,Computer Science and Engineering (Artificial Intelligence and Machine Learning),Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	State Faraday's laws of electromagnetic induction.	2 Marks	L1	CO1
	b)	A 230 V, 80 W lamp is connected in series with a 230 V, 40 W lamp across 230 V supply. What will be the current drawn by the lamps? What will be the power consumed by each lamp?	2 Marks	L2	CO1
	c)	What is stepper motor? Classify the stepper motors.	2 Marks	L1	CO1
	d)	List the applications of Series, Shunt and compound motors	2 Marks	L1	CO2
	e)	State the Laws of illumination	2 Marks	L1	CO2
	f)	List the components of UPS.	2 Marks	L1	CO3
	g)	Differentiate active and passive transducers.	2 Marks	L2	CO3
	h)	Define see back effect and Thompson effect.	2 Marks	L2	CO4
	i)	Explain the function of Zener diode with V-I characteristics.	2 Marks	L2	CO4
	j)	Compare half and full wave rectifiers	2 Marks	L1	CO5

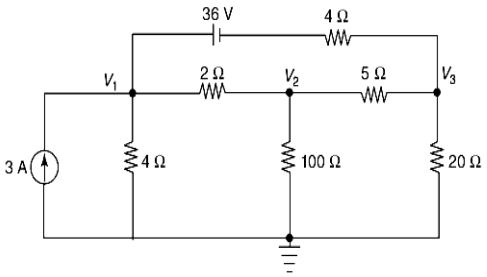
PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

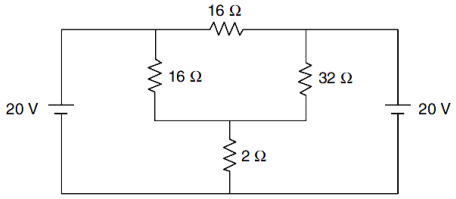
MODULE-I

2.	a)	Explain KVL with suitable examples in detail.	8 Marks	L1	CO1
	b)	Using Nodal Analysis, Determine the current through the 5 Ω resistor for the network shown in Fig.	8 Marks	L3	CO1



(OR)

3.	a)	Explain KCL with suitable examples in detail.	8 Marks	L1	CO1
	b)	Using mesh Analysis, find the current flowing through the 2 Ω resistor for the network shown in Fig.	8 Marks	L3	CO1



MODULE-II

4.	a)	What is a transformer? Explain the construction and working of a single-phase transformer.	8 Marks	L2	CO2
	b)	What is a stepper motor? Explain the construction and working with neat sketches.	8 Marks	L2	CO2

(OR)

5.	a)	Classify different types of Motors. Sketch the equivalent circuit for various types of motors.	8 Marks	L2	CO2
	b)	Suggest a suitable device which is working on a tripping mechanism. Explain the principle of operation with neat sketch.	8 Marks	L1	CO2

MODULE-III

6.	a)	Find the total saving in electrical load and percentage increase in illumination instead of using twelve 150 W tungsten filament lamps, twelve 80 W fluorescent tubes are used. It may be assumed that i) There is a choke loss of 25% of rated lamp wattage. ii) Average luminous efficiency throughout life for each lamp is 15 Lumen/W and for each tube 40 Lumen/W and The coefficient of utilization remains the same in both cases.	8 Marks	L3	CO3
	b)	Discuss in detail the following i) Industrial Lighting ii) Flood Lighting	8 Marks	L1	CO3

(OR)

7.	a)	Define UPS. Explain the operation of different types of UPS with neat sketch.	8 Marks	L3	CO3
	b)	An area of 30mX40m is to be illuminated for 15 Lux. Initially 35 Lumen/m^2. Is required to maintain an average illumination of 15 Lux considering wastage. Determine the number of 70 W high-pressure sodium vapour lamps required having an efficiency of 50 Lumens /Watt.	8 Marks	L2	CO3

MODULE-IV

8.	a)	With a neat sketch, explain how the temperature and humidity sensors work. Mention its advantages and disadvantages.	8 Marks	L2	CO4
	b)	With a neat sketch, explain how the distance is measured using ultrasound sensor. Mention its advantages and disadvantages.	8 Marks	L2	CO4

(OR)

9.	a)	Define Passive transducer. With neat sketch, explain the operation of LVDT.	8 Marks	L2	CO4
	b)	With neat block diagram discuss about Data Acquisition System. And Clarify the various parts of Analog Data Acquisition System.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain in detail the full wave rectifier with suitable diagram.	8 Marks	L2	CO4
	b)	Draw the characteristics of Zener diode and list the applications of it.	8 Marks	L2	CO4

(OR)

11.	a)	With neat sketch, Explain the operation of Weighted resistor type DAC with an example.	8 Marks	L2	CO4
	b)	With neat sketch, Explain the operation of Flash type ADC with an example.	8 Marks	L3	CO4

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

FUNDAMENTALS OF ELECTRICAL ENGINEERING

[Civil Engineering, Mechanical Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

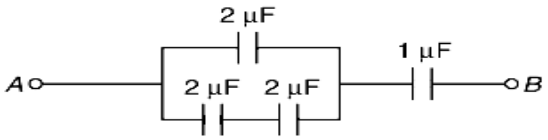
Time: 3 hours **Max. Marks: 100**

PART - A

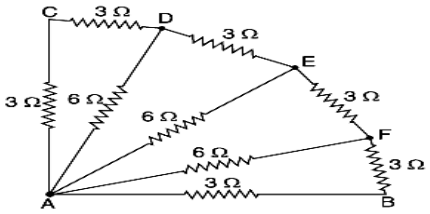
Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Find an equivalent resistance between A and B in the below network	2 Marks	L2	CO1



	b)	All the resistances in Fig. are in ohms. Find the effective resistance between the points A and B.	2 Marks	L2	CO1



	c)	A lamp rated at 100 V, 75 W is to be connected across a 230 V supply. Find the value of resistance to be connected in series with the lamp. Also find the power loss occurring in the resistor.	2 Marks	L1	CO2
	d)	Explain the significance of the power factor in electrical systems.	2 Marks	L1	CO2
	e)	What happens when the capacitor in a capacitor-run motor fails, and how does it affect the motor's operation?	2 Marks	L1	CO3
	f)	Why Single phase Induction Motor is not self starting?	2 Marks	L1	CO3
	g)	List out the disadvantages of BLDC motor.	2 Marks	L2	CO4
	h)	State the working principle of stepper motor.	2 Marks	L1	CO4
	i)	Why Transformer is rated in KVA?	2 Marks	L2	CO5
	j)	Define eddy current loss and hysteresis loss.	2 Marks	L1	CO5

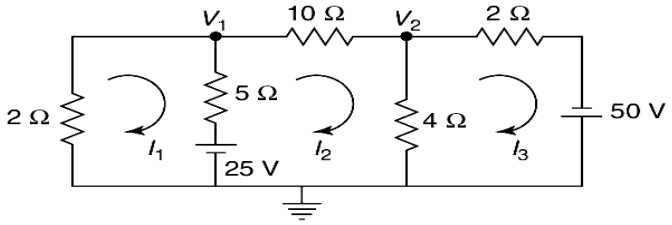
PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

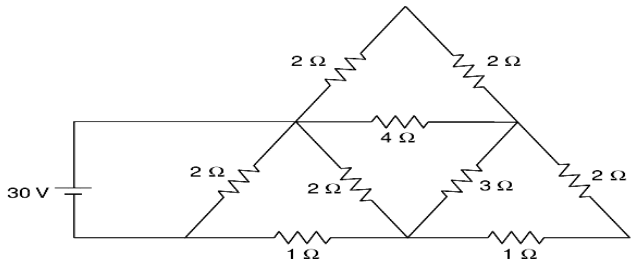
5 x 16 = 80 Marks

MODULE-I

2. a) Using Nodal analysis, Find currents I1, I2 and I3 for the network shown — 8 Marks — L3 — CO1

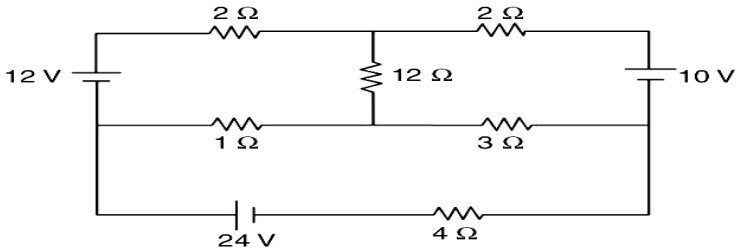


b) Determine the current delivered by the source in the network — 8 Marks — L3 — CO1

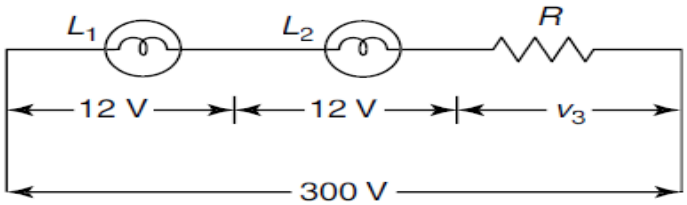


(OR)

3. a) Using Mesh analysis, find the current through the 4 Ω resistor — 10 Marks — L3 — CO1



b) A resistor R is connected in series with two lamps of 12 V, 9 W across a 300 V supply. Find the value of R so that both the lamps operate at rated conditions. If one of the lamps is short circuited, find the current through the circuit and the power dissipated in each lamp. — 6 Marks — L3 — CO1



MODULE-II

4. a) Discuss the behavior of an AC circuit with a series RL configuration. and Derive expressions for current and voltage in such circuits under steady-state conditions. — 8 Marks — L2 — CO2

b) Explain the following terminologies with respect to alternating quantities: — 8 Marks — L2 — CO2
i)Time period and Frequency ii) Phase difference
iii)Average Value and RMS value iv) Form factor and Peak factor

(OR)

5. a) Derive the expression for Q factor for RL series circuit. — 8 Marks — L2 — CO2

	b)	A coil of inductance 318.3mH and negligible resistance is connected in series witha 200Ωresistor to a 240 V, 50 Hz supply. Calculate i) the inductive reactance of the coil ii) the impedance of the circuit iii) the current in the circuit iv) the voltage across each component and v) the circuit phase angle.	8 Marks	L3	CO2
		MODULE-III			
6.	a)	With neat sketch, explain the working of capacitor Start and Run induction motor. Mention its applications.	8 Marks	L2	CO3
	b)	With neat sketch, explain the working of capacitor start induction motor. Mention its applications.	8 Marks	L2	CO3
		(OR)			
7.	a)	Draw the torque speed characteristics of capacitor start Induction Motor.	8 Marks	L2	CO3
	b)	With neat sketch, explain the working of Two valve capacitor induction motor. Mention its applications.	8 Marks	L2	CO3
		MODULE-IV			
8.	a)	With neat sketch, Explain the construction of PMBLDC motor Mention its applications.	8 Marks	L2	CO4
	b)	With neat sketch, explain the construction and working of Stepper motor. Mention its advantage, disadvantages and applications.	8 Marks	L2	CO4
		(OR)			
9.	a)	Differentiate between BLDC and PMBLDC motor based on their construction and operation	8 Marks	L2	CO4
	b)	What is the purpose of electronic commutation in BLDC motor.	8 Marks	L2	CO4
		MODULE-V			
10.	a)	Derive the expression for EMF equation of Single phase transformer.	8 Marks	L2	CO5
	b)	Obtain the equivalent circuit of a 200/400-V, 50-Hz, 1-phase transformer from the following test data : O.C test : 200 V, 0.7 A, 70 W – on L.V. side S.C. test : 15 V, 10 A, 85 W – on H.V. side Calculate the secondary voltage when delivering 5 kW at 0.8 p.f. lagging, the primary voltage being 200V.	8 Marks	L3	CO5
		(OR)			
11.	a)	With neat sketch, Explain the construction and working of Single phase Transformer.	8 Marks	L2	CO5
	b)	The corrected instrument readings obtained from open and short-circuit tests on 10-kVA, 450/120-V, 50-Hz transformer are : O.C. test : 120 V; 4.2 A; 80 W; S.C. test : 9.65 V; 22.2 A ; 120 W Compute the equivalent circuit (approximate) constants, efficiency and voltage regulation for an 80% lagging p.f. load, the efficiency at half full-load and 80% lagging p.f. load.	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) (Fasttrack) Regular Examinations April – 2026

ENGLISH FOR PROFESSIONALS

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Write any two differences between verbal and non-verbal communication.	2 Marks	L1	CO1
	b)	Write two examples of gadgets used by superheroes that exist in real life.	2 Marks	L1	CO5
	c)	What are the two main channels of communication?	2 Marks	L2	CO1
	d)	Identify whether the following communication is formal or informal: A scientist reporting alien activity to the government.	2 Marks	L1	CO1
	e)	Define "communication barrier" in one sentence.	2 Marks	L1	CO1
	f)	Mention two types of barriers to effective communication.	2 Marks	L1	CO1
	g)	Suggest two healthy eating habits for students and justify why they are important.	2 Marks	L2	CO2
	h)	Fill in the blank with the correct form of the verb and rewrite the sentence: If I ___ (be) you, I would avoid sugary drinks.	2 Marks	L2	CO2
	i)	Give two examples of business-related vocabulary and use each in a sentence.	2 Marks	L2	CO4
	j)	Write one effective answer to the interview question: "What is your strength?" and explain why it is good.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the importance of idiomatic expressions in enhancing spoken and written English with examples from superhero contexts.	8 Marks	L2	CO5
	b)	Frame five different types of questions (Yes/No, Wh-, Tag, Choice, Indirect) about the statement: "Thor wields a magical hammer."	8 Marks	L2	CO5

(OR)

3.	a)	Add suitable question tags to the following sentences: i) She is coming to the party, _____? ii) You don't like coffee, _____? iii) They have finished their homework, _____? iv) He can swim very well, _____? v) I am late, _____?	8 Marks	L2	CO2
	b)	Compare and contrast two superhero gadgets and their real-life scientific possibilities.	8 Marks	L2	CO1

MODULE-II

4.	a)	Read the given passage about aliens and answer the comprehension questions. Aliens have fascinated humans for centuries. Many stories, movies, and books depict them as beings with extraordinary intelligence and abilities, often different from humans in appearance and behavior. Scientists have long been curious about the possibility of life beyond Earth, leading to research in astronomy and space exploration. While no conclusive evidence has been found, the study of extraterrestrial life encourages critical thinking, imagination, and scientific inquiry among students and enthusiasts. **Comprehension Questions:** a) What is the main idea of the passage? b) Name two characteristics of aliens mentioned in the passage. c) Which field of study is mentioned that investigates extraterrestrial life? d) How does the study of aliens encourage human learning and curiosity? e) Write one sentence summarizing the passage in your own words.	8 Marks	L2	CO5
	b)	Write a description of an alien encounter you imagine.	8 Marks	L2	CO3
		(OR)			
5.	a)	Discuss the importance of articles in English grammar with examples.	8 Marks	L2	CO2
	b)	Write a detailed note on the different channels of communication with examples.	8 Marks	L3	CO1

MODULE-III

6.	a)	Write the main and secondary points with four examples each.	8 Marks	L2	CO1
	b)	Write a descriptive note on the importance of pronunciation in effective communication.	8 Marks	L2	CO3
		(OR)			
7.	a)	Convert the following passage in simple present into simple past. Ravi goes to the market every morning. He buys fresh vegetables and fruits. He meets his friends there and talks to them. After shopping, he returns home and cooks breakfast for his family	8 Marks	L2	CO2
	b)	Write about any three barriers to communication with examples.	8 Marks	L2	CO1

MODULE-IV

8.	a)	Discuss the advantages and disadvantages of technology-based communication in healthcare.	8 Marks	L2	CO5
	b)	Discuss the importance of breakfast in maintaining good health, citing research evidence.	8 Marks	L2	CO5
		(OR)			
9.	a)	Write a dialogue where one student gives advice on maintaining a balanced diet.	8 Marks	L2	CO1
	b)	Write a short essay on the importance of nutrition for young adults.	8 Marks	L2	CO5

MODULE-V

10.	a)	Explain the use of modal verbs in expressing necessity, obligation, and possibility with examples.	8 Marks	L2	CO2
	b)	Identify the main and secondary points from the passage about an entrepreneur's success story. Sara started her own bakery at the age of 22 with just a small loan from her family. Initially, she faced many challenges, including lack of customers and competition from established bakeries. However, she focused on quality, creativity, and excellent customer service. Within five years, her bakery became one of the most popular in her city, earning awards and expanding to multiple branches. Sara also started online baking classes to share her skills with others, inspiring many young entrepreneurs to follow their dreams.	8 Marks	L2	CO5

(OR)

11.	a)	Draft a proposal for setting up a small startup idea on campus.	8 Marks	L2	CO5
	b)	Write a note on "How to give effective answers during an interview."	8 Marks	L2	CO1

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

ENGLISH FOR PROFESSIONALS

[Civil Engineering , Computer Science and Engineering ,

Computer Science and Engineering (Artificial Intelligence and Machine Learning),

Computer Science and Engineering (Data Science), Computer Science and Engineering (Cyber Security) Information Technology , Electrical and Electronics Engineering , Mechanical Engineering,

Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Max. Marks: 100

Time: 3 hours

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Frame a Yes/No question for this statement: *"Iron Man created his first suit in a cave."*	2 Marks	L2	CO1
	b)	Mention two ways of identifying main points while listening to a lecture.	2 Marks	L2	CO5
	c)	Fill in the blank with the correct article and justify your answer: The Martians landed on ___ earth in the story.	2 Marks	L2	CO2
	d)	Write two examples of one-word substitutes related to "fear."	2 Marks	L2	CO4
	e)	Write the past tense forms of: discover, understand.	2 Marks	L1	CO2
	f)	What does "information transfer" mean in writing tasks?	2 Marks	L2	CO1
	g)	Mention two technology-based modes of communication used in healthcare and give examples.	2 Marks	L2	CO5
	h)	State the purpose of a mind map in listening tasks? Give one example.	2 Marks	L2	CO1
	i)	Correct the usage of the modal in the sentence and explain your correction: "Employees can to finish the project on time."	2 Marks	L2	CO2
	j)	What is the purpose of a technical description? Give one example.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2. a) Add suitable question tags to the following sentences: — 8 Marks, L3, CO1
   a) She is coming to the party, _____?
   b) You don't like coffee, _____?
   c) They have finished their homework, _____?
   d) He can swim very well, _____?
   e) I am late, _____?

   b) Compare and contrast two superhero gadgets and their real-life scientific possibilities. — 8 Marks, L2, CO5

(OR)

3.	a)	"Superheroes encourage creativity and imagination." – Write a paragraph expressing your views.	8 Marks	L2	CO5
	b)	Illustrate the importance of non-verbal communication (gestures, expressions, costumes) in superhero films.	8 Marks	L3	CO1

MODULE-II

4.	a)	Describe in detail any fictional alien gadget or technology.	8 Marks	L2	CO5
	b)	Explain how listening for main points is useful in classroom communication.	8 Marks	L3	CO1

(OR)

5.	a)	Write a description of a scientific experiment involving outer space.	8 Marks	L2	CO5
	b)	Prepare a comparative note on written, oral, and visual communication channels.	8 Marks	L2	CO1

MODULE-III

6.	a)	Convert the following passage in present tense into simple past : Ravi goes to the market every morning. He buys fresh vegetables and fruits. He meets his friends there and talks to them. After shopping, he returns home and cooks breakfast for his family	8 Marks	L2	CO2
	b)	Write about any three barriers to communication with examples.	8 Marks	L2	CO1

(OR)

7.	a)	Analyze the trend of major inventions in the 20th century and evaluate their impact on society. Write a paragraph describing your analysis."	8 Marks	L2	CO5
	b)	Explain the significance of polite disagreement in academic and professional settings.	8 Marks	L2	CO5

MODULE-IV

8.	a)	Discuss the advantages and disadvantages of technology-based communication in the modern world.	8 Marks	L2	CO1
	b)	Discuss the importance of breakfast in maintaining good health, citing research evidence.	8 Marks	L2	CO5

(OR)

9.	a)	Write a descriptive note on pronunciation problems faced by learners of English words related to health.	8 Marks	L2	CO3
	b)	Write five suggestions to improve the eating habits of college students.	8 Marks	L2	CO1

MODULE-V

10.	a)	Compare the functions of must, should, may, and might in business communication.	8 Marks	L2	CO2
	b)	Write a technical description of a business tool (e.g., projector, accounting software, POS machine).	8 Marks	L2	CO5

(OR)

11.	a)	Write an essay on the significance of women entrepreneurs in modern society.	8 Marks	L2	CO5
	b)	Frame any 10 sentences using modal verbs in a business context.	8 Marks	L2	CO2

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester Fasttrack (MBU-22) Regular Examinations,April – 2026

EMPOWERING YOUR ENGLISH

[Electronics and Communication Engineering, Computer Science and Engineering , Computer Science and Engineering (Artificial Intelligence and Machine Learning),

Computer Science and Engineering (Data Science),

Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	visited / last month / our family / Srinagar / (Arrange into a meaningful sentence).	2 Marks	L1	CO2
	b)	Their / assigned work / finished / they / before / lunch /. (Arrange into a meaningful sentence).	2 Marks	L1	CO2
	c)	to / the / they / went / a restaurant / last Saturday /. (arrange into a meaningful sentence).	2 Marks	L1	CO2
	d)	Education is the key to all …… (use correct form of the word- develop**).**	2 Marks	L1	CO2
	e)	He was …… (use correct form of the word- **success**) in completing the project on time.	2 Marks	L1	CO2
	f)	She didn't want to …… (use correct form of the word- irritate) her friend in front of others.	2 Marks	L1	CO2
	g)	We _____ (visit) the museum and _____ (learn) many interesting facts. (fill the blanks using simple past tense).	2 Marks	L1	CO2
	h)	The children _____ (play) in the park and _____ (enjoy) their time together. (fill the blanks using simple past tense).	2 Marks	L1	CO2
	i)	I _____(go) to the market yesterday and _____(purchase) a gift to my friend.(fill the blanks using simple past tense).	2 Marks	L1	CO2
	j)	He _____ (wake) up early and _____ (go) for a morning run.(fill the blanks using simple past tense).	2 Marks	L1	CO2

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Writing (A time to remember) – 100-150 words. Describe an unforgettable event or experience from your childhood that you still remember vividly. Why does it stand out in your memory?	6 Marks	L4	CO1
	b)	Reading comprehension: Ravi loved exploring nature. Every weekend, he would wake up early, pack a small bag with water and snacks, and set off on a new adventure. One Saturday, he decided to visit a nearby forest. The tall trees, chirping birds, and fresh air made him feel peaceful. As he walked deeper into the forest, he	10 Marks	L6	CO5

noticed a small stream flowing gently. Ravi sat by the stream, listened to the sound of water, and wrote in his diary about the beauty around him. He believed that spending time in nature helped him stay happy and healthy.

What did Ravi enjoy doing on weekends?
What items did Ravi carry in his bag?
Where did Ravi decide to go one Saturday?
How did the forest make Ravi feel?
What natural features did Ravi notice in the forest?
What did Ravi do when he found the stream?
vii) Why did Ravi write in his diary?
viii) What does Ravi believe about spending time in nature?
Find a word in the passage that means "calm and quiet."
Suggest one more activity Ravi could do in the forest to enjoy nature.

(OR)

3.	a)	Writing task (100-150 words). Imagine you went for watching a cricket match in a stadium with your friends. Describe how you enjoyed the match.	8 Marks	L6	CO5
	b)	E-mail writing (80-100 words) Write an email to your Dean regarding permission to attend a conference in other university.	8 Marks	L4	CO5

MODULE-II

4.	a)	Reading comprehension: Maria had always dreamed of becoming a teacher. As a child, she admired her school teachers and often pretended to teach her younger brother at home. After finishing her studies, she applied for a teaching position at a local school. On her first day, Maria felt nervous but excited. The students were curious about their new teacher, and Maria greeted them warmly. She used creative activities to make learning enjoyable, and soon the students began to respect and like her. Over time, Maria realized that teaching was not only about giving knowledge but also about inspiring confidence and kindness in her students.	10 Marks	L6	CO5

What was Maria's childhood dream?
Who did Maria pretend to teach when she was young?
iii) Where did Maria apply for a job after finishing her studies?
iv) How did Maria feel on her first day of teaching?
How did the students react to their new teacher?
vi) What did Maria do to make learning enjoyable?
vii) How did the students feel about Maria after some time?
viii) What did Maria realize about teaching?
ix) Find a word in the passage that means "to give courage or hope."
Suggest one quality that makes a teacher successful, based on the passage

	b)	Review Writing: Imagine you went to a movie released recently with your family. Write the detailed review on the movie.	6 Marks	L6	CO5

(OR)

5.	a)	Writing (A time to remember) – 100-150 words Discuss a time when you faced a challenging situation or overcame a difficult obstacle. How did you handle it and what did you learn from that experience?	8 Marks	L2	CO5
	b)	Draft a conversation between a patient and a doctor on some health issues.	8 Marks	L2	CO5

MODULE-III

6.	a)	Review Writing: Imagine you visited a new location on your holiday trip. Write the detailed review about your experience you had there using the following cues:	6 Marks	L6	CO5

i) How was your experience highlighting the key aspects that made this trip so remarkable?
ii) Explain your observations in terms of enjoyment and during your stay.
iii) What were the major cultural differences you noticed?
iv) How did it affect your personal life?
Summarize your overall impression of the trip.

b) Reading comprehension: 10 Marks L6 CO5

India is one of the oldest civilizations in the world, known for its rich culture, traditions, and history. It is the seventh-largest country by area and the most populous democracy. India's landscape ranges from the snowy Himalayas in the north to the tropical coasts in the south. The country is famous for its unity in diversity, with hundreds of languages, religions, and festivals celebrated across regions. Economically, India has grown rapidly in recent decades, becoming a hub for technology, agriculture, and industry. Education and healthcare have also improved, though challenges remain in providing equal opportunities for all citizens. India's contributions to art, science, and philosophy have influenced the world for centuries, making it a nation of both ancient wisdom and modern progress.

Answer the following:

What makes India one of the oldest civilizations in the world?

Which two geographical features are mentioned in the passage to describe India's landscape?

iii) Why is India called the most populous democracy?

iv) What does the phrase "unity in diversity" mean in the context of India?

Name three sectors where India has shown rapid economic growth.

vi) What improvements have been noted in India's social development according to the passage?

vii) What challenges still remain for India in education and healthcare?

viii) How has India contributed to global art, science, and philosophy?

ix) What balance does India represent between ancient wisdom and modern progress?

What is the overall message of the passage about India?

(OR)

7. a) E-mail writing (80-100 words) 10 Marks L2 CO5

You have recently undergone an operation. Write an email to your boss explaining your condition and request him for extending your medical leave.

b) Peter and Rosy want to go to Mumbai for their meeting with business clients for a week. They have to arrange and pay for the accommodation of their guests as well. An online search shows that these three hotels are available on the right dates. 6 Marks L2 CO5

Name	Room type	Price	Amenities
Hotel Taj	Economy Double Room	Rs.10000 per Night	Laundry Swimming Pool
Hotel Bliss	Classic Double Room	Rs.8000 per Night	Minibar Charging Station
Hotel Harriot	Standard Double Room	Rs.5000 per Night	Coffeemaker En-suite Facilities

Give rating to each hotel out of 5.

Which accommodation is best for them and why? Back up your answer with facts from the details mentioned above.

MODULE-IV

8. a) E-mail Writing (80-100 words) 8 Marks L6 CO5

Compose an email to your professor, asking for an extension on a deadline

and explaining the reason.

b) E-mail Writing (80-100 words) 8 Marks L6 CO5

Write an email to a job interviewer, expressing your gratitude for the interview and repeating your interest in the position.

(OR)

9. a) Writing (A time to remember) – 100-150 words 8 Marks L4 CO2

How can responsible use of money lead to long-term happiness and financial freedom?

b) Reading comprehension: 8 Marks L6 CO5

Education is one of the most powerful tools for personal and social growth. It provides individuals with knowledge, skills, and confidence to face challenges in life. A well-educated person can make informed decisions, contribute to society, and pursue meaningful careers. Beyond academics, education teaches values such as respect, responsibility, and cooperation. It also promotes equality by giving everyone the chance to improve their future, regardless of background. Communities with strong education systems often experience economic progress, better health, and social harmony. In short, education is not just about learning facts—it is about shaping lives and building stronger societies.

Answer the following:

What are some benefits of education mentioned in the passage?

How does education help individuals face challenges in life?

iii) What values does education teach beyond academics?

iv) Why is education considered a tool for equality?

How does education contribute to economic progress in communities?

vi) In what ways does education influence health and social harmony?

vii) What is the overall message of the passage about the role of education?

viii) How does the passage describe education beyond simply learning facts?

MODULE-V

10. a) Reading comprehension: 10 Marks L6 CO5

Good health is not just the absence of illness; it is the result of daily habits that strengthen the body and mind. Eating a balanced diet provides essential nutrients, while regular exercise improves heart health and builds strong muscles. Sleep is equally important, as it allows the body to recover and the brain to process information. Stress management, through activities like meditation or spending time with loved ones, also plays a key role in maintaining well-being. By practicing these habits consistently, people can prevent many diseases and enjoy a better quality of life.

Answer the following:

i) What does the passage suggest is the true meaning of good health?

ii) Name two benefits of regular exercise mentioned in the passage.

iii) Why is sleep considered important for health?

iv) How can stress be managed according to the passage?

v) What is the overall message of the passage about maintaining well-being?

b) Writing – 100 words 6 Marks L4 CO2

Write a passage highlighting the changes in your habits and lifestyle in the last few years.

(OR)

11 a) Define "Body Language" and its importance in communication 8 Marks L4 CO2

.	b)	E-mail Writing (80-100 words) Draft an email to your project leader, expressing your gratitude for his cooperation in implementing your project successfully.	8 Marks	L4	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech II Semester (MBU-22) (Fasttrack) Regular Examinations April – 2026

PROFESSIONAL ETHICS AND HUMAN VALUES

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Computer Science and Engineering (Artificial Intelligence and Machine Learning), Computer Science and Engineering (Data Science)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Write briefly about consensus and controversy.	2 Marks	LI	CO1
	b)	Mention any two senses of ethics.	2 Marks	LI	CO1
	c)	How can you say Engineers as Saviors?	2 Marks	LI	CO2
	d)	Define professionalism.	2 Marks	LI	CO2
	e)	How could you say Engineers as responsible experimentors?	2 Marks	L2	CO3
	f)	What is the method used to solve an Ethical problem?	2 Marks	LI	CO3
	g)	Define professional rights.	2 Marks	LI	CO4
	h)	Define 'Eudaimonism'.	2 Marks	LI	CO4
	i)	What is competence in professional ethics?	2 Marks	L2	CO5
	j)	Write a note on humanistic education.	2 Marks	LI	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Where and how do moral problems arise in engineering?	8 Marks	L1	CO1
	b)	Discuss engineering ethics and its philosophy.	8 Marks	L2	CO1
		(OR)			
3.	a)	What are the different levels of moral development suggested by Kohlberg?	8 Marks	L1	CO1
	b)	Carol Gilligan's theory of moral development focuses care and justice-based morality - Discuss.	8 Marks	L2	CO1

MODULE-II

4.	a)	Explain the importance of self confidence in ethics.	8 Marks	L2	CO2
	b)	Describe the professional roles played by an engineer.	8 Marks	L2	CO2
		(OR)			
5.	a)	Engineering is an important and learned profession. Discuss the code of ethics for Engineers.	8 Marks	L2	CO2
	b)	What is self-respect? How is it important for professionals?	8 Marks	L1	CO2

MODULE-III

6.	a)	How can an engineer become a responsible experimenter? Explain in detail?	8 Marks	L1	CO3
	b)	Explore the shared principles that govern both engineering and standard experimental approaches.	8 Marks	L1	CO3
		(OR)			

7.	a)	Make a list of ten values that you think are important for an engineering professional.	8 Marks	L1	CO3
	b)	What are the moral and ethical lessons we can be learned from space shuttle challenger tragedy and how the principal actors behave as responsible experiments	8 Marks	L1	CO3

MODULE-IV

8.	a)	Describe the BART case and its significant features.	8 Marks	L2	CO4
	b)	Differentiate External Whistle Blowing and Internal Whistle Blowing.	8 Marks	L2	CO4

(OR)

9.	a)	Explain in detail the Rights of Engineers.	8 Marks	L2	CO4
	b)	What are intellectual property rights? Explain the elements of intellectual property rights in details and benefits of IPRS.	8 Marks	L2	CO4

MODULE-V

10.	a)	Discuss different management models and production systems.	8 Marks	L2	CO5
	b)	Engineers are responsible for sustaining ecology. Discuss.	8 Marks	L2	CO5

(OR)

11.	a)	Are the engineers responsible to educate the public for safe operation of the equipment? How?	8 Marks	L1	CO5
	b)	What is the relationship between the Loyalty to the company and Professional responsibility to the public?	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

MULTIVARIABLE CALCULUS AND DIFFERENTIAL EQUATIONS

[Civil Engineering, Electrical and Electronics Engineering,Mechanical Engineering, Electronics and Communication Engineering,Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	State two properties of the Jacobian matrix.	2 Marks	L1	CO1
	b)	Find the critical points of f(x,y) = $x^2 - y^2$.	2 Marks	L1	CO1
	c)	Evaluate $\int_0^1\int_0^1\int_0^1 dxdydz$.	2 Marks	L1	CO2
	d)	Find the area bounded by the parabolas y = x^2 and x = y^2 .	2 Marks	L1	CO2
	e)	Find divergence of the vector field $\overline{f} = z\overline{i} + x\overline{j} + y\overline{k}$.	2 Marks	L1	CO3
	f)	State Stokes' Theorem.	2 Marks	L1	CO3
	g)	Solve $\frac{d^2y}{dx^2} - a^2y = 0$.	2 Marks	L1	CO4
	h)	Find the particular integral of $(D-1)^2(D+2)y = 0$.	2 Marks	L1	CO4
	i)	What is order and degree of a partial differential equation?	2 Marks	L1	CO4
	j)	Form the partial differential equation by eliminating the arbitrary constants from $(x-a)^2 + (y-b)^2 + z^2 = 25$.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	If $u = \frac{x+y}{1-xy}$ and $\theta = \tan^{-1}x + \tan^{-1}y$, then find $\frac{\partial(u,\theta)}{\partial(x,y)}$.	8 Marks	L2	CO1
	b)	If $x = r\cos\theta$, $y = r\sin\theta$ then show that $\frac{\partial r}{\partial x} = \frac{\partial x}{\partial r}$ and $\frac{1}{r}\frac{\partial x}{\partial \theta} = r\frac{\partial \theta}{\partial x}$.	8 Marks	L2	CO1

(OR)

3.	a)	Find the maxima and minima of the function $f(x,y) = x^3 + y^3 - 3axy$.	8 Marks	L3	CO1
	b)	Find the maximum value of $u = x^2y^3z^4$ subject to the condition $2x + 3y + 4z = a$.	8 Marks	L2	CO1

MODULE-II

4.		Evaluate $\iiint_V (x^2 + y^2 + z^2)\,dz\,dy\,dx$ where V is the volume of the cube bounded by the coordinate.	16 Marks	L3	CO2

(OR)

5.	a)	Evaluate $\int_0^{\frac{\pi}{4}}\int_0^{a\sin\theta}\frac{rdrd\theta}{\sqrt{a^2-r^2}}$.	8 Marks	L3	CO2
	b)	Change the order of integration and evaluate $\int_0^1\int_x^1\frac{y}{x^2+1}dxdy$.	8 Marks	L3	CO2

MODULE-III

6.	a)	If $u = x + y + z, v = x^2+y^2+z^2, w=yz + zx + xy$ then show that grad u, grad v and grad w are coplanar vector.	8 Marks	L1	CO3
	b)	Find the directional derivative of the $f = x^2 - y^2 + 2Z^2$ at the point P(1,2,3) in the direction of line PQ where Q is the point (5,0,4).	8 Marks	L3	CO3

(OR)

7.	Find the work done in moving a particle in the force field $F = 3x^2i + (2xz - y)j + zk$ along, i) the straight line from (0, 0, 0) to (2, 1, 3). ii) the curve defined by $x^2 = 4y, 3x^3 = 8z$ from $x = 0$ to $x = 2$	16 Marks	L3	CO3

MODULE-IV

8.	a)	Solve $\frac{d^2y}{dx^2}+4\frac{dy}{dx}+3y=e^{2x}$.	8 Marks	L2	CO4
	b)	Solve $(D^3-5D^2+8D-4)y=e^{2x}$.	8 Marks	L4	CO4

(OR)

9.	Solve $(D^2+a^2)y=\tan ax$ by the method of variation of parameters.	16 Marks	L3	CO4

MODULE-V

10.	a)	Form the partial differential equation by eliminating the arbitrary constants a and b from $z=ax+by+a^2+b^2$.	8 Marks	L2	CO4
	b)	Form the partial differential equation Eliminate a,b from $(x-a)^2+(y-b)^2=r^2$.	8 Marks	L2	CO4

(OR)

11.	Solve $\left(x^2-yz\right)p+\left(y^2-zx\right)q=z^2-xy$	16 Marks	L1	CO4

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

ENGINEERING PHYSICS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Interference.	2 Marks	L1	CO1
	b)	List any two applications of the polarization of a light wave.	2 Marks	L2	CO1
	c)	Describe the divergence of the magnetic field.	2 Marks	L2	CO2
	d)	Recall the principle of optical fibers.	2 Marks	L1	CO2
	e)	List out the types of semiconductors.	2 Marks	L2	CO3
	f)	What is a photodiode, which biased is used?	2 Marks	L1	CO3
	g)	List the various polarization types in dielectrics.	2 Marks	L1	CO4
	h)	Define magnetic permeability and magnetic susceptibility.	2 Marks	L1	CO4
	i)	What is a superconductor?	2 Marks	L1	CO5
	j)	Mention any two applications of nonmaterial's.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Explain the phenomenon of interference in the thin film by reflection. Derive the equation for dark and bright fringes.	12 Marks	L2	CO1
	b)	Distinguish between interference and diffraction	4 Marks	L4	CO1
		(OR)			
3.	a)	Describe the features of single-slit Fraunhofer diffraction.	10 Marks	L2	CO1
	b)	Derive an expression for the thickness of the half-wave and quarter-wave plates in polarization.	6 Marks	L1	CO1

MODULE-II

4.	a)	Explain the acceptance angle and acceptance cone, and state the equation for numerical aperture.	12 Marks	L2	CO2
	b)	Calculate the angle of acceptance of a given optical fibre, if the refractive indices of core and cladding are 1.563 and 1.498.	4 Marks	L3	CO2
		(OR)			
5.	a)	Discuss the classification of an optical fiber based on the modes of propagation with neat sketches.	10 Marks	L3	CO2
	b)	Write the applications of the optical fiber	6 Marks	L2	CO2

MODULE-III

6.	a)	Derive an expression for the carrier concentration of free electrons in the conduction band of intrinsic semiconductors.	12 Marks	L3	CO3
	b)	Distinguish direct and indirect band gap semiconductors.	4 Marks	L4	CO3

(OR)

7.	a)	Explain the construction and working mechanism of an LED with suitable diagrams. Illustrate its applications.	12 Marks	L2	CO3
	b)	Write the applications of the Semiconductors	4 Marks	L2	CO3

MODULE-IV

8.	a)	What is a Lorentz field?	2 Marks	L1	CO4
	b)	Derive an expression for the Lorentz field inside a dielectric material.	14 Marks	L3	CO4

(OR)

9.	a)	Classification of diamagnetic, paramagnetic, and ferromagnetic materials.	10 Marks	L2	CO4
	b)	Explain the hysteresis curve for ferromagnetic material.	6 Marks	L2	CO4

MODULE-V

10.	a)	Discuss the formation of Cooper pairs in superconductors on the basis of the BCS theory.	10 Marks	L2	CO5
	b)	Outline Meissner's effect, critical current, Type-I and Type-II superconductors.	6 Marks	L2	CO5

(OR)

11.	a)	Describe the pulsed laser deposition (PLD) technique for synthesizing nanomaterials.	8 Marks	L2	CO5
	b)	List the properties and applications of nanomaterials.	8 Marks	L1	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com V Semester Fasttrack (MBU-22) Regular Examinations April – 2026

INCOME TAX LAW AND PRACTICE

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define "Assessment Year."	2 Marks	L1	CO1
	b)	What is Agriculture Income?	2 Marks	L1	CO1
	c)	Define Salary.	2 Marks	L1	CO2
	d)	What is HRA?	2 Marks	L1	CO2
	e)	Define Annual Value.	2 Marks	L1	CO3
	f)	What is Municipal Tax?	2 Marks	L1	CO3
	g)	Mention one revenue receipt.	2 Marks	L1	CO4
	h)	Define income from profits and gains.	2 Marks	L1	CO4
	i)	What is TDS?	2 Marks	L1	CO5
	j)	What is specific incomes?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	What is a 'person'? Explain according to Income Tax Act, 1961.	16 Marks	L2	CO1

(OR)

3.	What are the provisions for determining residential status of an individual assessee?	16 Marks	L1	CO1

MODULE-II

4.	a)	What is the tax treatment of leave encashment?	8 Marks	L1	CO2
	b)	What form is used to declare salary income?	8 Marks	L1	CO2

(OR)

5.	What is Allowance? Discuss the different types of allowances.	16 Marks	L2	CO2

MODULE-III

6.	Mr. X is the owner of property. It is given on rent of Rs 11,000 p.m. Municipal value of the property is 1,35,000. Fair rent is 1,43,000 and standard rent is 1,30,000. Municipal tax paid by Mr. X is 26,000 on 1.4.2024 rent is increased from Rs 11,000 p.m. to Rs 14,000 p.m. with retrospective effect from 1.4.2025. Arrears of rent is paid on 1.4.2024. Find out taxable income from house property for the A.Y. 2025-26	16 Marks	L3	CO3

(OR)

7.	Explain the exempted incomes from house property. Discuss the deduction available in under section 24.	16 Marks	L2	CO3

MODULE-IV

8.	a)	What is the treatment of preliminary expenses?	8 Marks	L1	CO4
	b)	What are the conditions for claiming depreciation as an allowable expense?	8 Marks	L1	CO4

(OR)

9.	What are the deductions available in computation of income of other sources?	16 Marks	L2	CO4

MODULE-V

10.	a)	What is the treatment of dividend income?	8 Marks	L1	CO5
	b)	How is capital gain calculated?	8 Marks	L2	CO5

(OR)

11.	Briefly explain the capital gains which are exempted from tax.	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com V Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

RESEARCH METHODOLOGY FOR BUSINESS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define Applied research.	2 Marks	L1	CO1
	b)	Write characteristics of scientific investigation.	2 Marks	L1	CO1
	c)	What is Descriptive research.	2 Marks	L1	CO2
	d)	Write Applications in business research.	2 Marks	L1	CO2
	e)	What are primary data sources.	2 Marks	L1	CO3
	f)	Write Data collection methods.	2 Marks	L1	CO3
	g)	What is Good hypothesis.	2 Marks	L1	CO4
	h)	Write Conditions required to apply a t-test.	2 Marks	L1	CO4
	i)	What areObjectives of preparing a research report.	2 Marks	L1	CO5
	j)	What is Research report.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	Explain the differences between exploratory and descriptive research with examples.	16 Marks	L2	CO1
	(OR)			
3.	Describe how technology enhances the speed and quality of business research.	16 Marks	L2	CO1

MODULE-II

4.	Explain how exploratory research helps in problem identification with suitable examples.	16 Marks	L2	CO2
	(OR)			
5.	Describe the purpose and structure of experimental design in business research.	16 Marks	L2	CO2

MODULE-III

6.	Explain the differences between primary and secondary data using suitable business examples.	16 Marks	L2	CO3
	(OR)			
7.	Describe the benefits and limitations of secondary data in decision-making.	16 Marks	L2	CO3

MODULE-IV

8.	Explain the process of hypothesis development in business research.	16 Marks	L2	CO4
	(OR)			
9.	Describe the steps involved in hypothesis testing.	16 Marks	L2	CO4

MODULE-V

10.	Explain the purpose and key elements of a well-structured research report.	16 Marks	L2	CO5
	(OR)			
11.	Describe the function and structure of the table of contents in formal reports.	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com V Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

ADVANCE CORPORATE ACCOUNTING

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is nature of the merger?	2 Marks	L1	CO1
	b)	Define the nature of the purchase.	2 Marks	L1	CO1
	c)	What is the meaning of reconstruction?	2 Marks	L1	CO2
	d)	Name the procedure for reducing share capital.	2 Marks	L1	CO2
	e)	What is loss?	2 Marks	L1	CO3
	f)	What is a balance sheet?	2 Marks	L1	CO3
	g)	Define the cost of control.	2 Marks	L1	CO4
	h)	List out the features of holding companies.	2 Marks	L1	CO4
	i)	List out the objective of electricity companies.	2 Marks	L1	CO5
	j)	Write about Companies Act.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2. Explain the differences between amalgamation and external reconstruction. — 16 Marks L2 CO1

(OR)

3. The following is the balance sheet of Kavitha ltd as on 31-12-2020. — 16 Marks L4 CO1

Liabilites	Rs	Assets	Rs
10000 share @Rs.10	1,00,000	land and buildings	1,90,000
sundry creditors	1,60,000	machinery	50,000
bank overdraft	40,000	stock	27,000
		sundry debtors	32,000
		profit and loss ac	1,000
	3,00,000		3,00,000

The company went into voluntary liquidation and the assets were sold to Suresh ltd for Rs.2,00,000/- payable as to Rs. 80,000 in cash which suffix discharge creditorsand bank overdraft and pay the winding up expenses Rs.2000 and as to Rs.1,20,000 by the allotment 10000 share of Rs.10 each of Suresh ltd. Rs.750 per share paid up to the shareholders of X co ltd. Draw up journal entries in the books of Kavitha ltd and Suresh Ltd on the basis of nature of purchase.

MODULE-II

4. Balaji Company Ltd passed resolution and got court permission for the reduction of its share capital by Rs.3,00,000 for the purposes mentioned as under: — 16 Marks L4 CO2

1) To write off the debit balanceof P&L a/c Rs.1,10,000.
2) to reduce the value of plant and machinery by Rs 90,000 and good will by Rs 20,000.
3) to reduce the value of investments by Rs. 50,000.The reduction was made by converting 30,000 preference shares of Rs.20each fully paid to the same number of preference shares of Rs.15 each fully paidand by converting 30,000 equity shares of Rs.20 each which Rs.15 is paid up into50,000 equity shares of Rs.10 each fully paid up.

(OR)

5. Sathish company ltd passed resolution and got court permission for the reduction of its shae capital by Rs.3,00,000 for the purposes mentioned as under:1).to write off the debit balanceof P&L a/c Rs.1,10,000,2) to reduce the value of plant and machinery by Rs.90000 and good will by — 16 Marks L4 CO2

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com V Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

PROJECT MANAGEMENT

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is a project management?	2 Marks	L1	CO1
	b)	What is a planning phase?	2 Marks	L1	CO1
	c)	Advantages of project management.	2 Marks	L1	CO2
	d)	What is resource allocation?	2 Marks	L1	CO2
	e)	What is Project Monitoring?	2 Marks	L1	CO3
	f)	Project Management Information System (PMIS)?	2 Marks	L1	CO3
	g)	What happens in the planning phase of a project audit?	2 Marks	L1	CO4
	h)	What is the purpose of project closure?	2 Marks	L1	CO4
	i)	What does EIA check for?	2 Marks	L1	CO5
	j)	What is a project case study?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	What is the Project Management? What are the types of Project Management?	16 Marks	L2	CO1
	(OR)			
3.	What is a feasibility study? Explain the different types of feasibility studies.	16 Marks	L2	CO1

MODULE-II

4.	Discuss the importance of project scheduling in Project Management.	16 Marks	L2	CO2
	(OR)			
5.	What is resource leveling? How do resource leveling and its importance?	16 Marks	L2	CO2

MODULE-III

6.	Explain the three different types of contract Project Management.	16 Marks	L2	CO3
	(OR)			
7.	What is a Project Management Information System and explain its features?	16 Marks	L2	CO3

MODULE-IV

8.	What is project evaluation? What are the types of project evaluation?	16 Marks	L2	CO4
	(OR)			
9.	State the guidelines for project closeout reports.	16 Marks	L2	CO4

MODULE-V

10.	Explain the use of computers in Project Management.	16 Marks	L2	CO5
	(OR)			
11	Discuss risk identification in Project Management.	16 Marks	L2	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com IV Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

MANAGEMENT OF FINANCIAL SERVICES

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define Financial system.	2 Marks	L1	CO1
	b)	What are Financial instruments.	2 Marks	L1	CO1
	c)	Define primary market.	2 Marks	L1	CO2
	d)	Define secondary market.	2 Marks	L2	CO2
	e)	What are under writing Services?	2 Marks	L1	CO3
	f)	List any four Responsibilities of the Lead Manager.	2 Marks	L1	CO3
	g)	Explain the concept of Factoring	2 Marks	L2	CO4
	h)	Explain the concept of Reverse Mortgage	2 Marks	L2	CO4
	i)	Define the concept of Private Placement	2 Marks	L1	CO5
	j)	Define the term Equity-Securitization	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	What is a financial system? Explain the main elements of a financial system and why they are important for the economy.	16 Marks	L2	CO1

(OR)

3.	What is the role of the Reserve Bank of India (RBI)? Outline its primary functions and responsibilities	16 Marks	L2	CO1

MODULE-II

4.	Explain the structure of public and private sector banks in India. Compare their performance in terms of growth, profitability, and customer service.	16 Marks	L2	CO2

(OR)

5.	Compare the obstacles and potential growth areas for non-banking financial institutions (NBFIs) in the Indian context.	16 Marks	L3	CO2

MODULE-III

6.	a)	Explain the role and functions of SEBI in detail.	8 Marks	L2	CO3
	b)	Distinguish between Primary and secondary markets.	8 Marks	L3	CO3

(OR)

7.	Write short notes on the following: i) Book Building ii) Insider Trading iii) Buyback of shares iv) Price – rigging v) Lock in Period	16 Marks	L2	CO3

MODULE-IV

8.	a)	Define Leasing. Explain the different types of leasing.	8 Marks	L2	CO4
	b)	Is Factoring a fee-based service analysis.	8 Marks	L2	CO4
		(OR)			
9.	a)	How can venture capitalists finance new ideas? Discuss.	8 Marks	L2	CO4
	b)	What is Housing Finance? Explain the significance of Housing Finance.	8 Marks	L2	CO4

MODULE-V

10.	a)	The scope of merchant banking is great in India. Discuss	8 Marks	L2	CO5
	b)	What are the challenges faced by the Investment bankers?	8 Marks	L2	CO5
		(OR)			
11.	a)	Briefly discuss the various rating agencies functioning in the Indian capital market.	8 Marks	L2	CO5
	b)	Explain the challenges faced by investment banker.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com IV Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

COMPUTERISED ACCOUNTING WITH TALLY

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define computerized Accounting	2 Marks	L1	CO1
	b)	What accounting software is available in the market?	2 Marks	L1	CO1
	c)	Define TALLY ERP 9.0.	2 Marks	L1	CO2
	d)	Discuss to the versions of Tally.	2 Marks	L1	CO2
	e)	What is Tally inventory?	2 Marks	L1	CO3
	f)	What is the procedure for configuration?	2 Marks	L1	CO3
	g)	How to enable the TDS in Tally?	2 Marks	L1	CO4
	h)	TDS features in Tally.ERP 9.	2 Marks	L1	CO4
	i)	What is Payroll?	2 Marks	L1	CO5
	j)	Features of payroll in Tally.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the concept of computerized accounting.	6 Marks	L2	CO1
	b)	Explain the computerized accounting significance in modern business.	10 Marks	L2	CO1

(OR)

3.	a)	Contrast between traditional manual accounting and computerized accounting system.	10 Marks	L3	CO1
	b)	Discuss the Features of Computerized accounting system.	6 Marks	L2	CO1

MODULE-II

4.	a)	Discuss the steps involved in the creation of groups and ledgers in an accounting software environment.	8 Marks	L2	CO2
	b)	Explain the advantages of Computerized accounting.	8 Marks	L2	CO2

(OR)

5.		Explain the procedure for Company Creation in computerized accounting systems.	16 Marks	L2	CO2

MODULE-III

6.	a)	Narrate the importance of Inventory Management in Tally.	8 Marks	L2	CO3
	b)	Explain the concept of inventory management in Tally and its importance in business organisations.	8 Marks	L2	CO3

(OR)

7.		Discuss the inventory configuration options in Tally and their role in effective stock control.	16 Marks	L2	CO3

MODULE-IV

8.	a)	Explain the concept of Tax Deducted at Source (TDS).	8 Marks	L2	CO4
	b)	Discuss the advantages of TDS.	8 Marks	L2	CO4
		(OR)			
9.	a)	Discuss the types of payments covered under TDS and the circumstances under which tax is deducted.	8 Marks	L2	CO4
	b)	Explain the objectives of TDS.	8 Marks	L2	CO4

MODULE-V

10.	a)	Elaborate the procedure for enabling Payroll features in Tally.	8 Marks	L3	CO5
	b)	Discuss the advantages of Payroll.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain the concept of Payroll Accounting.	8 Marks	L2	CO5
	b)	Explain the importance of Payroll in business organisations.	8 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) (Fasttrack) Regular Examinations, April – 2026

PROGRAMMING FOR PROBLEM SOLVING

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering, Computer Science and Engineering, Computer Science and Engineering (Artificial Intelligence and Machine Learning), Computer Science and Engineering (Data Science), Computer Science and Engineering (Cyber Security), Information Technology]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is top down design?	2 Marks	L2	CO1
	b)	Write syntax of switch condition?	2 Marks	L2	CO1
	c)	Explain the importance of testing and debugging in problem solving.	2 Marks	L1	CO2
	d)	What are the basic steps involved in problem solving?	2 Marks	L1	CO2
	e)	Define Call by value mechanism	2 Marks	L2	CO3
	f)	What is recursion?	2 Marks	L1	CO3
	g)	How to declare pointer in c?	2 Marks	L2	CO4
	h)	What is a NULL pointer in C?	2 Marks	L2	CO4
	i)	Can you nest structures?	2 Marks	L2	CO5
	j)	What is the use of typedef in C?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Illustrate Arithmetic, Relation and Conditional Operators with example Programs?	8 Marks	L2	CO1
	b)	Write a C program to calculate the compound interest for the given principal amount. Enter the principal amount: 1000 Enter the rate of interest: 5 Enter the time period (in years): 2	8 Marks	L2	CO1

(OR)

3.	a)	Draw a flow chart for reversing a given number with example program.	8 Marks	L2	CO1
	b)	Write a C Program to calculate Radius of a Circle?	8 Marks	L2	CO1

MODULE-II

4.	a)	Write the Algorithm, Flowchart and Program for Sum of N natural numbers.	8 Marks	L2	CO2
	b)	Write a C Program for Checking whether the given number is Prime number or not?	8 Marks	L3	CO2

(OR)

5.	a)	Write a C program to check whether a given character is vowel or consonant or special symbol or digit.	8 Marks	L3	CO2
	b)	Display the following pattern using c Program. 12345 1234 123 12 1	8 Marks	L4	CO2

MODULE-III

6.	a)	Define function? How to declare function and write the built-in functions? Create functions with inputs and outputs.	8 Marks	L3	CO3
	b)	Write C programs to read two matrices and find the addition and multiplication of two matrices.	8 Marks	L3	CO3

(OR)

7.	a)	Define array? Explain the different types of arrays with an example	8 Marks	L4	CO3
	b)	List out the String manipulation functions with example?	8 Marks	L3	CO3

MODULE-IV

8.	a)	Define pointer and How to declare and initialize it and types of pointers.	8 Marks	L2	CO4
	b)	Write a C program for Array of Pointers.	8 Marks	L2	CO4

(OR)

9.	a)	Write a 'C' Program to Sort a list of Names using Array of Pointers to strings?	8 Marks	L3	CO4
	b)	Differentiate Call by value and Call by Reference?	8 Marks	L1	CO4

MODULE-V

10.	a)	Write a C program to read and display student details in a school using structure	8 Marks	L1	CO5
	b)	Differentiate unions, structures and arrays?	8 Marks	L2	CO5

(OR)

11.	a)	Classify different types of files? How to use them?	8 Marks	L2	CO5
	b)	What is a bit field? What is the importance of bit fields? What are its limitations?	8 Marks	L3	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA V Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

BUSINESS INFORMATION SYSTEMS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is an Information System (IS) in organizations?	2 Marks	L1	CO1
	b)	What are two characteristics of a Management Information System (MIS)?	2 Marks	L1	CO1
	c)	What is the difference between public and private information systems?	2 Marks	L1	CO2
	d)	What are two basic structural concepts of information systems?	2 Marks	L1	CO2
	e)	What is the primary purpose of system development in an organization?	2 Marks	L1	CO3
	f)	What are two commonly used system development methodologies?	2 Marks	L1	CO3
	g)	What is the primary purpose of implementation in the software life cycle?	2 Marks	L1	CO4
	h)	What are verification and validation in software development?	2 Marks	L1	CO4
	i)	What is the primary objective of an Enterprise Resource Planning (ERP) system?	2 Marks	L1	CO5
	j)	How does an ERP system differ from conventional software packages?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	What is an Information System (IS) in organizations? Explain its functions.	16 Marks	L2	CO1

(OR)

3.	What are the characteristics of a Management Information System (MIS)?	16 Marks	L1	CO1

MODULE-II

4.	How do basic structural concepts contribute to the effective functioning of an organization?	16 Marks	L1	CO2

(OR)

5.	What are the differences between formal and informal information systems? Give examples of each.	16 Marks	L1	CO2

MODULE-III

6.	What is system development and its importance in modern business operations?	16 Marks	L1	CO3

(OR)

7.	What are the differences between the SDLC and prototyping approaches in system development, and what are the advantages and disadvantages of each?	16 Marks	L1	CO3

MODULE-IV

8.	What is the implementation phase in the software life cycle, what activities are involved, and how does it ensure successful deployment of a Business Information System (BIS)?	16 Marks	L1	CO4
	(OR)			
9.	What is Enterprise Resource Planning (ERP), and what are the main objectives of implementing it in an organization?	16 Marks	L1	CO5

MODULE-V

10.	What is Enterprise Resource Planning (ERP), and what are the main objectives of implementing an ERP system in an organization?	16 Marks	L1	CO5
	(OR)			
11.	What are the differences between ERP systems and conventional software packages, and what are the advantages and limitations of each in terms of organizational efficiency?	16 Marks	L1	CO5

CODE No.: 22MG101015 MBU-22

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA V Semester Fasttrack (MBU-22) Regular Examinations April – 2026

INNOVATION AND CREATIVITY IN BUSINESS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define innovation in business.	2 Marks	L1	CO1
	b)	What is creativity?	2 Marks	L1	CO1
	c)	Define creativity.	2 Marks	L1	CO2
	d)	What is the creativity process?	2 Marks	L1	CO2
	e)	What is design thinking?	2 Marks	L1	CO3
	f)	Define empathy in design thinking.	2 Marks	L1	CO3
	g)	What is innovation measurement?	2 Marks	L1	CO4
	h)	Define ROI in innovation.	2 Marks	L1	CO4
	i)	What is innovation management?	2 Marks	L1	CO5
	j)	Define cross-functional teams.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	Explain the concept and importance of innovation and creativity in business.	16 Marks	L2	CO1
	(OR)			
3.	Distinguish between creativity and innovation with examples.	16 Marks	L2	CO1

MODULE-II

4.	Explain the meaning and concept of creativity in detail.	16 Marks	L2	CO2
	(OR)			
5.	Describe the stages of the creativity process.	16 Marks	L2	CO2

MODULE-III

6.	Explain the human-centered design thinking process in detail.	16 Marks	L2	CO3
	(OR)			
7.	Discuss the five stages of design thinking with examples.	16 Marks	L2	CO3

MODULE-IV

8.	Explain the process of capturing and managing new ideas.	16 Marks	L2	CO4
	(OR)			
9.	Discuss methods to measure innovation performance.	16 Marks	L2	CO4

MODULE-V

10.	Explain the role of innovation in business growth and competitiveness.	16 Marks	L2	CO5
	(OR)			
11.	Discuss the role of leadership in fostering innovation.	16 Marks	L2	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA V Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

BRAND MANAGEMENT

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is strategic brand management?	2 Marks	L1	CO1
	b)	State any one advantage of branding?	2 Marks	L1	CO1
	c)	List any two elements of brand identity.	2 Marks	L1	CO2
	d)	What is brand loyalty?	2 Marks	L1	CO2
	e)	What is points- of -difference?	2 Marks	L1	CO3
	f)	List the four stages of Keller's CBBE model.	2 Marks	L1	CO3
	g)	Explain role does a store's logo play in retail branding?	2 Marks	L1	CO4
	h)	why branding is important for insurance companies?	2 Marks	L1	CO4
	i)	What is the difference between a line extension and a category extension?	2 Marks	L1	CO5
	j)	How can social media be used as a brand promotion method?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Why is branding important for businesses, and how does it contribute to long-term success?	16 Marks	L1	CO1

(OR)

3.	Explain the significance of branding.	16Marks	L1	CO1

MODULE-II

4.	Explain the Reasons for brand failure.	16Marks	L2	CO2

(OR)

5.	Brand identity plays a critical role in shaping the overall brand experience-Justify this statement.	16Marks	L1	CO2

MODULE-III

6.	Effective brand positioning requires not only careful consideration of a brand? Points of difference, but also it points of parity with other points. Justify.	16Marks	L2	CO3

(OR)

7.	Explain different types of brand equity .	16Marks	L1	CO3

MODULE-IV

8.	Identify the Impact of Branding on Consumer Decision-Making in the Retail Sector	16Marks	L1	CO4

(OR)

9.	How does effective branding differentiate insurance companies from their competitors and enhance perceived value? Discuss the strategies used by insurance companies to build and maintain strong brands.	16Marks	L1	CO4

MODULE-V

10.	Discuss the role of social media in modern brand promotion strategies. What are the advantages and challenges associated with using social media for brand promotion?	16Marks	L2	CO5
	(OR)			
11.	Discuss the concept of re-branding. What are the key reasons companies undertake re-branding efforts?	16Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA V Semester Fasttrack (MBU-22) Regular Examinations April – 2026

STRESS MANAGEMENT

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	How can personality traits influence an individual's vulnerability to stress? Provide one example?	2 Marks	L2	CO1
	b)	Define eustress and distress with relevant examples.	2 Marks	L1	CO1
	c)	How does chronic stress affect memory?	2 Marks	L2	CO2
	d)	What role does the HPA axis play in the stress response?	2 Marks	L3	CO2
	e)	Discuss the sources of stress experienced across different stages of the lifespan.	2 Marks	L3	CO3
	f)	How can social support systems contribute to stress reduction?	2 Marks	L2	CO3
	g)	List the components of Emotional Intelligence.	2 Marks	L1	CO4
	h)	Give two examples of emotional coping strategies.	2 Marks	L2	CO4
	i)	Differentiate between emotional and cognitive coping styles. Provide one example of each.	2 Marks	L2	CO5
	j)	Identify two prevention strategies used to reduce stress.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Discuss how individual personality traits (Type A/Type B) affect susceptibility to stress, with relevant examples.	16 Marks	L3	CO1

(OR)

3	Define stress-related disorders, such as post-traumatic stress disorder (PTSD), and discuss their symptoms and potential treatments.	16 Marks	L2	CO1

MODULE-II

4	Examine the relationship between stress and memory, explaining how stress can enhance or impair memory processes, with suitable examples.	16 Marks	L4	CO2

(OR)

5	Provide an in-depth analysis of the HPA axis, including cortisol release, and assess its implications for stress management interventions.	16 Marks	L4	CO2

MODULE-III

6	Examine the sources of stress that individuals may encounter at different stages of the lifespan, from childhood to old age, and discuss how coping strategies may vary.	16 Marks	L4	CO3

(OR)

7	Examine how specific personality traits, such as neuroticism, extraversion, and conscientiousness, can influence an individual's response to stress and their ability to cope.	16 Marks	L3	CO3
	MODULE-IV			
8	Describe the components of Emotional Intelligence (EI) and their role in conflict resolution and stress reduction in both personal and professional contexts.	16 Marks	L2	CO4
	(OR)			
9	Discuss the influence of emotional intelligence on work performance, highlighting how individuals with high EI levels may excel in stress-prone environments.	16 Marks	L2	CO4
	MODULE-V			
10	Compare and contrast emotional and cognitive coping styles, identifying situations where each is most effective in stress management.	16 Marks	L4	CO5
	(OR)			
11	Evaluate how individuals can ensure that lifestyle changes for stress management remain consistent and sustainable over time.	16 Marks	L5	CO5

CODE No.: 22CM101009 MBU-22

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com II Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

LEGAL ASPECTS OF BUSINESS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define contract.	2 Marks	L1	CO1
	b)	List out the features of agreement	2 Marks	L1	CO1
	c)	What is creation of agency?	2 Marks	L1	CO2
	d)	Write about principal.	2 Marks	L1	CO2
	e)	Define unpaid seller.	2 Marks	L1	CO3
	f)	List out the rights of unpaid seller.	2 Marks	L1	CO3
	g)	Define memorandum.	2 Marks	L1	CO4
	h)	List out the features of article	2 Marks	L1	CO4
	i)	Define information technology act	2 Marks	L1	CO5
	j)	Write about national commission	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Define Contract and explain the objectives and features of the contract.	16 Marks	L2	CO1

(OR)

3.	Distinction between an agreement and contract.	16 Marks	L2	CO1

MODULE-II

4.	How do you narrate the creation of agency? Explain.	16 Marks	L2	CO2

(OR)

5.	What is the meaning of agent? Explain the various types of agents.	16 Marks	L2	CO2

MODULE-III

6.	What is agreement to sell? Explain the characteristics of agreement to sell.	16 Marks	L2	CO3

(OR)

7.	Difference between the condition and warranty.	16 Marks	L2	CO3

MODULE-IV

8.	What are the statements applicable in lieu of prospects? Explain.	16 Marks	L2	CO4

(OR)

9.	What is the processor for change of registered office? Explain.	16 Marks	L2	CO4

MODULE-V

10.	What are the silent features of information technology act? Explain.	16 Marks	L2	CO5

(OR)

11.	Name the application of the information technology act.	16 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com III Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

FINANCIAL ACCOUNTING -II

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What do you mean by Drawee?	2 Marks	L1	CO1
	b)	Write about the accommodation bill.	2 Marks	L1	CO1
	c)	What is Hire purchase system?	2 Marks	L1	CO2
	d)	List any two features of instalment system.	2 Marks	L1	CO2
	e)	Define Joint stock company.	2 Marks	L1	CO3
	f)	What is public limited company?	2 Marks	L1	CO3
	g)	Explain about Forfeiture of shares.	2 Marks	L1	CO4
	h)	What do you mean by Equity Shares?	2 Marks	L1	CO4
	i)	State the types of debentures.	2 Marks	L1	CO5
	j)	Definition of Debenture.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the features of the Promissory note.	8 Marks	L2	CO1
	b)	Discuss the importance of bills of exchange.	8 Marks	L2	CO1
		(OR)			
3.	a)	Discuss the importance of promissory note.	6 Marks	L2	CO1
	b)	On 1st January 2015, Ramesh owes Rajiv Rs. 3,000 and he accepts a bill for Rs. 2,900 for 2 months in full settlement of his account with Rajiv. Rajiv endorsed over the bill to his creditor, Arun on 3rd January 2015. The bill is met on the due date. Pass journal entries in the books of all parties.	10 Marks	L3	CO1

MODULE-II

4.	a)	Explain the features of the instalment purchase system.	8 Marks	L2	CO2
	b)	Explain the features of the Hire Purchase system.	8 Marks	L2	CO2
		(OR)			
5.	a)	Explain the importance of the instalment purchase system.	4 Marks	L2	CO2
	b)	Mr. Vishnu purchased 4 trucks of Rs. 21,000 each on 1st January 2015 under hire purchase system. The hire purchase price for all the trucks was Rs. 90,000 to be paid as Rs.22,500 as down payment each at the end of each year. Interest is charged at 5% p.a. The buyer depreciates the truck @10% p.a. on straight line method.	12 Marks	L3	CO2

MODULE-III

6.	Distinguish between private limited company and public limited company.	16 Marks	L3	CO3
	(OR)			
7.	Discuss Articles of Association and its contents.	16 Marks	L2	CO3

MODULE-IV

8.	V Ltd. Issued 20,000 Equity shares of Rs. 10 each at a premium ofRs. 3 payable as follows: On Application Rs. 4, On Allotment Rs. 5 (including Securities Premium Reserve), On First Cell Rs. 2, On Final Call Rs. 2. All shares were duly subscribed and all money duly received. Pass necessary Journal Entries.	16 Marks	L3	CO4
	(OR)			
9.	Eastern Company Limited issued 40,000 shares of Rs. 10 each to the public for the subscription out of its share capital, payable as Rs. 4 on application, Rs. 3 on allotment and the balance on Ist and final call. Applications were received for 40,000 shares. The company made the allotment to the applicants in full. All the amounts due on allotment and first and final call were duly received. Give the journal entries in the books of the company.	16 Marks	L3	CO4

MODULE-V

10.	Raj Ltd. Issued 2,000 12% Debentures of Rs.100 each at par payable Rs. 25 Application, Rs. 50 on Allotment and the balance on first and final call. In all 3,000 applications were received. Allotment was made to 2,000 applicant others were rejected. Give Journal entries.	16 Marks	L3	CO5
	(OR)			
11.	ABC Company Ltd., had 6% debentures of Rs. 1,00,000 on 1st January 2009 on which interest is paid on 3th June and 31st December. Pass necessary journal entries for the payment of interest for the year 2009, 10% tax is deducted at source from interest and remitted immediately. Books are closed on 31st December.	16 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com I Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

INFORMATION TECHNOLOGY FOR BUSINESS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define Computer System.	2 Marks	L1	CO1
	b)	What is Hardware?	2 Marks	L1	CO1
	c)	Define Data and Information.	2 Marks	L1	CO2
	d)	What is Information System (IS)?	2 Marks	L1	CO2
	e)	Define Multimedia.	2 Marks	L1	CO3
	f)	What are Multimedia Devices?	2 Marks	L1	CO3
	g)	What is Internet?	2 Marks	L1	CO4
	h)	Define WWW.	2 Marks	L1	CO4
	i)	What is Intranet?	2 Marks	L1	CO5
	j)	Define Extranet.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Describe different types of Hardware devices (I/O, Memory, Processor).	16 Marks	L3	CO1

(OR)

3.	Explain the components of a Computer System with examples.	16 Marks	L2	CO1

MODULE-II

4.	Describe types of Information Systems (Operational, Tactical, Strategic).	16 Marks	L3	CO2

(OR)

5.	Explain Data, Information, and Knowledge with examples.	16 Marks	L2	CO2

MODULE-III

6.	Describe different Multimedia Devices.	16 Marks	L3	CO3

(OR)

7.	Explain Multimedia and its components.	16 Marks	L2	CO3

MODULE-IV

8.	Describe Internet Architecture and Addressing.	16 Marks	L2	CO4

(OR)

9.	Explain the history and evolution of the Internet.	16 Marks	L2	CO4

MODULE-V

10.	Describe Internet Telephony and Groupware.	16 Marks	L2	CO5

(OR)

11.	Explain Intranet, Extranet, and VPN.	16 Marks	L2	CO5

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Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com & B.Sc (Allied Sciences) I Semester Fasttrack (MBU-25)
Regular Examinations April – 2026

TELUGU

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	కృషీవలుడు పాఠ్యభాగ రచయిత గురించి తెలపండి?	2 Marks	L1	CO2
	b)	ధ్రువుని తల్లిదండ్రులు ఎవరు?	2 Marks	L1	CO1
	c)	ధువ్వూరి కవితా విశేషాలను వివరించండి?	2 Marks	L1	CO1
	d)	యమకం	2 Marks	L2	CO1
	e)	చంపకమాల	2 Marks	L3	CO2
	f)	దువ్వూరి రచనలు ఏవి.	2 Marks	L1	CO2
	g)	గొప్పతనము పెరిగే కొద్దీ ఏది పెరగాలి?	2 Marks	L3	CO1
	h)	పోతన గురించి వివరించండి?	2 Marks	L3	CO1
	i)	"పెండ్లి పందిరి" ఏ సమాసమో తెలపండి?	2 Marks	L3	CO2
	j)	నాడీజంఘుడు ఎవరు?	2 Marks	L3	CO1

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	భారత భూమి ఎప్పుడు గొప్పగా ప్రకాశిస్తుంది?	8 Marks	L2	CO1
	b)	మనిషి ఉన్నంతవరకు ఏమి ఎదురు చూస్తుంటారు ?	8 Marks	L3	CO1

(OR)

3.	a)	గొప్పతనము పెరిగిన కొలదీ ఏది అలవడవలెను ?	8 Marks	L1	CO1
	b)	మానవుడు దేనిని విడువరాదు?	8 Marks	L4	CO1

MODULE-II

4.	a)	అన్నాహోలిక! నీదు జీవితము నెయ్యంబార వర్ణింప మే కొన్న న్నిర్ఝరసార వేగమున వాక్పూరంబు మాధుర్యం సం పన్నంబై ప్రవహించుగాని యితరుల్ భగ్నాశులై యూర్ధ్వతో నన్నుం గర్షకపక్షపాతియని నిందావాక్యముల్పల్కరే! ప్రతిపధార్థం వ్రాయండి	8 Marks	L4	CO2
	b)	'యిద్దురిత శరీరముందినగ దోసము మాకు 'సందర్భవాఖ్య వివరించండి?	8 Marks	L2	CO2

(OR)

5.	a)	వినుమొక బ్రాహ్మణుండు కులవృత్తము పెంపు దొఱింగి బోయదా నినొకత నాలి జేసికొని, నెమ్మి గిరాతుల గూడి వేటకుం జను దిను మాంస మద్దురితసక్తుడు భోగపరుండు గావునన్ ధనము ఘటింపగా దగు విధం బని చూచి వణిగ్జనంబుతోన్? ప్రతిపధార్థం వ్రాయండి.	8 Marks	L2	CO2
	b)	'వానికి దు:ఖమేటికిన్? నీదువిధము చెపుమా? సందర్భాలను వివరించండి?	8 Marks	L2	CO2
		MODULE-III			
6.	a)	"కుడిచిన పళ్ళెరంబును సకుంఠిత హర్షముతోడ నిచ్చినం గడుముదమంది యెత్తికొని గాఢభరంబున మార్చి మోపగా మెడయును వీపు మూపులును మిక్కలి నొవ్వున గొంకు వోవ నెక్కుడు వెస నేగుదెంచె గని కొక్కెర సమ్మదమంద మట్టికిన్". పద్యమునకు ప్రతి పదార్థం రాయండి?	10 Marks	L3	CO3
	b)	శ్రీహరిని కవి వర్ణించిన విధమును తెలపండి?	6 Marks	L2	CO3
		(OR)			
7.	a)	ఫలము ల్మెక్కెడివారు తత్ఫల రసాస్వాద క్రియాలోలురై పలుమాఱమ్మధురత్వము న్నుతుల సంభావింతురేగాని, త త్ఫల హేతుక్రమ వృక్షముందల పరెవ్వారైన, నట్లే రమా కలితుల్భోగములన్ భుజించుచు నినుంగన్నెత్తియుంజూతురే! ప్రతి పదార్థం వివరించండి ?	10 Marks	L3	CO3
	b)	నారదుడు ఉత్తానపాదునకు ఏమని సమాధానమిచ్చాడు ?	6 Marks	L2	CO3
		MODULE-IV			
8.	a)	ఎంత నిర్మలమోయి నీ హృదయకలిక సందర్భవాఖ్యం రాయండి	8 Marks	L2	CO4
	b)	నాడీజంఘుని గొప్పతనాన్ని వివరించండి?	8 Marks	L2	CO4
		(OR)			
9.	a)	ప్రస్తుత రైతు స్థితిగతులు ఏమిటి?	8 Marks	L2	CO4
	b)	కృషీవలుడు ద్వారా దువ్వూరి రైతు జీవనాన్ని ఎలా వివరించాడు.	8 Marks	L2	CO4
		MODULE-V			
10.	a)	లాటానుప్రాస, వృత్యనుప్రాస అలంకారములను వివరించండి?	8 Marks	L3	CO5
	b)	విభక్తులను తెలపండి?	8 Marks	L3	CO5
		(OR)			
11.	a)	ఉత్పలమాల, శార్దూలం పద్య లక్షణాలను వివరించండి?	8 Marks	L3	CO5
	b)	'తరువగ జాచ్చినంబెరు గుతాలి మినీయ దెవెన్న భాస్కరా ' పాదాన్ని గణ విభజ న చేసి, చందోలక్షణాలు తెలపండి.?	8 Marks	L3	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA I Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

FOUNDATIONAL ENGLISH

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is Professional English?	2 Marks	L1	CO1
	b)	Define skimming and scanning.	2 Marks	L1	CO1
	c)	What are prefixes?	2 Marks	L1	CO2
	d)	Define suffixes with an example.	2 Marks	L1	CO2
	e)	What is an official letter?	2 Marks	L1	CO3
	f)	Define agenda and minutes of a meeting.	2 Marks	L1	CO3
	g)	What are clichés?	2 Marks	L1	CO4
	h)	What is a paragraph?	2 Marks	L1	CO4
	i)	What is kinesics?	2 Marks	L1	CO5
	j)	Define pitch and intonation.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	Explain the dimensions of Professional English with examples.	16 Marks	L2	CO1
	(OR)			
3.	Discuss different reading techniques such as skimming, scanning, and assimilation.	16 Marks	L2	CO1

MODULE-II

4.	Explain the concept of word formation with examples.	16 Marks	L2	CO2
	(OR)			
5.	Discuss the importance of vocabulary building in professional writing.	16 Marks	L2	CO2

MODULE-III

6.	Explain the principles of business writing with examples.	16 Marks	L2	CO3
	(OR)			
7.	Describe the format of official writing (notices, agenda, and minutes).	16 Marks	L2	CO3

MODULE-IV

8.	Differentiate between descriptive and narrative sentences.	16 Marks	L2	CO4
	(OR)			
9.	Explain the features of technical writing style.	16 Marks	L2	CO4

MODULE-V

10.	Explain the importance of audience analysis in presentations.	16 Marks	L2	CO5
	(OR)			
11.	Describe communication strategies used in the workplace.	16 Marks	L2	CO5

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Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA I Semester Fasttrack (MBU-22) Regular Examinations April – 2026

BASICS OF ACCOUNTING

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Explain about Accounting Cycle.	2 Marks	L2	CO1
	b)	What is Business Entity concept?	2 Marks	L1	CO1
	c)	What are all Current Assets?	2 Marks	L1	CO2
	d)	Define Fixed Asset.	2 Marks	L1	CO2
	e)	What is book written down value of fixed asset?	2 Marks	L1	CO3
	f)	State three objectives of providing depreciation.	2 Marks	L2	CO3
	g)	Discuss about Quick ratio.	2 Marks	L1	CO4
	h)	Write short notes on Operating Ratio.	2 Marks	L1	CO4
	i)	Explain Accounting features in Tally.	2 Marks	L1	CO5
	j)	Explain Accounting Vouchers in Tally.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2. Explain about Accounting Cycle with relevant examples. 16 Marks L2 CO1

(OR)

3. 16 Marks L2 CO1

Date	Particulars
01.03.2022	started business with Rs.5,00,000
01.03.2023	Purchased machinery Rs.40,000
05.03.2023	Purchased goods on credit from Sharma Rs.25,000
08.03.2022	Sold Goods Rs.35,000
10.03.2022	Purchased goods from Abinav for cash Rs.10,000
12.03.2022	Deposited into Bank Rs.25,000
14.03.2022	Purchased goods from Sudheer Rs.15,000
16.03.2022	Withdrew cash for personal use 2,000
18.03.2022	Sold goods to Rama Rs.75,000
20.03.2022	Paid Rent Rs.2,000
25.03.2022	Received Commission Rs.5,000
26.03.2022	Sold goods to Surekha Rs.15,000
27.03.2022	Received cash from Rama 75,000
28.03.2022	Borrowed money from Venkat Rs.20,000
29.03.2022	Paid interest on loan Rs.1,500
30.03.2022	Outstanding salary Rs.1,000
31.03.2022	Goods withdrew for personal use Rs.2,500

Prepare Journal of Aravind from the above Transactions

MODULE-II

4.	What is the format of Trading and provide relevant examples?	16 Marks	L2	CO2
	(OR)			
5.	Discuss on Balance sheet format with relevant examples.	16 Marks	L3	CO2

MODULE-III

6.	Explain the merits and de-merits of straight line and diminishing balance methods.	16 Marks	L2	CO3
	(OR)			
7.	Explain the merits and de-merits of diminishing balance method.	16 Marks	L4	CO3

MODULE-IV

8.	Explain the significance of Ratio analysis.	16 Marks	L4	CO4
	(OR)			
9.	Explain the limitations of Ratio analysis.	16 Marks	L3	CO4

MODULE-V

10.	Discuss the process of recording vouchers using tally.	16 Marks	L2	CO5
	(OR)			
11.	How the accounts are opened in ledger using tally?	16 Marks	L2	CO5

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA II Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

FUNDAMENTALS OF STATISTICS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	State any two limitations of statistics.	2 Marks	L1	CO1
	b)	What are the two major types of statistics?	2 Marks	L1	CO1
	c)	Name any three commonly used measures of central tendency.	2 Marks	L1	CO2
	d)	Define arithmetic mean.	2 Marks	L1	CO2
	e)	What is Mean Deviation?	2 Marks	L1	CO3
	f)	Define Standard Deviation.	2 Marks	L1	CO3
	g)	What are regression lines?	2 Marks	L1	CO4
	h)	What are the two regression lines used in regression analysis?	2 Marks	L1	CO4
	i)	What is an identity matrix?	2 Marks	L1	CO5
	j)	What is a singular matrix?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2. Define primary and secondary data. Explain their differences and describe situations where each type is more appropriate. — 16 Marks, L1, CO1

(OR)

3. Write detailed notes on classification of data. Explain chronological, geographical, qualitative, quantitative and textual classification with examples. — 16 Marks, L1, CO1

MODULE-II

4. A survey was conducted to determine the age (in years) of 120 automobiles. The result of such a survey is as follows: — 16 Marks, L3, CO2

Age of auto:	0–4	4–8	8–12	12–16	16–20
Number of autos:	13	29	48	22	8

What is the median age for the autos?

(OR)

5. Describe the similarities and differences among median, quartiles, and percentiles as descriptive measures of position. — 16 Marks, L1, CO2

MODULE-III

6. Define Quartile Deviation. Explain its significance in business and statistical analysis. — 16 Marks, L3, CO3

(OR)

7. The following sample shows the weekly number of road accidents in a — 16 Marks, L3, CO3

city during a two-year period:

Number of Accidents:

	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44
Frequency:	05	12	32	27	11	9	4	3	1

Find the interquartile range and coefficient of quartile deviation.

MODULE-IV

8.	Explain probable error of correlation and its use in testing reliability of correlation coefficient.	16 Marks	L2	CO4

(OR)

9.	Explain residual analysis in regression and interpret its significance.	16 Marks	L2	CO4

MODULE-V

10.	Discuss the properties of determinants and prove any three properties using examples	16 Marks	L3	CO5

(OR)

11.	$Evaluate: \begin{vmatrix} 1 & a & a^2 \\ 1 & b & b^2 \\ 1 & c & c^2 \end{vmatrix}$	16 Marks	L3	CO5

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA I Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

BUSINESS MATHEMATICS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define Indices and give an example.	2 Marks	L1	CO1
	b)	Simplify $\frac{3^5 27^3 9^4}{3.(81)^4}$	2 Marks	L2	CO1
	c)	Define Geometrical interpretation of vector	2 Marks	L1	CO2
	d)	Define Trace of a Matrix with an example	2 Marks	L2	CO2
	e)	Find the differential coefficient of $9X^4 - 7X^3 + 8X^2 - \frac{8}{x} + \frac{10}{x^2}$ $w.r.t\ X$	2 Marks	L2	CO3
	f)	Evaluate $\frac{d}{dx} sec\ 7x$	2 Marks	L2	CO3
	g)	Write the formula of Marginal cost and write an example.	2 Marks	L1	CO4
	h)	Write the formula of Total cost and write an example	2 Marks	L1	CO4
	i)	How many terms of the AP : 24, 21, 18, . . . must be taken so that their sum is 78	2 Marks	L2	CO5
	j)	If the first term of a G.P. is 20 and the common ratio is 4. Find the 5th term.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain Quadratic function with two examples.	8 Marks	L2	CO1
	b)	If $3^{(x-y)} = 27$ and $3^{(x+y)} = 243$, find the value of x and y	8 Marks	L2	CO1

(OR)

3.	a)	Explain Limit of a function. What are the methods of evaluating limits.	8 Marks	L2	CO1
	b)	Evaluate $lim_{x\to\infty} \frac{2x^4 - x^2 + 8x}{-5x^4 + 7}$	8 Marks	L4	CO1

MODULE-II

4.	a)	If $A=\begin{bmatrix}1 & 5 & 3\\4 & 5 & 6\end{bmatrix}$, $B=\begin{bmatrix}5 & 3\\1 & 0\\2 & 8\end{bmatrix}$ Determine AB and BA. Is AB=BA	8 Marks	L2	CO2
	b)	Explain method of finding the determinant of a Square Matrix.	8 Marks	L2	CO2
		(OR)			
5.	a)	If $A=\begin{bmatrix}1 & -2 & 3\\-4 & 2 & 5\end{bmatrix}$, $B=\begin{bmatrix}1 & 3\\-1 & 0\\2 & 4\end{bmatrix}$, show that $(AB)^T=B^TA^T$	8 Marks	L2	CO2
	b)	Explain the method of finding the inverse of a matrix.	8 Marks	L3	CO2

MODULE-III

6.	a)	Differentiate $y= x^3 \log x$.	8 Marks	L2	CO3
	b)	Show that $x^5-5x^4+5x^3-1$ has a maximum when x=1 and minimum when x=3 and neither when x=0	8 Marks	L2	CO3
		(OR)			
7.	a)	Find $\frac{dy}{dx}, if\ y=\frac{x^2-1}{x^2+1}$	8 Marks	L2	CO3
	b)	Investigate $f(x)=x^3-x^4$ for maximum and minimum values.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain Average cost , Marginal Cost and Total Cost.	8 Marks	L2	CO4
	b)	The marginal cost c' as a function of units produced is given by c'= 106.4-5x. Find the total cost and average cost function if fixed cost is Rs.1630.	8 Marks	L3	CO4
		(OR)			
9.	a)	Explain the concept of Consumer Surplus.	8 Marks	L2	CO4
	b)	The marginal cost function c(x) where x is the number of units produced is given by $c'(x)=2+60x-5x^2$. Find the total cost and average cost function if fixed cost is Rs.65.	8 Marks	L4	CO4

MODULE-V

10.	a)	The sum of the first three terms of a G.P. is 21/2 and their product is 27. Find the common ratio	8 Marks	L2	CO5
	b)	'x' and 'y' are two numbers whose AM is 25 and GM is 7. Find the numbers.	8 Marks	L2	CO5
		(OR)			
11.	a)	A simple interest of Rs. 2500 is earned by investing a sum of money for 13 years. The interest rate is charged at 4% for the first 3 years, 5% for the next 4 years and 8% beyond 7 years. Find the sum of money invested.	8 Marks	L3	CO5
	b)	What will be simple interest for 1 yr and 8 months on a sum of Rs. 28500 at the rate of 12% per annum?	8 Marks	L4	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

BBA II Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

ORGANIZATIONAL BEHAVIOUR

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is the importance of perception in teamwork?	2 Marks	L1	CO1
	b)	Define individual roles in an organization.	2 Marks	L1	CO1
	c)	List few examples of personality.	2 Marks	L1	CO2
	d)	What is the key feature of personality.	2 Marks	L1	CO2
	e)	Define the Johari Window model.	2 Marks	L1	CO3
	f)	Define Leadership.	2 Marks	L1	CO3
	g)	Mention two types of stress experienced by employees.	2 Marks	L1	CO4
	h)	What is meant by preventive stress management?	2 Marks	L1	CO4
	i)	Mention two objectives of OD.	2 Marks	L1	CO5
	j)	State any two OD interventions.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Define Organizational Behavior. Explain the nature and scope of OB.	16 Marks	L2	CO1
	(OR)			
3	Discuss the linkages between organizational behavior and other social sciences.	16 Marks	L2	CO1

MODULE-II

4	Define Learning. Explain any one theories of Learning with examples	16 Marks	L2	CO2
	(OR)			
5	Define personality and explain its main importance in organizational behavior.	16 Marks	L2	CO2

MODULE-III

6	Discuss five stage Hierarchy of Needs theory and its importance at the workplace.	16 Marks	L2	CO3
	(OR)			
7	What are the different leadership styles? Explain with examples.	16 Marks	L2	CO3

MODULE-IV

8	Discuss the preventive measures organizations can take to reduce workplace stress.	16 Marks	L2	CO4
	(OR)			
9	Explain the different types of conflicts in organizations with examples.	16 Marks	L2	CO4

MODULE-V

10	What are the major issues to effective communication in organizations?	16 Marks	L2	CO5
	(OR)			
11	What are the key challenges in implementing OD interventions?	16 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA I Semester Fasttrack (MBU-22) Regular Examinations April – 2026

INFORMATION TECHNOLOGY FOR MANAGERIAL APPLICATIONS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define a computer.	2 Marks	L1	CO1
	b)	What is data?	2 Marks	L1	CO1
	c)	Describe the characteristics of computers in detail.	2 Marks	L1	CO2
	d)	What is RAM?	2 Marks	L1	CO2
	e)	What is MS Word?	2 Marks	L1	CO3
	f)	What is a document?	2 Marks	L1	CO3
	g)	What is MS Excel?	2 Marks	L1	CO4
	h)	Define workbook.	2 Marks	L1	CO4
	i)	What is MS PowerPoint?	2 Marks	L1	CO5
	j)	What is a slide?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

	MODULE-I			
2.	Explain the evolution of computers.	16 Marks	L2	CO1
	(OR)			
3.	Describe characteristics of computers in detail.	16 Marks	L2	CO1
	MODULE-II			
4.	Explain primary memory and its types.	16 Marks	L2	CO2
	(OR)			
5.	Describe RAM and ROM in detail.	16 Marks	L2	CO2
	MODULE-III			
6.	Explain MS Word environment.	16 Marks	L2	CO3
	(OR)			
7.	Describe working with Word documents.	16 Marks	L2	CO3
	MODULE-IV			
8.	Explain Excel workbook and worksheet.	16 Marks	L2	CO4
	(OR)			
9.	Describe working with Excel sheets.	16 Marks	L2	CO4
	MODULE-V			
10.	Explain working with PowerPoint slides.	16 Marks	L2	CO5
	(OR)			
11.	Describe creating a presentation.	16 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

MBA I Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

APTITUDE TRAINING

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Give the formula for fractions of LCM and HCF.	2 Marks	L1	CO1
	b)	Explain average speed.	2 Marks	L1	CO1
	c)	Give the formula for percentage of increase and decrease.	2 Marks	L1	CO1
	d)	Define factorial notation.	2 Marks	L1	CO2
	e)	Give the formulas for Gain and Loss percentages.	2 Marks	L1	CO2
	f)	Define line chart.	2 Marks	L1	CO3
	g)	Define Venn diagrams give the example.	2 Marks	L1	CO3
	h)	Explain data visualization.	2 Marks	L1	CO3
	i)	Explain blood relations.	2 Marks	L1	CO4
	j)	Define letter series.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5X16 = 80 Marks

MODULE-I

2.	a)	A number consists of 3 digits whose sum is 10. The middle digit is equal to the sum of the other two and the number will be increased by 99 if its digits are reversed. The number is:	8 Marks	L3	CO1
	b)	In an election between two candidates, one got 55% of the total valid votes, 20% of the votes were invalid. If the total number of votes was 7500, the number of valid votes that the other candidate got, was:	8 Marks	L3	CO1

(OR)

3.	a)	If one-third of one-fourth of a number is 15, then three-tenth of that number is?	8 Marks	L3	CO1
	b)	Let N be the greatest number that will divide 1305, 4665 and 6905, leaving the same remainder in each case. Then sum of the digits in N is?	8 Marks	L3	CO1

MODULE-II

4.	a)	Out of 7 consonants and 4 vowels, how many words of 3 consonants and 2 vowels can be formed?	8 Marks	L4	CO2
	b)	A bag contains 2 red, 3 green and 2 blue balls. Two balls are drawn at random. What is the probability that none of the balls drawn is blue?	8 Marks	L3	CO2

(OR)

5.	a)	A person crosses a 600 m long street in 5 minutes. What is his speed in km per hour?	8 Marks	L4	CO2
	b)	The difference between simple and compound interests compounded annually on a certain sum of money for 2 years at 4% per annum is Re. 1. The sum (in Rs.) is	8 Marks	L3	CO2

MODULE-III

6. The following table gives the percentage of marks obtained by seven students in six different subjects in an examination. 16 Marks L4 CO3

The Numbers in the Brackets give the Maximum Marks in Each Subject.

Student	Subject (Max. Marks)					
	Maths	Chemistry	Physics	Geography	History	Science
	(150)	(130)	(120)	(100)	(60)	(40)
Ayush	90	50	90	60	70	80
Aman	100	80	80	40	80	70
Sajal	90	60	70	70	90	70
Rohit	80	65	80	80	60	60
Muskan	80	65	85	95	50	90
Tanvi	70	75	65	85	40	60
Tarun	65	35	50	77	80	80

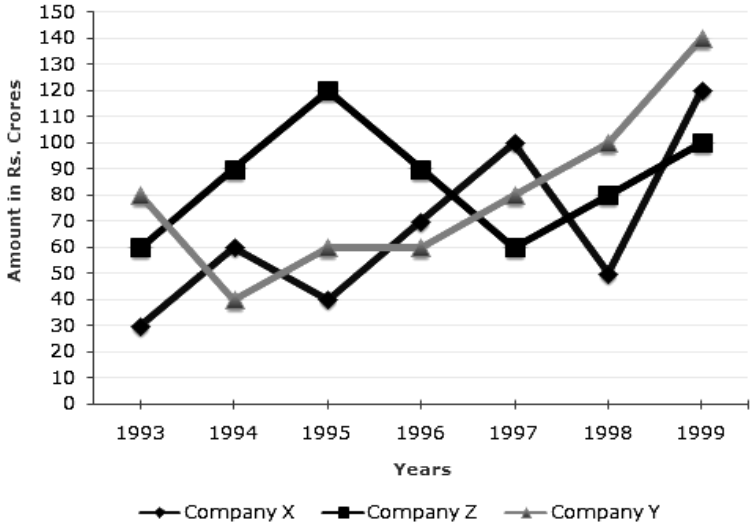
i) What are the average marks obtained by all the seven students in Physics? (rounded off to two digit after decimal)
ii) The number of students who obtained 60% and above marks in all subjects is?
iii) What was the aggregate of marks obtained by Sajal in all the six subjects?

What is the overall percentage of Tarun?

(OR)

7. Study the following line graph and answer the questions. 16 Marks L2 CO3

Exports from Three Companies Over the Years (in Rs. crore)



i) For which of the following pairs of years the total exports from the three Companies together are equal?
ii) Average annual exports during the given period for Company Y is approximately what percent of the average annual exports for Company Z?
iii) In which year was the difference between the exports from Companies X and Y the minimum?
iv) In how many of the given years, were the exports from Company Z more than the average annual exports over the given years?

MODULE-IV

8. a) Each of the following questions is based on the following information: 8 Marks L4 CO4

i) Six flats on a floor in two rows facing North and South are allotted to P, Q, R, S, T and U.

ii) Q gets a North facing flat and is not next to S.

iii) S and U get diagonally opposite flats.

iv) R next to U, gets a south facing flat and T gets North facing flat.

a) If the flats of P and T are interchanged then whose flat will be next to that of U?

b) Which of the following combination get south facing flats?

c) The flats of which of the other pair than SU, is diagonally opposite to each other?

Whose flat is between Q and S?

b) Santosh walks 10 meters towards the South. Turning to the left, he walks 20 meters and then moves to his right. After moving a distance of 20 meters, he turns to the right and walks 20 meters. Finally, he turns to the right and moves a distance of 10 meters. , . How far and in which direction is he from the starting point? 8 Marks L3 CO4

(OR)

9. a) P, Q, R, S, T, U, V and W are sitting round the circle and are facing the centre: 8 Marks L2 CO4

i) P is second to the right of T who is the neighbour of R and V.

ii) S is not the neighbour of P.

iii) V is the neighbour of U.

iv) Q is not between S and W. W is not between U and S.

a) Which one is immediate right to the V?

b) What is the position of S?

b) Pointing to a photograph. Bajpai said, "He is the son of the only daughter of the father of my brother." How Bajpai is related to the man in the photograph? 8 Marks L3 CO4

MODULE-V

10. a) Six years ago, the ratio of the ages of Kunal and Sagar was 6 : 5. Four years hence, the ratio of their ages will be 11 : 10. What is Sagar's age at present? 8 Marks L2 CO1

b) The cost price of 20 articles is the same as the selling price of x articles. If the profit is 25%, then the value of x is: 8 Marks L2 CO2

(OR)

11. a) In a certain store, the profit is 320% of the cost. If the cost increases by 25% but the selling price remains constant, approximately what percentage of the selling price is the profit? 8 Marks L3 CO4

b) K is 40 m South-West of L. If M is 40 m South-East of L, then M is in which direction of K? 8 Marks L2 CO2

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com. III Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

PROGRAMMING WITH C

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is an operator?	2 Marks	L1	CO1
	b)	What is a keyword in C?	2 Marks	L1	CO1
	c)	What is input in C?	2 Marks	L1	CO2
	d)	What is a loop?	2 Marks	L1	CO2
	e)	What is a string?	2 Marks	L1	CO3
	f)	What is strcat()?	2 Marks	L1	CO3
	g)	What is a function?	2 Marks	L1	CO4
	h)	What is call by value?	2 Marks	L1	CO4
	i)	What is a pointer?	2 Marks	L1	CO5
	j)	What is a binary file?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Write the basic structure of a C program.	8 Marks	L2	CO1
	b)	Explain structured programming language with advantages.	8 Marks	L2	CO1
		(OR)			
3.	a)	Explain different types of operators in C.	8 Marks	L2	CO1
	b)	Discuss generations of programming languages.	8 Marks	L2	CO1

MODULE-II

4.	a)	Differentiate all looping statements.	8 Marks	L3	CO2
	b)	Explain printf() and scanf() with examples.	8 Marks	L2	CO2
		(OR)			
5.	a)	Explain break and continue statements.	8 Marks	L2	CO2
	b)	Explain if and if-else statements.	8 Marks	L2	CO2

MODULE-III

6.	a)	Explain string handling functions.	8 Marks	L2	CO3
	b)	Explain array operations.	8 Marks	L2	CO3
		(OR)			
7.	a)	Explain accessing and storing values in arrays.	8 Marks	L2	CO3
	b)	Explain string initialization and input/output	8 Marks	L2	CO3

MODULE-IV

8.	a)	Explain function declaration and definition.	8 Marks	L2	CO4
	b)	Explain types of functions.	8 Marks	L2	CO4

(OR)

9.	a)	Explain recursion with example.	8 Marks	L2	CO4
	b)	Explain call by value and call by reference.	8 Marks	L2	CO4

MODULE-V

10.	a)	Explain file I/O functions.	8 Marks	L2	CO5
	b)	Explain pointers with examples.	8 Marks	L2	CO5

(OR)

11.	a)	Explain file operations (open, read, write, close).	8 Marks	L2	CO5
	b)	Explain text files and binary files.	8 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com I Semester Fasttrack (MBU-22) Regular Examinations, April – 2026

BUSINESS ECONOMICS

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	What is the Discounting Principle?	2 Marks	L1	CO1
	b)	What is meant by Equi-Marginal Principle?	2 Marks	L1	CO1
	c)	What is Consumer Equilibrium?	2 Marks	L1	CO2
	d)	Define an Indifference Curve.	2 Marks	L1	CO2
	e)	Define Price Elasticity of Demand.	2 Marks	L1	CO3
	f)	What is meant by Elasticity of Supply?	2 Marks	L1	CO3
	g)	What is the Long-Run Production Function?	2 Marks	L1	CO4
	h)	Define Marginal Product and Average Product.	2 Marks	L1	CO4
	i)	What is a Pricing Strategy?	2 Marks	L1	CO5
	j)	Define Marginal Revenue.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	Summarize the basic economic concepts of marginalism, opportunity cost, and discounting.	16 Marks	L2	CO1

(OR)

3.	Explain the Nature and Scope of Business Economics.	16 Marks	L2	CO1

MODULE-II

4.	Explain the Law of Equi-Marginal Utility and Illustrate how consumers allocate income across different goods.	16 Marks	L2	CO2

(OR)

5.	Explain the Law of Diminishing Marginal Utility and Illustrate how it influences consumer buying behaviour.	16 Marks	L2	CO2

MODULE-III

6.	Explain the concept of Price Elasticity of Demand and Illustrate its importance in pricing decisions.	16 Marks	L2	CO3

(OR)

7.	Explain the different types of Elasticity of Supply and Illustrate with suitable examples.	16 Marks	L2	CO3

MODULE-IV

8.	Explain how the Law of Variable Proportions operates through the stages of production?	16 Marks	L2	CO4

(OR)

9.	Explain the relationship between Total Cost, Average Cost, and Marginal Cost using cost curves?	16 Marks	L2	CO4

MODULE-V

10.	Summarize the concept of perfect competition and Explain how industry and firm equilibrium are achieved simultaneously.	16 Marks	L2	CO5

(OR)

11.	Explain the structure and features of Monopoly and Demonstrate the process of price determination in the short run and long run.	16 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Com I Semester Fasttrack (MBU-22) Regular Examinations April – 2026

BUSINESS ENVIRONMENT

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is Business environment?	2 Marks	L1	CO1
	b)	State the nature of Business environment.	2 Marks	L1	CO1
	c)	Write about economic environment.	2 Marks	L1	CO2
	d)	Name the concept of Economic environment.	2 Marks	L1	CO2
	e)	Name the concept of political environment.	2 Marks	L1	CO3
	f)	Define Legal environment.	2 Marks	L1	CO3
	g)	Name concept of socio-cultural environment.	2 Marks	L1	CO4
	h)	State the corporate governance.	2 Marks	L1	CO4
	i)	Define global Environment.	2 Marks	L1	CO5
	j)	State the concept Global environment.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Explain about techniques of environmental scanning and monitoring.	16 Marks	L2	CO1

(OR)

3.	Demonstrate influencing factors of business environment.	16 Marks	L2	CO1

MODULE-II

4.	Outline the elements of economic environment.	16 Marks	L2	CO2

(OR)

5.	Demonstrate economic system and business environment.	16 Marks	L2	CO2

MODULE-III

6.	Explain about business ethics and corporate governance.	16 Marks	L2	CO3

(OR)

7.	Demonstrate about rationale and extent of state intervention.	16 Marks	L2	CO3

MODULE-IV

8.	Explain the concept and nature of Socio environment.	16 Marks	L2	CO4

(OR)

9.	Explain scope and significance of Cultural environment.	16 Marks	L2	CO4

MODULE-V

10.	What is global business? Explain the nature of global business.	16 Marks	L2	CO5

(OR)

11.	Explain the concept and nature of global environment.	16 Marks	L2	CO5

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Sc. I Semester Fasttrack (MBU-22) Supplementary Examinations, March – 2026

GENERAL ENGLISH

[Microbiology, Biotechnology , Bioinformatics & Computer Science]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	List the plural forms to the following: i) Company ii) Loaf iii) Delay iv) Quiz	2 Marks	L1	CO3
	b)	Find the vowel sound in the given words. i) Key ii) Odd iii) Whole iv) Light	2 Marks	L1	CO3
	c)	State the meanings to the following words. i) Equilibrium ii) Brooding over	2 Marks	L1	CO2
	d)	List any two examples for imperative sentences.	2 Marks	L1	CO3
	e)	List any two examples for past perfect tense.	2 Marks	L1	CO3
	f)	List two examples for euphemism.	2 Marks	L1	CO3
	g)	State the passive voice for the give sentences. i) John is repairing radios. ii) She doesn't like insects.	2 Marks	L1	CO3
	h)	Use the following conjunctions in a sentence. i) Although ii) Either …. or	2 Marks	L3	CO1
	i)	Find the suitable article to fill the blank. i) People with pets often lead.....(A, An, The) healthier life. ii) I want to join ……. (A, An, The) university for higher studies.	2 Marks	L1	CO3
	j)	Find the number of syllables in the given words. i) Elephant ii) Game	2 Marks	L1	CO3

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Discuss the story 'A Snake in the Grass'.	8 Marks	L2	CO1
	b)	Do you consider Dasa actions as "a snake in the grass".	8 Marks	L2	CO1

(OR)

3.	a)	How does the family try to catch a cobra in 'A Snake in the Grass'?	8 Marks	L1	CO1
	b)	What superstitions or rituals are indicated in the story?	8 Marks	L1	CO1

MODULE-II

4.	a)	"Small courtesies play a major role in creating an impression on other people." Explain the statement with reference to the Lesson 'On Saying Please'.	8 Marks	L2	CO2
	b)	Suggest some ways to encourage people to adopt politeness.	8 Marks	L2	CO2

(OR)

5.	a)	Discuss the bus conductor's behavior with the passengers.	8 Marks	L2	CO2
	b)	Convert the following sentences into exclamatory sentences. i) He bowls very fast. ii) Sumitra sings melodiously. iii) Srinagar is a very cool place. iv) He brought a surprising gift.	8 Marks	L1	CO3

MODULE-III

6.	a)	Interpret the poem "If You Forget Me" in your own words.	8 Marks	L2	CO4
	b)	What do the flower and the land symbolize "if you forget me".	8 Marks	L2	CO4

(OR)

7.	a)	"The poem 'If You Forget Me' describe the nature of unrequited love". Explain.	8 Marks	L2	CO1
	b)	Use appropriate tense form to fill the blanks given. i) She.....in college. (Play) ii) .....is a great form of exercise. (Run) iii) They …… the seminar scheduled tomorrow. (Attend) iv) I.....my presentation tomorrow. (Finish) v) Sam _____(go)to school yesterday. vi) I____(read) this book for the last two days. vii) Prem _____(like) music. viii) John_____ (live) with her parents.	8 Marks	L2	CO3

MODULE-IV

8.	a)	The activities of terrorists disrupt the regular lives of common people. Explain in the context of 'After the Sunset'.	8 Marks	L2	CO1
	b)	Write a dialogue between friends on the causes of global warming?	8 Marks	L2	CO1

(OR)

9.	a)	How do the rich and powerful people treat the poor in the story?	8 Marks	L1	CO1
	b)	The story 'after the sunset' illiterates that ordinary people are the victims in many cases .Explain	8 Marks	L1	CO3

MODULE-V

10.	a)	Analyze the significance of the title 'Man's Peril' with reference to the text you read.	8 Marks	L1	CO2
	b)	Write a summary of Russell's essay 'mans peril'	8 Marks	L1	CO2

(OR)

11.	a)	What is Russell's opinion about the importance of humanity and the futility of war? Explain	8 Marks	L3	CO5
	b)	Rewrite the sentences with necessary corrections. i) The idea of having many colleges are nice. ii) The structure of buildings are good. iii) Dal and rice are her regular diet. iv) Neither you nor your sister have seen it.	8 Marks	L3	CO4

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MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.P.T II Semester Fasttrack (MBU-22) Supplementary Examinations, March - 2026

ANATOMY-II

[Bachelor of Physiotherapy]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is hepatopancreatic ampulla of vater?	2 Marks	L2	CO1
	b)	Write a brief note on trigone of urinary bladder.	2 Marks	L1	CO1
	c)	How laryngeal prominence is formed in larynx?	2 Marks	L3	CO2
	d)	What are paranasal air sinuses?	2 Marks	L3	CO2
	e)	Define reflex arc.	2 Marks	L1	CO3
	f)	Name the three coverings of brain, spinal cord, and its applied anatomy.	2 Marks	L2	CO3
	g)	List out the structures present in portal triad.	2 Marks	L2	CO4
	h)	How many zones are in suprarenal gland? and mention its hormones.	2 Marks	L3	CO4
	i)	Prepare a brief note on ***"gastrulation".***	2 Marks	L3	CO5
	j)	What is in-vitro fertilization?	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Name the parts of the urinary system, and add a note on ureter and its constrictions.	8 Marks	L1	CO1
	b)	Illustrate the external features, internal features, relations, blood supply, nerve supply, and applied anatomy of kidney.	8 Marks	L3	CO1

(OR)

3.	a)	Define the attachments of diaphragm muscle under following headings: i) Origin ii) Insertion iii) Nerve supply iv) Action v) Applied anatomy.	8 Marks	L1	CO1
	b)	Discuss the structure of pancreas under following headings: i) External features ii) Internal features iii) Relations iv) Blood supply & Nerve supply v) Applied anatomy.	8 Marks	L3	CO1

MODULE-II

4.	a)	Illustrate the structure of lateral wall of nose with a diagram.	8 Marks	L2	CO2
	b)	Explain external features, internal features, relations, blood supply, nerve supply, and applied anatomy of tongue.	8 Marks	L3	CO2

(OR)

5.	a)	What are carotid arteries? Explain the branches of it.	8 Marks	L3	CO2
	b)	Describe the structure of hyoid bone, and what are suprahyoid & infrahyoid muscles?	8 Marks	L2	CO2

MODULE-III

6.	a)	Name the parts of cerebellum, and list out the functions of cerebellum.	8 Marks	L1	CO3
	b)	Describe visual pathway, and mention visual defects.	8 Marks	L2	CO3
		(OR)			
7.	a)	Discuss the structure fourth ventricle of brain.	8 Marks	L3	CO3
	b)	What are basal ganglia? Write the functions of basal ganglia.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Draw the microscopic structure of liver, and gall bladder with a neat labeled diagram.	8 Marks	L3	CO4
	b)	Depict the histology of spinal cord, and spinal ganglia with a neat labeled diagram.	8 Marks	L2	CO4
		(OR)			
9.	a)	Sketch the microscopic structure of spleen, and thymus with a neat labeled diagram.	8 Marks	L2	CO4
	b)	Describe the histology of thick skin, and thin skin with a neat labeled diagram.	8 Marks	L1	CO4

MODULE-V

10.	a)	What are the three germ layers, and their derivatives?	8 Marks	L3	CO5
	b)	Write a note on ectodermal clefts, and its derivatives.	8 Marks	L2	CO5
		(OR)			
11.	a)	Explain stages of spermiogenesis.	8 Marks	L3	CO5
	b)	Define primitive streak, and mention its derivatives.	8 Marks	L1	CO5

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Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B. Pharmacy I Semester (SOP-BPH-23) Regular Examinations, February – 2026

PHARMACEUTICAL ANALYSIS

Time: 3 hours **Max. Marks: 75**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define redox reaction	2 Marks	L1	CO2
	b)	What is Oxidation reaction	2 Marks	L1	CO2
	c)	What is Reduction reaction	2 Marks	L1	CO2
	d)	Define Dichrometry	2 Marks	L1	CO2
	e)	Define Cerimetry	2 Marks	L1	CO2
	f)	What is Accuracy?	2 Marks	L1	CO1
	g)	What is Precision?	2 Marks	L1	CO1
	h)	What is Pharmacopoeia?	2 Marks	L1	CO2
	i)	Define Impurity?	2 Marks	L1	CO1
	j)	What is Limit test?	2 Marks	L1	CO1

PART - B

Answer any TWO Question.
All Questions Carry Equal Marks

2 x 10 = 20 Marks

2.	a)	Define Error and classify different types of Errors	5 Marks	L1	CO1
	b)	Define impurity and write a note on Sources of impurities	5 Marks	L1	CO1
3.	a)	Write the Procedure involved in preparation and standardization of Potassium Permaganate	5 Marks	L1	CO1
	b)	Write the different methods for expressing concentration	5 Marks	L1	CO1
4.	a)	Explain in detail about acid base titrations?	5 Marks	L1	CO2
	b)	Explain how Sodium Benzoate is estimated using non-aqueous titration.	5 Marks	L1	CO2

PART - C

Answer any SEVEN Question.
All Questions Carry Equal Marks

7 x 5 = 35 Marks

5.	Explain different techniques in Pharmaceutical Analysis	5 Marks	L1	CO1
6.	Explain different concentration expression methods	5 Marks	L1	CO1
7.	Write a brief note on different methods to helpful for to minimizing errors	5 Marks	L6	CO1
8.	Write a note on Acidimetric titrations?	5 Marks	L6	CO2
9	Write a note on Alkalimetry titrations?	5 Marks	L6	CO2
10.	Explain about neutralization curves?	5 Marks	L1	CO2
11.	Explain in detail about Diazotization titration reaction?	5 Marks	L1	CO3
12.	Explain about estimation of sodium chloride by Precipitation titration	5 Marks	L1	CO2
13.	Write the principle and applications of redox reactions	5 Marks	L6	CO2

CODE No.: 23PA101002 SOP-BPH-23

Reg. No. | | | | | | | | | | | | |

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SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B. Pharmacy I Semester (SOP-BPH-23) Regular Examinations, February – 2026

PHARMACEUTICAL INORGANIC CHEMISTRY

Time: 3 hours **Max. Marks: 75**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Write the disadvantages of systemic antacid.	2 Marks	L6	CO3
	b)	Describe achlorhydria.	2 Marks	L1	CO3
	c)	Define radio activity	2 Marks	L1	CO4
	d)	Write the limitations of Arrhenius theory	2 Marks	L6	CO2
	e)	Define dentifrice with example	2 Marks	L1	CO3
	f)	Describe emetics. Give examples.	2 Marks	L1	CO3
	g)	Write the molecular formula and uses of ferrous gluconate.	2 Marks	L6	CO3
	h)	Define astringent. Give two examples	2 Marks	L1	CO3
	i)	Describe test for purity	2 Marks	L1	CO1
	j)	Write about zinc eugenol cement	2 Marks	L6	CO3

PART - B

Answer any TWO Question.
All Questions Carry Equal Marks

2 x 10 = 20 Marks

2.	Explain the principle, reactions and apparatus of arsenic limit test.	10 Marks	L1	CO1
3.	Define buffer action? Explain various buffers used in pharmacy and add a note on buffer capacity.	10 Marks	L1	CO2
4.	Explain the principle, reactions and procedure involved in assay of Ammonium chloride and copper sulphate.	10 Marks	L1	CO1

PART - C

Answer any SEVEN Question.
All Questions Carry Equal Marks

7 x 5 = 35 Marks

5.	Explain the diagnostic and therapeutic applications of radioisotopes in detail.	5 Marks	L1	CO4
6.	Describe cathartic? Write its mechanism of action. Give the preparation of any one catharatics.	5 Marks	L1	CO3
7.	Define poison and classify antidote with suitable examples.	5 Marks	L1	CO3
8.	Write in detail about the important functions of sodium ions in the body.	5 Marks	L6	CO2
9.	Classify dental products? discuss the role of fluoride in dental caries	5 Marks	L2	CO3
10	Write the preparation, properties and assay for ferrous sulphate	5 Marks	L6	CO3
11.	Explain the method of preparation and use of aluminium hydroxide gel	5 Marks	L1	CO3
12.	Write a note on various methods for adjusting isotonicity	5 Marks	L6	CO2
13.	Write in detail about the types and sources of impurities	5 Marks	L6	CO1

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Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B. Pharmacy III Semester (SOP-BPH-23) Regular Examinations, January – 2026

PHYSICAL PHARMACEUTICS - I

Time: 3 hours **Max. Marks: 75**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	What is meant by 'ideal solubility parameters'?	2 Marks	L5	CO1
	b)	List two factors that influence the solubility of drugs and briefly explain their effects.	2 Marks	L2	CO1
	c)	Explain the concept of "sublimation" with an example of a substance that undergoes this process.	2 Marks	L5	CO1
	d)	What is the difference between "amorphous" and "crystalline" solids?	2 Marks	L2	CO1
	e)	Describe the concept of surface free energy?	2 Marks	L5	CO2
	f)	Define Surface Tension. How it is measured?	2 Marks	L2	CO2
	g)	What are the main applications of complexation in pharmaceutical chemistry? Provide examples.	2 Marks	L1	CO3
	h)	Define Raoult's law with respect to Ideal & Real gases .	2 Marks	L2	CO3
	i)	What is the principle of calorimetric pH determination?	2 Marks	L2	CO4
	j)	Define buffer capacity.	2 Marks	L2	CO4

PART - B

Answer any TWO Questions.
All Questions Carry Equal Marks

2 X 10 = 20 Marks

2.	Discuss the various solubility expressions used in pharmaceutical sciences. Provide examples and explain how each expression is used to quantify the solubility of a drug.	10 Marks	L1	CO1
3.	Describe and compare three different analytical methods used to study complexation and determine the stability constants of complexes.	10 Marks	L2	CO2
4.	Discuss the concept of buffer solutions by using "Henderson-Hasselbalch equation".	10 Marks	L2	CO4

PART - C

Answer any SEVEN Questions.
All Questions Carry Equal Marks

7 x 5 = 35 Marks

5.	Discuss the processes of solvation and association in relation to drug solubility. How do these processes influence the solubility of a drug in different solvents?	5 Marks	L5	CO1
6.	Analyze how temperature and pH affect the solubility of drugs. Provide specific examples to demonstrate the impact of these factors on drug solubility.	5 Marks	L3	CO1
7.	What is the critical point of a substance, and why is it significant in understanding the phase behaviour of materials? Provide an example of a substance and describe its critical point in terms of temperature	5 Marks	L5	CO1

	and pressure.			
8.	Define eutectic mixtures and describe their significance in pharmaceutical formulations. How does the eutectic point influence the melting behaviour of the components in the mixture?	5 Marks	L3	CO1
9.	Discuss the concept of surface free energy and its significance in the context of drug delivery systems. How does surface free energy influence the behaviour of solid drug particles?	5 Marks	L2	CO1
10	What is the spreading coefficient, and how does it affect the interaction between different phases in pharmaceutical formulations?	5 Marks	L4	CO1
11.	Describe the role of protein binding in drug action and its impact on the pharmacokinetics of drugs. How does the binding of a drug to plasma proteins influence its efficacy and distribution?	5 Marks	L2	CO2
12.	Explain the concept of stability constants (formation constants) and their significance in complexation. How are these constants determined experimentally.	5 Marks	L4	CO2
13.	Compare and contrast the calorimetric and electrometric methods for pH determination. What are the main advantages and disadvantages of each method?	5 Marks	L2	CO4

CODE No.: 23PH101003 SOP-BPH-23

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B. Pharmacy III Semester (SOP-BPH-23) Regular Examinations, January – 2026

PHARMACEUTICAL MICROBIOLOGY

Time: 3 hours **Max. Marks: 75**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Write the significance of Lister theory.	2 Marks	L6	CO1
	b)	Write applications of Tyndallization.	2 Marks	L1	CO1
	c)	Define anthrax.	2 Marks	L1	CO2
	d)	Write the factors affecting MIC.	2 Marks	L1	CO2
	e)	Define Indicator media.	2 Marks	L1	CO3
	f)	Construct a neat labelled diagram of incubator.	2 Marks	L6	CO3
	g)	Define filtration sterilization.	2 Marks	L1	CO4
	h)	Write Pasteurization and its significance.	2 Marks	L6	CO4
	i)	Write principle involved in MR test.	2 Marks	L6	CO5
	j)	Enlist the objectives of HEPA filter.	2 Marks	L4	CO5

PART - B

Answer any TWO Question.
All Questions Carry Equal Marks

2 X 10 = 20 Marks

2.	Write principle, construction and working of Autoclave.	10 Marks	L6	CO4
3.	Write Principles, construction, working, uses of Laminar air flow unit.	10 Marks	L6	CO4
4.	Write the Principle ,construction, working, advantages of Lyophilizer.	10 Marks	L6	CO4

PART - C

Answer any SEVEN Question.
All Questions Carry Equal Marks

7 X 5 = 35 Marks

5.	Derive Biochemical equation of indole test.	5 Marks	L1	CO1
6.	Explain the Principle, construction, working of various filters.	5 Marks	L4	CO1
7.	Define validation and classify them.	5 Marks	L1	CO2
8.	Write principle and applications of microbial assay.	5 Marks	L6	CO2
9.	Write the construction, working,uses of Growth curve.	5 Marks	L6	CO3
10	Explain the microbial spoilages.	5 Marks	L2	CO4
11.	Write a note on preservatives.	5 Marks	L6	CO5
12.	Write construction, working, advantages of deep freezer.	5 Marks	L6	CO3
13.	Write the biological contaminations.	5 Marks	L6	CO5

CODE No.: 23PH101004 SOP-BPH-23

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B. Pharmacy III Semester (SOP-BPH-23) Regular Examinations, January – 2026

PHARMACEUTICAL ENGINEERING

Time: 3 hours **Max. Marks: 75**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Write official standards of powders	2 Marks	L6	CO1
	b)	Differentiate ' attrition' and 'impact' in size reduction	2 Marks	L4	CO1
	c)	Write the mechanisms of heat transfer	2 Marks	L6	CO2
	d)	Construct a neat labeled diagram of simple distillation	2 Marks	L6	CO2
	e)	Write the factors affecting evaporation	2 Marks	L6	CO2
	f)	Define mixing and its applications	2 Marks	L1	CO3
	g)	Define critical moisture content and equilibrium moisture constant	2 Marks	L1	CO3
	h)	Write short note on filter aid.	2 Marks	L6	CO4
	i)	Define centrifugation.	2 Marks	L1	CO4
	j)	Define 'galvanic corrosion and pitting'	2 Marks	L1	CO5

PART - B

Answer any TWO Question.
All Questions Carry Equal Marks

2 X 10 = 20 Marks

2.		Write principle , construction and working of Venturimeter & End runner mill	10 Marks	L6	CO1
3.	a)	Write principle , construction and working of sigma blade blender	5 Marks	L6	CO3
	b)	Write the principle ,construction and working of Pneumatic conveyor	5 Marks	L6	CO5
4.		Write Principle, construction, working of Non-perforated basket centrifuge & Meta filter	10 Marks	L6	CO4

PART - C

Answer any SEVEN Question.
All Questions Carry Equal Marks

7 X 5 = 35 Marks

5.	Derive Bernoulli's equation stating the Assumptions in detail	5 Marks	L3	CO1
6.	Write the Principle, construction ,working of Bag filters	5 Marks	L6	CO1
7.	Define Heat Interchanger & Write Construction ,Working of Floating head two pass heater	5 Marks	L1	CO2
8.	Write principles, construction, working of Ribbon blender	5 Marks	L6	CO3
9.	Write the Principle, construction and working of Flash distillation	5 Marks	L6	CO2
10	Write the Principle, construction, working of Plate & frame filter	5 Marks	L6	CO4
11.	Write a note on Non-ferrous metals.	5 Marks	L1	CO5
12.	Define corrosion. Write Theories of corrosion in detail	5 Marks	L1	CO5
13.	Write the Principle, construction, working of super centrifuge	5 Marks	L1	CO4

CODE No.: 23PA101005 SOP-BPH-23

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B. Pharmacy III Semester (SOP-BPH-23) Regular Examinations, January – 2026

PHARMACEUTICAL ORGANIC CHEMISTRY - II

Time: 3 hours **Max. Marks: 75**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define sulphonation reaction of benzene?	2 Marks	L6	CO1
	b)	Define halogenation reaction of benzene?	2 Marks	L6	CO1
	c)	Write the structure and uses of naphthols ?	2 Marks	L6	CO2
	d)	Draw the srutcture and uses of β naphthol and α naphthol?	2 Marks	L4	CO2
	e)	Define iodine value?	2 Marks	L6	CO3
	f)	Define saponification ?	2 Marks	L6	CO3
	g)	Draw the structure of diphenylmethane and mention its uses	2 Marks	L4	CO4
	h)	Draw the structure of triphenylmethane and mention its uses	2 Marks	L4	CO4
	i)	Explain the bond angle deviation in cyclo propane	2 Marks	L5	CO5
	j)	Explain the bond angle deviation in cyclo butane	2 Marks	L5	CO5

PART - B

Answer any TWO Question.
All Questions Carry Equal Marks

2 x 10 = 20 Marks

2.	Explain any five analytical parameters of fats and oils ?	10 Marks	L5	CO3
3.	Explain in detail about bayers strain theory	10 Marks	L5	CO5
4.	Define polynuclear hydrocarbons, write the structure, synthesis, chemical reactions of naphthalene .	10 Marks	L6	CO4

PART - C

Answer any SEVEN Question.
All Questions Carry Equal Marks

7 x 5 = 35 Marks

5.	Write the mechanism of friedel crafts alkylation reaction of benzene	5 Marks	L6	CO1
6.	What are phenols and explain the acidity of phenols?	5 Marks	L4	CO2
7.	Write the important reactions of benzoic acid?	5 Marks	L6	CO2
8.	Write the preparations methods for aromatic acids?	5 Marks	L6	CO2
9.	Write the differences between fats and oils?	5 Marks	L6	CO3
10	Write the methods of synthesis of phenanthrene	5 Marks	L6	CO4
11.	Write a short note on sachse mohr theory	5 Marks	L6	CO5
12.	Explain coulson and moffits theory	5 Marks	L5	CO5
13.	Write the reactions involved in the synthesis of cyclo alkanes	5 Marks	L6	CO5

CODE No.: 23PC101001 SOP-BPH-23

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B. Pharmacy I Semester (SOP-BPH-23) Regular Examinations, February – 2026

HUMAN ANATOMY AND PHYSIOLOGY-I

Time: 3 hours **Max. Marks: 75**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Write a note on scope of anatomy.	2 Marks	L6	CO1
	b)	Draw a neat labeled diagram of neuromuscular junction.	2 Marks	L4	CO2
	c)	Enlist the bones of ribs.	2 Marks	L4	CO2
	d)	Short notes on Rh Factor	2 Marks	L6	CO3
	e)	Give a note on origin and functions of vagus nerve.	2 Marks	L6	CO4
	f)	Draw a neat labeled diagram of columnar and transitional epithelium	2 Marks	L4	CO1
	g)	Short notes on heart rate.	2 Marks	L2	CO5
	h)	Write a note on coronary blood vessels.	2 Marks	L6	CO4
	i)	Define neuron and neuroglia.	2 Marks	L1	CO3
	j)	Short notes on cardiac cycle.	2 Marks	L6	CO5

PART - B

Answer any TWO Question.
All Questions Carry Equal Marks

2 X 10 = 20 Marks

2.	Explain the Classification of tissues, structure, location and functions of connective and muscular tissue	10 Marks	L1	CO1
3.	Explain anatomy and physiology of Heart.	10 Marks	L1	CO5
4.	Describe the mechanisms of coagulation and write a note on coagulative factors.	10 Marks	L1	CO3

PART - C

Answer any SEVEN Question.
All Questions Carry Equal Marks

7 X 5 = 35 Marks

5.	Explain the cycles of Cell division.	5 Marks	L1	CO1
6.	Describe the anatomy and physiology of spleen and thymus.	5 Marks	L1	CO3
7.	Discuss the structure and functions of sympathetic and parasympathetic nervous system.	5 Marks	L1	CO4
8.	Explain the structure and functions of Ear.	5 Marks	L1	CO4
9.	Explain the conductive zones of heart and cardiac output.	5 Marks	L1	CO5
10	Explain the ABO Blood grouping system and blood transfusion.	5 Marks	L1	CO3
11.	Describe the classification of epithelial tissue and write a note on simple epithelium.	5 Marks	L2	CO2
12.	Explain the Homeostasis with examples.	5 Marks	L1	CO1
13.	Draw a neat labeled diagram of bone and write a note on types of bones cells.	5 Marks	L4	CO2

CODE No.: 23PH101001 SOP-BPH-23

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B. Pharmacy I Semester (SOP-BPH-23) Regular Examinations, February – 2026

PHARMACEUTICS

Time: 3 hours **Max. Marks: 75**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define dosage form. Enlist out different types of liquid dosage forms.	2 Marks	L1	CO1
	b)	Define Syrups and Elixirs.	2 Marks	L1	CO3
	c)	Define prescription. Explain the steps involved in handling of prescription.	2 Marks	L1	CO1
	d)	Define syrups and classify them.	2 Marks	L1	CO3
	e)	Define powders. List out different powders used for internal applications.	2 Marks	L2	CO2
	f)	Describe hygroscopic and deliquescent powders.	2 Marks	L2	CO2
	g)	Describe flocculated and deflocculated suspensions.	2 Marks	L1	CO3
	h)	Describe methods of preparation of emulsions.	2 Marks	L2	CO3
	i)	Define suppositories. List out the evaluation of suppositories.	2 Marks	L1	CO4
	j)	Define pastes and ointments.	2 Marks	L1	CO5

PART - B

Answer any TWO Question.
All Questions Carry Equal Marks

2 x 10 = 20 Marks

2.	a)	Define and classify the pharmaceutical powder using flow diagram.	3 Marks	L1	CO1
	b)	Explain in detail about bulk powders for external use	7 Marks	L2	CO1
3.	a)	Explain the formulation of suspensions.	5 Marks	L2	CO3
	b)	Explain stability problems of suspensions and methods to overcome.	5 Marks	L2	CO3
4.	a)	Summarize the methods of preparation of ointments.	5 Marks	L2	CO4
	b)	Explain the evaluation of ointments.	5 Marks	L2	CO4

PART - C

Answer any SEVEN Question.
All Questions Carry Equal Marks

7 x 5 = 35 Marks

5.	Explain about Indian Pharmacopoeia.	5 Marks	L2	CO1
6.	Define powder form. classification of powder dosage forms.	5 Marks	L1	CO2
7.	Explain in detail handling of prescription.	5 Marks	L2	CO1
8.	Define posology. Explain any 4 factors affecting the dose of the drug (posology).	5 Marks	L1	CO1
9.	Define suppository and Describe methods for preparation of suppositories.	5 Marks	L1	CO4
10	Define and classify powders. Add a note on dusting powders.	5 Marks	L1	CO2
11.	Explain about gargles and mouthwashes.	5 Marks	L2	CO3
12.	Explain the difference between pastes and ointments	5 Marks	L2	CO5
13.	Classify the types of incompatibility. Explain a note on different types of physical incompatibilities.	5 Marks	L2	CO4

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CODE No.: 23PY101001 SOP-BPH-23

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B. Pharmacy I Semester (SOP-BPH-23) Regular Examinations, February – 2026

COMMUNICATION SKILLS

Time: 3 hours **Max. Marks: 35**

PART - A

Answer any ONE Question

1 x 10 = 10 Marks

1.	Explain the barriers to communication in detail.	10 Marks	L2	CO1
2	Discuss the significance of Verbal Communication.	10 Marks	L4	CO2

PART - B

Answer any FIVE Question.

5 x 5 = 25 Marks

3.	Explain the importance of Basic Listening Skills.	5 Marks	L2	CO4
4.	Explain the characteristics of a good presenter.	5 Marks	L2	CO4
5.	Write about techniques of delivery in presentations.	5 Marks	L2	CO4
6.	Explain the difference between direct and indirect communication.	5 Marks	L1	CO4
7.	Explain the Do's and Don'ts of group discussion.	5 Marks	L2	CO5
8.	Write about the steps to writing effectively.	5 Marks	L3	CO5
9.	Describe the techniques for good technical writing	5 Marks	L4	CO5

CODE No.: 23PY101002 SOP-BPH-23

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

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B. Pharmacy I Semester (SOP-BPH-23) Regular Examinations, February – 2026

REMEDIAL BIOLOGY

Time: 3 hours **Max. Marks: 35**

PART - A

Answer any ONE Question

1 x 10 = 10 Marks

1.	Discuss the salient features of Kingdom Plantae and Animalia with suitable examples.	10 Marks	L4	CO1
2	Explain Anatomy and physiology of female reproductive system	10 Marks	L4	CO6

PART - B

Answer any FIVE Question.

5 x 5 = 25 Marks

3.	Describe the characteristic features of Kingdom Protista.	5 Marks	L2	CO1
4.	Explain the general characters of Kingdom Fungi with examples.	5 Marks	L2	CO1
5.	Explain nitrogen metabolism in plants.	5 Marks	L1	CO3
6.	Write a short note on nitrate reduction in plants.	5 Marks	L3	CO3
7.	Explain the structure and functions of urinary system.	5 Marks	L1	CO2
8.	Differentiate between aerobic respiration and anaerobic respiration.	5 Marks	L4	CO4
9.	Describe the anatomy and physiology of blood vessels.	5 Marks	L1	CO2

CODE No.: 23PY101003 SOP-BPH-23

Reg. No. | | | | | | | | | | | | |

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SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B. Pharmacy I Semester (SOP-BPH-23) Regular Examinations, February – 2026

REMEDIAL MATHEMATICS

Time: 3 hours **Max. Marks: 35**

PART - A

Answer any ONE Question

1 x 10 = 10 Marks

1.	a) Write the partial fraction of $\frac{2x+3}{(x+1)^2}$ b) Find $lim_{x\to 2}\frac{x^2-4}{x-2}$.	10 Marks	L2	CO1
2	a) Add and multiply the matrices: $A=\begin{bmatrix}1 & 2\\ 3 & 4\end{bmatrix},\ B=\begin{bmatrix}0 & 1\\ 5 & 6\end{bmatrix}$. b) Find minors and cofactors of all elements of $A=\begin{bmatrix}4 & 1\\ 2 & 3\end{bmatrix}$.	10 Marks	L2	CO2

PART - B

Answer any FIVE Question.

5 x 5 = 25 Marks

3.	Check whether $f(x)=x^2-3x+2$ has a maximum or minimum.	5 Marks	L2	CO3
4.	State chain rule, differentiate $y = ln(sin\ x)$.	5 Marks	L2	CO3
5.	Check whether the lines 2x - 3y + 1 = 0 and 3x + 2y – 5 = 0 are parallel.	5 Marks	L2	CO4
6.	Evaluate the definite integral $\int_0^2 (x+1)dx$.	5 Marks	L2	CO4
7.	Define order and degree of a differential equation. Find the order and degree of $\left(\frac{d^2y}{dx^2}\right)^3+\left(\frac{dy}{dx}\right)^2=y$.	5 Marks	L2	CO5
8.	Define Laplace transform. Find the inverse Laplace transform of $\frac{5}{s+4}$.	5 Marks	L2	CO5
9.	Solve the homogeneous equation $\frac{dy}{dx}=\frac{x+y}{x-y}$.	5 Marks	L2	CO5

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