SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech (SVEC10) Supplementary Examinations September – 2020

ENGINEERING MATHEMATICS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Electronics and Control Engineering, Computer Science and Systems Engineering]

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

Answer any FIVE questions
All questions carry equal marks

1. a) Solve the differential equation $\frac{dy}{dx} + x\sin 2y = x^3\cos^2 y$.

b) If the temperature of the air is 30^0C and the substance cools from 100^0C to 70^0C in 15 minutes, find when the temperature will be 40^0C.

2. a) Solve $(D^2 - 4D + 4)y = 8x^2e^{2x}\sin 2x$ ..

b) Solve by the method of variation of parameters $y^{11} - 2y^1 + y = e^x \log x$.

3. a) Find the maximum and minimum distances from the origin to the curve $3x^2 + 4xy + 6y^2 = 140$.

b) Calculate $\frac{\partial(u,v)}{\partial(r,\theta)}$, if $u = 2axy, v = a(x^2 - y^2)$. Where $x = r\cos\theta$, $y = r\sin\theta$.

4. a) Trace the curve $r^2 = a^2\cos 2\theta$ . .

b) Find the envelope of the family of circles passing through the origin and with their centers lying on the ellipse.

5. a) Find the Laplace Transform of $f(t) = |t-1| + |t+1|, t \geq 0$.

b) Find the inverse Laplace transform of (i) $\frac{s}{s^4 + 4a^4}$ (ii) $\log\frac{s^2+1}{s(s+1)}$.

6. a) Use Laplace transform method to solve $\frac{d^2x}{dt^2} - 2\frac{dx}{dt} + x = e^t$ with x=2, $\frac{dx}{dt} = -1$ at t=0.

b) Find the inverse Laplace transform of $\log\frac{s+1}{s-1}$.

7. a) Find the Volume of the tetrahedron bounded by the planes x=0, y=0, z=0 and $\frac{x}{a} + \frac{y}{b} + \frac{z}{c} = 1$

.

b) Change the order of integration in $I = \int_0^1 \int_0^{\sqrt{1-x^2}} y^2\, dx\, dy$ and hence evaluate the same.

8. a) Prove that $\nabla\left\{\frac{f(r)\bar{r}}{r}\right\} = \frac{1}{r^2}\frac{d(r^2 f(r))}{dr}$.

b) Use Green's theorem to evaluate $\int_C (x^2 ydx + x^2 dy)$, where C is the boundary described counter clock wise of the triangle with vertices (0,0) (1,0), (1,1).

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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I B.Tech (SVEC10) Supplementary Examinations September – 2020

MATHEMATICAL METHODS

[Electrical and Electronics 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 any FIVE questions
All questions carry equal marks

1. a) Define rank of a matrix. Find the rank of A by reducing to it's in normal form, where

$$A = \begin{bmatrix} 1 & 2 & 3 & -2 \\ 2 & -2 & 1 & 3 \\ 3 & 0 & 4 & 1 \end{bmatrix}$$

b) For which values of 'a' the following linear system has (i). No solution (ii). Unique solution (iii). Infinitely many solutions

$x + 2y - 3z = 4$, $3x - y + 5z = 2$, $4x + y + (a^2 - 14)z = a + 2$.

2. a) Find the eigen values and the corresponding eigen vectors of the matrix $\begin{pmatrix} -2 & 5 \\ -1 & 4 \end{pmatrix}$.

b) Find the inverse of the matrix $\begin{pmatrix} 1 & 0 & 2 \\ 0 & 1 & 2 \\ 1 & 2 & 0 \end{pmatrix}$ using Cayley- Hamilton theorem.

3. a) Find the real root of the equation **$x e^x - \cos x = 0$**, using Newton Raphson Method.

b) Fit a straight line of the form **$y = a + bx$** by the method of least squares to the data given below.

x	1	2	3	4
Y	4	11	35	100

4. a) From the following table values of x and $y = e^x$ interpolate values of y when x=1.91.

x	1.7	1.8	1.9	2	2.1	2.2
e^x	5.4739	6.0496	6.6859	7.3891	8.1662	9.0250

b) In the table below the values of y are consecutive terms of a series of which the number 21.6 is the 6th term. Find the 1st and 10th terms of the series.

x	3	4	5	6	7	8	9
y	2.7	6.4	12.5	21.6	34.3	51.2	72.9

5. a) From the following table, find x, correct to four decimal places, for which y is minimum and find this value of y.

x	0.60	0.65	0.70	0.75
y	0.6221	0.6155	0.6138	0.6170

b) Evaluate $\int_0^1 \sqrt{1 + x^4}\, dx$ using Simpson's $\frac{3}{8}$ rule.

6. Given that **$y^1 = 1 + xy^2$, $y(0) = 1$** , find **$y(0.1)$, $y(0.2)$, $y(0.3)$** by Euler's method and then find the value of **$y(0.4)$** by Milne's method.

7. a) Find the Z- transform of $\sin(3n + 5)$.

b) Find $Z\left\{\frac{1}{(n+2)(n+1)}\right\}$.

8. a) Find the half range cosine series for **f(x) = x (2 - x)** in **0 ≤ x ≤ 2** and hence find the sum of the series **$1/1^2 - 1/2^2 + 1/3^2 - 1/4^2 + \ldots$**

b) Find the Fourier sine transform of **$x / (a^2 + x^2)$.**

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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I B.Tech (SVEC10) Supplementary Examinations September – 2020

PROBLEM SOLVING AND COMPUTER PROGRAMMING

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Electronics and Control Engineering, Computer Science and Systems Engineering]

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

Answer any FIVE questions
All questions carry equal marks

1. a) With a net schematic diagram, establish the relationship between application and system software.
b) Briefly explain the top down design technique of problem solving.

2. a) Explain the following and illustrate it with an example each.
i) Increment and Decrement operator. ii) Conditional operator.
b) State the rules for evaluating an expression in automatic type conversion.

3. a) Explain about ***pretest*** loops?
b) Write a C program to find the sum of N terms of the following series:
sum = 2 + 3/1! - 6/2! + 9/3! - 12/4! .....!

4. a) Write a program to find GCD of given two numbers
b) Write a program to check whether a given number is palindrome or not.

5. a) Write a C program for bubble sort.
b) Distinguish strcpy( ) and strncpy( ) functions using appropriate examples.

6. a) Define recursion. Write a routine for factorial using recursion.
b) Explain nested structures with suitable example.

7. a) Write a C program for accessing structure members using structure pointer variable.
b) What are different arithmetic operations which can be performed on pointer variables?

8. a) Write a C program to display the contents of a file in reverse order.
b) Write a C program for implementing linear queue operations.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech (SVEC14) Supplementary Examinations December - 2019

ENGINEERING PHYSICS

[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)	What are the essential requirements of laser action? Describe the construction and working of a ruby laser with neat diagrams.	10 Marks
	b)	Find out the differences between spontaneous and stimulated emission of light.	4 Marks
		(OR)	
2	a)	What are the types of optical fibers? Classify optical fibers based on modes of propagation and index profile.	8 Marks
	b)	Describe the optical fiber communication in detail and write applications of optical fibers in sensors.	6 Marks

UNIT-II

3	a)	What is time dilation and length contraction?	4 Marks
	b)	Derive the energy-momentum relation.	10 Marks
		(OR)	
4	a)	Explain the reverberation and time reverberation.	6 Marks
	b)	Describe the absorption coefficient of sand and its measurements.	8 Marks

UNIT-III

5	a)	Describe the various Scattering source of electrical resistance in metals.	6 Marks
	b)	Derive and explain Fermi-Dirac distribution.	8 Marks
		(OR)	
6	a)	Discuss the electron in a periodic potential.	8 Marks
	b)	Explain the origin of energy band formation in solids.	6 Marks

UNIT-IV

7	a)	Discuss different types of dielectric polarization and explain electronic polarizability in atoms and obtain an expression for electronic polarizability in terms of the atomic radius.	8 Marks
	b)	Define Piezo Electric Effect and mention few applications of piezo electric materials.	6 Marks
		(OR)	
8	a)	What is Hall Effect? Give an elementary theory of Hall Effect to determine mobility of charge carriers. Mention the important uses of the Hall Effect.	8 Marks
	b)	Explain the principle and working of LED and give few applications of LED.	6 Marks

UNIT-V

9	a)	Describe the classification of magnetic materials.	7 Marks
	b)	Discuss on Type-I and Type-II superconductors.	7 Marks
		(OR)	

10 a) Describe the properties of nanomaterials. 7 Marks

b) Explain the application of nanomaterials. 7 Marks

CODE No.:14BT1BS02 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech (SVEC14) Supplementary Examinations December - 2019

ENGINEERING CHEMISTRY

[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)	Explain the properties of insulators with some examples.	7 Marks
	b)	Discuss constituent of composites with some examples.	7 Marks
		(OR)	
2	a)	Define term sensor. Explain the various types of sensors.	7 Marks
	b)	Give the classification of insulators with some examples.	7 Marks

UNIT-II

3	a)	A Sample of water on analysis has been found to contain the following in ppm **$Ca(HCO_3)_2$** = 4.86, **Mg $(HCO_3)_2$** = 5.84, **$CaSO_4$** = 6.80, **$MgSO_4$** = 8.40. Calculate the temporary and permanent hardness of water.	7 Marks
	b)	Describe the Zeolite process of water softening. Explain the reactions involved.	7 Marks
		(OR)	
4	a)	Write a short note on boiler corrosion.	7 Marks
	b)	Discuss the desalination of brackish water by electrodialysis.	7 Marks

UNIT-III

5	a)	Explain the working principle of proton exchange membrane fuel cell with reactions.	7 Marks
	b)	Derive the Nernst's equation for single electrode potential and explain the terms involved in it.	7 Marks
		(OR)	
6	a)	Write chemistry involved in Eco friendly battery.	8 Marks
	b)	Explain different types of corrosion.	6 Marks

UNIT-IV

7	a)	Explain mechanism of lubrication using boundary film lubrication.	7 Marks
	b)	Describe various steps involved in refining of petroleum.	7 Marks
		(OR)	
8	a)	Define calorific value of a fuel. Distinguish between gross and net calorific value.	7 Marks
	b)	Discuss any three properties of Lubricants.	7 Marks

UNIT-V

9	a)	Explain one method to synthesize nanomaterial.	7 Marks
	b)	Write the advantages of green chemistry.	7 Marks
		(OR)	
10	a)	Write the classification of nanomaterials.	7 Marks

b) Explain: i) Green manufacturing systems ii) Tools of green chemistry 7 Marks

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CODE No.:14BT1BS03 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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I B.Tech (SVEC14) Supplementary Examinations December - 2019

ENGINEERING MATHEMATICS

[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) Solve: $\frac{dy}{dx} + x\sin 2y = x^3\cos^2 y.$ 7 Marks

b) Solve: $y'' - 2y' + y = e^x \log x$ by the method of variation of parameters. 7 Marks

(OR)

2 a) Solve the differential equation $(D^2 + 2D + 2)y = e^{-x} + \sin 2x.$ 7 Marks

b) Applying the method of variation of parameters,solve $(D^2 + 4)y = \sec 2x.$ 7 Marks

UNIT-II

3 a) Determine the points where a function $x^3 + y^3 - 3axy$ has a maximum or minimum. 7 Marks

b) Trace the curve $r^2 = a^2\cos 2\theta.$ 7 Marks

(OR)

4 a) Sketch the curve for the equation $y^2(a - x) = x^3$ $(a > 0)$. 7 Marks

b) Estimate the radius of curvature ρ at any point of the cycloid $x = a(\theta + \sin\theta)$, $y = a(1 - \cos\theta)$ and evaluate ρ at $\theta = \pi/2$. 7 Marks

UNIT-III

5 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) Evaluate $\iint (x^2 + y^2)dxdy$ in the positive quadrant for which $x + y \le 1$. 7 Marks

(OR)

6 a) Evaluate $\int_0^1 \int_0^{\sqrt{1-y^2}} x^3 y\, dxdy$ by changing the order of integration. 7 Marks

b) Find the volume common to the cylinders $\boldsymbol{x^2 + y^2 = a^2}$ and $\boldsymbol{x^2 + z^2 = a^2}$. 7 Marks

UNIT-IV

7 a) State convolution theorem and hence evaluate $L^{-1}\left[\frac{s}{(s^2 + a^2)^2}\right]$. 7 Marks

b) Find the Laplace transform of (i) $t\,e^{2t}\sin 3t$ (ii) $\cos h$ at $\sin bt.$ 7 Marks

(OR)

8 a) Using Laplace transform solve $y'' - 3y' + 2y = 4x + e^{2x}$ where $y = 1, y' = -1$ at $x = 0$. 7 Marks

b) Using Laplace transform, evaluate $\int_0^\infty \frac{e^{-at}Sin^2 t}{t}dt$. 7 Marks

UNIT-V

9 a) Show that the vector field $\overline{F} = (x^2 + xy^2)\vec{i} + (y^2 + x^2y)\vec{j}$ is irrotational and find a scalar potential φ such that $\overline{F} = \nabla\phi$ — 7 Marks

b) Verify Green's Theorem for $\oint_c (xy + y^2)dx + x^2dy$, where C is bounded by $y = x$ and $y = x^2$. — 7 Marks

(OR)

10 a) Find the work done by $\overline{F} = (2x - y - z)i + (x + y - z)j + (3x - 2y - 5z)k$ along a curve *C* in the *xy*-plane given by $x^2 + y^2 = 9$, z = 0. — 7 Marks

b) Use Gauss divergence theorem, to evaluate $\iint_S (xdydz + ydzdx + zdxdy)$ where *S* is the portion of the plane $x + 2y + 3z = 6$, which lies in the first octant. — 7 Marks

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I B.Tech (SVEC14) Supplementary Examinations December - 2019

PROGRAMMING IN C AND DATA STRUCTURES

[Civil Engineering, Electrical and Electronics Engineering, Mechanical 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)	Draw a flowchart to find the largest of three numbers *A, B, C.*	7 Marks
	b)	What is an Algorithm? Write an algorithm for the addition of *N* given numbers.	7 Marks
		(OR)	
2	a)	What is a variable? Discuss its scope, initializations.	7 Marks
	b)	How to handle different data types in expression evaluation? Discuss type conversions in C.	7 Marks

UNIT-II

3	a)	What are formatted input and output statements in C? Give suitable examples.	7 Marks
	b)	Explain the two way selection (if, if-else, nested if-else, cascaded ifelse) in C language with syntax.	7 Marks
		(OR)	
4	a)	Explain about iterative and repetitive execution with a simple program using FOR loop.	7 Marks
	b)	Discuss about special control statements with their syntax.	7 Marks

UNIT-III

5	a)	Explain array and Multidimensional array in C.	7 Marks
	b)	Write a C program for searching an element within array.	7 Marks
		(OR)	
6	a)	Differentiate between call by value and call by reference with suitable program.	7 Marks
	b)	Demonstrate quick sort with a program.	7 Marks

UNIT-IV

7	a)	What is the difference between array of pointers and pointer to an array? What are the different ways for allocating memory for variables dynamically and write the syntax of each of them?	7 Marks
	b)	Write the differences between character array and a string. Explain any four string handling functions used in C programming language.	7 Marks
		(OR)	
8	a)	Explain the following with syntax and example. i) Pointer as function argument. ii) Function returning pointer.	7 Marks
	b)	Describe the pointer in C with an example.	7 Marks

UNIT-V

9	a)	What is circular linked list? What are its merits and demerits over single linked list?	7 Marks
	b)	Explain the applications of stacks in detail.	7 Marks
		(OR)	
10		Write a C program to add and multiply two polynomials using singly linked list.	14 Marks

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I B.Tech (SVEC14) Supplementary Examinations December – 2019

PROBLEM SOLVING AND COMPUTER PROGRAMMING

[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)	What are the characteristics of a flow chart?	7 Marks
	b)	Draw flow chart for finding largest among three numbers.	7 Marks
		(OR)	
2	a)	What is a constant? List out different constants used in C.	7 Marks
	b)	What is the use of variable? Why they are needed?	7 Marks

UNIT-II

3	a)	Give different control structures used in C.	7 Marks
	b)	Write a program to check given number is strong number or not.	7 Marks
		(OR)	
4	a)	Write note on switch and break statements.	7 Marks
	b)	Write a C program to print the given number in words.	7 Marks

UNIT-III

5	a)	Write a C program to insert an element in a given array.	7 Marks
	b)	Write a C program to find the transpose of a given matrix.	7 Marks
		(OR)	
6	a)	Explain Storage classes in C language.	7 Marks
	b)	Write a function to perform addition of two complex numbers.	7 Marks

UNIT-IV

7	a)	What are nested structures and how they are defined?	7 Marks
	b)	Write a program to process student records by using structures.	7 Marks
		(OR)	
8	a)	What is meant by pointer? Explain about pointer to array.	7 Marks
	b)	Write a C program to copy one string to another string using pointers.	7 Marks

UNIT-V

9	a)	Explain Comment line arguments with the help of example.	7 Marks
	b)	Write a C program to reverse the content of a file.	7 Marks
		(OR)	
10	a)	Define Stack. Illustrate stack with the help of example.	7 Marks
	b)	Write a C program to perform push and pop operation in stack.	7 Marks

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I B.Tech (SVEC14) Supplementary Examinations September – 2020

ENGINEERING PHYSICS

[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)	What are the Characteristics of Lasers?	6 Marks
	b)	Explain the Semiconductor Laser construction with neat diagram.	8 Marks
		(OR)	
2	a)	Write the Sabine's formula for reverberation time.	6 Marks
	b)	Explain the basic requirements of acoustically good hall.	8 Marks

UNIT-II

3	a)	What are the absolute frames of reference?	6 Marks
	b)	Discuss about Mass-Energy Equivalence.	8 Marks
		(OR)	
4	a)	How to determine the miller Indices in cubic crystals.	6 Marks
	b)	Derive the Bragg's law and describe the x-ray powder diffraction method.	8 Marks

UNIT-III

5	a)	What is effective mass? Derive an expression for effective mass of an electron.	9 Marks
	b)	Explain origin of energy band formation in solids.	5 Marks
		(OR)	
6	a)	Distinguish between metal, semiconductors and insulators based on band theory.	6 Marks
	b)	Derive the Kronig-Penney model for Potential Well.	8 Marks

UNIT-IV

7	a)	Distinguish between intrinsic and extrinsic semiconductors with examples.	6 Marks
	b)	Derive the Einstein's relation.	8 Marks
		(OR)	
8	a)	Derive the Clausius- Mossotti equation.	8 Marks
	b)	State and explain the polarization and dielectric constant.	6 Marks

UNIT-V

9	a)	Explain the Hysteresis of ferromagnetism.	6 Marks
	b)	Describe the classification of magnetic materials with properties and examples.	8 Marks
		(OR)	
10	a)	Describe the properties of nanomaterials.	7 Marks
	b)	Explain the application of nanomaterials.	7 Marks

CODE No.:14BT1BS02 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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I B.Tech (SVEC14) Supplementary Examinations September – 2020

ENGINEERING CHEMISTRY

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Electronics and Control Engineering, Computer Science and Systems Engineering, Bio-Technology]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Give the classification of composites.	7 Marks
	b)	Explain characteristic properties of insulators.	7 Marks
		(OR)	
2	a)	Define term sensor. Explain the various types of sensors.	7 Marks
	b)	Give the classification of insulators with some examples.	7 Marks

UNIT-II

3	a)	Write a short note on boiler corrosion.	7 Marks
	b)	Discuss the desalination of brackish water by electrodialysis.	7 Marks
		(OR)	
4	a)	Discuss various steps involved in the treatment of ground water to be used for domestic purposes.	7 Marks
	b)	Define Reverse Osmosis. Explain the process of purification of sea water using this technique.	7 Marks

UNIT-III

5	a)	Define electroplating. Explain electroplating of nickel.	8 Marks
	b)	Write the chemistry of Ni-Cd battery and give its important applications.	6 Marks
		(OR)	
6	a)	Define corrosion? Discuss concentration cell corrosion.	7 Marks
	b)	Compare H_2-O_2 fuel cell with traditional cells.	7 Marks

UNIT-IV

7	a)	How do you measure viscosity using Redwood viscometer?	8 Marks
	b)	Explain how refining of petroleum is carried out.	6 Marks
		(OR)	
8	a)	Define calorific value of a fuel. Distinguish between gross and net calorific value.	7 Marks
	b)	Discuss any three properties of Lubricants.	7 Marks

UNIT-V

9	a)	Write brief note on the applications of nano materials.	7 Marks
	b)	How nano materials are synthesized with the help of Chemical Vapor Deposition (CVD)	7 Marks
		(OR)	
10	a)	What are the factors affecting the properties of Nanomaterials.	7 Marks

b) How nanomaterials are classified. 7 Marks

CODE No.:14BT1ES01 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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I B.Tech (SVEC14) Supplementary Examinations September – 2020

PROGRAMMING IN C AND DATA STRUCTURES

[Civil Engineering, Electrical and Electronics Engineering, Mechanical 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)	Discuss guideline for drawing a flowchart and draw a flowchart for finding the sum of 'n' numbers starting from 1.	7 Marks
	b)	Discuss in detail the program execution steps.	7 Marks
		(OR)	
2	a)	Explain the structure of a C program with an example.	7 Marks
	b)	Define an operator. Explain different operators in C.	7 Marks

UNIT-II

3	a)	Explain the 'switch' statement with an example.	7 Marks
	b)	Write a C program to find the factorial of a number.	7 Marks
		(OR)	
4	a)	What are formatted input and output statements in C? Give suitable examples.	7 Marks
	b)	Explain the two way selection (if, if-else, nested if-else, cascaded ifelse) in C language with syntax.	7 Marks

UNIT-III

5	a)	Discus representation of array elements in memory with illustrations.	7 Marks
	b)	Write a program to display sum of the primary diagonal numbers in a n x n matrix	7 Marks
		(OR)	
6	a)	Differentiate between call by value and call by reference with suitable program.	7 Marks
	b)	Demonstrate quick sort with a program.	7 Marks

UNIT-IV

7	a)	Explain the following with syntax and example : i) Pointer as function argument. ii) Function returning pointer.	7 Marks
	b)	Describe the pointer in C with an example.	7 Marks
		(OR)	
8	a)	What is pointer variable? Write the advantages of pointers in C. What is the difference between malloc, calloc and realloc?	7 Marks
	b)	Write a C program to concatenate two strings using pointers (you are discouraged to use any system defined functions).	7 Marks

UNIT-V

9	a)	Describe the terms related to Binary Tree: Level, Depth, Leaf Node and Root Node.	7 Marks
	b)	Write a C program to implement Non recursive implementation of Binary search.	7 Marks
		(OR)	
10	a)	Discuss the operations allowed on queues with illustrations.	7 Marks
	b)	Can you construct a stack using single linked list? Justify your answer	7 Marks

CODE No.:14BT10301 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech (SVEC14) Supplementary Examinations September – 2020

ENGINEERING MECHANICS
[Civil Engineering, Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Reduce the following forces into single force and couple acting at the origin. 14 Marks
F_1=200N passing through (2,3) and (4,5).
F_2=400N passing through (-2,3) and (3,4).
F_3=600N passing through (2,-3) and (4,0).

(OR)

2 a) Explain the types of friction with examples. 4 Marks
b) Two equal bodies A and B of weight `W' each are placed on a rough inclined plane. The bodies are connected by a light string. If $\mu_A = 1/2$ and $\mu_B = 1/3$, show that the bodies will be both on the point of motion when the plane is inclined at $\tan^{-1}$ (5/12). 10 Marks

UNIT-II

3 a) Define 'Redundant Frame' with examples. 2 Marks
b) A cantilever truss of 3m span is loaded as shown in figure 1. Calculate the forces in the various members of the truss, using method of joints. 12 Marks

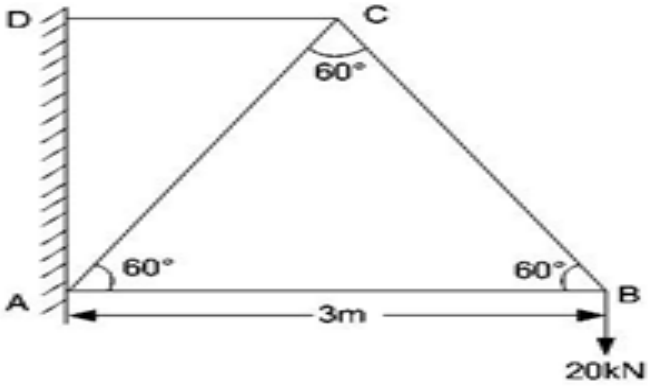

Figure 1

(OR)

4 Compute the forces in all the members of a truss shown in figure 2. 14 Marks

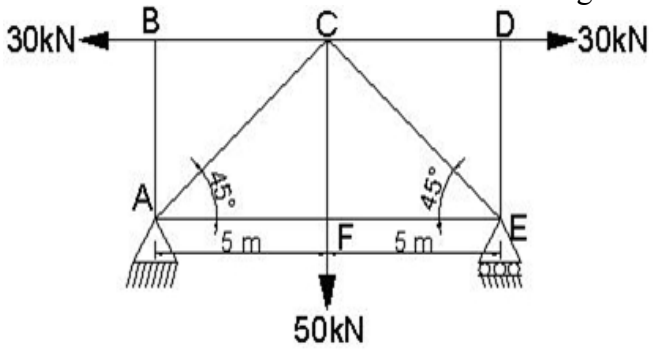

Figure 2

UNIT-III

5		Determine the Second moment area of a Tee-section about two orthogonal axes passing through the centroid. Height of the section is 220mm, flange width is 150mm, flange thickness is 20mm.	14 Marks

(OR)

6	a)	State and explain Pappus -Guldinus theorems for surface of revolution.	4 Marks
	b)	Find the moment of inertia of a rectangular section of 12cm long and 10cm deep about the centre of gravity.	10 Marks

UNIT-IV

7	a)	Distinguish between: i) Resultant velocity and relative velocity. ii) Acceleration and retardation.	4 Marks
	b)	A cricket ball thrown from a height of 1.8m at an angle of 30^0 with the horizontal with a speed of 18m/s is caught by another field man at a height of 0.60m from the ground. Estimate the distance between the two men.	10 Marks

(OR)

8		A bus starts from rest at point A and accelerates at the rate of $0.9 m/s^2$ until it reaches a speed of 7.2m/s. It then proceeds with the same speed until the brakes are applied. It comes to rest, at point B, 18m beyond the point where the brakes are applied. Assuming uniform acceleration, estimate the time required for the bus to travel from A to B. Distance AB = 90m.	14 Marks

UNIT-V

9		A glass ball is dropped on to a smooth horizontal floor from which it bounces to a height of 9m. On the second bounce it rises to a height of 6m. From what height the ball was dropped and what is the coefficient of restitution between the glass and the floor?	14 Marks

(OR)

10	a)	Derive the expressions for velocity and acceleration of a particle subjected to a force as a function of velocity.	7 Marks
	b)	Explain the equations of equilibrium of a rigid body experiencing a planar motion.	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations December - 2019

ENGINEERING CHEMISTY

[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)	Outline the type of hardness of water and summarize the disadvantages of hard water.	6 Marks
	b)	Discuss deionization process of water softening with neat diagram. Give the chemical reactions where ever is necessary.	8 Marks
		(OR)	
2	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

UNIT-II

3	a)	Discuss the synthesis, properties and applications of poly carbonates.	7 Marks
	b)	Explain the mechanism of degradation and applications of Bio-degradable polymers.	7 Marks
		(OR)	
4	a)	"All polymers are not insulators". Justify.	5 Marks
	b)	Discuss types of composites and mention their four industrial applications.	9 Marks

UNIT-III

5	a)	Recommend two tools of GREEN CHEMISTRY and discuss with the suitable examples.	7 Marks
	b)	Discuss the role of Nanomaterials in cosmetics and medical field.	7 Marks
		(OR)	
6	a)	Explain wet chemical synthesis of Nanomaterials.	7 Marks
	b)	Discuss the applications of GREEN CHEMISTRY in science and technology.	7 Marks

UNIT-IV

7	a)	Describe the working principle, construction and chemistry of 1.5 V Zn – MnO_2 cell.	8 Marks
	b)	Compare Lithium-ion battery and Lithium-polymer batteries	6 Marks
		(OR)	
8	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. i) Digital Camera. ii) MP3 Player.	10 Marks
	b)	Discuss the applications of electrochemical sensors.	4 Marks

UNIT-V

9	a)	Identify the factors involved in influencing corrosion in the given underground and marine structures and explain.	7 Marks
	b)	How will you assess the situation and select the lubricant? Also explain mechanism of lubrication.	7 Marks

(OR)

10	a)	A student in replying to an examination question writes: 'Corrosion of metal is due to electrical currents of electrochemical origin, stop current stop corrosion. Comment on the correctness or otherwise of this statement on the basis of your knowledge of electrochemistry.	10 Marks
	b)	Write the qualities of a good lubricant.	4 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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I B.Tech I Semester (SVEC-16) Supplementary Examinations December - 2019

MATRICES AND NUMERICAL METHODS

[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) Reduce the matrix "A" into its normal form and hence evaluate its rank where 7 Marks

$$A = \begin{bmatrix} 8 & 1 & 3 & 6 \\ 0 & 3 & 2 & 2 \\ -8 & -1 & -3 & 4 \end{bmatrix}.$$

b) Verify that that the system of equations 7 Marks

$2x_1-2x_2+x_3=\lambda x_1$

$2x_1-3x_2+2x_3=\lambda x_2$

$-x_1+2x_2=\lambda x_3$ can possess a non-trivial solution only if $\lambda = 1, \lambda = -3$.

Obtain the general solution in each case.

(OR)

2 a) Reduce the matrix $A = \begin{bmatrix} 2 & 1 & 2 & 1 & 6 \\ 6 & -6 & 6 & 12 & 36 \\ 4 & 3 & 3 & -3 & -1 \\ 2 & 2 & -1 & 1 & 10 \end{bmatrix}$ into its Echelon form and hence evaluate its rank. 7 Marks

b) Test the consistency and find the solution of the system of equations. 7 Marks

$x + y + z = 6$

$x - y + 2z = 5$

$3x + y + z = 8$

$2x - 2y + 3z = 7.$

UNIT-II

3 a) Estimate a real root of the equation $x^3 - 4x - 9 = 0$, using Regula-Falsi method. 7 Marks

b) Fit a polynomial of second degree to the data points given in the following table: 7 Marks

x	0	1.0	2.0
y	1.0	6.0	17.0

(OR)

4 a) Locate the interval which contains a nontrivial root of $\sin(x) = x^2$ where x is in radians. Perform the computation for finding the root corrected up to three decimal places. By bisection method. 7 Marks

b) A simply supported beam carries a concentrated load P(lb) at its midpoint corresponding to various values of P, the maximum deflection Y(in) is measured. The data are given below. 7 Marks

Evaluate an equation of the form **Y=a+bP** by the method of least squares.

P	100	125	140	160	180	200
Y	0.45	0.55	0.60	0.70	0.80	0.85

UNIT-III

5 a) Estimate the missing term in the following table: 7 Marks

x:	0	1	2	3	4
F(x):	1	3	9	-	81

b) Find the parabola passing through the points (0,1),(1,3) and (3,55) using Lagrange's interpolation formula. 7 Marks

(OR)

6 a) Use Lagrange's interpolation formula to find the value of y when x=10, if the following values of x and y are given: 7 Marks

x	5	6	9	11
y	12	13	14	16

b) From the following table, estimate the number of students who obtained marks between 40 and 45: 7 Marks

Marks	30-40	40-50	50-60	60-70	70-80
No. of students	31	42	51	35	31

UNIT-IV

7 a) The following table gives the velocity v of a particle at time t: 7 Marks

t (seconds) :	0	2	4	6	8	10	12
v (m/sec) :	4	6	16	34	60	94	136

Find the acceleration at t = 12 seconds.

b) A river is 80 feet wide. The depth d in feet at a distance x feet from one bank are given by the following table: 7 Marks

x	0	10	20	30	40	50	60	70	80
d	0	4	7	9	12	15	14	8	3

Find approximately the area of the cross-section river using Simpsons rule.

(OR)

8 a) The distance travelled by a vehicle at various time intervals during the initial running: 7 Marks

Time **t**(sec.):	6	7	8
Distance travelled s (km):	10.0	14.5	19.5

Estimate the velocity of the vehicle at time t= 6 seconds.

b) The velocity v(km/min) of a moped which starts from rest, is given at fixed intervals of time t (min) as follows: 7 Marks

t	2	4	6	8	10	12	14	16	18	20
v	10	18	25	29	32	20	11	5	2	0

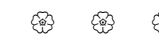
Estimate approximately the distance covered in 20 minutes.

UNIT-V

9 Solve the initial value problem $\frac{dy}{dx} = -2xy^2, y(0) = 1$ with h=0.5 on the interval [0, 1]. Use the fourth order Runge-Kutta method. 14 Marks

(OR)

10 Apply Runge-Kutta method of fourth order, find an approximate value of y for x = 0.2 insteps of 0.1 if $\frac{dy}{dx} = x + y^2$ given that y=1, when x=0. 14 Marks



SREE VIDYANIKETHAN ENGINEERING COLLEGE

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I B.Tech I Semester (SVEC-16) Supplementary Examinations December - 2019

MULTIVARIABLE 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 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) Obtain the solution of the differential equation: 7 Marks

$\frac{dy}{dx} + \frac{y\cos x + \sin y + y}{\sin x + x\cos y + x} = 0$.

b) Obtain the orthogonal trajectories of circles $r = a\cos\theta$. 7 Marks

(OR)

2 a) Determine the solution of the differential equation 7 Marks

$(x + y - 1)dy - (x - y + 2)dx = 0$.

b) If the air is maintained at 15ºC and the temperature of body drops from 70°C to 40°C in 10 minutes. Determine the temperature of the body after 30 minutes. 7 Marks

UNIT-II

3 a) Determine the solution of $(D^3 - 5D^2 + 8D - 4)y = e^{2x}$. 7 Marks

b) Apply variation of parameter method and obtain the solution of 7 Marks

$\frac{d^2y}{dx^2} + 4y = \tan 2x$.

(OR)

4 a) Determine the solution of $(D^2 + 1)y = \sin x \sin 2x$. 7 Marks

b) A condenser of capacity c discharged through an inductance L and resistance R in series and the charge q at time 't' satisfies the equation $L\frac{d^2q}{dt^2} + R\frac{dq}{dt} + \frac{q}{c} = 0$. Given that L=0.25 Henries, R=250 ohms, $c = 2\times 10^{-6}$ Farads and that when t = 0, charge q is 0.02 Coloumbs and the current $\frac{dq}{dt} = 0$, obtained the value of q in terms of 't'. 7 Marks

UNIT-III

5 a) If $x = e^r \sec\theta$, $y = e^r \tan\theta$ prove that $\frac{\partial(x,y)}{\partial(r,\theta)}\frac{\partial(r,\theta)}{\partial(x,y)} = 1$. 7 Marks

b) Apply Taylor's theorem to expand $e^x \sin y$ in powers of x and y. 7 Marks

(OR)

6 a) Verify if $u = 2x - y + 3z$, $v = 2x - y - z$, $w = 2x - y + z$ are functionally dependent and if so, obtain the relation between them. 7 Marks

b) Apply Taylor's theorem and compute $f(0.9, -1.2)$ approx. If $f(x,y) = \tan^{-1} xy$. 7 Marks

UNIT-IV

7 a) Obtain the area between the parabolas $y^2 = 4ax$ and $x^2 = 4ay$. 7 Marks

b) Evaluate $\iint_D xy\sqrt{1-x-y}\,dxdy$ where D is the region bounded by $x = 0;\ y = 0$ and $x + y = 1$ using the transformation $x + y = u$, $y = uv$. 7 Marks

(OR)

8 a) Evaluate $\int_0^\infty \int_0^\infty e^{-\left(x^2+y^2\right)}dxdy$ by changing into polar co-ordinates. 7 Marks

b) Apply triple integration and obtained the volume of the sphere $x^2 + y^2 + z^2 = a^2$. 7 Marks

UNIT-V

9 a) Evaluate the angle between the surfaces $x^2 + y^2 + z^2 = 9$ and $z = x^2 + y^2 - 3$ at the point (2,-1,2). 7 Marks

b) Verify the Stoke's for $F = \left(x^2 + y^2\right)i - 2xyj$ taken around the rectangle bounded by the lines $x = \pm a, y = 0, y = b$. 7 Marks

(OR)

10 a) Evaluate the curl of flux of F, at the point (1, 2, 3) given vector function $F = x^2yzi + xy^2zj + xyz^2k$. 7 Marks

b) Apply Stokes theorem and evaluate $\oint_C F.dr$ where $F = \left(x^2 + y^2\right)i - 2xyj$ and C is the rectangle in the XY-plane bounded by $y = 0, x = a, y = b, x = 0$. 7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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I B.Tech I Semester (SVEC-16) Supplementary Examinations December - 2019

TECHNICAL ENGLISH

[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	Define communication competence. What are the elements of communication competence?	14 Marks
	(OR)	
2	Give the etymology of the word communication. Identify the components and explain with appropriate examples the basics of communication.	14 Marks

UNIT-II

3	Briefly discuss the importance of listening in communication.	14 Marks
	(OR)	
4	Identify and explain the various reasons for poor listening.	14 Marks

UNIT-III

5	Discuss the attributes that a speaker should own in order to persuade the audience.	14 Marks
	(OR)	
6	What do you mean by perceptual barrier to speaking and how can you overcome such a barrier?	14 Marks

UNIT-IV

7	Discuss briefly the mechanics of reading skill.	14 Marks
	(OR)	
8	Discuss the general guidelines for improving your reading skill.	14 Marks

UNIT-V

9	Why has technical writing become too important for the industry and organization? Explain the various characteristics of technical writing.	14 Marks
	(OR)	
10	In relevance to technical writing, explain the following terms: i) Appropriateness. ii) Accuracy. iii) Conciseness and flow.	14 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations December - 2019

ELECTRIC CIRCUITS

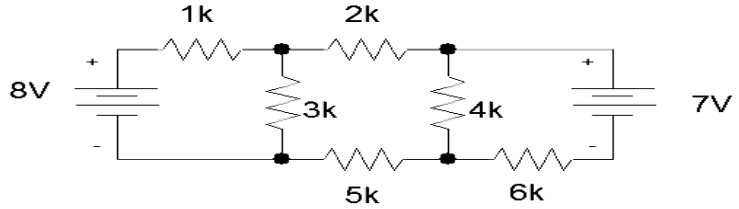
[Electrical and Electronics Engineering]

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

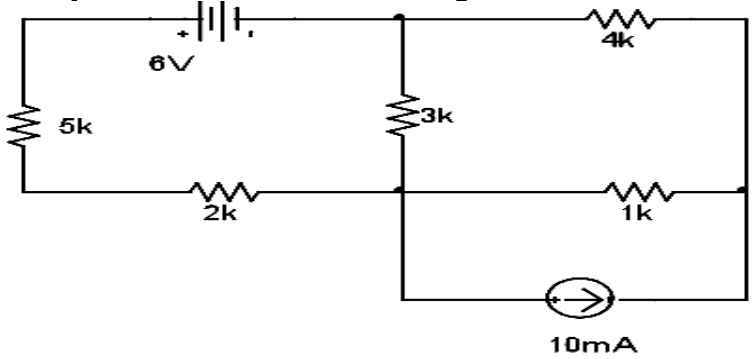
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Write the Node voltage equations for the circuit shown in figure and determine current through 4K ohm resistor. 7 Marks

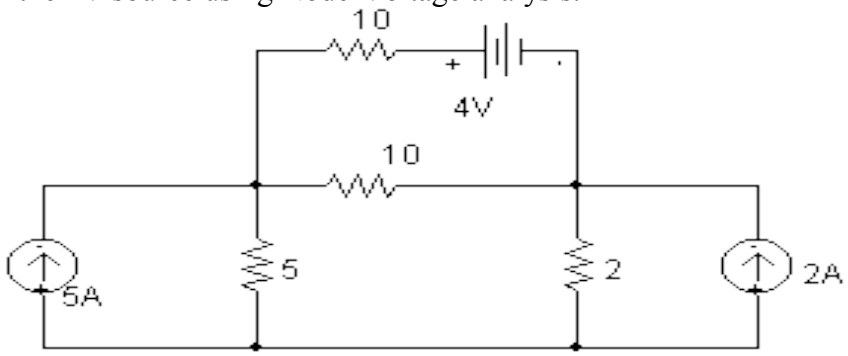


b) Compute the power absorbed by 3kΩ resistor and power delivered by 6V source using mesh analysis for the circuit shown in figure. 7 Marks

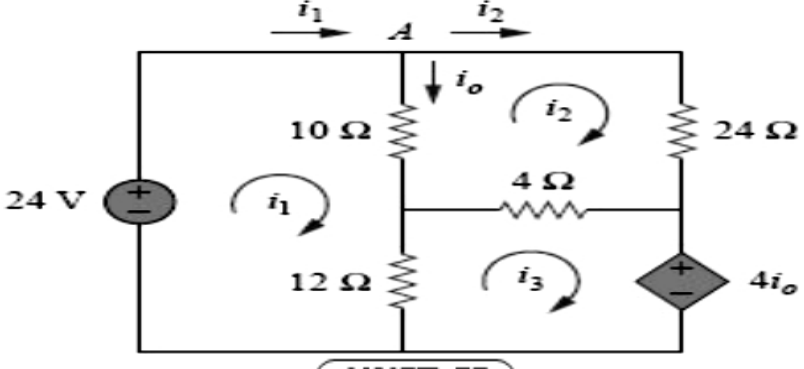


(OR)

2 a) Solve for the current through the 5Ω resistor shown in figure and the current through the 4V source using Node-Voltage analysis. 7 Marks

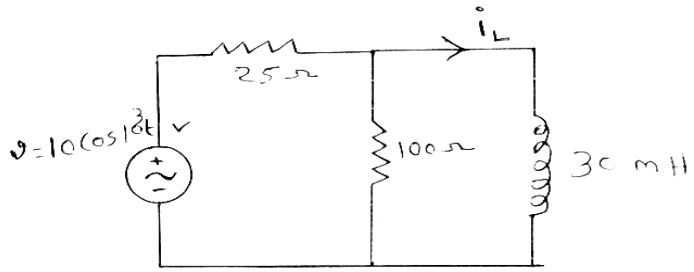


b) Compute the current passing through 4Ω resistor shown in figure. 7 Marks



UNIT-II

3 a) Find the current $i_L(t)$ in the circuit shown in figure. 7 Marks

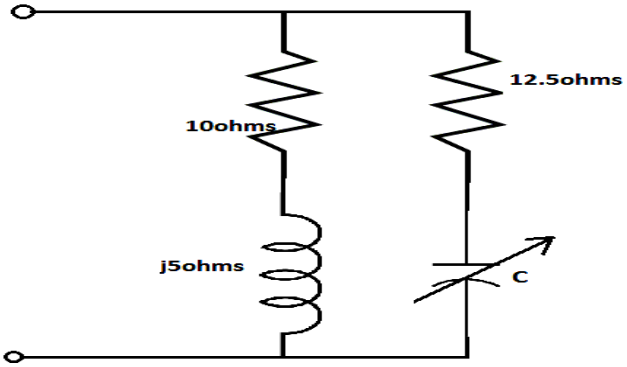


b) The voltage across the load is v(t) = 60 Cos (wt + 10^0) and the current through the element in the direction of the voltage drop is i(t) = 1.5 Cos (wt + 50^0). Find: 7 Marks

i) complex power. ii) real and reactive power.
iii) power factor. iv) load impedance.

(OR)

4 a) For the circuit shown in figure, find the value of 'C' such that the circuit resonates at 6366Hz. 7 Marks

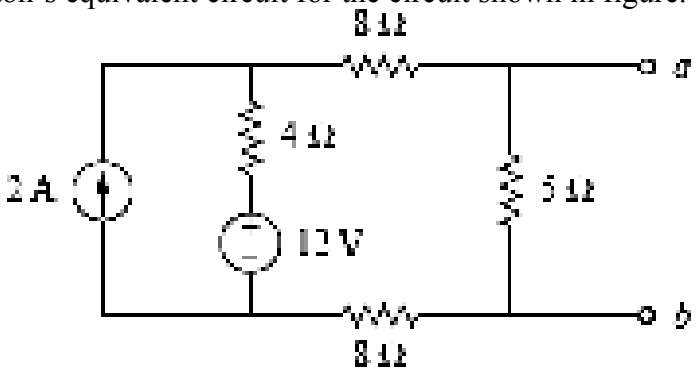


b) A series circuit having pure resistance of 10Ω, pure inductance of 100mH and a capacitor is connected across a 230V, 50Hz A.C supply. This RLC combination draws a current of 10A. Calculate: 7 Marks

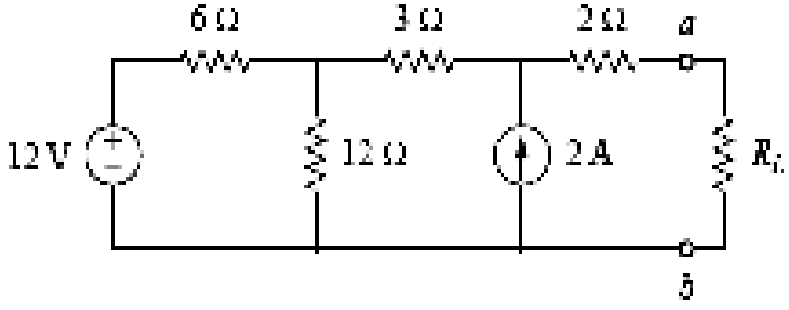
i) Power Factor of the circuit. ii) Capacitor value.

UNIT-III

5 a) Find the Norton's equivalent circuit for the circuit shown in figure. 7 Marks

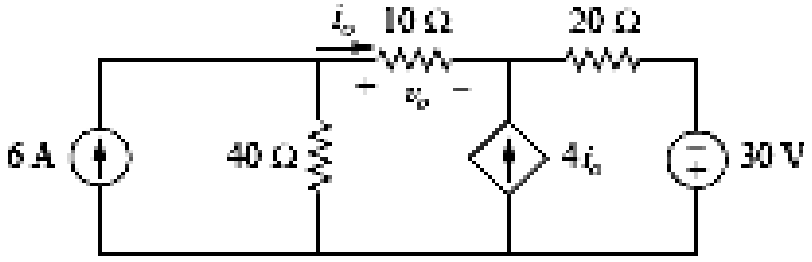


b) Find the value of R_L for maximum power transfer in the circuit of figure. Also find the maximum power. 7 Marks



(OR)

6 a) Use the superposition principle to find i_0 and v_0 in the circuit shown in figure. 8 Marks



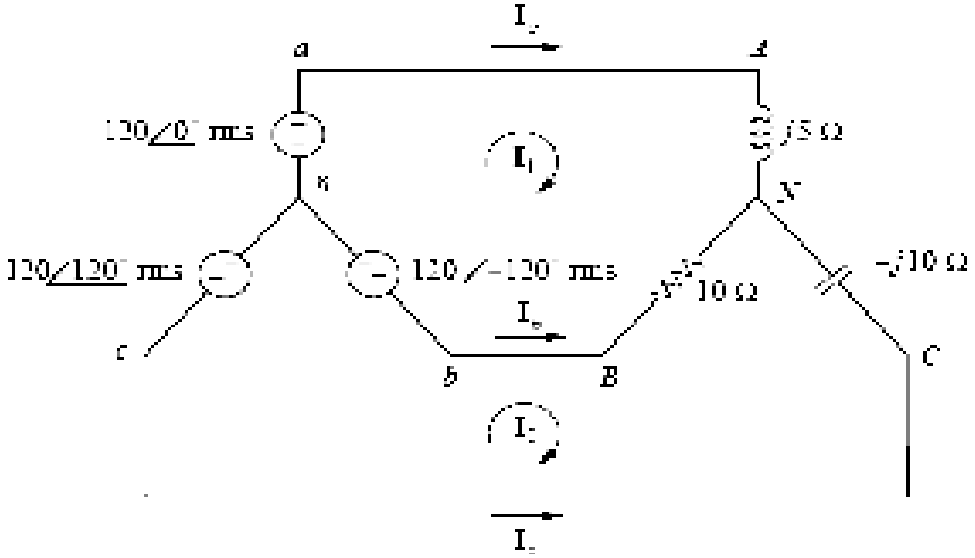
b) Explain the Tellegen's theorem with suitable example. 6 Marks

UNIT-IV

7 a) A 3-phase, 3-wire balanced Y-connected supply of $400\angle 0^0$ V is connected to a balanced 3-phase, 3-wire Δ-connected load of (10-j10)Ω per phase. Determine the line currents and the power consumed by the load. Follow RYB phase sequence. Draw the phasor diagram. 7 Marks

b) For the unbalanced circuit in figure, find: 7 Marks

i) the line currents.
ii) the total complex power absorbed by the load.
iii) the total complex power absorbed by the source.

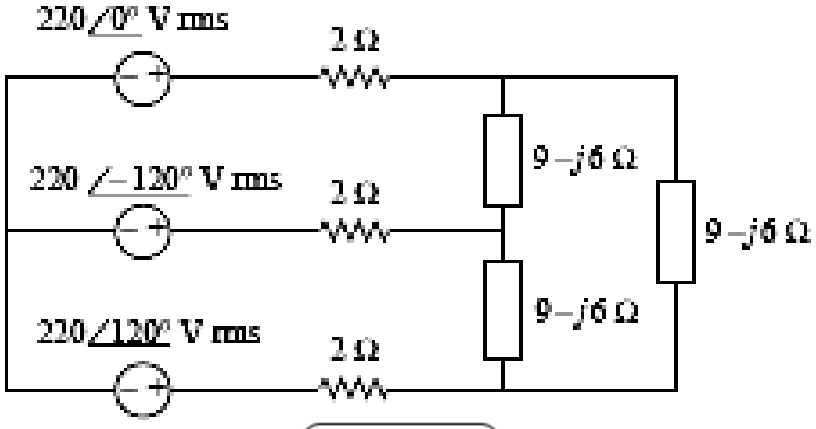


(OR)

8 a) A 3-phase, 3-wire balanced Δ-connected 400V supply feeds an unbalanced 3-phase, 3-wire, Δ-connected load having the three impedances $Z_{RY}=20\angle 30^0\,\Omega$, $Z_{YB}=40\angle 60^0\,\Omega$ and $Z_{BR}=10\angle -90^0\,\Omega$. Determine: 7 Marks

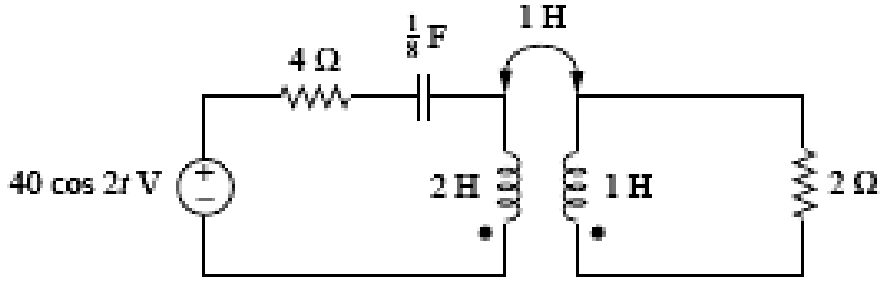
i) Phase currents. ii) Line currents.
iii) Total power consumed by the load.
iv) Draw the phasor diagram.

b) For the circuit shown in figure, find the line currents and average power delivered by source. 7 Marks

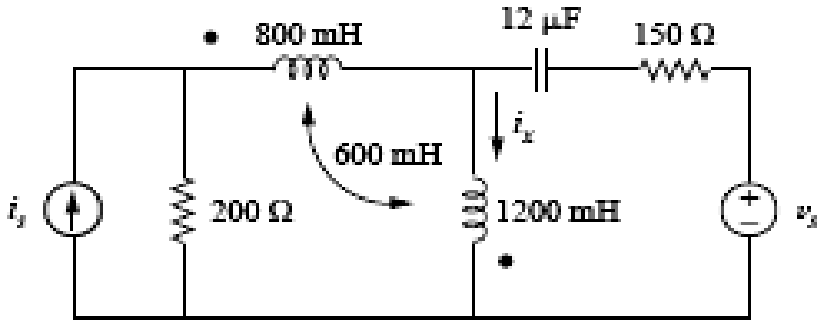


UNIT-V

9 a) Determine the voltage across 2 H inductor shown in figure. 7 Marks

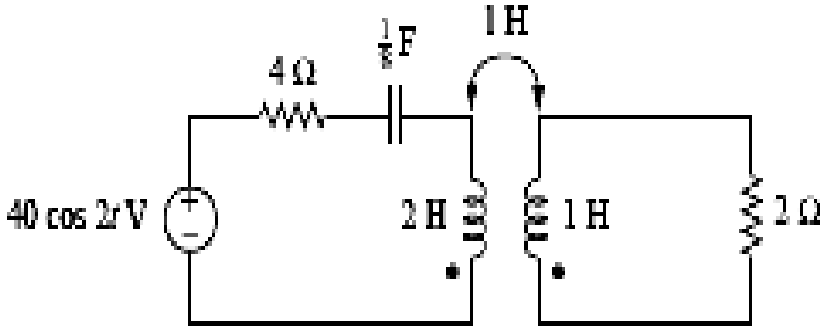


b) Use the mesh analysis to find i_x shown in figure, where $i_s(t) = 6\cos(600t)$ Amps and $v_s(t) = 165\cos(600t + 30^0)$ V. 7 Marks

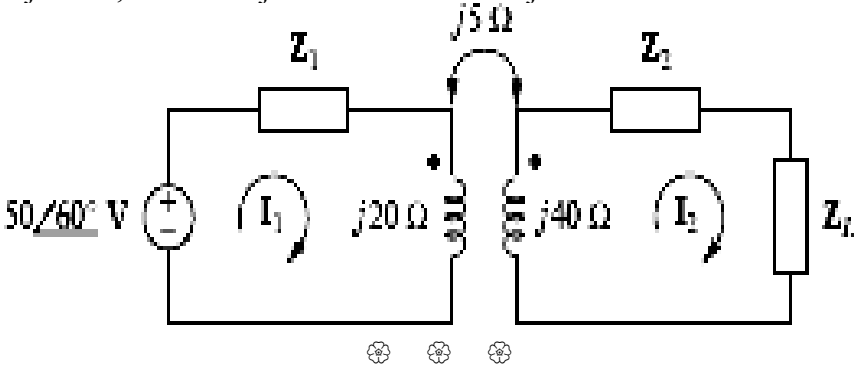


(OR)

10 a) For the circuit in the figure, determine the coefficient of coupling factor and energy stored in coupled inductor at t = 2 sec. 7 Marks



b) In the circuit of Figure, calculate the input impedance and current I_1. Take $Z_1 = 60 - j100\ \Omega$, $Z_2 = 30 + j40\ \Omega$ and $Z_L = 80 + j60\ \Omega$. 7 Marks



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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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I B.Tech I Semester (SVEC-16) Supplementary Examinations December - 2019

NETWORK ANALYSIS

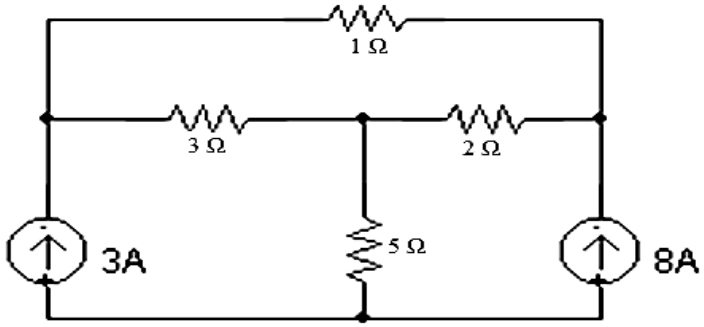
[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

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

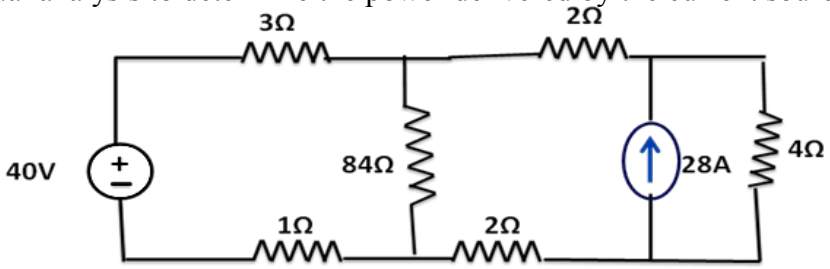
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Solve for the current through the 5Ω resistor and the voltage over the 3A source using Nodal analysis. 7 Marks

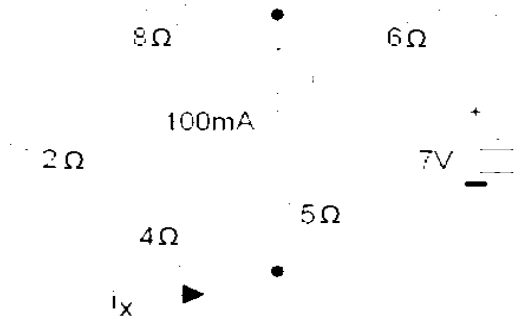


b) Use Nodal analysis to determine the power delivered by the current source. 7 Marks

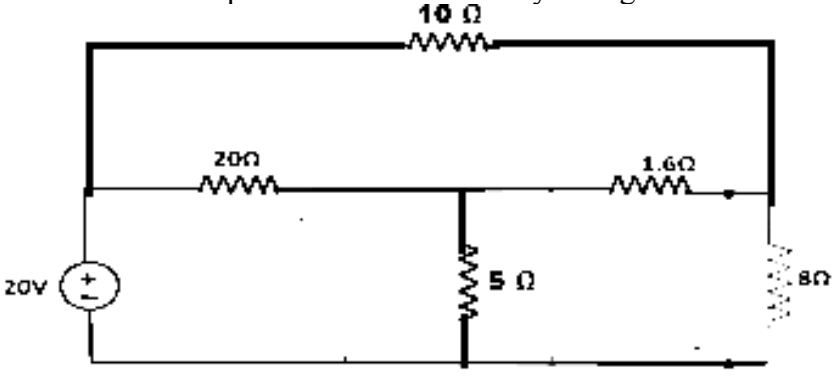


(OR)

2 a) Solve for the current i_x flowing right through the 4Ω resistor using Mesh analysis. 7 Marks

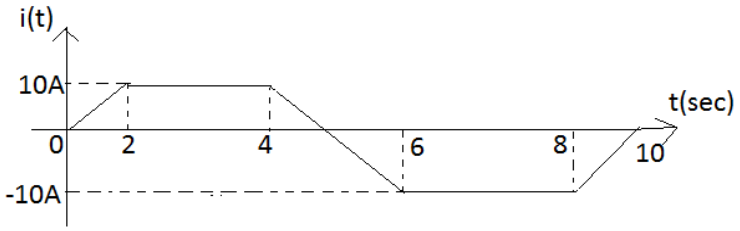


b) Compute the equivalent resistance across voltage source using star/delta transformation. Also compute current delivered by voltage source. 7 Marks

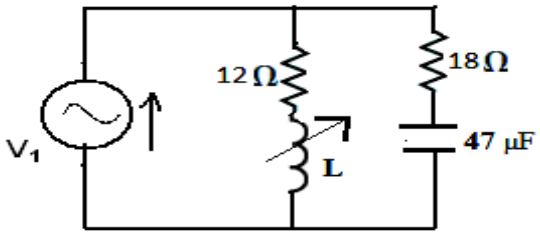


UNIT-II

3 a) Compute the effective value, average value, form factor and peak factor of the waveform shown below. 7 Marks

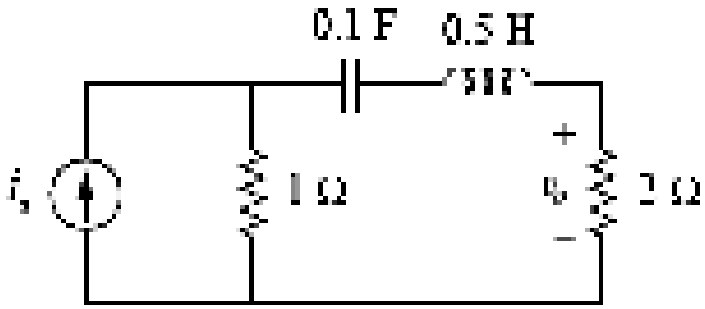


b) Verify the circuit shown in figure will resonate for any value of 'L' using current locus diagram at its supply frequency of 60Hz. Also compute value of L, current passing through both parallel branch if the circuit was excited by $110\angle 30^0$. 7 Marks

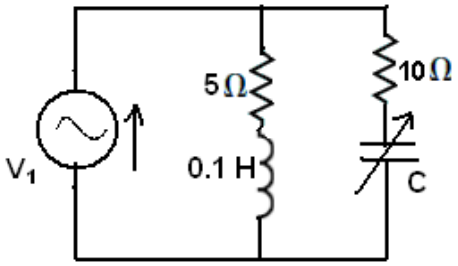


(OR)

4 a) If the voltage across 2Ω resistor $V_0 = -5 \cos 2t$, compute the source current i_s. 7 Marks

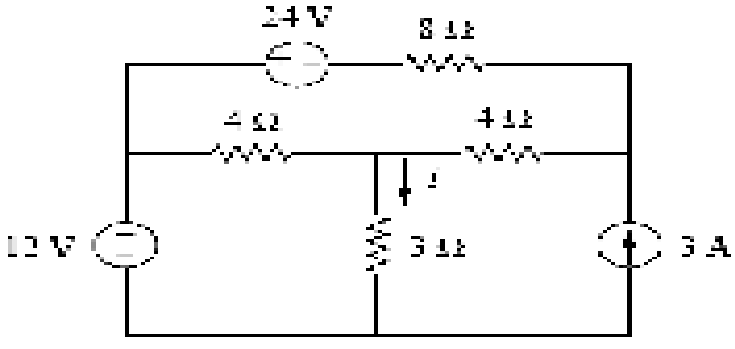


b) In a given network obtain its resonance at 100 kHz. Determine capacitance value, justify the resonance occurred with variable capacitance with locus diagram. If $V_1 = 200\angle 30^0$ V, compute current passing through inductor and capacitor. 7 Marks

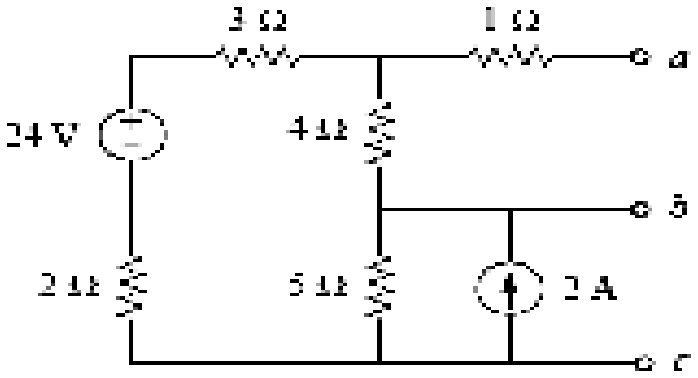


UNIT-III

5 a) For the circuit shown in figure use the superposition theorem to find i. 7 Marks

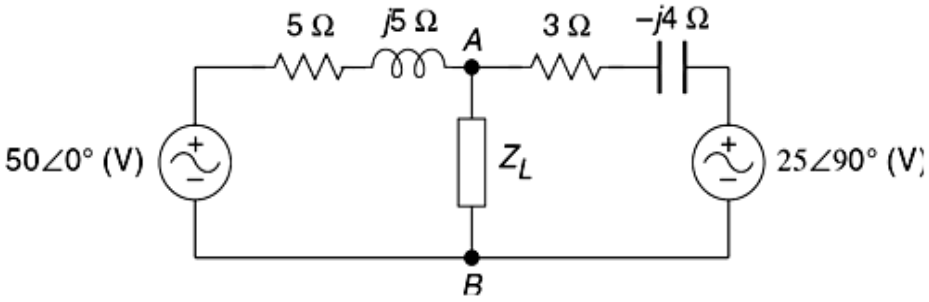


b) For the circuit shown in figure obtain the Thevenin's equivalent as seen from terminals. (i) a-b and (ii) b-c. 7 Marks

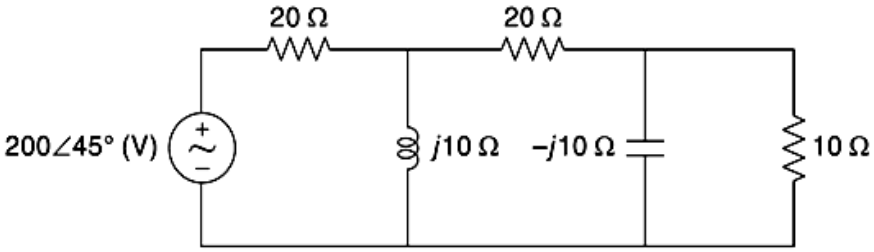


(OR)

6 a) Compute the equivalent impedance for which Z_L will receive the maximum power. What is the maximum power delivered to load? 7 Marks

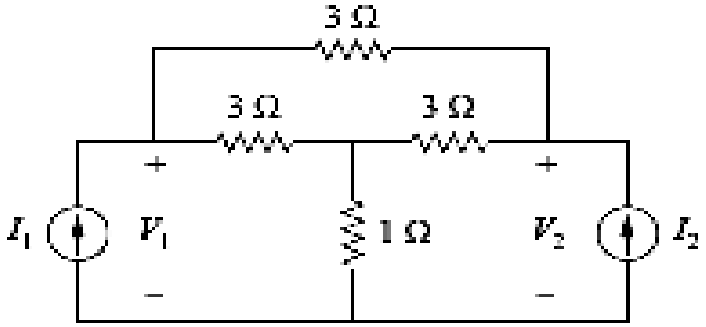


b) Verify the reciprocity theorem for the ladder network shown in figure. 7 Marks

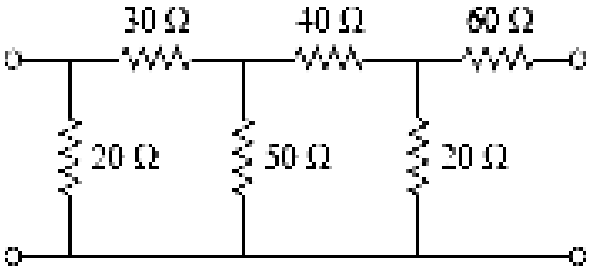


UNIT-IV

7 a) In the bridge circuit of figure, $I_1 = 10A$ and $I_2 = -4A$. (i) find V_1 and V_2 using Y parameters. (ii) Confirm the results of part (i) by direct current analysis. 8 Marks

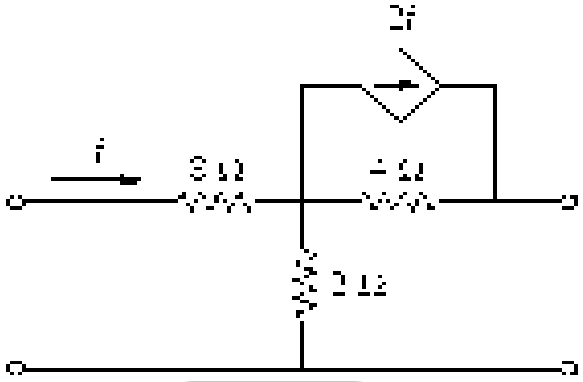


b) Compute the open circuit parameters of the two port network shown in figure. 6 Marks



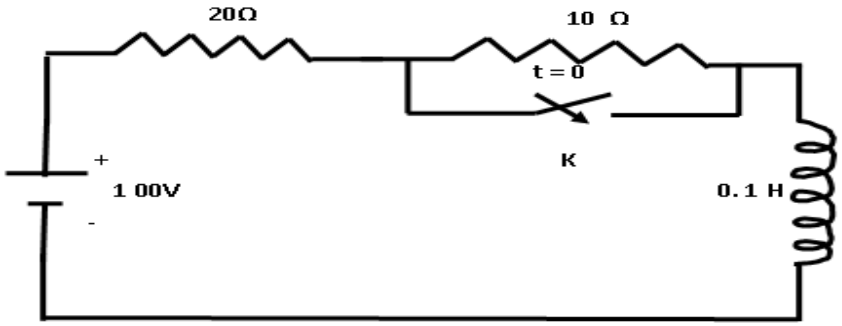
(OR)

8 Determine the Y parameters of the two port network given below and derive the hybrid parameters from Y parameters. 14 Marks

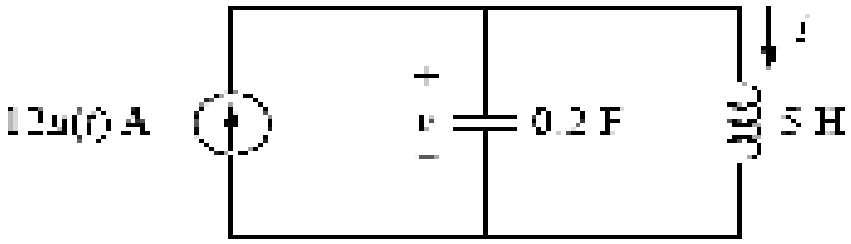


UNIT-V

9 a) A DC voltage of 100V is applied in the circuit shown in the figure and the switch is kept open. If the switch 'k' is closed at t=0, determine the expression for the resulting current. 7 Marks

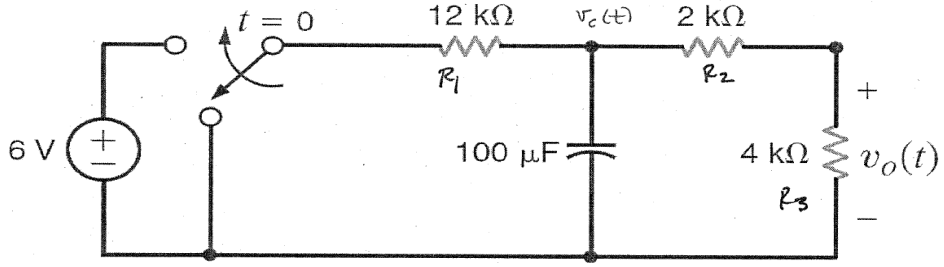


b) Find i(t) and v(t) for t>0 in the circuit of figure. 7 Marks

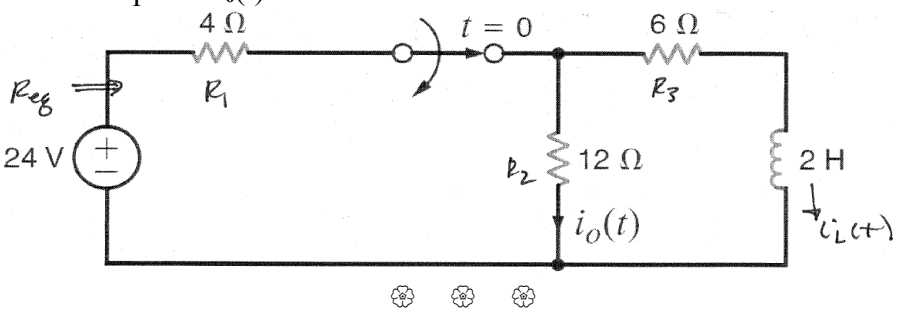


(OR)

10 a) Compute the $V_C(0^-)$ and also $V_C(t)$ for t > 0 in the circuit shown below. Plot the response including the time interval just prior to switching action. 7 Marks



b) Compute the response $i_0(t)$ for t > 0 in the circuit shown below. 7 Marks



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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations December – 2019

PROGRAMMING IN C

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation 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 happens to symbolic constants that appear within a C program during the compilation process?	7 Marks
	b)	In what order the operations are carried out within an expression that contains nested parentheses?	7 Marks
		(OR)	
2		Describe the five arithmetic operators in C. Summarize the rules associated with their use.	14 Marks

UNIT-II

3	a)	Can any of the three initial expressions in the *for*-statement be omitted? If so, what are the consequences of each omission?	7 Marks
	b)	Write a program to check whether input type is one of the following: i) Upper case ii) Lower case iii) Digit iv) Symbol	7 Marks
		(OR)	
4		Write a simple program that illustrates the syntactic differences in reading and writing a string that contains a variety of characters, including whitespace characters.	14 Marks

UNIT-III

5	a)	How is an external variable defined? How is it initialized? What happens if an external variable definition does not include the assignment of an initial value? Compare your answers with those for automatic variables.	8 Marks
	b)	Summarize the rules that apply to a function call. What relationships must be maintained between the actual arguments and the corresponding formal arguments in the function definition? Are the actual arguments subject to the same restrictions **as** the formal arguments?	6 Marks
		(OR)	
6	a)	Compare the definition of external variables within **a** multi-file program with the definition of external variables within a single-file program. What additional options are available in the multi-file case?	7 Marks
	b)	Write a program to retrieve a string from set of strings.	7 Marks

UNIT-IV

7	a)	Develop a Program to Swap two integer variables by Passing pointers to a function and also explain the concept of call-by-value.	7 Marks
	b)	Develop a program to read a line of text and a string **str1**and then insert **str1** in a specified position of the given text.	7 Marks

(OR)

8	a)	Develop a program to read amount (integer number) and then print that amount in text form. For example given number is 3012 then output is "three thousand twelve rupees".	7 Marks
	b)	Develop a program to insert a given string into a list of N strings in a specified position.	7 Marks

UNIT-V

9	a)	Describe the significance of files and also explain the file I/O functions with an example program.	7 Marks
	b)	Define a structure **Complex** whose fields are real and imaginary parts of a complex number. Write a function that receives the pointers to two complex numbers through arguments and return pointer to the sum of the two complex numbers. Write the corresponding calling function main() also.	7 Marks

(OR)

10	a)	Write a program that accepts inventory details item–name, number, price and quantity, stores them in a file and display the data on the screen	7 Marks
	b)	Describe the significance of files and also explain the operations on files.	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

ENGINEERING CHEMISTRY

[Civil Engineering; Mechanical Engineering; 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 Discuss the following boiler troubles in detail, 14 Marks
i) Scale formation. ii) Boiler corrosion. iii) Caustic embrittlement.

(OR)

2 What is the principle of EDTA method? Estimate the hardness of water by EDTA method. 14 Marks

UNIT-II

3 a) What are composite materials? Discuss important types of fibre-reinforced composites. 7 Marks

b) Distinguish between fibre and particle-reinforced composites. 7 Marks

(OR)

4 What are biodegradable polymers? Formulate the mechanism of degradation of biodegradable polymers and mention their applications. 14 Marks

UNIT-III

5 Why nanomaterials are so important? Write the applications of nanomaterials in different fields of science and technology. 14 Marks

(OR)

6 Classify the nanomaterials with examples based on different aspects. 14 Marks

UNIT-IV

7 Discuss the construction and working principle of Ni-Cd battery. List out the applications of Ni-Cd batteries. 14 Marks

(OR)

8 Define Battery. Explain lithium polymer batteries, and mention their applications. 14 Marks

UNIT-V

9 Define lubrication. Illustrate the mechanism of thin film and extreme pressure lubrication. 14 Marks

(OR)

10 Discuss the following protection methods. 14 Marks
i) Sacrificial anodic protection.
ii) Impressed current cathodic protection.

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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I B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

ENGINEERING PHYSICS

[Electrical and Electronics Engineering, Electronics and Communications 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)	With energy level diagram, explain the construction and working of a He-Ne laser.	9 Marks
	b)	Give any five applications of lasers.	5 Marks
		(OR)	
2	a)	Describe the construction and working of Nd:YAG laser.	9 Marks
	b)	Mention the applications of laser in various fields.	5 Marks

UNIT-II

3	a)	Define Fermi level. What is Fermi-Dirac distribution and how it effect with temperature.	8 Marks
	b)	Find the temperature at which there is a 1% probability that a state with energy 0.5 eV above Fermi energy.	6 Marks
		(OR)	
4		Explain Kronig-Penney model.	14 Marks

UNIT-III

5	a)	What is Hall Effect? Write its importance. Derive an expression for Hall coefficient.	10 Marks
	b)	The R_H of a specimen is $3.66 \times 10^{-4} m^3c^{-1}$. Its resistivity is $8.93 \times 10^{-3} \Omega m$. Find μ and n in an n-type semiconductor.	4 Marks
		(OR)	
6	a)	Define drift and diffusion currents in a semiconductor. Derive expression for drift and diffusion currents in semiconductor.	9 Marks
	b)	Deduce the Einstein relation.	5 Marks

UNIT-IV

7	a)	Define the term absorption coefficient. Explain the methods used to measure the absorption coefficients.	7 Marks
	b)	What are the basic necessities of an acoustically good hall?	7 Marks
		(OR)	
8	a)	What are the basic requirements of an acoustically good hall?	5 Marks
	b)	Write a note on reverberation and reverberation time. Derive Sabine's mathematical relation for reverberation time.	9 Marks

UNIT-V

9	a)	What are Miller indices? How are they obtained?	4 Marks
	b)	State and derive Bragg's law for diffraction in crystals. X-rays of wavelength 1.5402 **Å** are diffracted by (231) planes in a crystal at an angle 30° in the first order. Calculate the interatomic spacing.	10 Marks
		(OR)	
10	a)	Explain X- ray diffraction and derive Bragg's law.	7 Marks
	b)	Describe the powder diffraction to determine the crystal structure with suitable diagram.	7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

MATRICES AND NUMERICAL METHODS

[Civil Engineering, Mechanical Engineering, Electrical and Electronics 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) Discuss for what values of λ, μ the simultaneous equations $x + y + z = 6, x + 2y + 3z = 10, x + 2y + \lambda z = \mu$ have 7 Marks
i) no solution. ii) a unique solution.
iii) an infinite number of solutions.

b) Solve the system of equations 7 Marks
$x + y - 3z + 2w = 0$; $2x - y + 2z - 3w = 0$; $3x - 2y + z - 4w = 0$;
$-4x + y - 3z + w = 0$

(OR)

2 a) Define a system of homogeneous linear equations in n unknowns. Determine k such that the following system is consistent. 7 Marks
$2x + y + 2z = 0$, $x + y + 3z = 0$, $4x + 3y + kz = 0$.

b) Define Eigen value and the Eigen vector of a matrix and find the Eigen values and Eigen vectors of the following matrix $\begin{bmatrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{bmatrix}$. 7 Marks

UNIT-II

3 a) Estimate the values of a, b and c so that $y = a + bx + cx^2$ is the best fit to the data. 7 Marks

x	1	3	5	7	9
y	1.5	2.8	4.0	4.7	6.0

b) By the technique of least square principle; fit a straight line to the following data. 7 Marks

x	0	1	2	3	4
y	1	1.8	3.3	4.5	6.3

(OR)

4 a) Construct a straight line of the form y = ax + b, using the technique of least squares to the following data. 7 Marks

x	0	5	10	15	20	25	30
y	10	14	19	25	31	36	39

b) Evaluate the best fit values of a and b using the technique of least squares, to the curve $y = ae^{bx}$ to the following data. 7 Marks

x	2	4	6	8	10
y	4.077	11.084	30.128	81.897	222.62

UNIT-III

5 a) Evaluate $f(1.28)$ if $f(1.15) = 1.0723, f(1.20) = 1.0954, f(1.25) = 1.1180$ and $f(1.30) = 1.1401$ — 7 Marks

b) Construct the unique polynomial $P(x)$ of degree 2 or less such that $P(1) = 1, P(3) = 27, P(4) = 64$ using Lagrange's interpolation formula. — 7 Marks

(OR)

6 a) Determine $\sin 52^0$ using the data $\sin 45^0 = 0.7071$, $\sin 50^0 = 0.7660$, $\sin 55^0 = 0.8192$ and $\sin 60^0 = 0.8660$. — 5 Marks

b) Apply Newton' Back ward interpolation formula to evaluate $f(2)$ from the data $f(x) = 3.49, 4.82, 5.96, 6.5$ at $x = 1, 1.4, 1.8$ and 2.2 respectively. — 9 Marks

UNIT-IV

7 a) Find $\frac{dy}{dx}$ at $x = 7.5$ from the following data — 7 Marks

x	7.47	7.48	7.49	7.5	7.51	7.52	7.53
y	0.193	0.195	0.198	0.201	0.203	0.206	0.208

b) Write Trapezoidal rule and apply it to find $\int_0^1 (4x - 3x^2)dx$. — 7 Marks

(OR)

8 a) The table given below reveals the velocity v of a body during the specified time t . find the acceleration at $t = 1.1$ — 7 Marks

t	1.0	1.1	1.2	1.3	1.4
v	43.1	47.7	52.1	56.4	60.8

b) Evaluate $\int_0^{\frac{\pi}{2}} \sin x dx$ by Simpson's $\frac{1}{3}$ rd rule and compare with the exact value. — 7 Marks

UNIT-V

9 Given $y' = x + \sin y, y(0) = 1$ compute $y(0.2)$ and $y(0.4)$ with $h = 0.2$ by using Euler's modified method. — 14 Marks

(OR)

10 a) Evaluate $y(0.8)$ using Runge-Kutta method of order 4, given $y' = \sqrt{x + y}$ $y = 0.41$ at $x = 0.4$. — 7 Marks

b) Using Milne's predictor and corrector formulae, find $y(4.4)$ given $5xy' + y^2 - 2 = 0, y(4) = 1, y(4.1) = 1.0049, y(4.2) = 1.0097$ and $y(4.3)=1.0143$. — 7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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I B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

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 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) Examine the differential equation $(e^y + 1)\cos x\, dx + e^y \sin x\, dy = 0$ for the exactness and hence solve it. 7 Marks

b) Solve the differential equation 7 Marks

$$\left[y\left(1 + \frac{1}{x}\right) + \cos y \right] dx + (x + \log|x| - x\sin y)\, dy = 0$$

(OR)

2 a) Write the general form of exact equation and express the differential equation $y(2x^2 y + e^x)dx = (e^x + y^3)\, dy$ in the form of exact differential and solve it. 7 Marks

b) Evaluate a suitable integrating factor for the differential equation $(y + y^2)dx + xy\, dy = 0$ and hence solve it. 7 Marks

UNIT-II

3 a) Find a solution of the differential equation $(D^3 - 4D^2 - D + 4)y = e^{3x}\cos 2x$. 7 Marks

b) Solve the differential equation $(D^2 + 1)y = x^2 e^{3x}$. 7 Marks

(OR)

4 a) Solve the differential equation $\frac{d^2y}{dx^2} + 3\frac{dy}{dx} + 2y = xe^x \sin x$ 7 Marks

b) Find a solution for the differential equation 7 Marks

$(D^2 + 1)x = t\cos 2t$, given that $x = 0$, $\frac{dx}{dt} = 0$, *at* $t = 0$

UNIT-III

5 a) If $u = x^2 - y^2$, $v = 2xy$ where $x = r\cos\theta$, $y = r\sin\theta$ then show that $\frac{\partial(u,v)}{\partial(r,\theta)} = 4r^3$ 7 Marks

b) A rectangular box open at the top is to have a volume of 32 cubic feet. Find the dimensions of the box requiring least material for its construction using technique of finding maxima and minima. 7 Marks

(OR)

6 a) Verify $u = 2x - y + 3z$, $v = 2x - y - z$, $w = 2x - y + z$ are functionally dependent and establish a relationship between them. 5 Marks

b) Establish a Taylor series for the function $f(x,y) = e^x \log(1 + y)$ in terms of x and y up to second degree terms. 9 Marks

UNIT-IV

7 a) Find the surface area got by revolving one loop of the curve $r^2 = a^2 \cos 2\theta$ about the initial line. 7 Marks

b) Evaluate $\iint_R ydxdy$ where R is the region bounded by the parabolas $y^2=4ax$ and $x^2 = 4ay$. 7 Marks

(OR)

8 a) Evaluate $\iint_R xydxdy$ where R is the region bounded by x – axis, ordinate x = 2a and the curve $x^2 = 4$ ay. 7 Marks

b) By the technique of changing the order, evaluate $\int_0^1 \int_0^{\sqrt{1-x^2}} y^2 dydx$ 7 Marks

UNIT-V

9 a) Prove that div curl $\bar{f} = 0$. 6 Marks

b) Find the circulation of $\bar{F} = (2x - y + 2z)\bar{i} + (x + y - z)\bar{j} + (3x - 2y - 5z)\bar{k}$ along the circle $x^2+y^2 = 4$ in xy – plane. 8 Marks

(OR)

10 a) Find the work done by $\bar{F} = (2x - y - z)\bar{i} + (x + y - z)\bar{j} + (3x - 2y - 5z)\bar{k}$ along the curve in xy – plane given by $x^2+y^2 = 9$ and z = 0 . 9 Marks

b) Evaluate $\int_S \bar{F} \cdot \bar{n} dS$ 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. 5 Marks

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I B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

TECHNICAL ENGLISH

[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	Define Communication and state the importance of Communication.	14 Marks
	(OR)	
2	Illustrate and discuss the characteristics of language.	14 Marks

UNIT-II

3	Define Listening and write an essay on the importance of listening in effective communication.	14 Marks
	(OR)	
4	Critically examine the reasons for poor listening.	14 Marks

UNIT-III

5	Discuss the importance of effective speaking in academic, professional and personal life.	14 Marks
	(OR)	
6	Suggest ways to enhance confidence, clarity and fluency in speeches and presentations.	14 Marks

UNIT-IV

7	Identify the various purposes of reading and different reading rates adopted.	14 Marks
	(OR)	
8	"Reading between the lines, inferring a word's meaning, and interpreting ideas and graphics contribute towards interpretation of a text". Explain	14 Marks

UNIT-V

9	Define Technical writing and write the salient features based on its importance and characteristics.	14 Marks
	(OR)	
10	Describe the significance of language in writing and explain its characteristics.	14 Marks

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CODE No.: 16BT10241 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

NETWORK ANALYSIS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

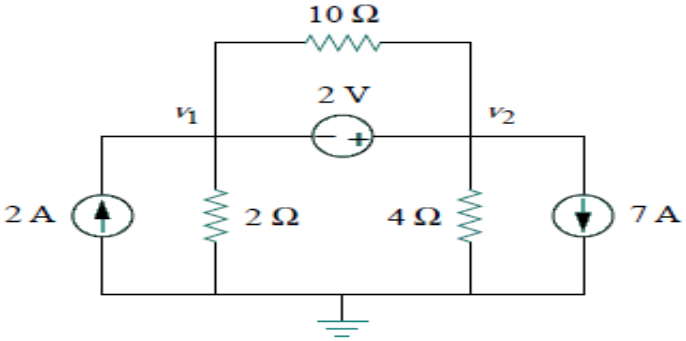
Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

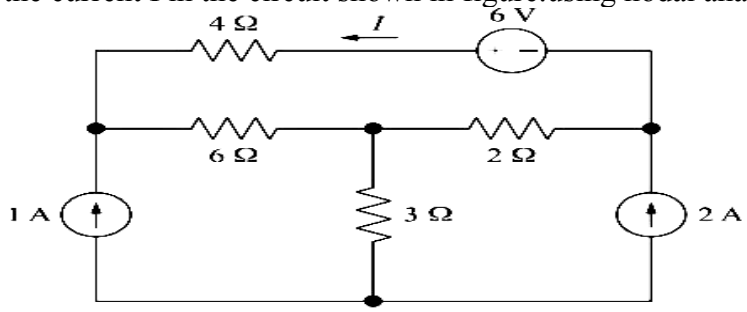
1 a) Explain the terms super mesh and super node and apply these concepts to electrical network. 7 Marks

b) Determine the node voltages in the circuit shown in the figure. 7 Marks

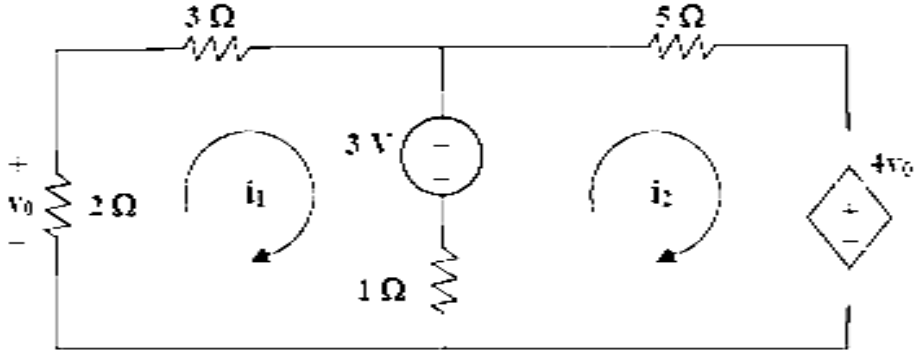


(OR)

2 a) Determine the current I in the circuit shown in figure.using nodal analysis. 7 Marks



b) Obtain the branch currents and loop currents in the circuit shown in figure using Mesh analysis. 7 Marks



UNIT-II

3 a) Define the Q-factor and derive an equation showing the relation between Q-factor, Bandwidth and Selectivity at resonance. 7 Marks

b) A series RLC circuit is connected across a variable frequency supply and has R=12 Ω, L = 1mH and C = 1000pF. Calculate resonant frequency, Q factor and cut-off frequencies. 7 Marks

(OR)

4 a) Draw the current, impedance and admittance loci for an RC Series circuit having constant reactance but variable resistance. 7 Marks

b) A voltage V = 10 sinwt is applied to series RLC circuit. Under resonance condition the max voltage across capacitor is found to be 500V, bandwidth is 400 rad/sec and the impedance at resonance is 100 ohms. Find the resonant frequency and circuit constants. 7 Marks

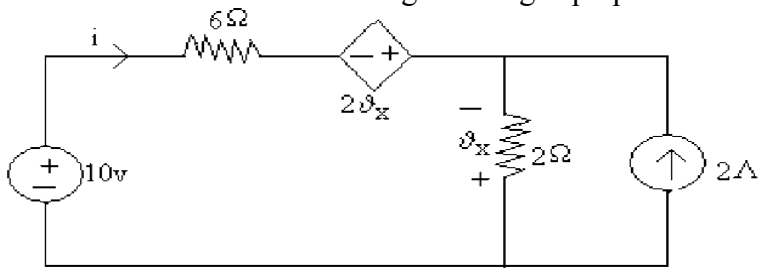
UNIT-III

5 State and explain Maximum power transfer theorem and derive the necessary conditions for maximum power transfer for DC and AC excitations. 14 Marks

(OR)

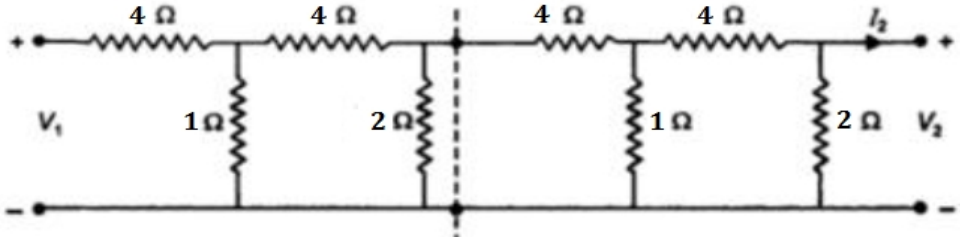
6 a) State and explain Maximum power transfer theorem and derive the necessary conditions for maximum power transfer for DC excitations. 5 Marks

b) Find the current i in the circuit shown in figure using superposition theorem. 9 Marks



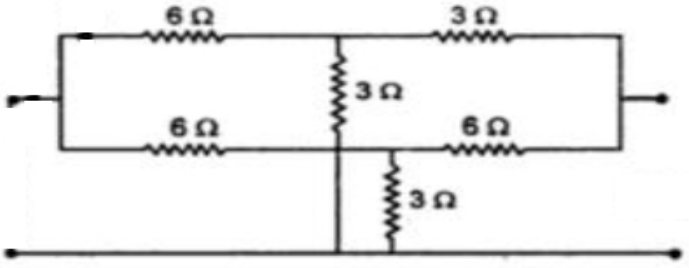
UNIT-IV

7 Find the Transmission parameters of the network shown in figure. 14 Marks



(OR)

8 Find the admittance parameters of the network shown in figure 14 Marks



UNIT-V

9 A series RC circuit with R = 50Ω and C = 2 micro farad has a sinusoidal voltage source V = 150 *Sin(*500*t* φ+π/3) volts applied at a time when φ=0. Find the expression for the total current. Use Laplace transforms method 14 Marks

(OR)

10 A series RLC circuit with R=2Ω, 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. 14 Marks

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CODE No.: 16BT10501 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

PROGRAMMING IN C

[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)	What is the relative precedence of the unary operators compared with the arithmetic operators? What is their associativity?	7 Marks
	b)	How can multiple assignments be written in C explain with examples?	7 Marks
		(OR)	
2		Analyze Arithmetic, Logical, Bitwise and Conditional Operators with example programs.	14 Marks

UNIT-II

3	a)	Write the difference between break and continue statement with examples.	7 Marks
	b)	Suppose a break statement is included with in the innermost of several nested control statement what happens when break statement is executed.	7 Marks
		(OR)	
4		Explain in detail about single character I/O functions with suitable examples.	14 Marks

UNIT-III

5	a)	How Recursion is Implemented? Describe with an example.	7 Marks
	b)	Write a 'C' program that illustrates Scope Rules in blocks.	7 Marks
		(OR)	
6	a)	Solve Towers of Hanoi Problem using Recursion.	7 Marks
	b)	Explain about Scope and Extent of a variable.	7 Marks

UNIT-IV

7	a)	Differentiate between "*Call by value"* and "*Call by Reference"*.	7 Marks
	b)	Write a 'C' program to sort a list of Names using Array of Pointers to strings.	7 Marks
		(OR)	
8		Demonstrate the concept of Pointers and functions with example programs.	14 Marks

UNIT-V

9	a)	Explain basic file operations with its Syntax.	7 Marks
	b)	Write a 'C' program to illustrate Opening and Closing of files.	7 Marks
		(OR)	
10	a)	Demonstrate how to work with binary files.	7 Marks
	b)	Write a 'C' program to compare two files.	7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Regular Examinations December - 2019

DIFFERENTIAL EQUATIONS AND MULTIVARAIBLE CALCULUS

[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: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Solve the differential equation $(D^3 - 6D^2 + 11D - 6)y = e^{-2x} + e^{-3x}$.	6 Marks	L3	CO1	PO1 PO2
	b)	Solve the differential equation $y''' + 2y'' - y' - 2y = 1 - 4x^3$.	6 Marks	L3	CO1	PO1 PO2
		(OR)				
2.	a)	Using the method of variation of parameters solve $(D^2 + 1)y = x\cos x$.	6 Marks	L3	CO1	PO1 PO2
	b)	Change the differential equation $x^3\frac{d^3y}{dx^3} + 2x^2\frac{d^2y}{dx^2} + 2y = 10\left(x + \frac{1}{x}\right)$ into linear equation with constant coefficients and find the general solution.	6 Marks	L2	CO1	PO1 PO2

UNIT-II

3.	a)	Construct the partial differential equation by eliminating the arbitrary function from the relation $Z = f(x + at) + g(x - at)$.	6 Marks	L3	CO1	PO1
	b)	Find the complete solution of the partial differential equation $p + q = \sin x + \sin y$.	6 Marks	L1	CO1	PO1 PO2
		(OR)				
4.	a)	Solve the partial differential equation $4\frac{\partial^2 z}{\partial x^2} - 4\frac{\partial^2 z}{\partial x \partial y} + \frac{\partial^2 z}{\partial y^2} = 16\log(x + 2y)$.	6 Marks	L3	CO1	PO1 PO2
	b)	Applying the method of separation of variables, solve $3\frac{\partial u}{\partial x} + 2\frac{\partial u}{\partial y} = 0,\ u(x,0) = 4e^{-x}$.	6 Marks	L3	CO1	PO1 PO2

UNIT-III

5.	a)	Find $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z}$; *if* $u = f(y - z, z - x, x - y)$.	6 Marks	L1	CO2	PO1
	b)	Evaluate $\frac{\partial(x,y,z)}{\partial(u,v,w)}$; *if* $x + y + z = u,\ y + z = uv,\ z = uvw$.	6 Marks	L5	CO2	PO1 PO2
		(OR)				
6.	a)	Investigate the maxima and minima, if any, of the function $f(x,y) = x^3y^2(1 - x - y)$.	6 Marks	L5	CO2	PO1 PO2
	b)	Calculate the maximum value of $x^m y^n z^p$, given $x + y + z = a$ using Lagrange's method of undetermined multipliers.	6 Marks	L3	CO2	PO1 PO2

UNIT-IV

7.	a)	Evaluate $\iint_R y\,dx\,dy$ where R is the region bounded by the parabolas $y^2 = 4x$ *and* $x^2 = 4y$.	6 Marks	L5	CO2	PO1 PO2
	b)	Using change the order of integration, evaluate $\int_0^{4a} \int_{\frac{x^2}{4a}}^{2\sqrt{ax}} dydx$.	6 Marks	L3	CO2	PO1 PO2
		(OR)				
8.	a)	Evaluate $\int_{-1}^{1} \int_{0}^{z} \int_{x-z}^{x+z} (x + y + z)\,dxdydz$.	6 Marks	L5	CO2	PO1
	b)	By changing into polar coordinates, evaluate $\int_{y=0}^{1} \int_{x=y}^{a} \frac{x}{x^2 + y^2} dxdy$.	6 Marks	L3	CO2	PO1 PO2

UNIT-V

9.	a)	Find div $\vec{F}$ and curl $\vec{F}$ at the point (1,2,3) given $\vec{F}$ = grad $\left(x^3y + y^3z + z^3x - x^2y^2z^2\right)$.	6 Marks	L1	CO3	PO1 PO2
	b)	Evaluate $\int_S \vec{F}\,ds$, *where* $\vec{F} = 4x\bar{i} - 2y^2\bar{j} + z^2\bar{k}$ and S is the surface bounding the region $x^2 + y^2 = 4, z = 0$ and z = 3.	6 Marks	L5	CO3	PO1 PO2
		(OR)				
10.		Verify Green's theorem for $\int_C [(xy + y^2)dx + x^2dy]$, where C is the bounded by $y = x$ *and* $y = x^2$.	12 Marks	L5	CO3	PO1 PO2

CODE No.: 19BT1BS02 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Regular Examinations December - 2019

BIOLOGY FOR ENGINEERS

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

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

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		Enumerate any ten major points of difference between prokaryotes and eukaryotes with two examples for each group of organisms.	12 Marks	L2	CO1	PO1
		(OR)				
2.		Discuss in detail the classification of organisms based on the utilization of carbon and energy sources.	12 Marks	L1	CO1	PO1
		UNIT-II				
3.		Explain with suitable examples the hierarchical organization of protein structure with special emphasis on the importance of 3D structure.	12 Marks	L2	CO1	PO1
		(OR)				
4.		Give the functional classification of proteins encompassing the six major classes with two examples for each.	12 Marks	L1	CO1	PO1
		UNIT-III				
5.		What is a Dihybrid cross? Discuss the Mendel's Law of inheritance that can be explained by a dihybrid cross. Work out the results of a dihybridcross upto F_2 generation and throw light on genotypic and phenotypic ratios.	12 Marks	L2	CO2	PO1
		(OR)				
6.	a)	Define 'Genetic code'. Elaborate on the triplet code system at the level of DNA and RNA.	6 Marks	L1	CO2	PO1
	b)	What do you understand by 'Degenerate codons'? Give two examples of amino acids with redundant codons.	6 Marks	L1	CO2	PO1
		UNIT-IV				
7.		What are Transgenic Organisms? Elaborate on the steps involved in the production of a transgenic plant.	12 Marks	L1	CO2	PO6
		(OR)				
8.		Discuss the two significant recombinant products that are successfully employed in the treatment of human diseases.	12 Marks	L2	CO2	PO6
		UNIT-V				
9.		Define 'Synapse'. Explain the synaptic transmission of nerve impulse across a neuro-muscular junction.	12 Marks	L1	CO1	PO1
		(OR)				
10.		What is DNA Fingerprinting? Explain the methodology with two major applications in forensic studies.	12 Marks	L2	CO3	PO6

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Regular Examinations December - 2019

ENGINEERING PHYSICS

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

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

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Derive the expression for maxima and minima of interference in thin films.	8 Marks	L3	CO1	PO1
	b)	Write short note on Double refraction.	4 Marks	L1	CO1	PO2
		(OR)				
2.	a)	Explain the theory of a plane transmission diffraction grating.	9 Marks	L2	CO1	PO1
	b)	A half wave plate is fabricated for a wave length of 3800**Å,** for what wave length does it work as a quarter wave plate.	3 Marks	L4	CO1	PO1
		UNIT-II				
3.	a)	Write Maxwell's equations in differential form.	4 Marks	L1	CO2	PO2
	b)	Show that the velocity of EM waves is same as the velocity of light.	8 Marks	L4	CO2	PO1
		(OR)				
4.	a)	Derive the expression for the Numerical Aperture (NA) of an optical fibre.	6 Marks	L3	CO2	PO2
	b)	Differentiate between the step index and graded index optical fibres.	6 Marks	L4	CO2	PO2
		UNIT-III				
5.	a)	Derive an expression for electron concentration in an intrinsic semiconductors.	6 Marks	L3	CO3	PO1
	b)	Define Hall Effect. Obtain an expression for Hall coefficient.	6 Marks	L2	CO3	PO1 PO2
		(OR)				
6.	a)	Explain the construction and working of semiconductor laser.	8 Marks	L2	CO3	PO1
	b)	Explain how solids are classified on the basis of energy band gap.	4 Marks	L1	CO3	PO1
		UNIT-IV				
7.	a)	Explain the frequency dependence of polarization.	6 Marks	L1	CO4	PO1
	b)	Derive the Clausius-Mosotti relation in dielectrics subjected to a static electric field.	6 Marks	L2	CO4	PO2
		(OR)				
8.	a)	Derive an expression for orbital magnetic moment of an electron.	6 Marks	L3	CO4	PO2
	b)	Differentiate between soft and hard magnetic material based on hysteresis curve.	6 Marks	L4	CO4	PO1
		UNIT-V				
9.	a)	What are the critical parameters? Explain BCS theory.	8 Marks	L2	CO5	PO1 PO2
	b)	Write short notes on high T_C super conductors.	4 Marks	L1	CO5	PO1
		(OR)				
10.	a)	Define Nano materials. Give the classification of Nano materials.	4 Marks	L1	CO5	PO1 PO2
	b)	Explain the synthesis of Nano materials by PLD method.	8 Marks	L2	CO5	PO1

CODE No.: 19BT1BS04 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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I B.Tech I Semester (SVEC-19) Regular Examinations December - 2019

ENGINEERING CHEMISTRY

[Civil Engineering, Mechanical Engineering, 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)	Explain molecular orbital theory.	6 Marks	L2	CO1	PO1 PO2
	b)	Explain π-molecular orbitals of benzene.	6 Marks	L2	CO1	PO1 PO2
		(OR)				
2.	a)	Explain Quantum mechanical model of Hydrogen atom.	7 Marks	L2	CO1	PO1 PO2
	b)	Discuss the bonding in homo nuclear diatomic molecule N_2.	5 Marks	L2	CO1	PO1 PO2

UNIT-II

3.		Explain how Fluoride content in the water will effect on human health and discuss how to remove fluoride content from water by defluoridation technique.	12 Marks	L2	CO2	PO1 PO6
		(OR)				
4.	a)	The water sample is alkaline to both phenolphthalein and methyl orange. From this water sample, 100ml on titration with 0.02N H_2SO_4 required 8mL of acid to reach phenolphthalein end point. When 4 drops of MO are added to the same solution and titration is further continued, the yellow color of the solution just turned pink after addition of another 8mL of acid solution. Report the type and extent of alkalinity present in water sample. Also write the chemical reactions involved in titration.	8 Marks	L3	CO2	PO1 PO6
	b)	Discuss briefly various types of boiler troubles.	4 Marks	L2	CO2	PO1 PO6

UNIT-III

5.	a)	An engineer is assigned to design an electrochemical cell that will deliver a potential of exactly 1.52V. Design and sketch a cell to provide this voltage, detailing the solutions, their concentrations and the electrodes you will need. Write equations for all possible reactions.	8 Marks	L3	CO3	PO1 PO2
	b)	If the SHE was assigned a value of 4.00V rather than 0.00V, what would happen to all of the values listed in the table of standard reduction potentials in electro chemical series.	4 Marks	L3	CO3	PO1 PO2
		(OR)				
6.	a)	Discuss the discharging and charging process of auto mobile (Pb-acid) battery with neat diagram and chemical reactions.	7 Marks	L2	CO3	PO1 PO2
	b)	Illustrate with the aid of label diagrams that show how a Magnesium Bar could be used to prevent or at least decrease the extent of corrosion of a steel underground pipeline used for carrying gases?	5 Marks	L2	CO3	PO1 PO2

UNIT-IV

7.		Discuss the principle and working of UV-Visible Spectrotometer with neat diagram.	12 Marks	L2	CO4	PO1 PO5
		(OR)				
8.		Discuss the principle and applications of SEM and XRD.	12 Marks	L2	CO4	PO1 PO5

UNIT-V

9.		Discuss the classification of Lubricants and any four properties.	12 Marks	L2	CO5	PO1 PO2
		(OR)				
10.	a)	Explain classification of fuels.	5 Marks	L2	CO5	PO2
	b)	Calculate the net and gross calorific value of coal sample has the following composition. C=85%, H=8%, S=1% and ash 4%.	7 Marks	L3	CO5	PO1 PO2

CODE No.: 19BT1HS01 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Regular Examinations December - 2019

COMMUNICATIVE ENGLISH

[Civil Engineering, Mechanical Engineering, 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.		"Language is a tool of communication." Justify the given statement with reference to characteristics of language.	12 Marks	L4	CO1	PO2 PO10
		(OR)				
2.	a)	Explain the importance of non-verbal communication for effective interaction.	6 Marks	L2	CO1	PO2 PO10
	b)	State the importance of assertive communication.	6 Marks	L2	CO1	PO2 PO10
		UNIT-II				
3.		"Barrier to effective listening is present at every factor of the listening process." Justify the given statement from your viewpoint.	12 Marks	L4	CO1	PO2 PO4 PO10
		(OR)				
4.	a)	Explain any three traits of a good listener.	6 Marks	L4	CO1	PO2 PO10
	b)	Write the importance of note-taking while listening for specific information.	6 Marks	L4	CO1	PO2 PO10
		UNIT-III				
5.		"Attending Conferences, Symposia and Seminars enhances speaking skills." Justify the given statement.	12 Marks	L4	CO1	PO2 PO4 PO10
		(OR)				
6.	a)	Explain briefly types of speaking.	6 Marks	L2	CO1	PO2 PO10
	b)	Summarize how you would use the characteristic nuances of voice.	6 Marks	L2	CO1	PO2 PO10
		UNIT-IV				
7.	a)	Explain briefly different interpretation methods in reading.	6 Marks	L2	CO1	PO2 PO10
	b)	**In the following paragraph, identify the topic sentence and the key words in the topic sentence that the other sentences support.** Growing a garden can be fun, good exercise, and will provide fresh fruits and vegetables for the gardener. It is interesting to watch the seeds pop their heads above the soil for the first time.	6 Marks	L2	CO1	PO2 PO5 PO10

It is sometimes hard to believe that a little seed can become a large vine or plant in just a few weeks.

Planting the seeds and pulling weeds are good exercise for anyone. Then, after watching the plant grow and produce, the gardener ends up with delicious tomatoes, beans, or other yummy produce from the garden.

(OR)

8.		Discuss briefly the SQRRR technique for constructive reading.	12 Marks	L2	CO1	PO5 PO2 PO10

UNIT-V

9.		"Appropriate, acceptable, concise and flow of words play a key role in writing." Illustrate.	12 Marks	L4	CO1	PO2 PO4 PO10

(OR)

10.	a)	Discuss how would you apply adaptability and economy that makes up good writing.	6 Marks	L2	CO1	PO2 PO10
	b)	Explain briefly different types of essays with their characteristic features.	6 Marks	L2	CO1	PO2 PO10

CODE No.: 19BT10201 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Regular Examinations December - 2019

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

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

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

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Classify different types of network elements.	6 Marks	L4	CO1	PO2
	b)	Define RMS value and obtain the RMS value for a sine wave.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	State Ohm's law and mention the limitations of it.	6 Marks	L1	CO1	PO2
	b)	Define the following: i) Real power ii) Reactive power iii) Apparent power	6 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Classify the circuit breakers and write the list of parts of a MCB.	6 Marks	L4	CO2	PO2
	b)	Discuss the various causes of low power factor. Explain briefly any one of the method to improve the power factor.	6 Marks	L3	CO2	PO1
		(OR)				
4.	a)	Draw the layout of typical thermal power plant and explain features.	6 Marks	L2	CO2	PO1
	b)	Distinguish between Inverter and UPS with neat diagrams.	6 Marks	L2	CO2	PO2
		UNIT-III				
5.	a)	Describe slip of induction motor. Why induction motor cannot run at synchronous speed?	6 Marks	L2	CO3	PO1
	b)	Develop torque–slip characteristics of a 3-phase induction motor and explain.	6 Marks	L3	CO3	PO3
		(OR)				
6.	a)	Explain the construction and working principle of a single-phase transformer.	6 Marks	L2	CO3	PO3
	b)	Categorize single-phase induction motors and list out their applications.	6 Marks	L4	CO3	PO1
		UNIT-IV				
7.	a)	Elucidate, how can be a Zener diode used as a voltage regulator.	6 Marks	L3	CO4	PO2
	b)	Illustrate the input and output characteristics of BJT in three configurations.	6 Marks	L3	CO4	PO2
		(OR)				
8.	a)	Explain the operation of a half-wave rectifier with relevant waveforms. What is its output current when **rms** input voltage is 220V AC and R_L = 50 ohm?	6 Marks	L3	CO4	PO3
	b)	List the various rectifier circuits for full wave rectification. Describe their advantages and disadvantages.	6 Marks	L1	CO4	PO1
		UNIT-V				
9.	a)	Draw the ***op-amp*** circuit which acts as differentiator and explain its operation.	6 Marks	L2	CO5	PO1
	b)	Deduce how an ***op-amp*** can be used as an inverting amplifier.	6 Marks	L2	CO5	PO1
		(OR)				
10.	a)	Compare the ideal and practical characteristics of ***op-amp***.	6 Marks	L3	CO5	PO1
	b)	Explain how an ***op-amp*** can be used as an adder.	6 Marks	L2	CO5	PO2

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CODE No.: 19BT10341 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Regular Examinations December - 2019

BASIC CIVIL AND MECHANICAL ENGINEERING

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

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

Answer One Question from each Unit
All questions carry equal marks

PART-A

UNIT-I

1.		Classify bricks and state its characteristics and uses of each one of them.	12 Marks	L1	CO1	PO1 PO8
		(OR)				
2.	a)	The following are the observed fore bearing of a traverse sides: AB, 70° 30′; BC,140° 15′; CD, 260° 15′; and DE, 335° 30′. Find their back bearings.	6 Marks	L4	CO1	PO1 PO2
	b)	Classify the surveying based upon the objective of survey.	6 Marks	L1	CO1	PO1 PO2

UNIT-II

3.	a)	What is Dam and what are the points to be considered for selection of site for the Dam?	6 Marks	L4	CO2	PO1 PO2
	b)	What are points to be observed in construction stone masonry?	6 Marks	L4	CO2	PO1 PO8
		(OR)				
4.	a)	Compare brick masonry and stone masonry.	6 Marks	L4	CO2	PO1 PO8
	b)	What do you understand by foundations? Draw sketches to show various types of shallow foundations.	6 Marks	L4	CO2	PO1 PO8

PART-B

UNIT-III

5.		Explain the working of a four stroke petrol engine with neat sketches at different stages.	12 Marks	L2	CO4	PO1
		(OR)				
6.		Differentiate the Impulse Turbine and Reaction Turbine with a neat sketch in brief.	12 Marks	L2	CO3	PO1

UNIT-IV

7.		Derive the expression for length of the cross belt.	12 Marks	L2	CO3	PO1
		(OR)				
8.		Explain various gear trains used for power transmission with neat sketches.	12 Marks	L1	CO3	PO2

UNIT-V

9.		Explain the process of rolling and welding with applications, advantages and disadvantages.	12 Marks	L2	CO4	PO1
		(OR)				
10.		Explain the parts in lathe with neat sketches.	12 Marks	L1	CO4	PO1

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CODE No.: 19BT10501 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Regular Examinations December - 2019

PROGRAMMING FOR PROBLEM SOLVING

[Civil Engineering, Mechanical Engineering, 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)	Define Algorithm. Write about implementation of algorithms.	6 Marks	L1	CO1	PO1
	b)	Write an algorithm to accept two numbers; compute the sum and print the result. Evaluate.	6 Marks	L3	CO1	PO1
		(OR)				
2.	a)	Define flowchart. What are the symbols used in flowcharting type?	6 Marks	L1	CO1	PO1
	b)	Explain Input and output statements in python.	6 Marks	L2	CO1	PO1

UNIT-II

3.	a)	What are the different iterative statements?	6 Marks	L3	CO1	PO1
	b)	Write a Python program using while loop first N numbers divisible by 5.	6 Marks	L3	CO1	PO2
		(OR)				
4.	a)	Write the syntax for if...elif...else conditionals.	6 Marks	L3	CO1	PO1
	b)	Print the following pattern in python script. **1** **2 2** **3 3 3** **4 4 4 4** **5 5 5 5 5**	6 Marks	L3	CO1	PO2

UNIT-III

5.	a)	Write about list comprehension. Give an example for list comprehension.	6 Marks	L3	CO1	PO1
	b)	Write a Python program to get the 4^{th} element and 4^{th} element from last of a tuple.	6 Marks	L3	CO1	PO2
		(OR)				
6.	a)	What is list? List the methods of list data type.	6 Marks	L2	CO1	PO1
	b)	Define Queue. Implement Queue operations using Python.	6 Marks	L1	CO1	PO2

UNIT-IV

7.	a)	What is the difference between local and global variables? Give examples.	6 Marks	L3	CO2	PO1
	b)	Write a function that prints all the prime numbers between 0 and **limit**, where limit is a parameter.	6 Marks	L3	CO2	PO2
		(OR)				
8.	a)	Define File. List the file opening modes.	6 Marks	L2	CO2	PO1
	b)	Write a Python program to count the number of words in a text file.	6 Marks	L3	CO2	PO2

UNIT-V

9.	a)	Write the process of creating Data Frame with example.	6 Marks	L3	CO2	PO1
	b)	Develop Python script to get the first 3 rows of a given Data Frame.	6 Marks	L3	CO2	PO2
		(OR)				
10.	a)	Define indexing. List out different choices for indexing.	6 Marks	L3	CO2	PO1
	b)	Design Python script to read total profit of all months and show it using a line plot.	6 Marks	L3	CO2	PO2

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations September – 2020

DIFFERENTIAL EQUATIONS AND MULTIVARAIBLE CALCULUS

[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: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Find the general solution of the differential equation $(D^2 + 5D + 6)y = e^x \sin x$.	6 Marks	L1	CO1	PO1 PO2
	b)	Change the differential equation $(1+x)^2 \frac{d^2y}{dx^2} + (1+x)\frac{dy}{dx} + y = \sin[\log(1+x)]$ in to linear equation with constant coefficients and find its general solution.	6 Marks	L2	CO1	PO1 PO2
		(OR)				
2.		The charge q in a L-C-R circuit is given by the differential equation $L\frac{d^2q}{dt^2} + R\frac{dq}{dt} + \frac{q}{C} = E\sin pt$ where $p^2 = \frac{1}{LC}$. If initially the current i and the charge q in the circuit are zero, then show that for small values of $\frac{R}{L}$, the current i in the circuit at time t is $\frac{ET}{2L}\sin pt$.	12 Marks	L2	CO1	PO1 PO2

UNIT-II

3.	a)	Determine the complete solution of the linear partial differential equation $(x^2 - yz)p + (y^2 - zx)q = z^2 - xy$. .	6 Marks	L3	CO1	PO1 PO2
	b)	Find the complete solution of the non-linear partial differential equation $z^2(p^2x^2 + q^2) = 1$. .	6 Marks	L1	CO1	PO1 PO2
		(OR)				
4.	a)	Solve the linear homogeneous partial differential equation $\frac{\partial^2 z}{\partial x^2} - \frac{\partial^2 z}{\partial x \partial y} = \cos x \cos 2y$.	6 Marks	L3	CO1	PO1 PO2
	b)	Using the method of separation of variables, solve $x^2\frac{\partial u}{\partial x} + y^2\frac{\partial u}{\partial y} = 0$.	6 Marks	L3	CO1	PO1 PO2

UNIT-III

5.	a)	Calculate the value of $\frac{\partial(u,v,w)}{\partial(x,y,z)}$ at the point (1, -1, 0) where $u = x + 3y^2 - z^3$, $v = 4x^2yz$ *and* $w = 2z^2 - xy$.	6 Marks	L3	CO2	PO1
	b)	Identify stationary points and discuss the maxima and minima of a function $f(x,y) = x^3y^2(1-x-y)$ at their points.	6 Marks	L3	CO2	PO1 PO2
		(OR)				

6.	a)	Examine the following function for extreme values $f(x,y) = x^4 + y^4 - 2x^2 + 4xy - 2y^2$.	6 Marks	L4	CO2	PO1 PO2
	b)	Applying Lagrange's method, find the dimensions of the rectangular box requiring least material for its construction when the box open at the top is to have a volume of 32 cubic feet.	6 Marks	L3	CO2	PO1 PO2

UNIT-IV

7.	a)	Evaluate the double integral $\int_0^\infty \int_0^\infty e^{-(x^2+y^2)}\,dxdy$ by changing into polar coordinates.	6 Marks	L5	CO2	PO1 PO2
	b)	Show that the area between the plane curves $y^2 = 4ax$ *and* $x^2 = 4ay$ *is* $\frac{16}{3}a^2$.	6 Marks	L2	CO2	PO1

(OR)

8.	a)	Evaluate the triple integral $\int_0^1 \int_0^{\sqrt{1-x^2}} \int_0^{\sqrt{1-x^2-y^2}} xyzdxdydz$.	6 Marks	L5	CO2	PO1
	b)	Determine the area of the plane curve $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ in first quadrant.	6 Marks	L3	CO2	PO1 PO2

UNIT-V

9.	a)	Find the directional derivative of the scalar field $f(x,y,z) = xy^3 + yz^3$ at the point (2, -1, 1) in the direction $\bar{i} + 2\bar{j} + 2\bar{k}$.	6 Marks	L1	CO3	PO1
	b)	Determine the work done in moving a particle in the force field $\bar{F} = 3x^2\,\bar{i} + (2xz - y)\,\bar{j} + z\,\bar{k}$ along the curve defined by $x^2 = 4y, 3x^2 = 8z$ *from* $x = 0$ *to* $x = 2$.	6 Marks	L3	CO3	PO1 PO2

(OR)

10.		Verify Green's theorem for $\int_C (xy + y^2)\,dx + x^2\,dy$, where C is a curve bounded by $y = x$ *and* $y = x^2$.	12 Marks	L5	CO3	PO1 PO2

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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I B.Tech I Semester (SVEC-19) Supplementary Examinations September – 2020

BIOLOGY FOR ENGINEERS

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

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

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		Define living organisms. Explain the differences between prokaryotes and eukaryotes.	12 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Classify living organisms based on the carbon and energy sources.	6 Marks	L2	CO1	PO1
	b)	Summarize cellular basis of life.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Define bio-molecules and classify Carbohydrates.	8 Marks	L1	CO1	PO1
	b)	Explain fermentation and its industrial applications.	4 Marks	L2	CO3	PO6
		(OR)				
4.	a)	Define enzymes and describe its industrial applications.	7 Marks	L1	CO1	PO1
	b)	Explain structure and function of nucleic acids.	5 Marks	L2	CO1	PO1
		UNIT-III				
5.	a)	Summarize Mendel laws. Add a note on single gene disorders.	6 Marks	L2	CO2	PO1
	b)	Explain the Genetic code with a neat labeled table.	6 Marks	L2	CO2	PO1
		(OR)				
6.	a)	Define replication. Describe the mechanism of replication with a neat labeled diagram.	6 Marks	L1	CO1	PO1
	b)	Describe in detail Transcription and Translation.	6 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	Explain the recombinant DNA technology.	6 Marks	L2	CO3	PO6
	b)	How to generate transgenic microbes and plants? Give examples for both the transgenic organisms.	6 Marks	L1	CO3	PO6
		(OR)				
8.	a)	Identify the role of biosensors and biochips.	6 Marks	L3	CO3	PO1
	b)	Analyze the pros and cons of recombinant vaccines.	6 Marks	L4	CO3	PO6
		UNIT-V				
9.	a)	Define DNA Micro array and describe it's applications.	6 Marks	L1	CO3	PO6
	b)	Explain the role of Neurons in the Neurotransmission	6 Marks	L2	CO1	PO1
		(OR)				
10.		Explain the human digestive system with neat diagram.	12 Marks	L2	CO1	PO1

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations September – 2020

ENGINEERING PHYSICS

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

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

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		Discuss the diffraction grating and obtain conditions for the intensity distribution and positions of maxima and minima.	12 Marks	L2	CO1	PO1 PO2
		(OR)				
2.	a)	Explain the necessary theory to determine the wavelength of a light using Newton's ring method.	9 Marks	L2	CO1	PO1 PO2
	b)	The refractive indices of mica for ordinary and extraordinary rays are 1.586 and 1.592 with a wavelength of 5460Å. Find the thickness of mica sheet to act as a quarter wave plate.	3 Marks	L1	CO1	PO2
		UNIT-II				
3.	a)	Define Gradient, divergence and curl of a vector.	4 Marks	L1	CO2	PO1
	b)	State and explain Maxwell's equation for electromagnetic field. Deduce the wave equation for a plane wave in a free space using Maxwell's equation.	8 Marks	L2	CO2	PO1 PO2
		(OR)				
4.	a)	Explain the block diagram of optical communication system through fiber optic cable.	8 Marks	L2	CO2	PO1
	b)	List the applications of optical fibers in various fields of engineering.	4 Marks	L1	CO2	PO2
		UNIT-III				
5.	a)	Explain the concepts of drift and diffusion in semiconductors.	5 Marks	L2	CO3	PO1
	b)	Derive an expression for drift and diffusion currents in semiconductors.	7 Marks	L3	CO3	PO2
		(OR)				
6.	a)	What is the principle of photodiode? Describe the construction and working of photodiode with neat diagram.	10 Marks	L2	CO3	PO1 PO2
	b)	Outline dark current in photodiode.	2 Marks	L1	CO3	PO1
		UNIT-IV				
7.	a)	What is Piezoelectricity? Explain.	4 Marks	L1	CO4	PO1
	b)	Explain ionic and orientation polarization.	8 Marks	L2	CO4	PO2
		(OR)				
8.	a)	State magnetic moment. Explain the origin of magnetic moment in an atom.	8 Marks	L2	CO4	PO1 PO2
	b)	Differentiate between hard and soft magnetic materials.	4 Marks	L2	CO4	PO1
		UNIT-V				
9.	a)	Explain AC and DC Josephson's effect.	8 Marks	L2	CO5	PO2
	b)	What is flux quantization?	4 Marks	L1	CO5	PO1
		(OR)				
10.	a)	Explain how the physical, optical and magnetic properties of a nanomaterial differ from that of the bulk material.	9 Marks	L2	CO5	PO1
	b)	List any three applications of nanomaterials.	3 Marks	L1	CO5	PO1

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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I B.Tech I Semester (SVEC-19) Supplementary Examinations September – 2020

ENGINEERING CHEMISTRY

[Civil Engineering, Mechanical Engineering, 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)	Illustrate the pi molecular orbitals of 1, 3-butadiene made from four isolated 'p' orbitals.	6 Marks	L2	CO1	PO1
	b)	Recall the conditions required for the formation of molecular orbital.	6 Marks	L1	CO1	PO1
		(OR)				
2.		Show that the energies of a particle in a potential box are quantized.	12 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	What are zeolites? Explain the zeolite process. List the advantages and disadvantages of zeolite process.	8 Marks	L2	CO2	PO1
	b)	Define hard water and explain the types of hardness.	4 Marks	L2	CO2	PO1
		(OR)				
4.	a)	What are boiler troubles? Why they are caused? How the boiler corrosion can be avoided?	8 Marks	L1	CO2	PO1 PO2 PO6
	b)	Define portable water. List any six WHO and BIS standards of portable water.	4 Marks	L1	CO2	PO1 PO6
		UNIT-III				
5.	a)	Explain the chemistry involved in concentration cell corrosion.	4 Marks	L2	CO3	PO1
	b)	Define electroplating. Explain electroplating of nickel over metal object.	8 Marks	L2	CO3	PO1 PO2
		(OR)				
6.	a)	Define reference electrode. What is its importance in the measurement of EMF of a cell? Explain by taking suitable example.	8 Marks	L2	CO3	PO1 PO2
	b)	Discuss the working principle of alkali metal sulphide battery.	4 Marks	L2	CO3	PO1
		UNIT-IV				
7.		Discuss the principle and working of an IR spectrometer with the help of a block diagram.	12 Marks	L2	CO4	PO1 PO5
		(OR)				
8.	a)	State Beer –Lamberts law and discuss various types of electronic transitions.	6 Marks	L2	CO4	PO1
	b)	Write the principle and applications of Transmission Electron Microscope.	6 Marks	L1	CO4	PO1
		UNIT-V				
9.	a)	Write a note on calorific value of a fuel. Distinguish between gross and net calorific value of a fuel.	4 Marks	L4	CO5	PO1
	b)	What is meant by cracking of petroleum? Explain how gasoline can be obtained making use of various catalytic cracking methods.	8 Marks	L3	CO5	PO1
		(OR)				
10		Discuss the classification of lubricants with suitable examples.	12 Marks	L 2	CO5	PO1

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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I B.Tech I Semester (SVEC-19) Supplementary Examinations September - 2020

COMMUNICATIVE ENGLISH

[Civil Engineering, Mechanical Engineering, 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.		Classify barriers to communication according to the processes of message formation and delivery.	12 Marks	L4	CO1	PO2 PO1 PO10
		(OR)				
2.	a)	Write short note on various modes of communication. What is the basis of categorizing them?	6 Marks	L2	CO1	PO1 PO10
	b)	Explain in detail the importance of verbal and non-verbal communication.	6 Marks	L2	CO1	PO1 PO10
		UNIT-II				
3.		"Listening Modes are significant for effective communication." Interpret the given statement referring to the modes of listening.	12 Marks	L4	CO1	PO2 PO1 PO10
		(OR)				
4.	a)	Write the importance of Note-taking while listening for specific information.	6 Marks	L2	CO1	PO1 PO10
	b)	State the possible reasons if a person has poor listening skills.	6 Marks	L2	CO1	PO1 PO10
		UNIT-III				
5.		"Effective speaking involves overcoming the barriers and conveying a clear and concise message". Discuss elaborately.	12 Marks	L4	CO1	PO2 PO1 PO10
		(OR)				
6.	a)	'Organizing a conference requires meticulous planning and systematic preparation'. Analyze the guidelines helpful in planning a conference.	6 Marks	L4	CO1	PO2 PO1 PO10
	b)	Discuss the steps that may be carried out in organizing a symposium.	6 Marks	L2	CO1	PO1 PO10
		UNIT-IV				
7.		Discuss SQ3R reading technique elaborately with suitable examples.	12 Marks	L4	CO1	PO2 PO1 PO10 PO5
		(OR)				
8.	a)	Illustrate the author's techniques in reading and interpretation.	6 Marks	L2	CO1	PO1 PO10 PO5
	b)	Outline the various aspects of critical reading.	6 Marks	L2	CO1	PO1 PO10
		UNIT-V				
9.		"Achieving conciseness and flow is important in technical writing". Justify the given statement with suitable examples.	12 Marks	L4	CO1	PO2 PO1 PO10
		(OR)				

10.	a)	'Essays are often used as tools to help improve writing skills.' Outline the guidelines for essay writing.	6 Marks	L2	CO1	PO1 PO10
	b)	How to use concrete and specific words in technical writing?	6 Marks	L2	CO3	PO1 PO10

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations September - 2020

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

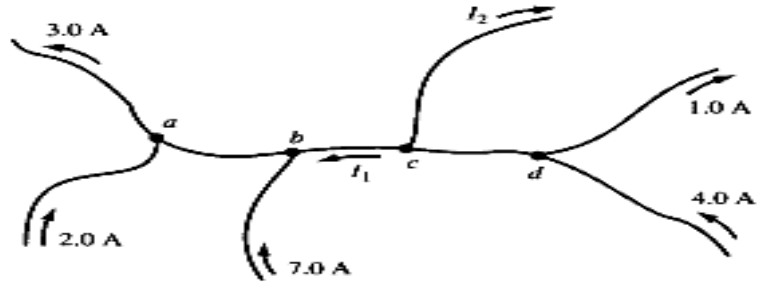
[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

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

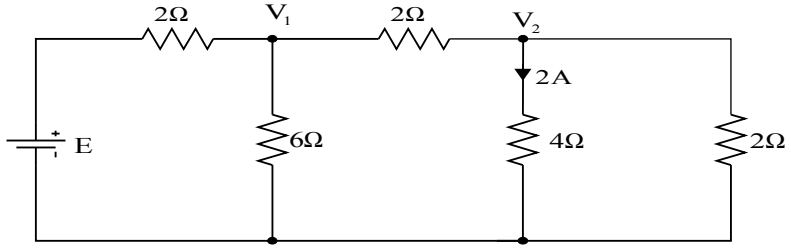
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Obtain the currents I_1 and I_2 for the network shown in Fig.	6 Marks	L2	CO1	PO2

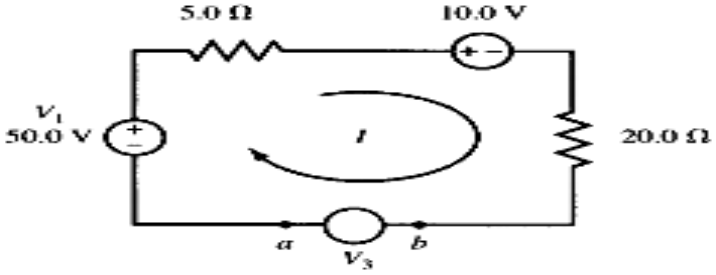


	b)	For the circuit shown in figure, apply KVL to find the node voltages. Where E = 100 V.	6 Marks	L3	CO1	PO2



(OR)

2.	a)	Define: i) Active power iii) Power factor v)Apparent power ii) Reactive power iv) Peak factor.	6 Marks	L1	CO1	PO1
	b)	Find V_3 and its polarity if the current *I* in the circuit shown in figure is 0.40 A.	6 Marks	L3	CO1	PO2



UNIT-II

3.	a)	With a block diagram, explain the principle and process of power generation in a solar power plant.	6 Marks	L1	CO2	PO1
	b)	Elucidate the significance of Neutral and Earth.	3 Marks	L2	CO2	PO1
	c)	Bring out the significant differences between RCCB and MCB.	3 Marks	L2	CO2	PO1

(OR)

4.	a)	Derive the expression for most economical power factor.	6 Marks	L2	CO2	PO2
	b)	Differentiate: i) Fuse and circuit breaker. ii) MCCB and ELCB.	6 Marks	L2	CO2	PO1

UNIT-III

5.	a)	Explain the principle of operation and constructional features of a three phase induction motor.	6 Marks	L1	CO3	PO1
	b)	Derive the expression for EMF equation of single phase transformer.	6 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Explain the constructional details of single phase resistor start induction motor.	6 Marks	L1	CO3	PO1
	b)	Explain the constructional details of synchronous machine and mention any one application.	6 Marks	L1	CO3	PO5

UNIT-IV

7.		Explain the operation of a p-n junction diode in forward biased and reverse biased condition and also draw its V-I characteristics.	12 Marks	L1	CO4	PO1
		(OR)				
8.	a)	Distinguish between Half wave rectifier and full wave rectifier.	6 Marks	L2	CO4	PO2
	b)	Explain the input and output characteristic of a transistor in common base configurations.	6 Marks	L1	CO4	PO1

UNIT-V

9.	a)	What are the characteristics of an ideal Op-amp and discuss in detail?	6 Marks	L1	CO5	PO1
	b)	Construct a circuit to realize $\mathbf{V_{out} = 10v_1 + 20v_2 - 5v_3}$.	6 Marks	L3	CO5	PO3
		(OR)				
10.	a)	Derive an expression for V_0 of the integrator circuit by using an Op-amp.	6 Marks	L2	CO5	PO2
	b)	Define CMRR and obtain the expression for output voltage in terms of CMRR.	6 Marks	L2	CO5	PO2

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations September – 2020

BASIC CIVIL AND MECHANICAL ENGINEERING

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

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

Answer One Question from each Unit
All questions carry equal marks

PART-A

UNIT-I

1.	a)	Discuss the various specialized sub disciplines of civil engineering and briefly explain their societal applications.	6 Marks	L2	CO1	PO1 PO6
	b)	The following readings were taken with an auto level and 4m staff. Draw up a level book page and reduce the levels by height of instrument method. 0.585, 1.010, 1.735, 3.295, 3.775, 0.350, 1.300, 1.795, 2.575, 3.375, 3.895, 1.735, 0.635, 1.605m. The instrument was shifted after fifth and eleventh readings. Take RL of first point as 136.440m.	6 Marks	L4	CO1	PO1 PO2 PO5
		(OR)				
2.	a)	Explain the properties of the various materials used in concrete.	6 Marks	L2	CO1	PO1 PO2
	b)	The resultant of two forces, when they act at an angle of 60^0 is 13N. If the same forces are acting at right angles, their resultant is 10N. Determine the magnitude of the two forces.	6 Marks	L3	CO1	PO1 PO2

UNIT-II

3.	a)	Explain in detail about the various components of super structure with neat sketch.	6 Marks	L2	CO1	PO1 PO10
	b)	What are the requirements of good building stone? State important varieties of building stones.	6 Marks	L2	CO1	PO1 PO8
		(OR)				
4.	a)	What do you mean by interior design? Discuss the basic principles to be considered in interior design.	6 Marks	L2	CO1	PO1
	b)	Define rain water harvesting and explain the structure of dam with neat sketch.	6 Marks	L2	CO1	PO1 PO7 PO10

PART-B

UNIT-III

5.		Describe the working principle of a De-Laval turbine with neat diagram.	12 Marks	L2	CO2	PO1
		(OR)				
6.		Write the comparisons between the four stroke and two stroke engines.	12 Marks	L1	CO2	PO1

UNIT-IV

7.	a)	Write the advantages of V-belts over flat belt drive.	6 Marks	L1	CO2	PO1
	b)	The central distance two shaft is 4m having two pulleys with diameter having 500mm and 700mm respectively find the length of belt required - i) for open belt drive ii) for cross belt drive.	6 Marks	L3	CO2	PO1 PO2
		(OR)				
8.	a)	Explain gear terminology with neat sketch.	6 Marks	L2	CO2	PO1
	b)	List the types of gear train and explain.	6 Marks	L2	CO2	PO1

UNIT-V

9.	Draw a neat diagram of welding process, and explain its working principle.	12 Marks	L2	CO2	PO1
	(OR)				
10.	Give an illustrative explanation of shaping processand explain its working principle.	12 Marks	L2	CO2	PO1

CODE No.: 19BT10501 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations September – 2020

PROGRAMMING FOR PROBLEM SOLVING

[Civil Engineering, Mechanical Engineering, 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)	Define flow chart, explain various symbols used in flowchart design.	6 Marks	L1	CO1	PO1
	b)	Illustrate Membership and Identity operators in Python with an example for each.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Design an algorithm to print first N Fibonacci terms.	6 Marks	L3	CO1	PO2
	b)	Write a python script to perform swapping of two numbers without using third variaLe.	6 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Write the difference between break and continue statements with examples.	6 Marks	L2	CO1	PO1
	b)	Given two integers dividend and divisor, write a python program to divide two integers without using multiplication, division and mod operator. (Ex: Dividend=10, Divisor-3, Ouput-3).	6 Marks	L3	CO1	PO2
		(OR)				
4.	a)	Write a python program to check whether given character is vowel or consonant or special symbol or digit.	6 Marks	L3	CO1	PO2
	b)	Display the following pattern using python script. 12345 1234 123 12 1	6 Marks	L3	CO1	PO2

UNIT-III

5.	a)	Write a python script to delete duplicate strings from a list of strings. (Insertion order should maintain after deleting duplicate string).	6 Marks	L3	CO1	PO3
	b)	Vamsi loves lucky numbers. Everybody knows that lucky numbers are positive integers whose decimal representation contains only the lucky digits 4 and 7. For example, numbers 47, 744, 4 are lucky and 5, 17, 467 are not. Write a python script to find whether the given number is Lucky or not.	6 Marks	L3	CO1	PO2
		(OR)				
6.	a)	Define queue. Write a python script to implement queue operations.	6 Marks	L3	CO1	PO3
	b)	Create a dictionary and display dictionary. Update any one key value and display the updated dictionary.	6 Marks	L3	CO1	PO2

UNIT-IV

7.	a)	Write a python script to count number of lines, words and characters present in a given file.	6 Marks	L3	CO2	PO3
	b)	Define recursion. Write a recursive function to calculate factorial of a given number.	6 Marks	L3	CO2	PO2

(OR)

8.	a)	Develop a python script to calculate GCD of given list of numbers.	6 Marks	L3	CO2	PO3
	b)	Explain functionality of the following properties. i) shape. ii) ndim.	6 Marks	L1	CO2	PO1

UNIT-V

9.	a)	Create a dictionary it contains student information, convert dictionary into pandas data frame.	6 Marks	L2	CO2	PO1
	b)	Consider data frame contains employee salary information. Write a python script to display employee details whose salary >30000.	6 Marks	L3	CO2	PO3

(OR)

10.	a)	Illustrate different ways of slicing operations used in selecting data from data frame.	6 Marks	L2	CO2	PO1
	b)	Draw bar plots by considering discrete data.	6 Marks	L3	CO2	PO3

CODE No.: 16BT1BS01 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

ENGINEERING CHEMISTRY

[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		Discuss the following boiler troubles in detail. i) Scale formation. ii) Boiler corrosion. iii) Caustic embrittlement.	14 Marks
		(OR)	
2	a)	Discuss permutit process for water softening.	7 Marks
	b)	1g of $CaCO_3$ was dissolved in dil. HCl and diluted to 1000ml, 50ml of this solution required 48ml of EDTA solution for titration. 50ml of Hard water sample required 15ml of EDTA solution for titration. 50 ml of same hard water on boiling, filtering, etc required 10ml of EDTA solution. Calculate the different kinds of Hardness in ppm.	7 Marks

UNIT-II

3	a)	Discuss about: i) Particulate composites. ii) Layered composites.	7 Marks
	b)	Explain the mechanism of degradation of Bio-degradable polymers.	7 Marks
		(OR)	
4		Explain in brief about the types of composite materials and mention their applications.	14 Marks

UNIT-III

5	a)	Explain the significance of green solvents with examples	7 Marks
	b)	What are the advantages of bio-diesel and mention their commercial applications.	7 Marks
		(OR)	
6		Write the principles of Green Chemistry and evaluate their role on Chemistry and environment.	14 Marks

UNIT-IV

7		Define sensor. Classify the sensors with examples and give the applications of electrochemical sensor.	14 Marks
		(OR)	
8		Explain the working principle and construction of electrochemical sensor.	14 Marks

UNIT-V

9		Explain the role of sacrificial anodic and impressed current cathodic protection methods in the protection of buried pipelines	14 Marks
		(OR)	
10	a)	Write short note on: i) Cloud and pour points. ii) Aniline points.	7 Marks
	b)	Summarize the role of corroding environment in influencing the corrosion	7 Marks

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CODE No.: 16BT1BS02 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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I B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

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)	Define: i) Critical angle. ii) Acceptance angle. iii) Numerical aperture.	4 Marks
	b)	Obtain an expression for acceptance angle and numerical aperture.	10 Marks
		(OR)	
2	a)	Explain with block diagram, the working of an optical fiber communication system.	9 Marks
	b)	Write various applications of optical fibers.	5 Marks

UNIT-II

3		Discuss the motion of an electron in a periodic potential field and explain the formation of energy bands.	14 Marks
		(OR)	
4	a)	Describe the Fermi-Dirac distribution function of electrons. Explain the effect of temperature on the distribution function.	8 Marks
	b)	Classify the conductors, semiconductors and insulators based on band theory of solids.	6 Marks

UNIT-III

5		Obtain an expression for the internal field experienced by an atom in a dielectric material.	14 Marks
		(OR)	
6	a)	Explain the following: i) Dielectric constant. ii) Electric susceptibility. iii) Electric polarization. iv) Ferro-electricity.	7 Marks
	b)	Discuss in detail about the electronic polarization.	7 Marks

UNIT-IV

7	a)	Show that super conductors exhibits diamagnetic nature based on Meissner effect.	7 Marks
	b)	Write a note on Penetration depth and Flux quantization.	7 Marks
		(OR)	
8	a)	Define superconductivity. Write the general properties of superconductors. A superconducting tin has a critical temperature of 3.722K at zero magnetic fields and a critical field of 0.0305 Tesla at 0K. Find the critical field at 2K.	10 Marks
	b)	Write various applications of superconductivity.	4 Marks

UNIT-V

9	a)	What do you mean by nanomaterial? Explain any five properties of nanomaterials.	8 Marks
	b)	Elaborate the fabrication of nanomaterials by using ball milling method.	6 Marks
		(OR)	
10	a)	Describe the basic properties of nanomaterials.	7 Marks
	b)	Explain the applications of nanomaterials in different fields.	7 Marks

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CODE No.: 16BT1HS01 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

TECHNICAL ENGLISH

[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	Distinguish the productive and receptive skills towards effective and assertive communication.	14 Marks
	(OR)	
2	What is communication barrier? Discuss the communication barriers in various scenarios.	14 Marks

UNIT-II

3	Contrast the Dos and Don'ts of effective listening.	14 Marks
	(OR)	
4	Identify the barriers to effective listening and choose the ways to overcome them.	14 Marks

UNIT-III

5	Classify various types of speaking.	14 Marks
	(OR)	
6	Discuss 'credibility' and 'emotional appeal' to develop skills of persuasion.	14 Marks

UNIT-IV

7	Differentiate between reading an essay and a novel.	14 Marks
	(OR)	
8	Assess the applicability of SQ3R reading technique in developing the comprehensive skill.	14 Marks

UNIT-V

9	Infer the importance of referencing and styling and write a short note on plagiarism.	14 Marks
	(OR)	
10	Interpret the usage of the right words in the right context as one of the essential elements of effective writing.	14 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

TRANSFORMATION TECHNIQUES AND PARTIAL 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 Prove that $x^2 = \frac{\pi^2}{3} + 4\sum_{n=1}^{\infty}(-1)^n \frac{\cos nx}{n^2}$, $-\pi < x < \pi$ and hence show that $\sum \frac{1}{n^2} = \frac{\pi^2}{6}$. 14 Marks

(OR)

2 Define Fourier series of $f(x)$ in the interval $(-\pi, \pi)$ and develop the same for $f(x) = \begin{cases} -\pi, & -\pi < x < 0 \\ x, & 0 < x < \pi \end{cases}$ and hence deduce that $\frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \ldots = \frac{\pi^2}{8}$. 14 Marks

UNIT-II

3 State Fourier transform of $f(x)$ and develop a Fourier transform of $f(x) = \begin{cases} 1 & for \quad |x| < 1 \\ 0 & for \quad |x| > 1 \end{cases}$ and hence evaluate $\int_0^{\infty} \frac{\sin x}{x}\, dx$. 14 Marks

(OR)

4 State Fourier transform of $f(x)$ and find the Fourier transform of $e^{-a^2x^2}$, $a < 0$. Hence deduce that $e^{-x^2/2}$ is self reciprocal in respect of Fourier transform. 14 Marks

UNIT-III

5 a) Find (i) **L (e^{4t} sin 2t cos t)**. (ii) **L (cosh at sin bt)**. 7 Marks

b) Making use of L ($\sin\sqrt{t}$) = $\frac{\sqrt{\pi}}{2s^{3/2}} e^{\frac{-1}{4s}}$ then find L ($\frac{\cos\sqrt{t}}{\sqrt{t}}$). 7 Marks

(OR)

6 Making use of the properties of transforms find 14 Marks

i) **L (t e^{-t} cosh t)**. ii) **L (t^2cos 3t)**.

UNIT-IV

7 a) State and prove initial value theorem. 7 Marks

b) State shifting principle of z - transform and applying it find $Z\left[(n+1)^2\right]$ 7 Marks

given that $Z(n^2) = \dfrac{z^2 + z}{(z-1)^3}$.

(OR)

8 a) Write the convolution theorem of Z – transforms and find the inverse Z-transform of $\dfrac{z^2}{\left(z-\frac{1}{2}\right)\left(z-\frac{1}{3}\right)}$ applying it. 7 Marks

b) Write the initial value theorem and apply it to evaluate $f(2)$ and $f(3)$, if $f(z) = \dfrac{5z^2 + 3z + 12}{(z-1)^4}$. 7 Marks

UNIT-V

9 a) Obtain the partial differential equation by eliminating the arbitrary function from $xy + yz + zx = f\left(\dfrac{z}{x+y}\right)$. 7 Marks

b) By the technique of separation of variables derive a solution for $u_x = 4u_y, u(0, y) = e^{-3y}$. 7 Marks

(OR)

10 a) Estimate the general solution of partial differential equation $x^2(y-z)p + y^2(z-x)q = z^2(x-y)$. 7 Marks

b) A string of length l is initially at rest in equilibrium position and each of its points is given the velocity $\left(\dfrac{\partial y}{\partial t}\right)_{t=0} = b\sin^3\left(\dfrac{\pi x}{l}\right)$. Create an expression for the displacement $y(x, t)$. 7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

BUILDING MATERIALS AND CONSTRUCTION TECHNOLOGY

[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 tests to be conducted on stones to determine their suitability.	14 Marks
		(OR)	
2		Interpret the various agencies which tend to reduce the life of a building stone.	14 Marks

UNIT-II

3		Enumerate the methods of preparation of lime mortar. Describe any two major tests to determine the quality of lime.	14 Marks
		(OR)	
4		List out the different types of lime mortar. Mention their properties.	14 Marks

UNIT-III

5		Distinguish between Thermoplastics and Thermosetting plastics.	14 Marks
		(OR)	
6		Demonstrate penetration of bitumen.	14 Marks

UNIT-IV

7	a)	Write a note on pile foundation and its types.	7 Marks
	b)	Describe the process of underpinning with relevant uses.	7 Marks
		(OR)	
8	a)	Draw the plan and elevation of 1.5 brick thick wall of English bond.	7 Marks
	b)	Distinguish between English bond and Flemish bond.	7 Marks

UNIT-V

9	a)	Describe the procedure for carrying out the plastering with lime or cement mortar in two coats.	7 Marks
	b)	Write brief note on cost effective building materials.	7 Marks
		(OR)	
10	a)	Explain the constituents of paints and list the types of paints.	7 Marks
	b)	Explain: i) Ceramic flooring. ii) Marble flooring.	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

ENGINEERING MECHANICS

[Civil Engineering and Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

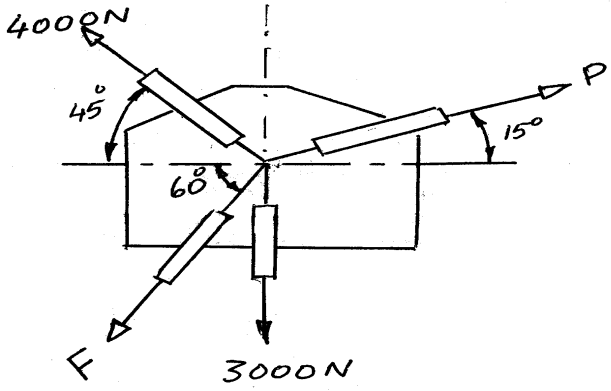
1 a) Two forces of magnitude P and Q act at a point. Their resultant is inclined to first, at an angle α and has magnitude R. If the magnitude of the first force is increased by R, determine the angle made by the new resultant with the first force. 7 Marks

b) Two forces of magnitude (P+Q) and (P-Q) acting at a point include an angle 2θ. Show that if their resultant makes an angle α with the bisector of the angle between them, then P tan α = Q tan θ. 7 Marks

(OR)

2 a) Define the following: 7 Marks
- i) Law of parallelogram of forces.
- ii) Principle of force transmissibility.
- ii) Particle.
- iv) Rigid body.

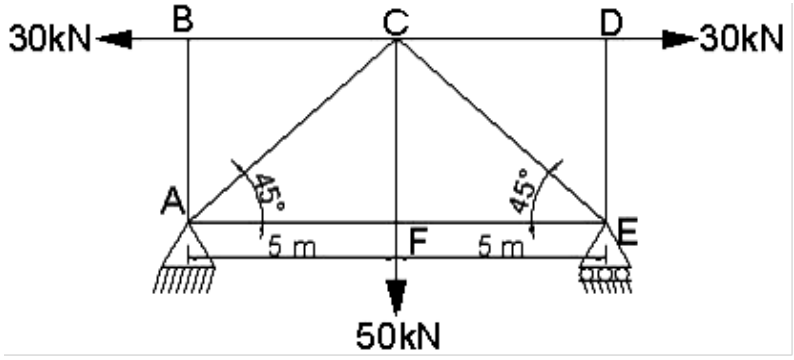
b) The forces on the gusset plate of a joint in a bridge truss act as shown in figure. Determine the magnitudes of the two forces P and F to maintain equilibrium of the joint. 7 Marks



UNIT-II

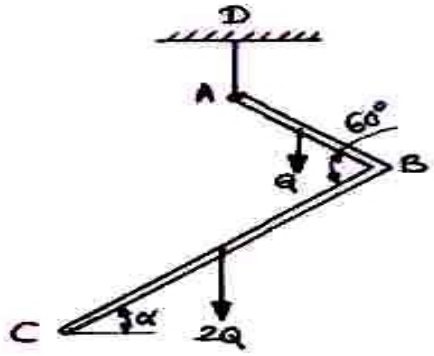
3 a) What is perfect frame and imperfect frame? Write the advantage of method of sections as compared to method of joints. 7 Marks

b) Determine the forces in all the members of a truss shown in figure using method of joints. 7 Marks



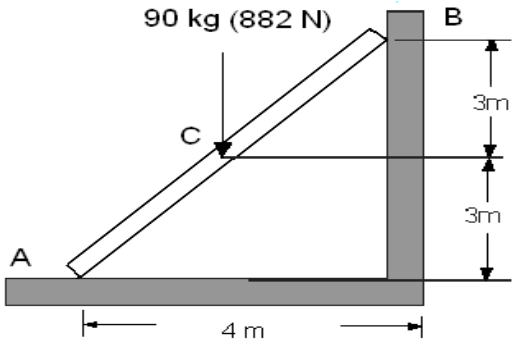
(OR)

4 Two prismatic bars AB and BC of lengths ‘L’ and ‘2L’ respectively are rigidly joined at B and suspended by string AD as shown in figure. Determine the position of equilibrium as defined by the angle ‘α’, that the bars will assume under the action of the weights ‘Q’ and ‘2Q’. 14 Marks



UNIT-III

5 A person of mass 90 kg is standing on a ladder at point C, shown in figure. The ladder rests on a rough horizontal floor at A and against a smooth vertical wall at B. If the ladder is just on the point of slipping find the coefficient of friction between the ladder and the floor. Neglect the weight of the ladder. Also find the reactions at A and B. 14 Marks



(OR)

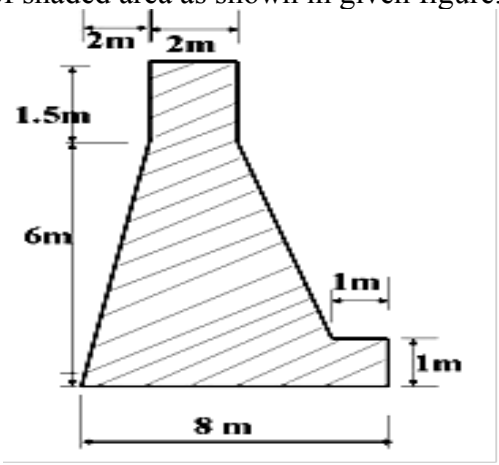
6 a) What is friction? Explain how friction is both desirable and undesirable in engineering applications also state the laws of static and dynamic friction. 7 Marks

b) A body of weight 50N is placed on a rough horizontal plane. To just move the body on the horizontal plane, a push of 15N inclined at 30° to the horizontal plane is required. Find the coefficient of friction. 7 Marks

UNIT-IV

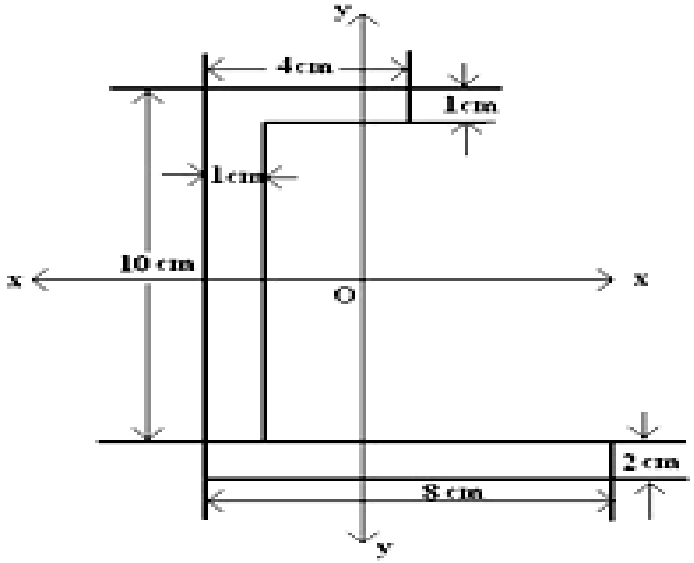
7 a) State and prove the theorem of perpendicular axis. 7 Marks

b) Determine centroid of shaded area as shown in given figure. 7 Marks



(OR)

8 Find the moment of inertia of the plane area shown in figure about X and Y axes through its centroid. 14 Marks



UNIT-V

9 a) An elevator weighing 5000 N is ascending with an acceleration of 3m/s². During this ascent, its operator whose weight is 700N is standing on the weighing pan placed on the floor. What is the weighing pan reading? What will be the total tension in the cables of elevator during this motion? 7 Marks

b) Explain D'Alembert's principle with neat example. 7 Marks

(OR)

10 a) A person of weight W moves with an acceleration 'a' in an elevator. Find the expression for the forces exerted by the person on the floor of the lift for upward and downward motions. 7 Marks

b) A lift carries a weight of 1000N and is moving with a uniform acceleration of 1.962 m/sec². Calculate the tension in the cables supporting the lift, when; 7 Marks

i) lift is moving upward.

ii) lift is moving downward.

CODE No.: 16BT20241 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

[Civil Engineering, Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Find the following in the circuit shown in Fig.1. 14 Marks

i) Unknown resistances.
ii) Current in each resistor.

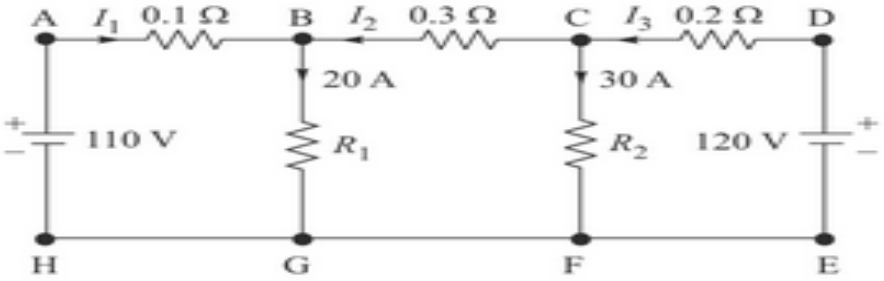


Fig. 1

(OR)

2 Calculate the current flowing through 5Ω resistor using nodal analysis shown in Fig.2. 14 Marks

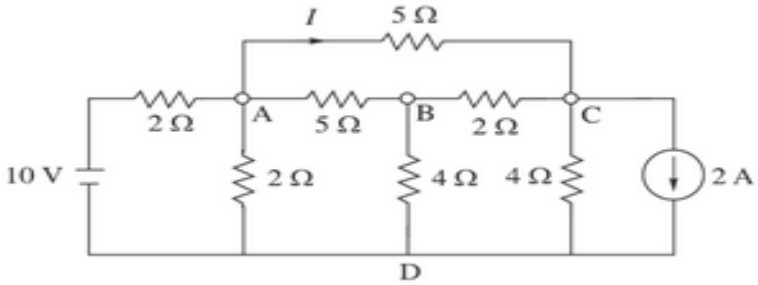


Fig. 2

UNIT-II

3 A choke is connected in series with a non-inductive resistor across a 250V, 50Hz supply. It draws a current of 5A. The voltage across the coil and the non-inductive resistance are 125V and 200V respectively. Find: 14 Marks

i) Resistance, Reactance, impedance and Admittance.
ii) Power loss in the coil.
iii) Total power supplied. Sketch the phasor and impedance diagrams.

(OR)

4 Two impedances $Z_1=(150-j157)\Omega$ and $Z_2 = (100+j100)\Omega$ are connected in parallel across a 200V, 50Hz supply. Find: 14 Marks

i) Branch currents. ii) Total current.
iii) Complex power. iv) Total power.

Sketch the complete phasor and admittance diagrams.

UNIT-III

5 A 125kVA transformer has a primary voltage of 2000V at 50Hz with 182 and 40 turns on primary and secondary respectively. Neglecting the losses calculate (i) no load secondary emf (ii) full load primary and secondary currents (iii) flux in the core. 14 Marks

(OR)

6	a)	Explain the principle of operation and constructional features of a three phase induction motor.	7 Marks
	b)	A 12- pole, 3 phase alternator is coupled to an engine running at 500 r.p.m. The generator supplies an induction motor having a full load speed of 1440 r.p.m. Find the percentage slip and number of poles of this induction motor.	7 Marks

UNIT-IV

7	a)	Give the applications of multimeter	4 Marks
	b)	Describe the various parts of multimeter with neat sketch.	10 Marks

(OR)

8		With neat sketch, describe the various parts working principle of digital voltmeter.	14 Marks

UNIT-V

9	a)	Explain the principle and operation of full wave rectifier and also give the advantages and disadvantages of full wave rectifier.	10 Marks
	b)	Draw the V-I characteristics of p-n junction diode.	4 Marks

(OR)

10	a)	What do you understand by depletion region at p-n junction? What is the effect of forward and reverse biasing of p-n junction on the depletion region? Explain with necessary diagrams.	8 Marks
	b)	Explain the concept of tunneling with energy band diagrams.	6 Marks

CODE No.: 16BT20301 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

ENGINEERING MATERIALS

[Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Classify the engineering materials and write their applications.	7 Marks
	b)	How the materials are selected based on their properties?	7 Marks
		(OR)	
2	a)	Write the various mechanical properties and define them.	7 Marks
	b)	How the properties of materials varied based on the composition?	7 Marks

UNIT-II

3		Explain primary and secondary bonding in materials.	14 Marks
		(OR)	
4	a)	Define unit cell and space lattice.	7 Marks
	b)	Explain interstitial and vacancy diffusions.	7 Marks

UNIT-III

5	a)	Give the detail classifications of Ferrous and non ferrous metals.	7 Marks
	b)	Classify the steels with respect to presents of percentage of carbon in Fe.	7 Marks
		(OR)	
6	a)	What is meant by stainless steel? Write various types of stainless steel and also mention its applications.	7 Marks
	b)	Write the importance of HSS used as cutting tool.	7 Marks

UNIT-IV

7	a)	Compare the properties of crystalline ceramics and glass ceramics.	7 Marks
	b)	What is the role of matrix in a composite material? Discuss various types of matrix materials.	7 Marks
		(OR)	
8		How ceramic materials are classified? Discuss each class with their properties and applications.	14 Marks

UNIT-V

9		What is Ultrasonic testing? Explain it with a neat sketch.	14 Marks
		(OR)	
10		Explain Impact tests with a neat sketch.	14 Marks

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 December - 2019

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 Determine the ripple factor of an L-section filter comprising a 10H choke and 8μF capacitor, used with a FWR. The DC voltage at the load is 50V. Assume the line frequency as 50Hz. 14 Marks

(OR)

2 A full wave rectifier circuit uses two silicon diodes with a forward resistance of 20Ω each. A DC voltmeter connected across the load of 1KΩ reads 55.4 volts. Calculate: 14 Marks

i) Irms. ii) Average voltage across each diode.
iii) Ripple factor. iv) Transformer secondary voltage rating.

UNIT-II

3 Design a self-bias circuit using silicon transistor to achieve a stability factor of 10 with the following specifications: 14 Marks
V_{CC} = 16V, V_{BE} = 0.7V, V_{CEQ} = 8V, I_{CQ} = 4mA and β = 50.

(OR)

4 a) If the base current in a transistor is 20μA when the emitter current is 6.4mA, what are the values of α_{dc} and β_{dc}? Also determine the collector current. 8 Marks

b) Draw and explain the input and output characteristics of a transistor in common emitter configurations. 6 Marks

UNIT-III

5 A common Emitter circuit has the following, components. 14 Marks
R_s=1KΩ, R_1=110KΩ, R_2=12KΩ R_c=6KΩ. h-parameters are h_{ie}=1.2KΩ, h_{re}=2.5x10^{-4}, h_{fe}=75, h_{oe}=25uA/V. Draw the equivalent hybrid model and calculate A_i, R_i, R_o and A_v.

(OR)

6 The hybrid parameters of a transistor used as an amplifier in the CE configuration are h_{ie} = 800Ω, h_{fe} = 46, h_{oe} = 80 x 10^{-6} and h_{re} = 5.4 x 10^{-4}. If R_L = 5KΩ and R_s =500Ω, calculate A_i, R_i , A_v and P_i. 14 Marks

UNIT-IV

7 a) A self biased p–channel JFET has a pinch–off voltage of V_P = 5V and I_{DSS}=12mA. The supply voltage is 12V. Determine the values of R_D and R_S so that I_D = 5mA and V_{DS} = 6V. 10 Marks

b) Sketch the drain characteristics of MOSFET for different values of V_{GS} and mark different regions of operation. 4 Marks

(OR)

8 a) In an n-channel FET, the effective channel width is 3x10^{-4}cm and the donor impurity concentration is 1015 electrons/cm^3. Find the pinch-off voltage. 8 Marks

b) Explain how a FET can be made to act as a switch. 6 Marks

UNIT-V

9 Give the construction details of UJT and explain its operation with the help of equivalent circuits. 14 Marks

(OR)

10 What is the photo diode? Explain its principle of operation and applications in detail. 14 Marks

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CODE No.: 16BT20441 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

BASIC ELECTRONIC DEVICES AND CIRCUITS

[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) The reverse saturation current of a silicon p-n function diode at an operating temperature of 27^0C is 50nA. Estimate the dynamic forward and reverse resistances of the diode for applied voltages of 0.8V and -0.4V respectively. 8 Marks

b) Distinguish between drift and diffusion current in a semiconductor. State continuity equation. 6 Marks

(OR)

2 a) Determine the dynamic forward and reverse resistance of p-n junction silicon diode when the applied voltage is 0.25V at T=300^0K with give I_0=2μA. 7 Marks

b) Explain the concept of diode capacitance. Derive expression for transition capacitance. 7 Marks

UNIT-II

3 What are the compensation techniques used for V_{BE} and I_{CO}? Explain with help of suitable circuits. 14 Marks

(OR)

4 a) For an NPN transistor with α_N= 0.98, J_{CO} = 2μA and I_{EO} = 1.6μA connected in Common Emitter Configuration, determine the minimum base current for which the transistor enters into saturation region. V_{CC} and load resistance are given as 12V and 4.0KΩ respectively. 7 Marks

b) Determine the significance of operating point, DC and AC load lines to ensure active region operation of a BJT in CE amplifier application. 7 Marks

UNIT-III

5 a) A Common Source FET amplifier circuit with un bypassed RS has the following circuit parameters: 10 Marks
R_d = 15K, R_S = 0.5K, R_g = 1M, r_d = 5K, g_m= 5mhos and V_{DD} = 20V.
Determine A_V and R_O.

b) Derive the expression for trans conductance of MOSFET. 4 Marks

(OR)

6 a) The P-channel FET has a $|I_{DS}|$=-12mA, |Vp|=5V, V_{GS} is 1.6V. Determine I_D, G_m and G_{m0}. 7 Marks

b) Explain the significance of threshold voltage of a MOSFET. Discuss the methods to reduce threshold voltage (V_T). 7 Marks

UNIT-IV

7 Derive the frequency of oscillation for colpitts oscillator. 14 Marks

(OR)

8 Explain RC phase shift oscillator. 14 Marks

UNIT-V

9 Explain Schottky diode with necessary sketches. 14 Marks

(OR)

10 Explain the operation of tunnel diode and draw its equivalent circuit. 14 Marks

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CODE No.: 16BT20541 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

FOUNDATIONS OF DATA STRUCTURES

[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)	Compare the following sorting techniques. i) Counting Sort. ii) Bucket Sort .	7 Marks
	b)	Discuss about divide and conquer approach.	7 Marks
		(OR)	
2		Sort the following list using Quick Sort : 66, 33, 40, 20, 50, 88, 60, 11, 77, 30, 45, 65.	14 Marks

UNIT-II

3		Write a program to implement queue operations using arrays.	14 Marks
		(OR)	
4		Explain the relevance of stack implementation with recursive function evaluation.	14 Marks

UNIT-III

5	a)	List out the advantages of doubly linked list over singly linked list.	6 Marks
	b)	Write a program to insert a given value into an ordered doubly linked list into its proper position.	8 Marks
		(OR)	
6	a)	List the advantages of linked list over arrays.	7 Marks
	b)	What is a linked list? With a neat diagram, show how an element is added and removed from front end of the list.	7 Marks

UNIT-IV

7	a)	Explain the way of representing Generic Trees.	7 Marks
	b)	Given a tree, write an algorithm for finding the sum of all the elements of the tree.	7 Marks
		(OR)	
8		What is a BST? Explain with suitable algorithm for inserting a node at different instances. Illustrate with suitable example.	14 Marks

UNIT-V

9		Describe in detail about breadth first traversal of a graph with suitable example.	14 Marks
		(OR)	
10		Write a C program to implement breadth first traversal of a graph.	14 Marks

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CODE No.: 16BT21201 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

OBJECT ORIENTED PROGRAMMING THROUGH C++

[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		Discuss the issues of procedural oriented programming systems with respect to data security. If object oriented programming solves it, then how.	14 Marks
		(OR)	
2		Define the terms encapsulation, polymorphism and inheritance in object oriented programming.	14 Marks

UNIT-II

3		Explain about short circuiting and Boolean operations with example.	14 Marks
		(OR)	
4		Give any three math functions in C++. Write a CPP program for generating random numbers.	14 Marks

UNIT-III

5	a)	Define Array. How to initialize it and State Array out of bound?	6 Marks
	b)	Give the syntax for passing an Array to a function, printing memory location of an array.	8 Marks
		(OR)	
6		Write a program that reads a line of integers (maximum limit 6 digits) and then displays each integers and sum of all the integers. (Hint: Use StringTokenizer class).	14 Marks

UNIT-IV

7		Write a C++ program to define a class called TIME with hour, minute and second as data members and read (), display () and add () as member functions.	14 Marks
		(OR)	
8		Write a class Fraction that defines methods addition, subtraction, multiplication and division of fractions by overloading basic arithmetic operators.	14 Marks

UNIT-V

9		Define virtual functions and its use. Give an example. How compilers resolve a call to a virtual function?	14 Marks
		(OR)	
10		Describe briefly with a figure, class hierarchy provided by C++ for stream handling.	14 Marks

CODE No.: 16BT21501 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

DIGITAL LOGIC DESIGN

[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) Compute dual of the following Boolean expressions. 7 Marks
i) AB + A(B + C) + B'(B + D). ii) A + B + A'B'C.

b) Compliment the following Boolean expressions. 7 Marks
i) A'B + A'BC' + A'BCD + A'BC'D'E.
ii) ABEF + ABE'F' + A'B'EF.

(OR)

2 a) Explain with means of truth tables the validation of Demorgan's theorem for three variables $xyz = (xyz)' = x' + y' + z'$. 7 Marks

b) Show that A Θ B Θ AB = A + B. 7 Marks

UNIT-II

3 a) Simplify using K-map, f(A, B, C, D) = Σ M(0, 2, 3, 6, 7, 8, 9, 12, 13). Write simplified SOP and POS equations for the above and draw logical diagram using NAND gates only. 7 Marks

b) Implement the boolean function with NAND - NAND logic 7 Marks
F(A, B, C) = ∑ m(O, 1, 3, 5)

(OR)

4 Given the logical expression 14 Marks
Y = (A + B + C' + D'). (A'+C+D').(B'+C)(B'+C').(A+B')(B'+D')
i) Express in standard POS form.
ii) Draw K map for the equation.
iii) Minimize and realise using NOR gates only.

UNIT-III

5 a) Implement 64 x 1 multiplexer with four 16 x 1 and one 4 x 1 multiplexer. 7 Marks

b) Design a BCD-to seven segment decoder that converts a decimal digit in BCD to an appropriate code for selection of segments in a display indicator. 7 Marks

(OR)

6 a) Explain design procedure of a combinational circuit. 7 Marks

b) A majority circuit 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

UNIT-IV

7 a) A sequential circuit with 3 D-flip-flops A, B and C has only one input 'X' and one output 'X' with following relationship DA = B Θ C Θ X, DB = A, DC = B 7 Marks
i) Draw the logic diagram of the circuit.
ii) Obtain logic diagram, state table and state diagram.

b) Explain the basic operation of JK Master Slave Flip Flop with truth table. 7 Marks

(OR)

8 a) Describe the operation of the SR Latch using NAND gate with the help of truth table, transition table and the circuit. 7 Marks

b) Find a circuit that has no static hazards and implement the following Boolean function F(A,B,C,D)= ∑(0,2,6,7,8,10,12) for the resultant circuit. 7 Marks

UNIT-V

9 a) Derive the PLA programming table and the PLA structure for the combinational circuit that squares a 3- bit number. Minimize the number of product terms. 7 Marks

b) Implement the following Boolean functions using PAL. 7 Marks

$w(A,B,C,D) = \Sigma m (0,2,6,7,8,9,12,13)$

$x(A,B,C,D) = \Sigma m (0,2,6,7,8,9,12,13,14)$

$y(A,B,C,D) = \Sigma m (2,3,8,9,10,12,13)$

$z(A,B,C,D) = \Sigma m (1,3,4,6,9,12,14)$.

(OR)

10 a) Compare PROM, PLA and PAL. 7 Marks

b) Draw and explain the block diagram of PAL. 7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

ENGINEERING CHEMISTRY

[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 following: 7 Marks
i) Priming. ii) Foaming.

b) Give reasoning for the following: 7 Marks
i) Why does hard water consume lot of soap?
ii) Calgon treatment prevents scale formation in boilers. Give reason.

(OR)

2 a) Illustrate the details of scale and sludge formation in boilers and explain the methods for their prevention. 7 Marks

b) A ground water sample has the following composition: 7 Marks
$Ca(HCO_3)$ = 16.2 ppm, $Mg(HCO_3)_2$= 14.6 ppm, MgCl = 9.5 ppm, $MgSO_4$=12.0 ppm, $CaSO_4$ = 13.6 ppm..
Calculate carbonate and non-carbonate hardness of water

UNIT-II

3 a) Summarize the fiber reinforced composites. 7 Marks

b) What are the advantages of composite material? Write their engineering applications. 7 Marks

(OR)

4 Write the synthesis, properties and applications of the following engineering plastics . i) PMMA. ii) Teflon. 14 Marks

UNIT-III

5 How the Green Chemistry manages Science and Technology in eco-friendly way? 14 Marks

(OR)

6 Explain the following tools with suitable examples. 14 Marks
i) Alternative feed stocks. ii) Alternative solvents.
iii) Alternative reaction conditions.

UNIT-IV

7 Define Battery. Explain lithium polymer batteries, and mention their applications. 14 Marks

(OR)

8 Define fuel cell. Explain the construction, working of H_2-O_2 fuel cell and write its applications. 14 Marks

UNIT-V

9 a) Discuss extreme-pressure lubrication and additives to improve the lubricant properties. 7 Marks

b) Brief the liquid lubricants and mention four properties of it. 7 Marks

(OR)

10 a) Under what situations greases are used? What are the main functions of soap in grease? 7 Marks

b) Explain: i) Cloud and pour points. ii) Flash point and fire point. 7 Marks

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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 October – 2020

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)	Explain the construction and working of a He-Ne laser with energy level diagram.	9 Marks
	b)	Write any five applications of lasers.	5 Marks
		(OR)	
2	a)	Discuss various pumping mechanisms in lasers.	5 Marks
	b)	Explain the construction and working of Nd: YAG laser.	9 Marks

UNIT-II

3	a)	Define Fermi level. Explain Fermi-Dirac distribution for electron in a metal. Discuss its variation with temperature.	11 Marks
	b)	Calculate the wavelength associated with an electron with energy 2000eV.	3 Marks
		(OR)	
4		Explain in detail about Kronig-Penney model.	14 Marks

UNIT-III

5	a)	Define drift and diffusion currents in a semiconductor. Derive expression for drift and diffusion currents in semiconductor.	9 Marks
	b)	Deduce the Einstein relation in semiconductors.	5 Marks
		(OR)	
6	a)	State Hall Effect. Write its importance. Derive an expression for Hall coefficient.	10 Marks
	b)	The R_H of a specimen is $3.66 \times 10^{-4}\ m^3c^{-1}$. Its resistivity is $8.93 \times 10^{-3}\ \Omega m$. Find μ and n in an n-type semiconductor.	4 Marks

UNIT-IV

7	a)	Write a note on reverberation and reverberation time. What is Sabine's mathematical relation for reverberation time	9 Marks
	b)	What are the basic requirements of an acoustically good hall?	5 Marks
		(OR)	
8	a)	Define the term absorption coefficient. Describe the methods used to measure the absorption coefficients.	7 Marks
	b)	Discuss the basic requirements of an acoustically good hall	7 Marks

UNIT-V

9	a)	Describe crystal planes and crystal direction.	4 Marks
	b)	Formulate the expression for inter plannar distance between consecutive planes for a cubic system.	10 Marks
		(OR)	
10	a)	What way the X-rays are suitable in determination of crystal structure.	4 Marks
	b)	Derive Bragg's law for diffraction in crystals. X-rays of wavelength 1.5418 Å are diffracted by (111) planes in a crystal at an angle 30^0 in the first order. Calculate the inter atomic distance	10 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

TRANSFORMATION TECHNIQUES AND PARTIAL 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 Define Fourier series of $f(x)$ in the interval $(0, 2\pi)$ and Express $f(x) = e^{-x}$ as Fourier series for $0 < x < 2\pi$. **14 Marks**

(OR)

2 Develop Fourier series for the function $x - x^2$ from $x = -\pi$ to $x = \pi$ and hence deduce that $\frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \ldots = \frac{\pi^2}{12}$. **14 Marks**

UNIT-II

3 State Fourier integral theorem and applying Fourier integral show that $e^{-ax} - e^{-bx} = \frac{2(b^2 - a^2)}{\pi} \int_0^\infty \frac{\lambda \sin \lambda x \, d\lambda}{(\lambda^2 + a^2)(\lambda^2 + b^2)}$, $a, b > 0$. **14 Marks**

(OR)

4 Show that $\int_0^\infty \frac{1 - \cos \pi\lambda}{\lambda} \sin x\lambda \, d\lambda = \begin{cases} \pi/2, & if \ 0 < x < \pi \\ 0, & if \ x > \pi \end{cases}$ making use of Fourier integral. **14 Marks**

UNIT-III

5 Define Laplace transform of the function f(t) and evaluate: **14 Marks**
i) L $\{e^t(\cos 2t + \frac{1}{2} \sin h\, 2t)\}$. ii) L(| sin t |).

(OR)

6 Write the change of scale property and applying it evaluate L ($\sin^2$ at) **14 Marks**

UNIT-IV

7 a) Define z-transform and find the inverse Z-transform of $\frac{z}{(z-1)(z-2)}$. **7 Marks**

b) State shifting principle. Find $z\left(\frac{1}{n}\right)$ and applying the shifting principle evaluate $Z\left(\frac{1}{n+3}\right)$. **7 Marks**

(OR)

8 a) Applying shifting theorem, evaluate $Z\left[\frac{1}{(n+2)!}\right]$. **7 Marks**

b) Applying z – transforms solve the difference equation $\mathbf{4u_n - u_{n+2} = 0}$ given that $\mathbf{u_o = 0, u_1 = 2}$. **7 Marks**

UNIT-V

9 a) Design a partial differential equation of the family of the spheres having their centers lie on z-axis with a given radiusr. 7 Marks

b) A rod of length ***l*** with insulated sides is initially at a uniform temperature $\mathbf{u_0}$. Its ends are suddenly cools to $\mathbf{0^0}$C and kept at that temperature. Construct an expression to find the temperature at time ***t*** at a point distant ***x*** from one end of the rod. 7 Marks

(OR)

10 a) Construct a partial differential equation by eliminating the arbitrary function $z = yf(x) + xg(y)$. 7 Marks

b) A tightly stretched string with fixed end points $x = 0$ and $x = l$ is initially in a position given by $y = y_0 \sin^3\left(\frac{\pi x}{l}\right)$. If it is released from rest from this position, then design a mathematical formula for displacement $\boldsymbol{y(x,t)}$. 7 Marks

CODE No.: 16BT20101 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

BUILDING MATERIALS AND CONSTRUCTION TECHNOLOGY
[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Develop a flow chart of various operations involved in the making of bricks. Explain them.	14 Marks
		(OR)	
2		Briefly explain the tests conducted on bricks for their suitability for construction work.	14 Marks

UNIT-II

3		Describe the operations involved in the manufacture of lime.	14 Marks
		(OR)	
4		Construct a flow diagram for dry and wet process of manufacture of cement with brief explanation.	14 Marks

UNIT-III

5		Show the chemical reaction between iron and other atmospheric agents which cause corrosion.	14 Marks
		(OR)	
6		List and explain the market forms of steel.	14 Marks

UNIT-IV

7	a)	Draw typical sketches of the following with details. i) Longitudinal section of RCC lintel for a span of 1.5 m. ii) Segment arch.	7 Marks
	b)	Draw near and appropriate sketches showing the elevation of: i) Fully paneled door (double shutter). ii) Glazed window with ventilator (double shutter).	7 Marks
		(OR)	
8	a)	Differentiate between precast doors and windows.	7 Marks
	b)	Define roof. What are the requirements of a good roof?	7 Marks

UNIT-V

9	a)	Write a note on weather proof course for the RCC roof slabs.	7 Marks
	b)	Why formwork is necessary? Explain the shuttering details of RCC beams and slab floors. List latest types of form work.	7 Marks
		(OR)	
10	a)	What is damp proof course? Explain its necessity in a building.	7 Marks
	b)	Define formwork. What are the chief requirements of a good formwork? Briefly discuss them.	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

ENGINEERING MECHANICS
[Civil Engineering, Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

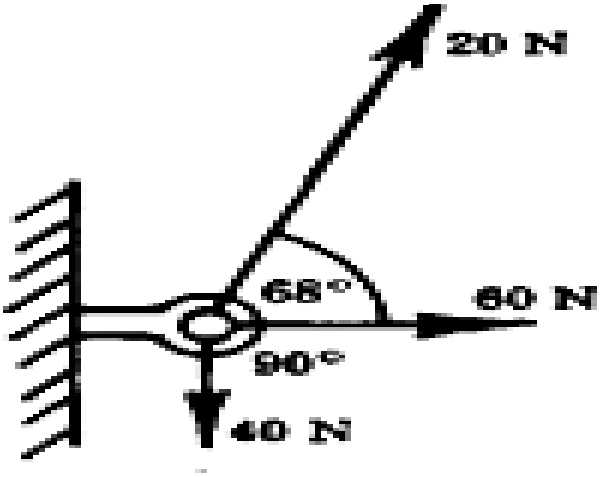
1 a) State and prove Lami's theorem with neat sketch. 7 Marks

b) What is meant by the product of a vector and a scalar? How does this product differ from the original vector? Explain all possibilities. 7 Marks

(OR)

2 a) Define the following with examples: 7 Marks
i) Coplanar and Non-coplanar forces.
ii) Collinear and Non-collinear forces.

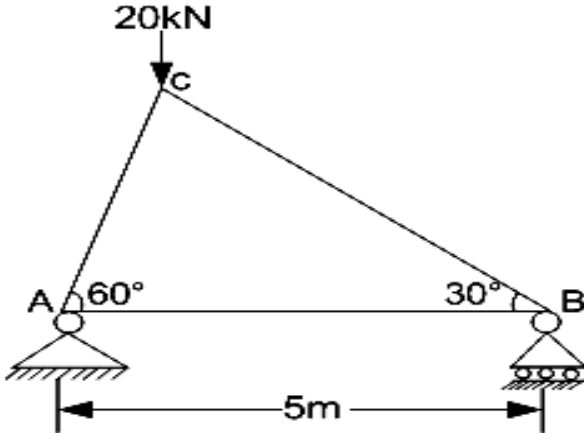
b) The resultant of three forces is 60N as shown in figure. Two of the three forces are also shown as 20N and 40N. Determine the third force. 7 Marks



UNIT-II

3 a) What are plane trusses? Discuss the assumptions in design of trusses. What do you understand by a 'Deficient Frame'? 7 Marks

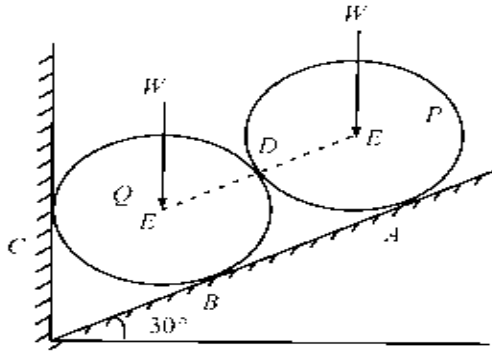
b) The truss ABC shown in figure has a span of 5m. It is carrying a load of 20kN at its apex. Find the forces in the members AB, BC and AC, using method of joints. End A is hinged and B is supported on rollers. 7 Marks



(OR)

4 Two cylindrical identical rollers *A* and *B*, each of weight W = 500N are 14 Marks

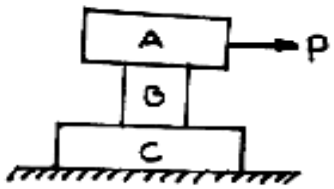
supported by an inclined plane and vertical wall and makes an angle of 30^0 with the horizontal as shown in figure. Assuming all surfaces to be smooth, determine the reactions at A, B and C.



UNIT-III

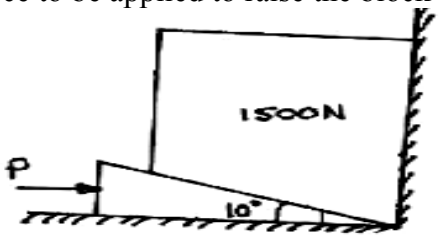
5 a) Explain the terms: i) Friction. ii) Angle of friction. 7 Marks
iii) Limiting friction. iv) Cone of friction.

b) Find the least horizontal force 'P' to start motion of any part of the system of three blocks resting upon one another as shown in the below figure. The weights of the blocks are A = 3000N, B = 1000N, C =2000N. Between A and B μ= 0.3, between B and C, μ = 0.2 and between C and the ground μ = 0.1. 7 Marks



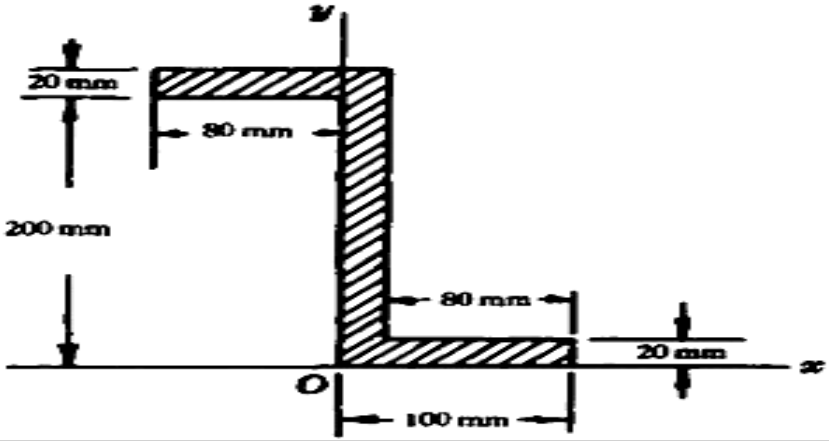
(OR)

6 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. 14 Marks



UNIT-IV

7 Find the area moment of inertia about the x and y axes of the plane area shown in figure. 14 Marks



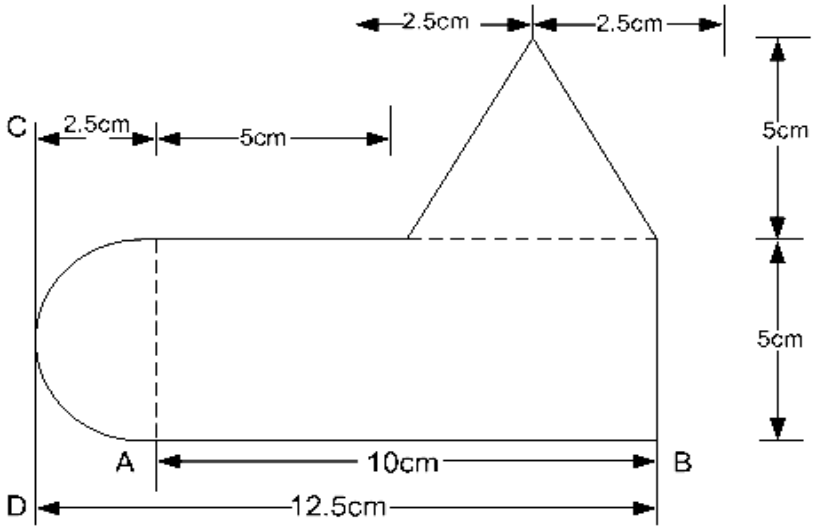
(OR)

8 a) Discuss the following terms with suitable examples: 7 Marks

i) Centroid. ii) Centre of mass.

iii) Centre of gravity. iv) Radius of gyration.

b) Determine the centre of gravity of the plane uniform lamina shown in figure. 7 Marks



UNIT-V

9 a) A train is uniformly accelerated and passes successive kilometer stones with velocities of 18 km/hr and 36 km/hr respectively. Calculate the velocity when it passes the third kilometer stone. Also find the time taken for each of the two intervals of one kilometer. 7 Marks

b) A ball projected vertically upwards attains a maximum height of 400 meters. Calculate the velocity of projection and compute the time of flight in air. At what altitude will this ball meet a second ball projected vertically upwards 4 seconds later with a speed of 120 meters per second? 7 Marks

(OR)

10 a) A jet-propelled object has straight-line motion according to the equation $\mathbf{x = 2t^3 - t^2 - 2}$, where $\boldsymbol{x}$ is in meters and $\boldsymbol{t}$ is in seconds. What is the change in displacement while the speed changes from 4 m/s to 48 m/s. 7 Marks

b) A body moves along a straight line so that its displacement from a fixed point on the line is given by $\boldsymbol{s = 3t^2 + 2t}$. Find the displacement, velocity and acceleration at the end of $\boldsymbol{t = 3s}$. 7 Marks

CODE No.: 16BT20241 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

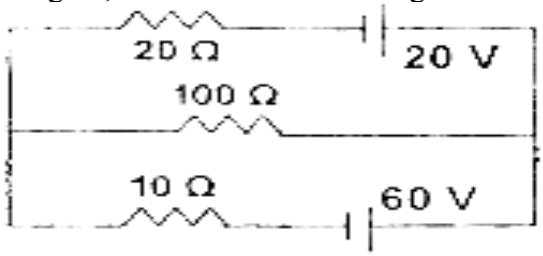
[Civil Engineering, Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) The circuit shown in figure, find the current flowing in each resistor. 6 Marks

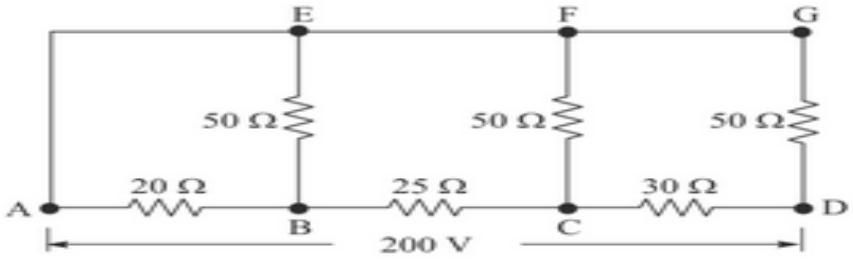


b) Define the following terms. 8 Marks
i) Current. ii) Potential difference. iii) Power. iv) Energy.

(OR)

2 a) Obtain the expressions for star-delta equivalence of resistive network. 6 Marks

b) The circuit shown in figure, find the current in each resistor. 8 Marks



UNIT-II

3 A capacitor of 15 μF is connected in series with a non-inductive resistance of 100Ω across a 100V, 50Hz supply. Find: 14 Marks
i) Capacitive reactance. ii) Impedance.
iii) Current. iv) Power factor.
v) Phase angle. vi) Voltages across R and C and
vii) Power dissipated.
Obtain expressions for voltage and current. Also sketch the phasor and vector diagrams.

(OR)

4 An RLC series circuit has the following data. R=25Ω, L=150mH, C=20μF, 250V, 50Hz supply. Determine the supply current and the various voltage drops. Represent them in a phasor diagram. 14 Marks

UNIT-III

5 a) Explain the different types of DC motors. Mention their applications. 7 Marks

b) Explain the significance of back emf of a DC motor. Derive an expression for the back emf. 7 Marks

(OR)

6 a) Explain the construction and principle of operation of single phase transformer. 8 Marks

b) Derive the emf equation of a transformer. 6 Marks

UNIT-IV

7		With neat sketch, describe the various parts and working principle of multimeter.	14 Marks

(OR)

8	a)	Describe the characteristics of transducers.	7 Marks
	b)	Describe the construction and principle working of thermocouples.	7 Marks

UNIT-V

9	a)	Derive the expressions for ripple factor of full wave rectifier with and without a capacitive filter.	10 Marks
	b)	Show that the ripple factor of full wave rectifier is 0.48.	4 Marks

(OR)

10	a)	A full wave rectifier is fed by 220V, 50Hz via a step down transformer of turns ratio is 11:5. Find: i) The output DC. ii) Peak inverse voltage under no load condition.	7 Marks
	b)	Draw the circuit diagram of half-wave rectifier and explain the working with relevant input and output waveforms.	7 Marks

CODE No.: 16BT20301 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

ENGINEERING MATERIALS
[Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Define Hardness, Toughness and brittleness. Explain in detail the relation between them. 14 Marks

(OR)

2 a) Define melting point. How the melting point is varied based on the crystal structure and atomic bonding? 7 Marks

b) Explain about specific heat and corrosion resistance. 7 Marks

UNIT-II

3 Differentiate between interstitial and substitutional impurity defects. Explain using a schematic representation and provide at least one example of each. 14 Marks

(OR)

4 Reveal the importance of grain and grain boundaries. 14 Marks

UNIT-III

5 Draw microstructures, properties and application for the following metals with their composition. 14 Marks

i) Gray cast iron. ii) White cast iron. iii) Spheroidal cast iron.

(OR)

6 Write the properties and applications for the following metals. 14 Marks

i) White cast iron. ii) Malleable cast iron.
iii) Spheroidal cast iron. iv) Gray cast iron.

UNIT-IV

7 a) Give the properties and applications of Abrasive materials and Cermets. 7 Marks

b) Explain about Al_2O_3. 7 Marks

(OR)

8 Discuss about metal matrix composite and also mention its applications in detail. 14 Marks

UNIT-V

9 What is gamma ray testing? Explain it. 14 Marks

(OR)

10 Explain eddy current inspection to find defect in a material. 14 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 October – 2020

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 Derive the expression for the ripple factor of π-Section filter when used with a Half-wave-rectifier. Make necessary approximations. 14 Marks

(OR)

2 a) Explain the temperature dependence of V-I characteristics of PN diode. 7 Marks

b) Find the value of D.C resistance and A.C resistance of a Germanium junction diode at 250^0C with reverse saturation current, **Io** = 25μA and at an applied voltage of 0.2V across the diode. 7 Marks

UNIT-II

3 Draw the self bias circuit and obtain the expression for the stability factor. Discuss the advantages and disadvantages of self biasing. 14 Marks

(OR)

4 a) Define 'Thermal Runaway' in transistors. Derive the condition to prevent 'Thermal Runaway' in Bipolar Junction Transistors. 8 Marks

b) Explain the input and output characteristic of a transistor in common collector configurations. 6 Marks

UNIT-III

5 a) Explain the concept of Millers theorem and its applications 8 Marks

b) Compare enhancement and depletion modes of a MOSFET with the help of its characteristics and construction. 6 Marks

(OR)

6 a) A bipolar junction transistor with h_{ie} = 1100Ω, h_{fe} = 50, h_{re} = 2.4 x 10^{-4}, h_{oe} = 25 μA/V, is to drive a load of 1KΩ in CB amplifier arrangement. Estimate A_V, A_I, R_i and R_0. 10 Marks

b) Explain the small signal model of JFET with neat diagram. 4 Marks

UNIT-IV

7 a) Explain the construction and operation of a P-channel MOSFET in enhancement and depletion modes with the help of static drain characteristics and transfer characteristics. 10 Marks

b) Explain the Drain characteristics for p-channel JFET. 4 Marks

(OR)

8 Explain the principle of CS amplifier with the help of circuit diagram. Derive the expressions for AV, input impedance and output Impedance. 14 Marks

UNIT-V

9 Sketch the static characteristics and firing characteristics of SCR and explain the shape of the curve. 14 Marks

(OR)

10 Explain how a variable capacitance can be built using a varactor diode. 14 Marks

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CODE No.: 16BT20441 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

BASIC ELECTRONIC DEVICES AND CIRCUITS

[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)	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: R_F=0, R**r** = 0, Vγ =0.6	4 Marks

(OR)

2		Explain the operation of inductor filter and derive expression for ripple factor (FWR).	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		Draw the small-signal model of common drain FET amplifier. Derive expressions for voltage gain and output resistance.	14 Marks

(OR)

6	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-IV

7	a)	Explain how the nonlinear distortion can be reduced by using negative feedback in an amplifier.	8 Marks
	b)	Derive voltage gain, input impedance and output impedance of a CE amplifier with Voltage-Series negative feedback.	6 Marks

(OR)

8		Explain Hartley oscillator and derive the equation for oscillation.	14 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 application of a UJT as a relaxation oscillator.	14 Marks

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CODE No.: 16BT20541 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

FOUNDATIONS OF DATA STRUCTURES

[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		Construct step by step, how Merge sort sorts, for the following list of numbers {142, 543, 123, 65, 453, 879, 572, 434} and explain in detail.	14 Marks
		(OR)	
2		Illustrate shell sort algorithm with an example.	14 Marks

UNIT-II

3	a)	Explain What is a circular queue. How do you check the queue full condition?	7 Marks
	b)	Illustrate with an algorithm to count the nodes in a circular queue.	7 Marks
		(OR)	
4	a)	Distinguish between array, stack and queue.	5 Marks
	b)	What do you think about stack? Give some applications of stack.	5 Marks
	c)	What do you think about queue, give its applications?	4 Marks

UNIT-III

5	a)	Can you write C program to add two polynomials?	6 Marks
	b)	Can you write an algorithm that takes the first node in a linked list, Reverse it and return the first node in the resulting linked list without recursion and with recursion?	8 Marks
		(OR)	
6		Describe and compare the linked list Implementation of Stack and Queue.	14 Marks

UNIT-IV

7	a)	Define binary search tree and its properties.	7 Marks
	b)	Write a program to insert a node into a binary search tree.	7 Marks
		(OR)	
8	a)	Construct binary tree and identify preorder from given inorder and postorder traversals. Inorder : D B E A F C Postorder : D E B F C A	9 Marks
	b)	Can we construct a binary tree, if preorder and postorder are given? Justify your answer.	5 Marks

UNIT-V

9		Construct and discuss about any two collision avoiding techniques.	14 Marks
		(OR)	
10		Determine the various Hashing techniques and explain in detail.	14 Marks

CODE No.: 16BT21201 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

OBJECT ORIENTED PROGRAMMING THROUGH C++
[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		Demonstrate the overloading of assignment operator in C++ program.	14 Marks
		(OR)	
2	a)	Distinguish classes with objects.	4 Marks
	b)	Write the syntax for creating a class and defining an object for the class.	10 Marks

UNIT-II

3		Differentiate the mechanism of parameters passing by Value and Passing by Reference.	14 Marks
		(OR)	
4		Define Void function and Boolean function each with a suitable example.	14 Marks

UNIT-III

5		Explain in brief about reference and dereference operators in C++.	14 Marks
		(OR)	
6		How to use Arrays with Enumerated types and explain Type Definitions.	14 Marks

UNIT-IV

7	a)	Which three keywords are provided by C++ for implementing exception handling?	7 Marks
	b)	What is the need of class objects instead of values of fundamental types? Give example.	7 Marks
		(OR)	
8		Write a C++ program to implement try, throw and catch keywords for implementing exception handling.	14 Marks

UNIT-V

9		Describe the various classes available for file operations.	14 Marks
		(OR)	
10		What is a file mode? Describe the various file mode operations available in C++.	14 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

DIGITAL LOGIC DESIGN

[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)	Represent decimal number 8620 in: i) BCD. ii) Excess-3code. iii) Octal. iv) Binary.	8 Marks
	b)	Perform the following subtraction using 2's complement. i) (11011)2 - (10100)2. ii) (11100)2 – (00100)2.	6 Marks
		(OR)	
2	a)	State and explain De Morgan's laws. Draw the logic diagram and construct the truth table for X = A+B+ (DC).	8 Marks
	b)	Reduce the expression A+B [AC+ (B+C') D].	6 Marks

UNIT-II

3	a)	Why a NAND and NOR gates are known as universal gates? Represent all the logical operations using NAND and NOR gates.	7 Marks
	b)	Reduce the following function using K-map technique and implement using NAND Gates. F(A,B,C,D)=∑m(1,3,7,11,15)+d(0,2,5).	7 Marks
		(OR)	
4	a)	Construct a K-map for the following expression and obtain minimal SOP expression. Implement the function with 2-level NAND-NAND form. F(A, B, C,D) = (A+C+D) (A+B+D) (A+B+C) (A+B+D‘)	6 Marks
	b)	Implement the following Boolean function F using the two - level form: i) NAND-AND. ii) AND-NOR F (A, B, C,D) = Σ0, 1, 2, 3, 4, 8, 9, 12.	8 Marks

UNIT-III

5	a)	Implement full adder with 4 to 1 multiplexer.	6 Marks
	b)	Implement 64 x 1 multiplexer with four 16 x 1 and one 4 x 1 multiplexer.	8 Marks
		(OR)	
6	a)	Draw and explain the concept of 4-bit Carry-Look-ahead Adder.	7 Marks
	b)	Implement the following function using 8*1 multiplexer F(A,B,C,D)=∑(1,3,5,6,7).	7 Marks

UNIT-IV

7	a)	Explain the operation of a 4 bit shift register.	7 Marks
	b)	Explain the operation of a Johnson counter.	7 Marks
		(OR)	
8	a)	Define excitation table. Explain D-flip flop and obtain the state equation, the state diagram, state table and excitation table of the same.	7 Marks
	b)	Explain the operation of a JK flip flop and give the advantages of JK flip flop.	7 Marks

UNIT-V

9	a)	Explain RAM technology.	7 Marks
	b)	Implement F**1** (a, b, c, d) = Σ m(0,1, 2, 3, 6, 9, 11) using PAL.	7 Marks
		(OR)	
10	a)	What is ROM? Discuss in brief about different types of ROMs.	7 Marks
	b)	Write a brief note on sequential programmable devices.	7 Marks

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CODE No.: 19BT1BS02 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Regular Examinations, December - 2020

BIOLOGY FOR ENGINEERS

[Civil Engineering, Mechanical Engineering, 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.		Compare biological organisms with man-made systems.	12 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Explain the differences between prokaryotes and eukaryotes.	6 Marks	L2	CO1	PO1
	b)	Classify living organisms basing on carbon and energy source.	6 Marks	L2	CO1	PO1

UNIT-II

3.		Describe the structure and functions of proteins.	12 Marks	L1	CO1	PO1
		(OR)				
4.	a)	Explain chemical composition of nucleic acids.	6 Marks	L2	CO1	PO1
	b)	Explain fermentation and its applications.	6 Marks	L2	CO3	PO6

UNIT-III

5.		Explain law of Independent Assortment with dihybrid cross.	12 Marks	L2	CO2	PO1
		(OR)				
6.		Describe the mechanism of DNA replication.	12 Marks	L1	CO1	PO1

UNIT-IV

7.		Explain the process of rDNA technology.	12 Marks	L2	CO3	PO6
		(OR)				
8.	a)	Explain the role of biosensors and biochips.	6 Marks	L3	CO3	PO1
	b)	Analyze the pros and cons of transgenic microbes.	6 Marks	L4	CO3	PO6

UNIT-V

9.		Explain human digestive system with labeled diagram.	12 Marks	L2	CO1	PO1
		(OR)				
10		Explain DNA fingerprinting.	12 Marks	L2	CO3	PO6

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CODE No.: 19BT1BS03 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Regular Examinations, December 2020

ENGINEERING PHYSICS

[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)	Explain the concept of interference in thin films due to reflected light.	8 Marks	L2	CO1	PO2
	b)	List out some engineering applications of diffraction and polarization.	4 Marks	L1	CO1	PO1
		(OR)				
2.	a)	The diameter of the tenth bright ring in a Newton's rings apparatus changes from 1.5 cm to 1.3 cm when a liquid is introduced between the lens and the plate. Find the refractive index of the liquid.	4 Marks	L1	CO1	PO1
	b)	Explain the concept of polarization by reflection and refraction.	8 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	How an electromagnetic wave does propagate in conducting and non-conducting media?	8 Marks	L2	CO2	PO2
	b)	Explain the significance of gradient and curl.	4 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Derive expressions for the numerical aperture and the fractional index change of an optical fiber.	8 Marks	L2	CO2	PO2
	b)	List out the applications of optical fibers.	4 Marks	L1	CO2	PO1
		UNIT-III				
5.	a)	Derive an expression for density of electrons in n-type semiconductors.	6 Marks	L3	CO3	PO2
	b)	State Hall effect and obtain an expression for the Hall coefficient.	6 Marks	L4	CO3	PO1
		(OR)				
6.	a)	Explain the concept of PN junction diode.	6 Marks	L2	CO3	PO1
	b)	Discuss the working of photodiode.	6 Marks	L2	CO3	PO2
		UNIT-IV				
7.	a)	Elaborate the concept of frequency dependence of polarization.	8 Marks	L3	CO4	PO2
	b)	What are internal fields?	4 Marks	L1	CO4	PO1
		(OR)				
8.	a)	Distinguish between soft and hard magnetic materials.	6 Marks	L3	CO4	PO2
	b)	Explain the classification of magnetic materials.	6 Marks	L2	CO4	PO1
		UNIT-V				
9.	a)	How superconductors are different from other materials?	6 Marks	L3	CO5	PO1
	b)	Write a note on Josephson effect.	6 Marks	L2	CO5	PO2
		(OR)				
10	a)	What are nanomaterials and how they are useful to us?	6 Marks	L2	CO5	PO2
·	b)	List out some properties of nanomaterials.	6 Marks	L1	CO5	PO1

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Regular Examinations, December – 2020

ENGINEERING CHEMISTRY

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

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

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain Schrodinger wave equation and write the significance of φ and φ^2.	8 Marks	L2	CO1	PO1
	b)	Recall the conditions required for the formation of molecular orbitals from atomic orbitals.	4 Marks	L1	CO1	PO1
		(OR)				
2.		Explain postulates of VSEPR theory for the shapes of molecules with suitable examples.	12 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	Discuss the conversion of hard water into soft water by Ion exchange process.	8 Marks	L2	CO2	PO2
	b)	Explain any two methods for prevention of scale formation.	4 Marks	L2	CO2	PO2
		(OR)				
4.	a)	Explain defluoridation by Nalgonda method.	8 Marks	L2	CO2	PO6
	b)	What are the reasons for formation of sales in boilers?	4 Marks	L2	CO2	PO2
		UNIT-III				
5.	a)	Explain the construction and working of Glass electrode with chemical equations.	6 Marks	L2	CO3	PO1
	b)	Explain oxidation corrosion.	6 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Explain the construction and working of Lithium Ion battery with chemical equations for discharging and charging.	8 Marks	L2	CO3	PO1
	b)	Discuss impressed current cathodic protection method for protection of metals from corrosion.	4 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	Explain the working of IR spectrophotometer with neat diagram.	8 Marks	L2	CO4	PO1
	b)	Discuss any two applications of UV –Visible spectroscopy.	4 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Write the principle and applications of SEM.	8 Marks	L2	CO4	PO1
	b)	Explain different types of molecular vibrations.	4 Marks	L2	CO4	PO1
		UNIT-V				
9.	a)	Discuss preparation of synthetic petrol by using Bergius process.	8 Marks	L2	CO5	PO1
	b)	Explain the following properties of Lubricants. i) Cloud point. ii) Pour point.	4 Marks	L2	CO5	PO1
		(OR)				
10.	a)	Calculate the minimum amount of air required for the complete combustion of 1 kg of a fuel containing C=90%, H_2=3.5%, S=0.5%, O_2=3 % N_2=0.5% and ash 1.5%.	6 Marks	L3	CO5	PO1
	b)	Explain the concept of knocking. How do you minimize it using anti-knocking agents? Give examples.	6 Marks	L2	CO5	PO1

CODE No.: 19BT1HS01 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Regular Examinations, December 2020

COMMUNICATIVE ENGLISH

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

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

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		Illustrate and discuss 'language as a tool of communication'.	12 Marks	L2	CO1	PO2 PO10
		(OR)				
2.	a)	Explain the different modes of communication.	6 Marks	L2	CO1	PO2 PO10
	b)	State the importance of Non-Verbal communication.	6 Marks	L2	CO1	PO2 PO10
		UNIT-II				
3.		Explain the traits of a good speaker with examples.	12 Marks	L4	CO1	PO2 PO4 PO10
		(OR)				
4.	a)	Discuss the barriers to effective listening.	6 Marks	L2	CO1	PO2 PO10
	b)	State and explain different modes in the process of listening.	6 Marks	L2	CO1	PO2 PO5 PO10
		UNIT-III				
5.		"Clarity of thought and expression can play a significant role in speeches and presentation", justify the given statement to be a good speaker.	12 Marks	L4	CO1	PO2 PO1 PO10
		(OR)				
6.	a)	Explain briefly the paralinguistic features of speaking.	6 Marks	L2	CO1	PO1 PO10
	b)	Discuss briefly types of speaking.	6 Marks	L2	CO1	PO1 PO10
		UNIT-IV				
7.		Analyze the role and importance of reading to become an effective speaker and a writer.	12 Marks	L2	CO1	PO5 PO2 PO10
		(OR)				
8.	a)	Discuss diverse types of reading methods.	6 Marks	L2	CO1	PO2
	b)	Explain briefly different techniques for good comprehension.	6 Marks	L2	CO1	PO2
		UNIT-V				
9.		"Adaptability, Clarity, Economy and Sentence Variety are essential elements of effective writing.", Illustrate.	12 Marks	L4	CO1	PO2 PO4 PO10
		OR)				
10.	a)	Discuss the features of a paragraph with suitable examples.	6 Marks	L2	CO1	PO2 PO10
	b)	Explain briefly the elements of styles in writing.	6 Marks	L2	CO1	PO2

CODE No.: 19BT2BS01 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Regular Examinations December - 2020

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]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Obtain the Fourier series for x^2 in the interval $-\pi < x < \pi$. Hence show that $1-\frac{1}{2^2}+\frac{1}{3^2}-\frac{1}{4^2}+\frac{1}{5^2}\ldots\ldots=\frac{\pi^2}{12}$	8 Marks	L3	CO1	PO2
	b)	1. Find the Fourier transform of $f(x)=\begin{cases}1 & \text{for } \lvert x\rvert < a\\ 0 & \text{for } \lvert x\rvert > a\end{cases}$	4 Marks	L2	CO1	PO1

(OR)

2.	a)	Find the half-range Cosine series for the following function: 2. $f(x)=2x-1$ *for* $0<x<1$.	6 Marks	L2	CO1	PO1
	b)	Obtain Fourier cosine transform of $f(x)=\begin{cases}2x\ ; & 0<x<1\\ 2-x\ ; & 1<x<2\\ 0\ ; & x>2.\end{cases}$	6 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Find the Laplace transform of $t\sin at$.	6 Marks	L1	CO1	PO1
	b)	Using Laplace transform, evaluate the integral $\int_0^\infty \frac{\sin 2t}{t}dt$	6 Marks	L3	CO1	PO2

(OR)

4.	a)	1. Determine Laplace transform of $\int_0^t t^2\sin t\ dt$.	6 Marks	L2	CO1	PO1
	b)	Find the Laplace transform of $f(t)=\begin{cases}0, & 0<t<1\\ 1, & 1<t<2\\ 2, & t>2\end{cases}$.	6 Marks	L2	CO1	PO1

UNIT-III

5.	a)	Solve the following differential equation using Laplace transform $y''+2y'+2y=5\sin t,\ y(0)=y'(0)=0$.	8 Marks	L3	CO1	PO2
	b)	Find $L^{-1}\left[\frac{2s+3}{s^2-4s+13}\right]$.	4 Marks	L2	CO1	PO1

(OR)

6.	a)	Find $L^{-1}[\frac{s-3}{s^2+4s+13}]$.	6 Marks	L2	CO1	PO1
	b)	Apply convolution theorem to find $L^{-1}[\frac{1}{s(s^2+4)}]$.	6 Marks	L3	CO1	PO2

UNIT-IV

7.		Verify that the only real value λ for which the following equations have nontrivial solution is 6 and solve them when λ =6. b) $x+2y+3z=\lambda x$ c) $3x+y+2z=\lambda y$ d) $2x+3y+z=\lambda z$	12 Marks	L3	CO2	PO2

(OR)

8.	a)	Find the eigenvalues and the corresponding eigen vectors of the matrix $\begin{bmatrix} 2 & 2 & 1 \\ 1 & 3 & 1 \\ 1 & 2 & 2 \end{bmatrix}$.	8 Marks	L3	CO2	PO2
	b)	Find the rank of the matrix $\begin{bmatrix} 1 & 2 & 3 & 0 \\ 2 & 4 & 3 & 2 \\ 3 & 2 & 1 & 3 \\ 6 & 8 & 7 & 5 \end{bmatrix}$.	4 Marks	L1	CO2	PO1

UNIT-V

9.	a)	Determine whether the vectors $\begin{bmatrix} 1 \\ 1 \\ 0 \end{bmatrix}, \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix}$ and $\begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix}$ are linearly independent.	4 Marks	L2	CO2	PO1
	b)	Determine the rank and nullity of the linear transformation T: P_3 to R^2 defined by $T(a+bx+cx^2+dx^3) = \begin{bmatrix} a+2b+c+2d \\ 3a+4b-c-2d \end{bmatrix}$.	8 Marks	L3	CO2	PO2

(OR)

10.	a)	2. Show that the vectors {(1,1,2), (1,2,5), (5,3,4)} do not form a basis for $R^3(R)$.	4 Marks	L2	CO2	PO1
	b)	Let T:P_2 to P_2 be the linear transformation defined by $T(p(x) = p(2x-1)$ Find the matrix of T with respect to the basis $\{1, x, x^2\}$.	8 Marks	L3	CO2	PO2

CODE No.: 19BT2BS02 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Regular Examinations, December 2020

APPLIED PHYSICS

[Civil Engineering, Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the principle of optical fibers with a neat diagram.	8 Marks	L2	CO1	PO1
	b)	Define the terms: Acceptance angle and Numerical aperture.	4 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Describe the double crucible technique to fabricate optical fiber.	8 Marks	L2	CO1	PO1
	b)	Give the various advantages of optical fibers over conventional cables.	4 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Explain various factors affecting architectural acoustics and their remedies.	8 Marks	L1	CO1	PO1
	b)	A hall has a volume of 2265 m^3 and its total absorption is equivalent to 92.9 m^2 of open window. What will be the effect on reverberation time if audience fill the hall and thereby increase the absorption by another 92.9 m^2?	4 Marks	L3	CO1	PO2
		(OR)				
4.	a)	What is magnetostriction effect? With necessary diagram, explain the production of ultrasonics using magnetostriction method.	8 Marks	L2	CO1	PO1
	b)	Explain any two applications of ultrasonics.	4 Marks	L1	CO1	PO1
		UNIT-III				
5.	a)	Sketch displacement-time, velocity-time curves of particle in a rectilinear motion.	6 Marks	L3	CO2	PO2
	b)	Distinguish between rectilinear and curvilinear motion.	6 Marks	L2	CO2	PO1
		(OR)				
6.	a)	Explain the terms: work, energy and power.	8 Marks	L2	CO2	PO1
	b)	A wheel has an angular acceleration of 3 rad/sec^2 and an initial angular speed of 2 rad/sec. In a time of 2 sec it has rotated through an angle (in radian) of _____.	4 Marks	L3	CO2	PO2
		UNIT-IV				
7.	a)	Derive the expression for coefficient thermal conductivity.	6 Marks	L3	CO2	PO2
	b)	Explain how the thermal conductivity of a bad conductor can be determined.	6 Marks	L2	CO2	PO1
		(OR)				
8.		Explain heat conduction through compound media.	12 Marks	L2	CO2	PO2
		UNIT-V				
9.	a)	Explain how metallic glasses are prepared by using RF sputtering technique.	8 Marks	L2	CO3	PO1
	b)	Write any four applications of metallic glasses.	4 Marks	L1	CO3	PO1
		(OR)				
10.	a)	What are shape memory alloys? Write its applications.	6 Marks	L1	CO3	PO1
	b)	What are composites? Explain various types of composites.	6 Marks	L1	CO3	PO1

CODE No.: 19BT10201 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Regular Examinations, December-2020

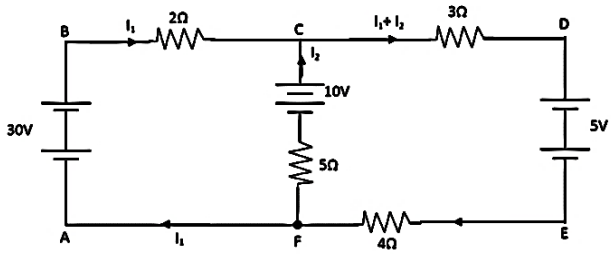
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

[Civil Engineering, Mechanical Engineering, 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)	For the circuit shown, find the current flowing in all the branches. 	6 Marks	L3	CO1	PO3
	b)	State and explain Kirchhoff's current law with an example.	6 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Define: i) reactive power ii) apparent power iii) real power iv) power factor	4 Marks	L3	CO1	PO2
	b)	Explain in detail about operation of a single-loop generator.	8 Marks	L3	CO1	PO3

UNIT-II

3.	a)	What is the significance of power factor and its correction in electrical systems?	6 Marks	L2	CO2	PO3
	b)	Explain the block diagram of inverter with details.	6 Marks	L1	CO2	PO2
		(OR)				
4.	a)	Explain the operation of hydro power plant with layout.	6 Marks	L2	CO2	PO2
	b)	What is the importance of earthing and explain about pipe-earthing?	6 Marks	L2	CO2	PO4

UNIT-III

5.	a)	Derive the **emf** equation in single phase transformer.	6 Marks	L2	CO3	PO2
	b)	Explain the constructional features of 3-phase induction motor.	6 Marks	L3	CO3	PO2
		(OR)				
6.	a)	Give the constructional details in synchronous machine.	6 Marks	L2	CO3	PO2
	b)	Explain the operation of single phase resistor-start induction motor.	6 Marks	L3	CO3	PO3

UNIT-IV

7.	a)	Explain transistor as an amplifier with a neat circuit diagram.	6 Marks	L2	CO4	PO1
	b)	Justify how a Zener diode can act as a voltage regulator.	6 Marks	L2	CO4	PO4
		(OR)				
8.	a)	Explain in detail about the V-I characteristics of p-n junction diode with a neat diagram.	6 Marks	L2	CO4	PO2
	b)	With a neat diagram explain the operation of half-wave rectifier with C-filter.	6 Marks	L3	CO4	PO3

UNIT-V

9.	a)	Explain the basic internal block diagram of a typical Op-Amp.	4 Marks	L1	CO4	PO1
	b)	Discuss about the closed loop configuration of an inverting and non-inverting Op-Amp and obtain the gain.	8 Marks	L3	CO4	PO3
		(OR)				
10.	a)	Explain in detail about the characteristics of Op-Amp.	6 Marks	L2	CO4	PO1
	b)	Explain the operation of an integrator using Op-Amp.	6 Marks	L3	CO4	PO2

CODE No.: 19BT10501 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Regular Examinations, December-2020

PROGRAMMING FOR PROBLEM SOLVING

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

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

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Describe basic building blocks of flowchart with suitable examples.	6 Marks	L1	C01	PO1
	b)	Discuss about type conversion with necessary examples.	6 Marks	L2	C01	PO1
		(OR)				
2.	a)	Describe comparison, logical and bitwise operators in detail with examples.	6 Marks	L1	C02	PO1
	b)	Explain the basic data types available in Python with examples.	6 Marks	L2	C01	PO1
		UNIT-II				
3.	a)	Write Python code to check if a given year is a leap year or not.	6 Marks	L1	C02	PO2
	b)	Write Python code to find the factorial of a number.	6 Marks	L1	C02	PO2
		(OR)				
4.	a)	Write Python program to reverse a number and also find the Sum of digits in the reversed number.	6 Marks	L2	C02	PO2
	b)	Discuss about usage of pass and else statements used with loops.	6 Marks	L2	C01	PO1
		UNIT-III				
5.	a)	Write Python program to perform a search for a given key number in the list and report success or failure.	6 Marks	L2	C02	PO1
	b)	Write Python program to convert uppercase letters to lowercase and vice versa.	6 Marks	L2	C02	PO2
		(OR)				
6.	a)	Write about the following in Python: i) list ii) dictionary iii) tuple	6 Marks	L2	C02	PO3
	b)	Write Python program to sort numbers of any list of integers in ascending order.	6 Marks	L2	C02	PO2
		UNIT-IV				
7.	a)	What is need for function? Explain how to define and call function.	6 Marks	L2	CO1	PO1
	b)	How to write to and read from a file? Give suitable examples.	6 Marks	L2	CO2	PO2
		(OR)				
8.	a)	Discuss about recursive functions with suitable examples.	6 Marks	L2	CO1	PO1
	b)	List out any three built in functions in date and time and explain.	6 Marks	L2	CO1	PO2

UNIT-V

9.	a)	How to read the data from `.csv` file?	6 Marks	L2	CO2	PO3
	b)	Write a python script to drop the missing data from data frame.	6 Marks	L2	CO2	PO2
		(OR)				
10	a)	Discuss about the creation of data frame with suitable example.	6 Marks	L3	CO2	PO2
.	b)	Explain bar plot with a suitable programming example. Hint: Given the number of students enrolled - 23,17,35,29,12 courses offered - 'C', 'C++', 'Java', 'Python', 'PHP'.	6 Marks	L3	CO2	PO3

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Regular Examinations, December - 2020

CIVIL ENGINEERING MATERIALS AND CONCRETE TECHNOLOGY

[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	List out various properties of good building stones and describe any two.	6 Marks	L3	CO1	PO1
	b)	Discuss the process of blasting.	6 Marks	L4	CO1	PO1
		(OR)				
2.	a)	Explain the importance of various ingredients in good brick earth.	6 Marks	L4	CO1	PO1 PO2
	b)	Describe about manufacture of tiles.	6 Marks	L4	CO1	PO1
		UNIT-II				
3.	a)	What are the various causes for early decay of timber?	6 Marks	L4	CO1	PO1
	b)	Define seasoning and explain briefly various methods of seasoning.	6 Marks	L4	CO1	PO1 PO2
		(OR)				
4.	a)	List out various properties of timber and describe any four of them.	6 Marks	L2	CO1	PO1 PO2 PO8
	b)	Discuss about plastics and ceramic products.	6 Marks	L4	CO1	PO1
		UNIT-III				
5.		Explain in detail various field and laboratory tests to be conducted on cement.	12 Marks	L4	CO1	PO1 PO2 PO5
		(OR)				
6.	a)	Write a note on various admixtures used in concrete.	6 Marks	L2	CO1	PO1
	b)	Discuss about alkali aggregate reaction.	6 Marks	L4	CO1	PO1
		UNIT-IV				
7.	a)	Describe the process of manufacture of concrete.	6 Marks	L4	CO1	PO1 PO2
	b)	Explain how the water /cement ratio effects on concrete.	6 Marks	L4	CO1	PO1 PO2
		(OR)				
8.	a)	Describe briefly about ready mix concrete.	6 Marks	L4	CO1	PO1 PO2
	b)	Write a short note on Gel Space ratio, Maturity concept.	6 Marks	L2	CO1	PO1
		UNIT-V				
9.	a)	What do you mean by modulus of elasticity and dynamic modulus of elasticity?	6 Marks	L4	CO1	PO1
	b)	Write a note on durability of concrete and Poisson's ratio.	6 Marks	L2	CO1	PO1

(OR)

10.	Design a M35 concrete mix using IS methods of mix design for the following data: i) Maximum size of aggregate: 20 mm. 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: 2.60 c) CA: 2.80 vi) Water absorption: a) CA- 0.5% b) FA- 1.0% vii) Free Surface Moisture: a) CA – Nil b) FA- Nill viii) Sand confirms to Zone III grading Assume any other data required suitably	12 Marks	L6	CO2	PO1 PO2 PO3 PO8

CODE No.: 19BT20102 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Regular Examinations December - 2020

ENGINEERING MECHANICS

[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain parallelogram law, principle of transmissibility, law of superposition and equilibrium law	4 Marks	L1	CO1	PO1
	b)	Two cylinders of weights Q and R are interconnected by a bar of negligible weight hinged to each other at its geometric center by ideal pins. Determine magnitude of P applied at the centre of the cylinder R to keep the cylinders in equilibrium in the position shown in Fig1. The numerical data are given: Q = 200N and R = 1000N.	8 Marks	L3	CO1	PO1

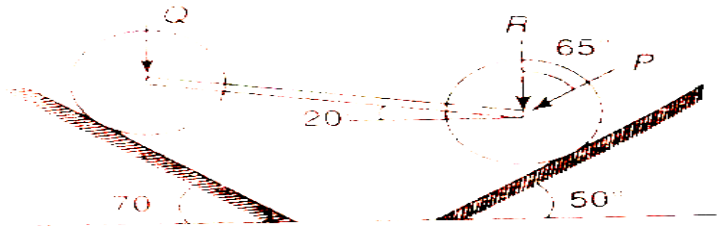

Fig.1

(OR)

2.	Using method of sections, determine the axial forces in the bars 1, 2, 3 of a truss shown in Fig 2.	12 Marks	L3	CO1	PO1

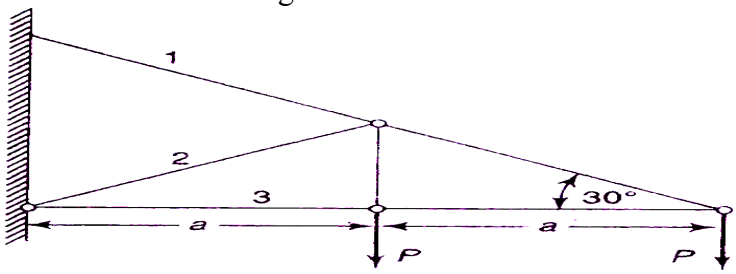

Fig.2

UNIT-II

3.	Two blocks are connected by a horizontal link AB and rest on two planes as shown in Fig.3. What is the smallest weight of the block A for which the equilibrium can exist? Assume the coefficient of friction for the block A and the horizontal surface to be 0.4 and the angle of friction for the block B on the inclined plane is 20^0. The weight of the block B is 500 N.	12 Marks	L3	CO1	PO1

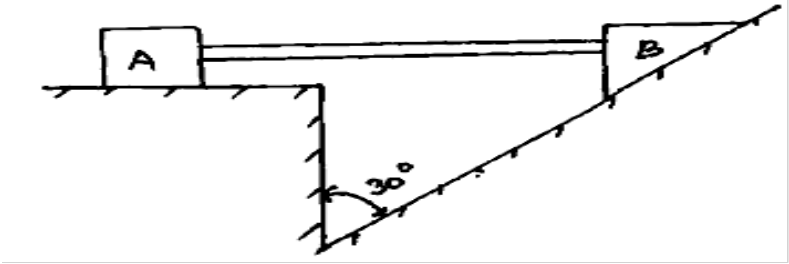

Fig.3

(OR)

4.		A 7m long ladder rests against a vertical wall, with which it makes an angle of 45^0, and on floor. If a man, whose weight is one of half of that of the ladder, climbs it, at what distance along the ladder will he be, when the ladder is about to slip? The coefficient of friction between wall and ladder is 0.3 and that between ladder and the floor is 0.5.	12 Marks	L3	CO1	PO1

UNIT-III

5.	a)	State and explain theorem of Pappus.	4 Marks	L1	CO1	PO1
	b)	Determine the coordinates of the centroid of the composite area. (Fig 4.)	8 Marks	L2	CO1	PO1

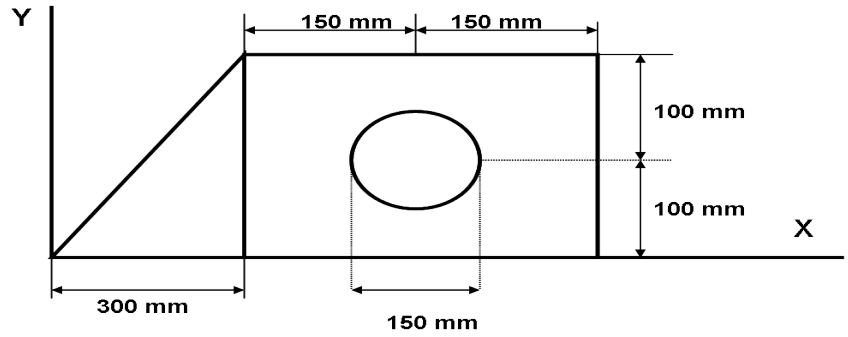

Fig.4

(OR)

6.	a)	Find the moment of area of a square sides of length ***a*** with respect to a diagonal.	4 Marks	L2	CO1	PO1
	b)	Find the area moment of inertia about the centroidal axis of the plane area shown in Fig 5.	8 Marks	L2	CO1	PO1

All dimensions are in mm

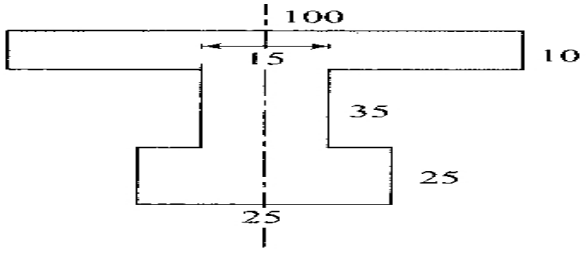

Fig.5

UNIT-IV

7.	Derive an expression for the stress induced in a body due to suddenly applied load. Also find the value of thermal expansion in the body.	12 Marks	L2	CO1	PO1

(OR)

8.	Determine changes in length, breadth, and thickness of a steel bar which is 4m long, 30mm wide and 20mm thick and is subjected to an axial pull of 30kN in the direction of its length. Take $E=2x10^5$ N/mm^2 and poisson's ratio = 0.3	12 Marks	L3	CO1	PO1

UNIT-V

9.	Show that in thin cylindrical shells subjected to an internal pressure, the circumferential stress is twice the longitudinal stress.	12 Marks	L4	CO1	PO1

(OR)

10.	Find the thickness of metal necessary for a cylindrical shell of internal diameter 160mm to withstand an internal pressure of 8MPa. The maximum hoop stress in the section is not to exceed 35MPa.	12 Marks	L4	CO1	PO1

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Regular Examinations, December - 2020

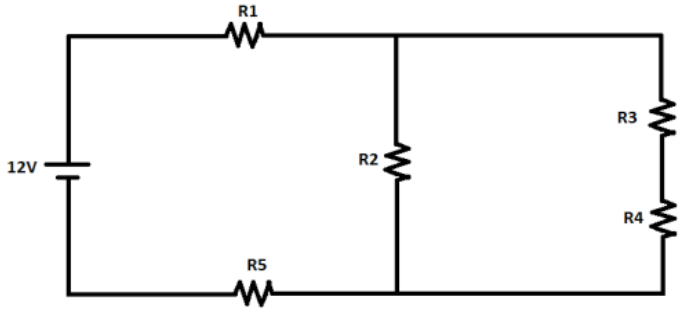
ELECTRIC CIRCUITS

[Electrical and Electronics Engineering]

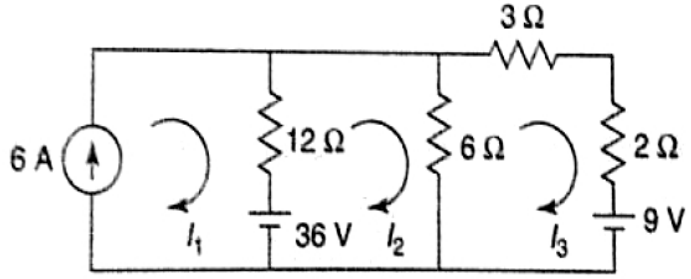
Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is the total equivalent resistance of the circuit across 12V Source? Given that R1=5Ω, R2=3Ω, R3=1Ω, R4=2Ω, R5=2Ω.  	6 Marks	L3	CO1	PO2
	b)	Give the details of Source Transformation technique with an example.	6 Marks	L3	CO1	PO3

(OR)

2.	a)	Explain clearly about Star-delta and delta-Star transformation.	6 Marks	L3	CO1	PO3
	b)	Find the Voltage drop across the 2 Ω resistor.  	6 Marks	L3	CO1	PO2

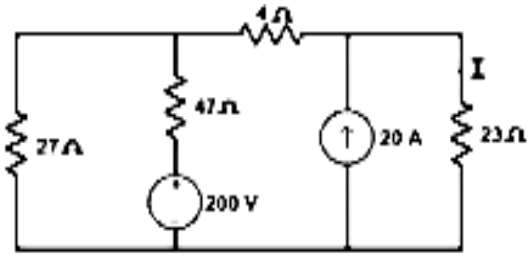
UNIT-II

3.	a)	Determine the DC response of RL and RC circuit and sketch the voltage transients.	6 Marks	L2	CO2	PO1
	b)	Derive the expression for bandwidth of series resonating circuit and its relation with Q.	6 Marks	L1	CO2	PO1

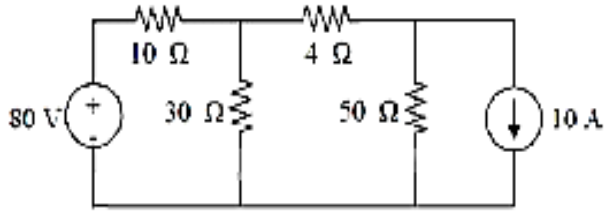
(OR)

4.	a)	In a series RLC circuit with variable capacitance, the current is at maximum value with capacitance of 20 μF and the current reduces to 0.707 times the maximum value with a capacitance of 30 μF. Find the values of R and L. What is the bandwidth of the circuit if supply voltage is V(t)=20 sin(6280t) volts?	6 Marks	L2	CO2	PO1
	b)	Elucidate measurement of power and power factor of a balanced 3 phase load with neat sketch using two Wattmeter method.	6 Marks	L2	CO2	PO1

UNIT-III

5.	a)	Compute the current in 23 Ohm resistor using super position theorem for the circuit shown. 	6 Marks	L2	CO3	PO1
	b)	State and explain Thevenin's theorem with an example.	6 Marks	L2	CO3	PO3

(OR)

6.	a)	Verify the Tellegen's theorem for the circuit shown. 	6 Marks	L1	CO3	PO2
	b)	Explain duality in electrical engineering. State the steps followed in finding the dual of a network.	6 Marks	L3	CO3	PO3

UNIT-IV

7.	a)	i) What is mutual inductance? How it is related with the self-inductance of coils. ii) What is the equivalent inductance if inductor L1 = 5H and L2= 15 H are connected in parallel with opposing mutual inductance M= 5H?	6 Marks	L1	CO4	PO2
	b)	Derive the expression of the coefficient of coupling for the coupled circuit.	6 Marks	L2	CO4	PO2

(OR)

8.	a)	Define and explain self and mutual inductance.	6 Marks	L2	CO4	PO4
	b)	Write the comparison between series resonance and parallel resonance.	6 Marks	L2	CO4	PO4

UNIT-V

9.	a)	Design a constant **K**-high pass filter and explain its design procedure in detail.	6 Marks	L2	CO4	PO2
	b)	Explain the classification of pass band and stop band in detail.	6 Marks	L3	CO4	PO3

(OR)

10.	a)	Derive necessary expressions for m-derived high pass filter.	6 Marks	L3	CO4	PO4
	b)	Design a band elimination filter and explain its design procedure in detail.	6 Marks	L2	CO4	PO1

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CODE No.: 19BT20241 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Regular Examinations, December - 2020

NETWORK ANALYSIS

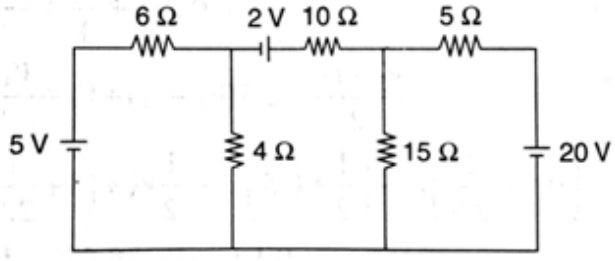
[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

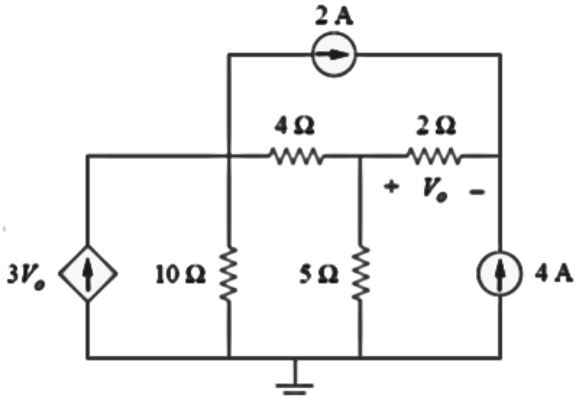
UNIT-I

1.	a)	State and explain KVL and KCL with examples.	6 Marks	L2	CO1	PO2
	b)	Determine the current through 10Ω resistor in the fig below using mesh analysis.	6 Marks	L4	CO1	PO2

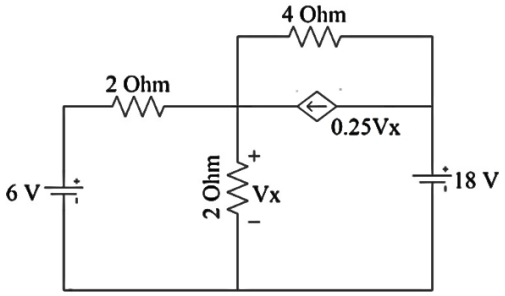


(OR)

2.	a)	Obtain the Node equation for the circuit shown below and compute the V_0.	6 Marks	L3	CO1	PO2

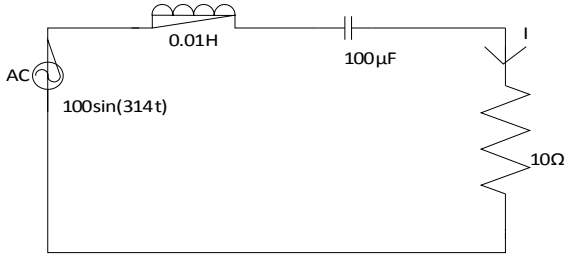


	b)	Find V_x for the circuit shown below.	6 Marks	L4	CO1	PO2



UNIT-II

3.	a)	Find current I for the circuit shown below	6 Marks	L4	CO1	PO2



	b)	A series connected load draws a current I(t) = 4sin (100πt) A	6 Marks	L4	CO1	PO2

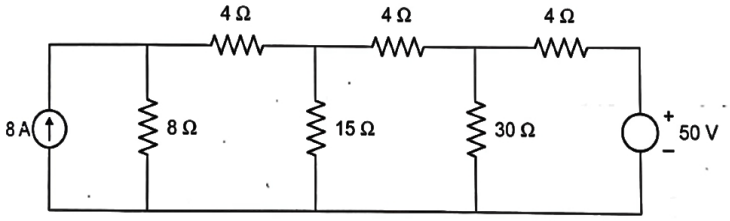
when the applied voltage is V(t) = 120 sin (100πt) V. Find the power factor.

(OR)

4.	a)	Derive expression for bandwidth of series resonance circuit.	6 Marks	L2	CO1	PO2
	b)	In a series RLC circuit with R = 10 Ω, L = 0.1 H and C = 50 μF, find resonant frequency, quality factor and band width.	6 Marks	L3	CO2	PO3

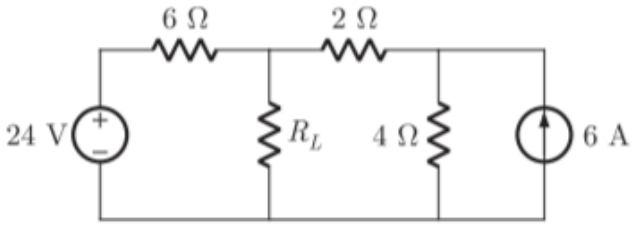
UNIT-III

5.	a)	State and explain Thevinin's theorem.	6 Marks	L2	CO1	PO2
	b)	For the circuit shown in figure find the current through the 15Ω resistor using Superposition theorem.	6 Marks	L4	CO1	PO2



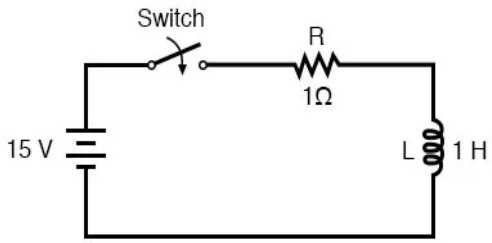
(OR)

6.	a)	State and explain reciprocity theorem.	6 Marks	L2	CO1	PO2
	b)	Determine the value of R_L and also calculate P_{max} by using maximum power transfer theorem.	6 Marks	L4	CO1	PO5



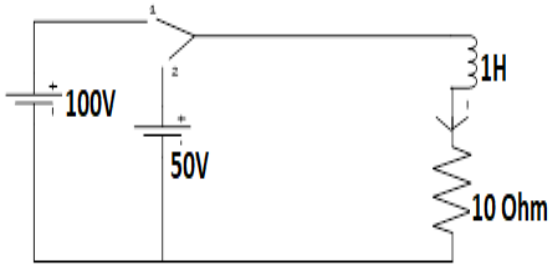
UNIT-IV

7.	a)	Find the transient response of RL series circuit for dc excitation.	6 Marks	L3	CO1	PO2
	b)	For the circuit shown below find the current in the circuit after closing the switch at t=0.	6 Marks	L4	CO1	PO2



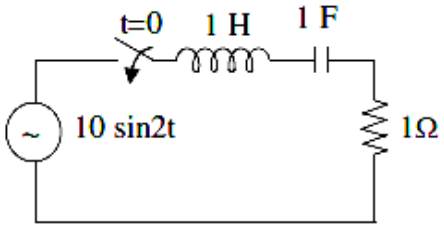
(OR)

8.	a)	The switch is in position 1 for long time and moved to position 2 at t= 0, find current i.	6 Marks	L4	CO1	PO2



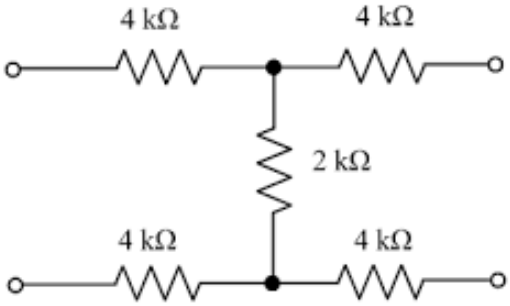
	b)	Find the current in the circuit shown for t > 0. At t = 0 sec. the	6 Marks	L3	CO2	PO6

network was unenergized.

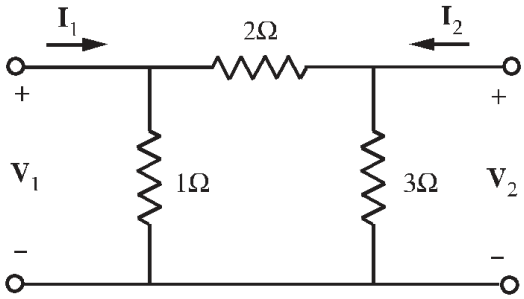


UNIT-V

9.	a)	Determine the Z parameters of the network shown below.	6 Marks	L3	CO1	PO1

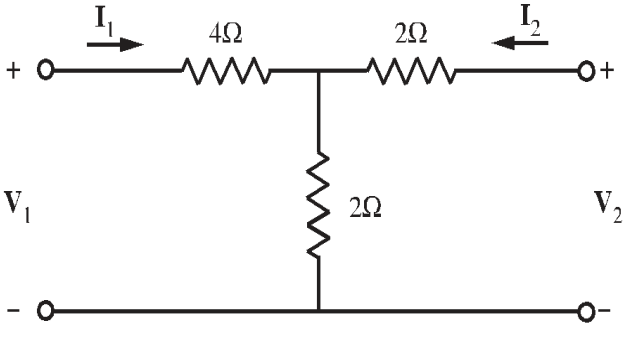


	b)	Find the y-parameters of the two-port network shown below.	6 Marks	L4	CO2	PO3



(OR)

10.	a)	Prove that reciprocity and symmetry condition for Z-parameters.	6 Marks	L2	CO1	PO2
	b)	Find the ABCD parameters of the two-port network shown below.	6 Marks	L4	CO1	PO2



CODE No.: 19BT20301 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Regular Examinations, December - 2020

BASIC ENGINEERING MECHANICS

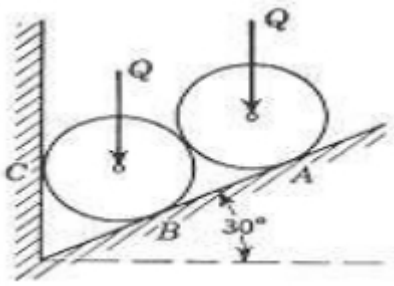
[Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	Two identical rollers, each of weight 100 N, are supported by an inclined plane and a vertical wall as shown in below. Assuming smooth surfaces, find the reactions induced at the points of support A, B and C.	12 Marks	L2	CO1	PO1 PO2



(OR)

2.	A weight Q is suspended from a small ring C, supported by two cords AC and BC as shown in Figure.2. The cord AC is fastened at A while the cord BC passes over a frictionless pulley at B and carries the weight P as shown. If P = Q and α = 50°, find the value of the angle ß.	12 Marks	L2	CO1	PO1 PO2

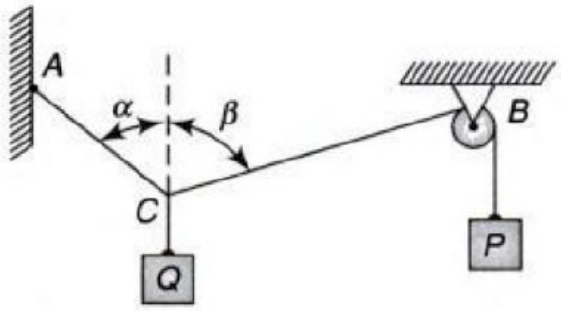


Figure.2

UNIT-II

3.	A roller of radius *r* = 304.8 mm and weight Q = 2225 N is to be pulled over a curb of height h = 152.4 mm by a horizontal force P applied to the end of a string wound around the circumference of the roller as shown in Figure.3. Find the magnitude of P required to start the roller over the curb.	12 Marks	L2	CO1	PO1 PO2

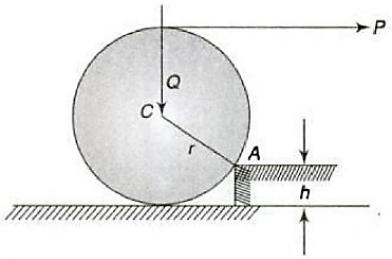


Figure.3

(OR)

4.	Using the method of joints, find the axial force in each of bars 1, 2, 3 of the plane truss in Figure.4.	12 Marks	L2	CO1	PO1 PO2

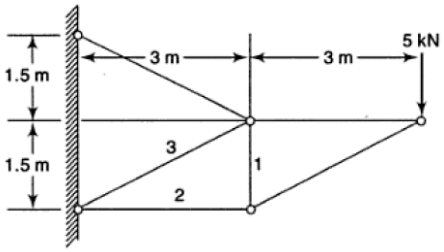


Figure.4

UNIT-III

5.	Two blocks of weights W_1 and W_2 rest on a rough inclined plane and are connected by a short piece of string as shown in Figure.5. If the coefficients of friction are $\mu_1 = 0.2$ and $\mu_2 = 0.3$ respectively, find the angle of inclination of the plane for which sliding will impend. Assume $W_1 = W_2 = 22.25$ N.	12 Marks	L2	CO1	PO1 PO2

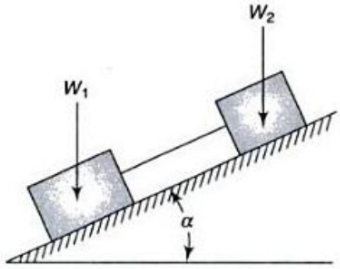


Figure.5

(OR)

6.	A block of weight W_1= 890N rests on a horizontal surface and supports on top of it another block of weight W_2= 222.5N as shown in Figure.6. The block W_2 is attached to a vertical wall by the inclined string AB. Find the magnitude of the horizontal fore P applied to the lower block as shown that will be necessary to cause slipping to impend. The coefficient of static friction for all contiguous surfaces is $\mu = 0.3$.	12 Marks	L2	CO1	PO1 PO2

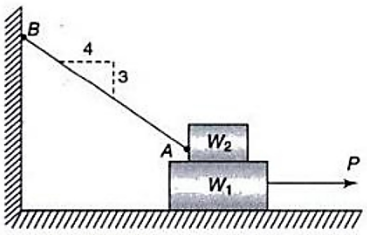


Figure.6

UNIT-IV

7.	Locate the centroid *C* of the shaded area obtained by cutting a semicircle of diameter *a* from the quadrant of a circle of radius *a* as shown in Figure.7.	12 Marks	L2	CO2	PO1 PO2

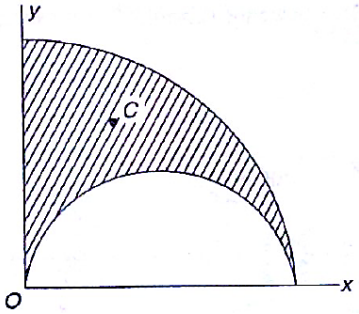


Figure.7

(OR)

8.		Calculate the moment of inertia of the shaded area in Figure.8 with respect to a centroidal axis parallel to the *x*-axis.	12 Marks	L2	CO2	PO1 PO2

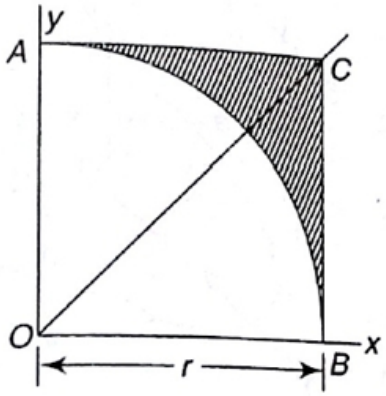
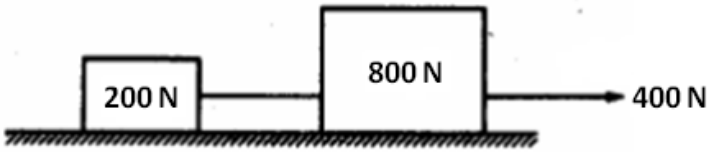


Figure.8

UNIT-V

9.	a)	Two weights 800 N and 200 N are connected by a thread and they move along a rough horizontal plane under the action of a force of 400 N applied to the 800 N weight as shown in figure. The coefficient of friction between the sliding surface of the weights and the plane is 0.3. Using D-Alembert's principle, determine the acceleration of the weights and tension in the thread.	6 Marks	L2	CO3	PO1 PO2



	b)	A flywheel weighing 50 kN and having radius of gyration 1m loses its speed from 400 rpm to 280 rpm in 2 minutes. Calculate the retarding torque acting on it.	6 Marks	L3	CO3	PO1 PO2

(OR)

10.	a)	Explain simple harmonic motion with a neat sketch.	6 Marks	L2	CO4	PO1
	b)	Determine the amplitude and maximum velocity of a particle which moves in simple harmonic motion with a maximum acceleration of 4.5 m/s^2 and a frequency of 8 Hz.	6 Marks	L2	CO4	PO1

CODE No.: 19BT20302 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Regular Examinations December - 2020

MATERIAL SCIENCE AND ENGINEERING

[Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Give the coordination number for SC, BCC and FCC structures.	6 Marks	L1	CO1	PO1
	b)	Distinguish between the following: i) Primitive cell and Unit cell. ii) Crystalline and Amorphous solids.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Derive the expression for Gibb's phase rule.	6 Marks	L1	CO1	PO1
	b)	State Hume Rothery rules of solid solubility.	6 Marks	L2	CO1	PO7
		UNIT-II				
3.	a)	Define annealing and recall the types of annealing processes.	6 Marks	L1	CO2	PO1
	b)	With a neat sketch, explain Induction hardening process.	6 Marks	L2	CO2	PO2
		(OR)				
4.	a)	Describe TTT curves in detail.	6 Marks	L1	CO2	PO1
	b)	What is carburising? List out various types of carburising process.	6 Marks	L2	CO2	PO4
		UNIT-III				
5.	a)	Explain each type of steels with microstructure, properties and applications: i) HSS. ii) Hadfield Manganese steel.	6 Marks	L2	CO3	PO1
	b)	Differentiate carbon steels and alloy steels.	6 Marks	L1	CO3	PO4
		(OR)				
6.		Draw the microstructures of Greycast iron and Malleable cast iron. Also mention its composition, properties and applications.	12 Marks	L2	CO3	PO2
		UNIT-IV				
7.	a)	Define refractory. Classify various refractory materials.	6 Marks	L1	CO4	PO7
	b)	List the properties and applications of Copper.	6 Marks	L2	CO4	PO2
		(OR)				
8.	a)	List the properties and applications of Nickel.	6 Marks	L1	CO4	PO3
	b)	Explain any two types of Nickel alloys with their properties and applications.	6 Marks	L2	CO4	PO2
		UNIT-V				
9.	a)	Discuss the advantages and limitations of metal matrix composites.	6 Marks	L1	CO5	PO4
	b)	Distinguish between particulate composites and dispersion strengthened composites.	6 Marks	L2	CO5	PO2
		(OR)				
10.	a)	Write a brief note on ceramic matrix composites. Give any two examples.	6 Marks	L1	CO5	PO1
	b)	What is polymerization? Write in detail about the types of polymerization.	6 Marks	L2	CO5	PO5

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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I B.Tech II Semester (SVEC-19) Regular Examinations, December - 2020

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)	Convert the following numbers into binary i) $(27.315)_{10}$ ii) $(68BE)_{16}$ iii) $(265)_8$.	6 Marks	12	CO1	PO1
	b)	Reduce the following Boolean function to four literals and draw the logic diagram. $F = (A'+C)(A'+C')(A+B+C'D)$.	6 Marks	L3	CO1	PO1
		(OR)				
2.	a)	Draw and explain different types of logic gates.	6 Marks	L3	CO1	PO1
	b)	Find the 2's complement of the following numbers i) 01100100 ii) 10010010 iii) 11011000	6 Marks	L3	CO1	PO1
		UNIT-II				
3.	a)	Express the Boolean function F=A+B'C in a sum of min terms.	6 Marks	L4	CO1	PO2
	b)	Use k-map to simplify F(x,y,z)=Σm(3,6,8,11,13,14)+Σd(4,10,15)	6 Marks	L4	CO1	PO3
		(OR)				
4.	a)	Minimize the following Boolean equation F = Σm(0,1,2,4,5,7,11,15) using K-map.	6 Marks	L4	CO1	PO2
	b)	Find the SOP and POS form the following expression F(A, B, C, D) = Σ(0, 1, 2, 5, 8, 10, 11).	6 Marks	L4	CO1	PO2
		UNIT-III				
5.	a)	Design a full adder circuit with two half adders and one OR gate.	6 Marks	L4	CO2	PO5
	b)	Sketch 1:8 design de-multiplexer circuit.	6 Marks	L4	CO2	PO3
		(OR)				
6.	a)	Design the following Boolean function with the 4x1 multiplexer F = Σm(0, 1, 3, 5, 7).	6 Marks	L4	CO2	PO4
	b)	Design a magnitude comparator.	6 Marks	L4	CO2	PO4
		UNIT-IV				
7.	a)	Explain SR, JK, T and D flip-flop with truth table.	6 Marks	L2	CO2	PO1
	b)	Explain the operation of Johnson counter.	6 Marks	L4	CO2	PO4
		(OR)				
8.	a)	Design 4-bit ripple up counter.	6 Marks	L4	CO2	PO2
	b)	Explain about universal shift register.	6 Marks	L2	CO2	PO1
		UNIT-V				
9.	a)	Explain the difference between RAM, ROM.	6 Marks	L4	CO2	PO2
	b)	Implement the following Boolean function using PAL. i) F1 = Σ(0,1,2,4) ii) F2 = Σ(0,5,6,7)	6 Marks	L2	CO2	PO1
		(OR)				
10.		Give the realization of the following Boolean function using PLA with 5 inputs, 4 outputs and 8 AND gates. F1=Σ(0,1,2,3,11,12,13,14,15,16,17,18,19,27,28,29,30,31) F2=Σ(4,5,6,7,8,9,10,11,20,21,22,23,30)	12 Marks	L4	CO1	PO2

CODE No.: 19BT21501 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Regular Examinations December - 2020

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

[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)	Define a class and object with syntax. Create a class Student with data members: student_no, student_name and member functions setStudent(int,String) and getStudent() to set and display the values. Create an object to invoke the methods.	6 Marks	L3	CO1	PO1
	b)	List and explain features of Java Programming Language.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Define a constructor. Illustrate how constructors are created in Java with an example.	6 Marks	L3	CO1	PO2
	b)	Describe the need and importance of this keyword in Java with an example.	6 Marks	L5	CO1	PO1
		UNIT-II				
3.	a)	Is it possible to convert from one data type to another data type in Java? If so, explain with an example.	6 Marks	L2	CO1	PO1
	b)	Write a Java Program to find the largest two numbers in a given array.	6 Marks	L3	CO2	PO2
		(OR)				
4.	a)	Discuss about the various methods of StringTokenizer class in Java Language.	6 Marks	L2	CO2	PO2
	b)	Illustrate how method overloading is implemented in Java with an example.	6 Marks	L3	CO2	PO2
		UNIT-III				
5.	a)	What is inheritance? Discuss about various types of inheritance available in Java.	6 Marks	L1	CO2	PO4
	b)	Discuss about the importance of packages in Java and how packagers are created?	6 Marks	L2	CO2	PO4
		(OR)				
6.	a)	Demonstrate how Java supports multiple inheritance.	8 Marks	L3	CO2	PO4
	b)	Write a short note on the keyword final.	4 Marks	L2	CO2	PO1
		UNIT-IV				
7.	a)	Explain the following: i) try. ii) catch. iii) throw.	6 Marks	L1	CO2	PO1
	b)	Write a Java Program to create a Thread using Runnable interface.	6 Marks	L2	CO2	PO2
		(OR)				
8.	a)	Distinguish between Array List and Linked List.	6 Marks	L5	CO2	PO2
	b)	Write a program to implement thread priorities.	6 Marks	L3	CO1	PO2
		UNIT-V				
9.	a)	Describe the life cycle of an Applet with its architecture.	6 Marks	L1	CO3	PO5
	b)	Create an applet to print different polygons.	6 Marks	L3	CO3	PO5
		(OR)				
10.	a)	Write the syntax to create the following Swing components: i) JText Field. ii) JButton. iii) JCheckbox.	6 Marks	L2	CO3	PO5
	b)	List and explain various listener interfaces and methods in it to	6 Marks	L1	CO3	PO3

handle various events in Java.

CODE No.:10BT30105 **SVEC-10**

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC10) Supplementary Examinations November - 2019

FLUID MECHANICS-I

[Civil Engineering]

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

Answer any FIVE questions
All questions carry equal marks

1. a) Explain the terms: i) Dynamic viscosity. ii) Kinematic viscosity. Give their dimensions.
b) Define Newtonian and Non - Newtonian fluids.
c) If the volume of a liquid decreases by 0.2% for an increase of pressure from 6.867MN/m^2 to 15.696MN/m^2, what is the value of the Bulk Modulus of the liquid?

2. a) An opening of 1m depth and 3m width is provided in the vertical side of a large tank. The water surface in the tank is 4m above the top of the opening. If the opening is closed by a plate which is held in place by 4 bolts placed at the corners, determine the force in each bolt.
b) Explain how the total force acting on submerged curved surface is determined.

3. a) Show from basic principles that the continuity equation for one dimensional steady compressible flow is given by $\frac{d\rho}{\rho} + \frac{dV}{V} + \frac{dA}{A} = 0$
b) The stream function for a two dimensional plane flow is given by $\Psi = 2xy$. Determine the velocity potential function if it exists.

4. a) Explain the following.
i) Steady and unsteady flows.
ii) Uniform and non-uniform flows.
iii) Rotational and irrotational flows.
b) For a two-dimensional flow $\emptyset = 3xy$ and $\Psi = 1.5 (y^2-x^2)$. Determine velocity components at the points (1,3) and (3,3). Also find the discharge passing between the stream lines passing through these points.

5. a) Derive Darcy - Weisbach formula for calculating loss of head due to friction in a pipe.
b) A compound pipe line 1650m long made up of pipes 450mm diameter for 900m, 375mm for 450m and 300mm for 300m, is required to be replaced by a pipe of uniform diameter. Find the diameter of the new pipe, assuming the length to remain the same.

6. Define an orifice meter. How is it different from a venturimeter? Prove that the discharge through an orifice meter is proportional to square root of head causing flow.

7. a) Derive Hagen - Poiseuille equation and state the assumptions made.
b) Define shear velocity for turbulent flow in circular pipes.

8. a) Explain the concept of dimensional analysis and state three uses of dimensional analysis.
b) Explain the Buckingham's π-method.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC10) Supplementary Examinations November - 2019

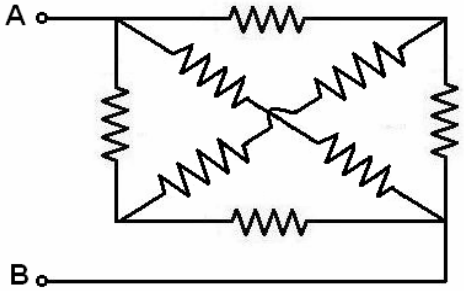
CIRCUIT THEORY

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

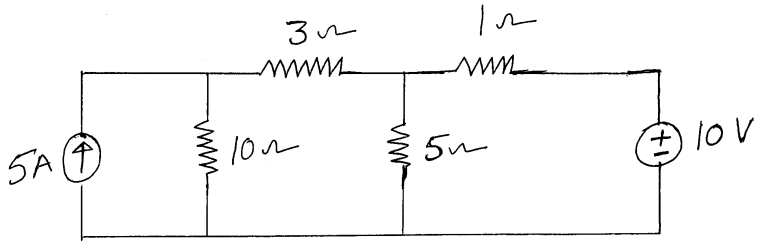
Time: 3 hours **Max. Marks: 70**

Answer any FIVE questions
All questions carry equal marks

1. a) Differentiate between independent and dependent sources. What is their circuit representation?
b) Find the equivalent resistance between AB in the circuit shown in figure. All resistances are equal to 1Ω.



2. a) Explain the concept of Nodal and Mesh analysis
b) Write node voltage equations and determine the currents in each branch for the network shown below



3. a) Define: Time period, frequency, Phase and Phase difference.
b) Obtain average value, RMS value, form factor and peak factor of a half wave rectified sine wave.

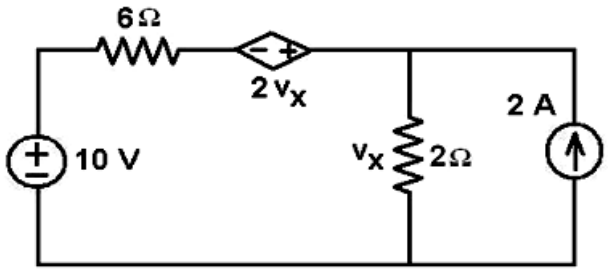
4. a) For a circuit, the applied voltage is $v(t)=75 \sin(5000t+45^0)$ V and the resultant current is $i(t)=1.5 \sin(5000t-15^0)$ A. Calculate the circuit constants.
b) A RLC series circuit of 8Ω resistance should be designed to have a band width of 50Hz. Determine the values of L and C, so that the system resonates at 250Hz.

5. a) Derive the equation for the transient current i(t) in a series RL circuit excited by a sinusoidal voltage $v(t)=V_m \sin \omega t$, at time t=0. Assume zero initial conditions.
b) A series RLC circuit with R=20 Ω, L=0.05 henries and C=20 microfarads has a constant voltage of 100 Volts applied at time t=0. Determine the transient current i(t). Assume zero initial conditions.

6. a) Explain concept of self and mutual inductance and write about dot rule.
b) Two coils connected in series have an equivalent inductance of 0.4H when connected in aiding and the equivalent inductance 0.2H when connected in opposition. Calculate the mutual inductance of the coils.

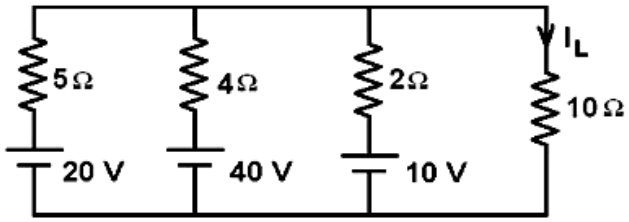
7. a) State and explain Superposition theorem.

b) Find the current I, which is flowing through 2Ω in the circuit shown below, using Superposition theorem.



8. a) State and explain Millman's theorem.

b) Find the current I_L by using Millman's theorem.



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CODE No.:10BT40404 **SVEC-10**

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC10) Supplementary Examinations November - 2019

SWITCHING THEORY AND LOGIC DESIGN

[Electronics and Instrumentation Engineering]

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

Answer any FIVE questions
All questions carry equal marks

1. a) Explain different methods used to represent negative numbers in binary system.
b) Perform the subtraction with the following unsigned binary numbers by taking the 2's complement of the subtrahend
i) 11010 – 10010. ii) 11011 – 1101.
iii) 100 – 110000. iv) 1010100 – 1010100.
v) 11 – 1011.

2. a) Given F=(BC'+A'D)(AB'+CD'). Then F' will be _____
b) Express F=xy+x'z in a product of maxterm form.
c) Implement 2 variable EX-OR gate using minimum number of 2 input NAND gates.
d) Implement F=AB+BC+DE using only 2 input NAND gates.

3. Solve the following function using Quine-Mc Cluskey method and list out its prime and essential prime implicants $f(A,B,C,D,E) = \Sigma m(1,3,5,7,9,11,13,15,17,19,20,21,23,25,27,29,31)$.

4. a) Design a four input priority encoder.
b) Construct a 4-to-16 line decoder with five 2-to-4 line decoder with enable.

5. Realize the following logical functions using an PLA and also the architecture of the PLA used
i) $F_1(x,y,z) = \Sigma m(0,1,2,4,6)$ and $F_2(x,y,z) = \Sigma m(0,2,6,7)$.
ii) $F_1(x,y,z) = \Sigma m(0,1,3,5)$ and $F_2(x,y,z) = \Sigma m(1,3,5,7)$.

6. a) Design a four bit binary synchronous counter with D flip flops.
b) Derive the characteristic equation of T flip flop.

7. a) Design an overlapping sequence detector for detecting the sequence of 110110.
b) Explain the capabilities and limitations of finite state machines.

8. a) How do you indicate Moore outputs and mealy outputs in an ASM block?
b) Draw the ASM chart for binary multiplier and explain with an example.

CODE No.:10BT31001 **SVEC-10**

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC10) Supplementary Examinations September – 2020

THERMODYNAMICS AND FLUID MECHANICS

[Electronics and Instrumentation Engineering]

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

Answer any FIVE questions
All questions carry equal marks

1. a) What is Zeroth Law of Thermodynamics?
b) An open system is defined for a fixed region and closed system for a synonymous. Explain.

2. a) Explain the classification of thermodynamic cycles.
b) Explain the classification of air compressors with neat sketches.

3. a) Distinguish between Carnot and Rankine cycles.
b) What are the different types of Calorimeters? Explain one of them with neat sketches.

4. a) Explain the importance of cooling and dehumidification and heating and humidification processes in air-conditioning.
b) Define: i) conduction. ii) convection. iii) radiation.

5. a) Define density, Specific Volume, weight density and Specific gravity.
b) Explain how small pressure difference reading can be amplified by using a micro manometer or inclined tube manometer.

6. Write a short note on:
i) Stream lines. ii) Streak lines. iii) Flow nets.
iv) Stream function. v) Velocity potential function.

7. a) Describe the Rayleigh's method for dimensional analysis and what are the uses of dimensional analysis.
b) What is model analysis? Explain advantages of model testing.

8. a) What are the advantages of centrifugal pump over reciprocating pumps?
b) Explain how hydraulic turbines are classified.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations November - 2019

MATRICES AND NUMERICAL METHODS

[Civil Engineering, Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Define rank of a matrix and find the rank of $\begin{bmatrix} 2 & 1 & 3 & 5 \\ 4 & 2 & 1 & 3 \\ 8 & 4 & 7 & 13 \\ 8 & 4 & -3 & -1 \end{bmatrix}$ by reducing it into normal form. 7 Marks

b) Write the statement of Cayley- Hamilton's theorem and apply it to find the inverse of $\begin{bmatrix} 1 & 2 & 3 \\ 2 & -1 & 4 \\ 3 & 1 & -1 \end{bmatrix}$. 7 Marks

(OR)

2 a) Discuss the solutions of the system of equations $2x+3ky+(3k+4)z=0;\ x+(k+4)y+(4k+2)z=0;\ x+2(k+1)y+(3k+4)z=0$ for all possible real values of k. 7 Marks

b) Calculate the eigen values and eigen vectors of the matrix $\begin{bmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & -1 & 3 \end{bmatrix}$. 7 Marks

UNIT-II

3 a) Find the root of the equation x sin x + cos x =0 using Newton-Raphson method. 7 Marks

b) A simply supported beam carries a concentrated load P (lb) at its mid-point, corresponding to various values of P, the maximum deflection Y (in) is measured, The data are given below: 7 Marks

P	100	120	140	160	180	200
Y	0.45	0.55	0.60	0.70	0.80	0.85

Find a law of the form Y=a+bP by the method of least squares.

(OR)

4 a) By using bisection method, find an approximate root of the equation Sin x =1/x, that lie between x=1 and x= 1.5(measured in radians), carry out computations up to 5 stages. 7 Marks

b) A curve passes through the points (1,-3), (3,9), (4,30) and (6,132). Find the slope of the curve at x=2. 7 Marks

UNIT-III

5 a) Evaluate the first two derivatives of y at x = 1.1 from the following data. 7 Marks

x	1.0	1.2	1.4	1.6	1.8	2.0
y	0	0.128	0.544	0.296	2.432	4.0

b) Using Euler's method, solve for 'y' at x = 0.1 from $\frac{dy}{dx} = x + y + xy,\ y(0) = 1$ taking step size h = 0.025. 7 Marks

(OR)

6 a) Evaluate $\int_0^z e^{-x^z}\,dx$ using Simpson's 1/3 rule taking h= 0.25. 7 Marks

b) Using Modified Euler's method, determine y(0.04) taking h = 0.02 given that $x^2 + y,\ y(0) = 1$. 7 Marks

UNIT-IV

7 a) Find the Fourier series to represent the function $f(x)$ given by 7 Marks

$$f(x) = \begin{cases} -k & for\ -\pi < x < 0 \\ k & for\ 0 < x < \pi \end{cases}$$

Hence deduce that $1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \text{--------} = \frac{\pi}{4}$.

b) Use Fourier cosine integral, show that $\int_0^\infty \frac{\cos \omega x}{1+\omega^2} d\omega = \frac{\pi}{2} e^{-x} (x > 0)$. 7 Marks

(OR)

8 a) Obtain the half –range sine and cosine series for e^x in $(0, \pi)$. 7 Marks

b) Find the Fourier integral representation of $f(x) = \begin{cases} 1 - x^2 & for\ |x| \le 1 \\ 0 & for\ |x| > 1 \end{cases}$ 7 Marks

UNIT-V

9 a) Form the partial differential equation by eliminating the arbitrary function φ from $\varphi\left(\frac{y}{x}, x^2 + y^2 + z^2\right) = 0$ 7 Marks

b) A tightly stretched string with fixed end points x = 0 and x = ℓ is initially in a position given by $y = y_0 \sin^3 \frac{\pi x}{\ell}$. If it is released from rest from this position, find the displacement y(x,t) . 7 Marks

(OR)

10 a) Form a partial differential equation arising from $\varphi\left(x + y + z, x^2 + y^2 + z^2\right) = 0$ where φ is an arbitrary function. 7 Marks

b) An insulated rod of length ℓ has its ends A and B maintained at 0º C and 100º C respectively until steady state condition prevails. If B is suddenly reduced to 0º C and maintained at 0º C, obtain an expression to find the temperature at a distance x from A at time t. 7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations November - 2019

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 and gamma functions and establish a relationship between them. 7 Marks

b) State Bessels differential equation and its solution $J_n(x)$. Show that $J_{1/2}(x) = \sqrt{\frac{2}{\pi x}} \sin x$. 7 Marks

(OR)

2 a) Show that $2^{2n-1}\Gamma(n)\left(n+\frac{1}{2}\right) = \Gamma(2n)\sqrt{\pi}$. 7 Marks

b) Show that $J_{3/2}(x) = \sqrt{\frac{2}{\pi x}}\left(\frac{1}{x}\sin x - \cos x\right)$. 7 Marks

UNIT-II

3 a) Define continuity of a function f(z) at the point z = z_0 and show that the function $f(z) = \frac{\bar{z}}{z}$ is not continuous at z = 0. 7 Marks

b) Construct a most general analytic function with $v = e^x$ (xsin y + y cos y) as its imaginary part. 7 Marks

(OR)

4 a) Define an analytic function and show that the function $f(z) = e^{-z^{-4}}$, $z \neq 0$ and f(0)=0 is not analytic at z = 0, though C-R equations are satisfied at origin. 7 Marks

b) Define a harmonic function and show that the real and imaginary parts of an analytic functions are harmonic**.** 7 Marks

UNIT-III

5 a) Evaluate $\int_c (x+2y)dx + (y^2 - x^2)dy$ where ***c*** is the boundary of the first quadrant of the circle $x^2 + y^2 = 4$. 7 Marks

b) Verify Cauchy's theorem for the function $\int_c (z+1)dz$ where ***c*** is the boundary of the square whose vertices at the points $z=0$, $z=1$, $z=1+i$, $z=i$. 7 Marks

(OR)

6 a) Expand $f(z) = \frac{1}{z^2 - z - 6}$ about $z=1$. 7 Marks

b) Evaluate $\int_c \frac{z^2 - 2z - 2}{(z^2+1)^2 z}$ where ***c*** is $|z - i| = \frac{1}{2}$ using Cauchy's integral formula. 7 Marks

UNIT-IV

7 a) Determine the poles and corresponding residues for the function $f(z) = \frac{z^2 - 2z}{(z+1)^2(z^2+4)}$. 7 Marks

b) By the method of residues, evaluate $\int_0^{2\pi} \frac{d\theta}{5 - 3\cos\theta}$. 7 Marks

(OR)

8 a) Calculate the value of $\oint_c \frac{z-3}{z^2+2z+5}\,dz$ where c is circle |z+ l-i |=2. 7 Marks

b) Evaluate $\int_{-\infty}^{\infty} \frac{dx}{x^4+1}$. 7 Marks

UNIT-V

9 a) Show that the transformation $W = \frac{2z+3}{z-4}$ maps the circle $x^2+y^2-4x=0$ on the straight line 4u+3= 0. 7 Marks

b) Find the Bilinear Transformation which maps the points z = 1, I,-1 into the points w = 0,1,∞ . 7 Marks

(OR)

10 a) Find the image of the circle |z| = 2 under the transformation w = z +3 +2i. 7 Marks

b) Discuss the transformation w = cos z. 7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations November - 2019

PROBABILITY AND STATISTICS

[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) Define random variable, discrete random variable, continuous random variable and conditional probabilities. 7 Marks

b) If x and y are continues random variable, then prove that $E(X+Y)=E(X)+E(Y)$. 7 Marks

(OR)

2 a) If *x* and *y* are continuous random variable, then prove that $E(XY)=E(X)E(Y)$. 7 Marks

b) A Probability cure y = f (x) has a range from 0 to $\propto$ if f (x) = e^{-x}, find the mean, variance and the third moment. 7 Marks

UNIT-II

3 a) Five coins are tossed 96 times; find the probability of getting 5 heads 3 times. 7 Marks

b) Explain all normal curve properties with graphs. 7 Marks

(OR)

4 a) If X is a Poisson variate such that 3P(x = 4) = ½ P(x=2) + P (x = 0), calculate: 6 Marks
i) the mean of X. ii) P (x ≤ 2).

b) If X is a normal variate with mean 30 and standard deviation 5. Calculate the probabilities that i) 26 ≤ X ≤ 40. ii) X ≥ 45. 8 Marks

UNIT-III

5 a) Calculate coefficient of correlation from the following data. 7 Marks

x	12	9	8	10	11	13	7
y	14	8	6	9	11	12	3

b) The following are the marks obtained by 8 students in Economics and Statistics 7 Marks

Economics (X)	78	56	36	66	25	75	82	62
Statistics (Y)	84	44	57	58	60	68	62	58

Compute the spearman Rank correlation coefficient between X and Y.

(OR)

6 a) The number of defective items in 20 samples, containing 2000 items are 425, 430, 216, 341, 225, 322, 280, 306, 337, 305, 356, 402, 216, 264, 126, 409, 193, 280, 326, 389. Calculate the values for central line and the control limits for P-Chart. 7 Marks

b) Calculate the correlation coefficient for the following heights (in inches) of fathers (X) and their sons (Y): 7 Marks

X	65	66	67	67	68	69	70	72
Y	67	68	65	68	72	72	69	71

UNIT-IV

7 a) 20 People were attacked by a disease and only 18 survived. Will you reject the hypothesis that the survival rate if attacked by this disease is 85% in favor of the hypothesis that is More than 5% level? 8 Marks

b) Among 900 people in a state, 90 are found to be chapatti eaters. Find the standard 6 Marks

error at proportion of chapatti eaters and also construct 99% confidence internal.

(OR)

8 a) In two large populations, there are 30% and 25% respectively of fair hired People. Is this difference likely to be hidden in samples of 1200 and 900 respectively from the two populations? 7 Marks

b) A coin was tossed 960 times and returned heads 183 times. Test the hypotheses that the coin is unbiased at 0.05 level of significance. 7 Marks

UNIT-V

9 a) A random sample of 10 boys had the IQS 70, 120, 110, 101, 88, 83, 95, 98, 107, 100. Does this data support the assumption of population IQ of 100 (Tabulated value2.262 at 5% L.O.S) 7 Marks

b) Two independent random sample each of 8 individuals provide the following data. Estimate the variance ration and test the significance. 7 Marks

Sample –I	63	64	65	65	66	66	67	68
Sample-II	69	66	67	67	66	68	69	69

(tabulated each 3.80 at 5% L. O.S)

(OR)

10 a) Two Horses A and B were Tested according to the time (in seconds) to run a particular track with the following results. 7 Marks

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. (Tabulated value 2.20 at 5% L.O.S).

b) Fit a Poisson distribution to the following data and test the goodness of fit at 5% leave of significance. 7 Marks

X	0	1	2	3	4	5	6	7
F	305	366	210	80	28	9	2	1

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations November - 2019

MECHANICS OF SOLIDS

[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Define stress, strain, hooks law, strain energy and poison's ratio. 7 Marks

b) Explain stress-strain curve diagram of mild steel. 7 Marks

(OR)

2 A circular rod of 150mm in diameter and 80mm long is subjected to a tensile force of 1500kN. Determine the modulus of rigidity, bulk modulus and change in length, diameter and volume if poison's ratio is 0.3 and young's modulus id $2 \times 10^5 N/mm^2$. 14 Marks

UNIT-II

3 A simply supported beam 6m long is carrying a uniformly distributed load of 5kN/m over a length of 3m from the right end. Draw shear force and bending moment diagrams for the beam and also calculate the maximum bending moment on the beam. 14 Marks

(OR)

4 A cantilever of 2m long is loaded with a UDL of 2kN/m which run over a length of 1.35m from the free end. It also carries a point load of 2.5kN at a distance of 0.25m from the free end. Draw the SF and BM diagrams for the cantilever. 14 Marks

UNIT-III

5 State the assumptions involved in theory of simple bending and derive the Bending equation. 14 Marks

(OR)

6 A rectangular strut is 150mm and 120mm thick. It carries a load of 180kN at an eccentricity of 10mm in a plane bisecting the web. Find the maximum and minimum intensities of stress in the section. 14 Marks

UNIT-IV

7 a) Define the term pure torsion. Find suitable expression to determine the angle of twist of any cross section of a circular shaft subjected to an external torque. 7 Marks

b) A hollow shaft is of 120mm external diameter and diameter ratio 0.6. If the maximum shear stress in the shaft is limited to 100MPa and allowable twist is 1° per metre length, find the maximum power that can be transmitted to the shaft, if it is to rotate at100 r.p.m. Take $C = 8 \times 10^4 MPa$. 7 Marks

(OR)

8 Derive Torsion equation and determine the power transmitted by a solid shaft of 120mm diameter rotating at 100 r.p.m., if the maximum shear stress is not to exceed 80Mpa. The maximum torque is 20% more than its mean value. 14 Marks

UNIT-V

9 A thin steel cylindrical shell of thickness 14mm, 1m diameter and 3.25m long is carrying a fluid at a pressure of 1.6 N/mm^2. Find the change in dimensions of the cylinder. 14 Marks

(OR)

10 Derive lame's equations for the analysis of thick cylinders. Also sketch the variation of radial stress and hoop stress across the thickness of cylinder having internal radius 150mm and external radius 400mm subjected to an internal pressure of 8Mpa. 14 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations November - 2019

FLUID MECHANICS-I

[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Explain the terms: (i) Dynamic viscosity. (ii) Kinematic viscosity. Give their dimensions. Calculate the density, specific weight and weight of one litre of petrol of specific gravity 0.7. 14 Marks

(OR)

2 a) Define and write short note on the fallowing. 6 Marks
i) Pascal Law. ii) Hydrostatic law. iii) Surface Tension.

b) The velocity distribution in a fluid is given by **u** = 30000 y (1-2y) where **u** is the velocity in m/sec at a distance of y meters normal to the boundary. If the dynamic viscosity of fluid is 1.8 x10 poise, determine the shear stress at y = 0.2m. 8 Marks

UNIT-II

3 The stream function in a two dimensional flow is $\psi = 3x-2y+5xy$. Verify whether the flow is irrotational. Determine the direction of stream line at a point (1,-2). Determine also the expression for the velocity potential. 14 Marks

(OR)

4 250 litres/s of water is flowing in a pipe having a diameter of 300mm. If the pipe is bent by 135° (that is change from initial to final direction is 135°), find the magnitude and direction of the resultant force on the bend. The pressure of water flowing is 39.24 N/cm^2. 14 Marks

UNIT-III

5 Derive an expression for loss of head due to sudden enlargement and find the head lost due to friction in a pipe of diameter 360mm and length 60m through which water is flowing at a velocity of 2.5m/s using Darcy formula and Chezy's formula for which C=60. Assume kinematic viscosity as 0.01 stoke. 14 Marks

(OR)

6 Differentiate between notch and weir and A discharge of 0.06cumec. was measured over right angled notch. While measuring the head over the notch, an error of 1.5mm was made. Determine the percentage error in the discharge, if coefficient of discharge of notch is 0.6. 14 Marks

UNIT-IV

7 Describe the Reynolds's experiment with a neat sketch. Explain how would you distinguish between hydro dynamically smooth and rough boundaries. 14 Marks

(OR)

8 Explain the terms 'laminar flow' and 'turbulent flow'. Derive an expression for the velocity distribution for viscous flow through a circular pipe. Also sketch the velocity distribution and shear stress distribution across a section of the pipe. 14 Marks

UNIT-V

9	Discharge Q through a turbine is a function of the turbine speed **n**, head H, diameter D of the runner, density **ρ** and viscosity **μ** of the fluid and acceleration due to gravity **g**. Find an expression for Q.	14 Marks

(OR)

10	Explain Froude model law and A 1:64 model is constructed of an open channel in concrete which has Manning's N=0.014. Find the value of N for the model.	14 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations November - 2019

ELECTROMAGNETIC FIELDS

[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)	State and explain Coulomb's Law in vector form.	6 Marks
	b)	Three concentrated charges of 0.25μC are located at the vertices of an equilateral triangle of 10m side. Find the magnitude and direction of the force on one charge due to the other two charges.	8 Marks

(OR)

2	a)	Derive the expression for Electric Field Intensity Due to volume charge distribution.	7 Marks
	b)	Derive the expression for Capacitance of a spherical Capacitor.	7 Marks

UNIT-II

3	a)	Derive the continuity equation in integral form and differential form.	7 Marks
	b)	A copper conductor is 1000ft long and has a circular cross-section with a diameter of 0.8 inch. If there is D.C voltage of 1.2v between the ends, find: (i) The current density. (ii) The current.	7 Marks

(OR)

4	a)	Derive the expression for EFI inside a dielectric material.	7 Marks
	b)	A parallel plate capacitor of 10cm x 10cm and d = 1 cm, is charged to a potential of 1KV, with air as the dielectric. i) Find the energy stored. ii) The capacitance is now disconnected from the source and a dielectric slab is inserted into the capacitor (ε_r=4). Calculate the energy stored.	7 Marks

UNIT-III

5	a)	State and explain Biot-Savart's Law.	6 Marks
	b)	Using Biot-Savart's Law, obtain the magnetic field intensity at the centre of square loop carrying a current of 'I' amperes with side of 'a' meters.	8 Marks

(OR)

6	a)	State and explain Ampere's circuital law in integral and differential forms.	7 Marks
	b)	Explain the concept of magnetic dipole and dipole moment.	7 Marks

UNIT-IV

7	a)	Explain the concept of vector magnetic potential.	7 Marks
	b)	Derive the expression for self inductance per unit length of an infinitely long solenoid.	7 Marks

(OR)

8	a)	Explain about of classification of magnetic materials 7.	7 Marks
	b)	Determine the self inductance of a coaxial cable of inner radius 'a' and outer radius 'b'.	7 Marks

UNIT-V

9	a)	Write and explain about the modified Maxwell's equations for time varying fields Both in integral and Point forms.	7 Marks
	b)	State and explain about the Generator EMF. Also derive the expression.	7 Marks

(OR)

10	a)	Explain about the transformer EMF and also derive the expression.	7 Marks
	b)	State and prove Poynting theorem.	7 Marks

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CODE No.:14BT30202 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations November - 2019

DC 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) Discuss the principle of operation of D.C machine as a motor and as a generator. 7 Marks

b) Derive the expression of emf generated in case of generator from the first principles. 7 Marks

(OR)

2 a) State the advantages of analyzing energy conversion devices by field energy concept. 7 Marks

b) Show that the torque developed in a doubly excited magnetic system is equal to the rate of increase of field energy with respect to the displacement at constant currents. 7 Marks

UNIT-II

3 a) Explain about different excitation methods of DC Generators. 7 Marks

b) Explain about demagnetizing AT/pole and cross magnetizing AT/pole in DC generators. 7 Marks

(OR)

4 a) Explain the principle of operation of D.C. generator. Why is a commutator and brush arrangement necessary for the operation of a dc generator? 7 Marks

b) A 4 pole, long-shunt lap- wound generator supplies 25 KW at a terminal voltage of 500 V. The armature resistance is 0.03 ohm, series field resistance is 0.04 ohm and shunt field resistance is 200 ohm. The brush drop may be taken as 1.0 V. Determine the e.m.f. generated. Calculate also the No. of conductors if the speed is 1200 r.p.m. and flux per pole is 0.02 weber. Neglect armature reaction. 7 Marks

UNIT-III

5 a) Explain the use of equalizer bars and cross connection of field windings. 8 Marks

b) The magnetization characteristic for a 4-pole, 110 V, 1000 rpm shunt generator is as follows : 6 Marks

Field current (A)	0	0.5	1	1.5	2	2.5	3
O.C. voltage (V)	5	50	85	102	112	116	120

Armature is lap-connected with 144 conductors.
Field resistance is 45 ohms. Determine

i) voltage, the machine will build up at noload.
ii) the critical resistance.
iii) the speed at which the machine just failsto excite.

(OR)

6 a) Write the reasons and remedial measures for failure of voltage build up in a self excited DC generator. 7 Marks

b) Define critical field resistance. Explain the procedure for determination of critical field resistance of DC shunt generator experimentally. 7 Marks

UNIT-IV

7 a) Derive torque equation of dc motor. 7 Marks

b) A series motor drives a fan for which the torque varies as square of the speed. Its resistance between the terminals is 1.2 ohm. On 220 V its runs at 350 rpm and takes 30 A. The speed is to be raised to 450 rpm by increasing the voltage. Find the voltage. Assume that flux varies directly as current. 7 Marks

(OR)

8 a) Discuss various speed control methods of dc series motor. 7 Marks

b) A 230 V DC shunt motor drives a load at 900 rpm drawing a current of 30 A. The resistance of armature is 0.4 ohm. The torque of load is proportional to speed. Calculate the resistance to inserted into armature circuit to get 600 rpm 7 Marks

UNIT-V

9 a) Explain the experimental procedure to conduct Hopkinson's test with help of circuit diagram. 7 Marks

b) Field's test on two mechanically coupled dc series machines gave the following data: 7 Marks

	Armature voltage (V)	Field winding drop (V)	Armature Current (A)
Motor	500	38	50
Generator	400	36	38

Resistance of each armature winding is 0.2 ohm. Calculate efficiency of each machine at this load.

(OR)

10 a) Explain how different components of stray losses can be separated using an experiment. 7 Marks

b) Describe a suitable method of determining efficiency of dc series motor. 7 Marks

CODE No.:14BT30203 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations November - 2019

ELECTRIC 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) Obtain the expression for converting star connected resistive network into delta connected resistive network. 7 Marks

b) A circuit of three resistors 15Ω, 21Ω and 39Ω respectively joined in parallel is connected in series with the fourth resistance. The whole circuit is applied with 50V and is found that the power dissipated in 15Ω resist or is 35W. Determine the value of the fourth resistance and the total power dissipated in the circuit. 7 Marks

(OR)

2 a) Determine the equivalent resistance between the terminals A and B for the network shown in Fig. 1. 7 Marks

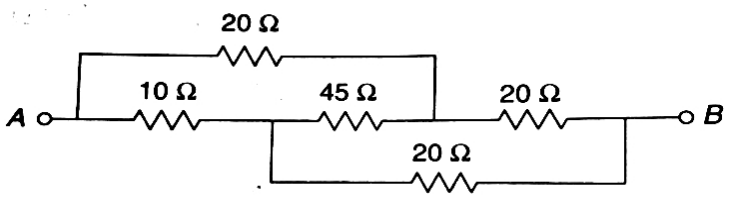

Fig. 1.

b) Determine the current I_x in the network shown in Fig. 2 using mesh analysis. 7 Marks

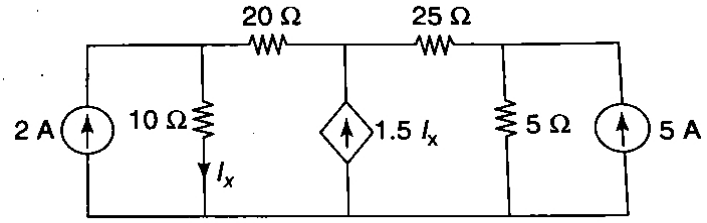

Fig. 2

UNIT-II

3 a) Analyze the behavior of a series RC circuit excited by a sinusoidal voltage source. 7 Marks

b) A series circuit consumes 2kW at 0.8 power factor lag when connected to 230V, 50Hz supply. Calculate current, kVA , kVAR. 7 Marks

(OR)

4 Determine the resonant frequency of the parallel circuit shown in Fig. 3. 14 Marks

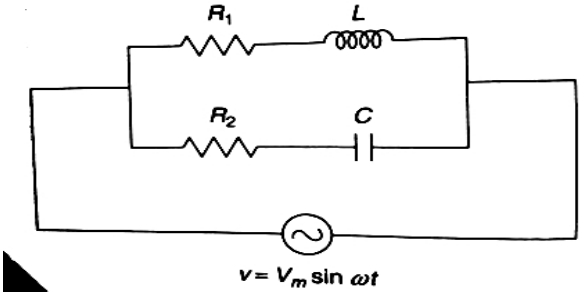

Fig. 3

UNIT-III

5 a) A load impedance of (4+j3)Ω each is connected in star and a supply voltage of 415V, 50Hz is applied to the load. Determine the line current, power factor, active power, reactive power and apparent power. 7 Marks

b) Derive the relation between line and phase quantities in a three phase balanced delta connected system with neat phasor diagram. 7 Marks

(OR)

6 Explain the measurement of three phase power using two wattmeter methods with neat phasor diagram. 14 Marks

UNIT-IV

7 Derive the expression for equivalent inductance when two coils with self inductances L1, L2 and mutual inductance M are connected in parallel with cumulative coupling. 14 Marks

(OR)

8 a) Derive the relation among self-inductance, Mutual inductance and coefficient of coupling. 7 Marks

b) Obtain the equation for the total inductance when two coils are connected in: 7 Marks
i) Series aiding and opposing. ii) Parallel aiding and opposing.

UNIT-V

9 a) State and explain the Norton's theorem with a suitable example. 6 Marks

b) In the circuit shown in Fig.4, find the voltage across the 20Ω resistor using superposition theorem. 8 Marks

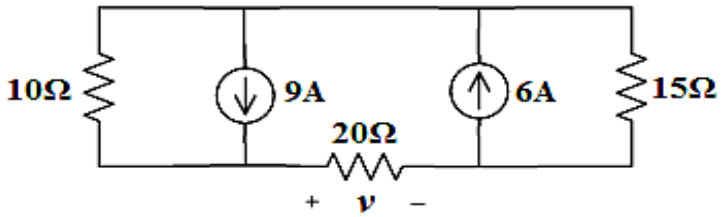

Fig.4

(OR)

10 Find the current in 2Ω resistor using thevenin's theorem in Fig.5 and verify the result by norton's theorem. 14 Marks

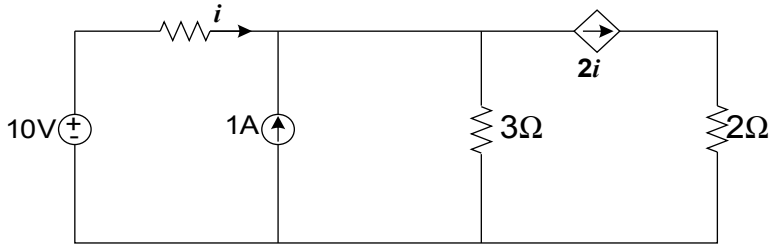

Fig.5

CODE No.:14BT30231 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations November - 2019

ELECTRICAL TECHNOLOGY

[Electronics and Communication Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 State various methods to control the speed of a DC shunt motor and explain with neat circuit diagrams. 14 Marks

(OR)

2 a) What are the different types of DC motors and give their applications. 7 Marks

b) A 230V DC shunt motor takes 32A at full load. Find the back **emf** on full load, if R_a = 0.2Ω and R_f = 150Ω respectively. 7 Marks

UNIT-II

3 a) Derive the **emf** equation of a single phase transformer. 7 Marks

b) Explain the working principle of a single phase transformer. 7 Marks

(OR)

4 Explain, how to conduct OC and SC tests on a single phase transformer. Also explain, how to find out the efficiency and regulation of a single phase transformer from OC and SC tests. 14 Marks

UNIT-III

5 Explain in detail about the production of three phase voltages with neat figures and derive the relation between speed 'N' and Frequency 'f' from the fundamentals. 14 Marks

(OR)

6 a) Derive the relation between line and phase quantities in a star connected network. 7 Marks

b) Three identical resistances are connected star fashion against a balanced three phase supply. If one of the resistance is removed, then how much power is to be reduced. 7 Marks

UNIT-IV

7 a) Describe the principle and operation of 3-φ induction motor. 7 Marks

b) Derive an **emf** equation of an alternator. 7 Marks

(OR)

8 a) Explain the principle of operation of an alternator. 7 Marks

b) Derive the **emf** equation of an alternator. 7 Marks

UNIT-V

9 Explain the construction and principle operation of universal motor with neat diagrams. 14 Marks

(OR)

10 Explain the construction and principle operation of shaded pole induction motor with neat diagrams. 14 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations November - 2019

NETWORK ANALYSIS

[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) State and explain Ohm's law and list out its limitations. 6 Marks

b) Find the current through 1Ω resistor shown in Fig.1 using network reduction techniques. 8 Marks

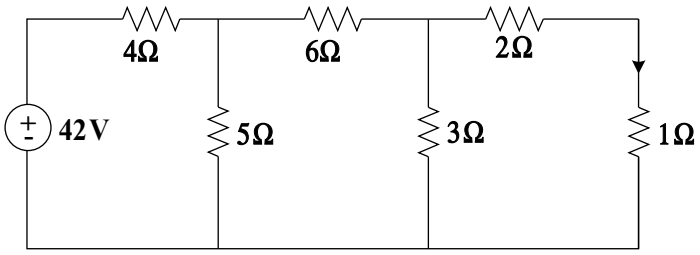

Fig.1.

(OR)

2 a) Briefly explain about source transformation techniques. 7 Marks

b) Find the voltage across 10Ω resistor in Fig.2 as shown below. 7 Marks

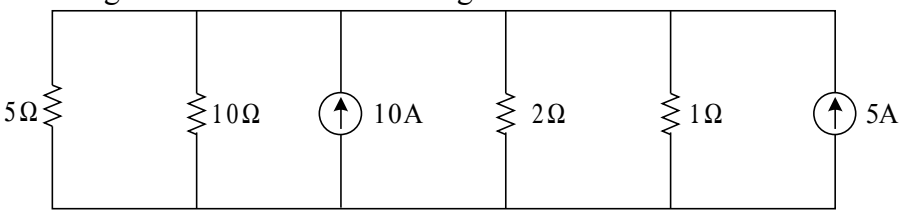

Fig.2

UNIT-II

3 a) Define the following terms with respect to fundamental sinusoidal a.c quantity. 8 Marks
i) Average value. ii) RMS value. iii) Form factor. iv) Peak factor.

b) The Q factor of a RLC circuit is 5 at its resonance frequency of 1kHz. Assuming the power dissipation of 250W when the current drawn is 1A, find the circuit parameters and band width of the circuit. 6 Marks

(OR)

4 a) Define resonance and list out its implications. 6 Marks

b) What is locus diagram? Draw and explain current locus diagram for a series RL circuit, with fixed resistance by deriving necessary expressions. 8 Marks

UNIT-III

5 a) Derive the expressions of Transient response of RL parallel circuit with DC excitation. 7 Marks

b) Determine the voltage at the terminals of a coil having R=10Ω and L =15mH at the instant when the current is 10A and increasing at the rate of 5A/sec. Also find the stored energy in the inductor. 7 Marks

(OR)

6 Explain and derive the expressions of Transient response of RLC series circuit with sinusoidal excitation. 14 Marks

UNIT-IV

7 a) Derive Hybrid parameters from Impedance parameters. 8 Marks

b) Obtain the condition for symmetry and reciprocity of ABCD parameters. 6 Marks

(OR)

8 Design a prototype band pass filter section both T and Π having cut off frequencies of 3000 Hz and 6000 Hz and nominal characteristic impedance of 600Ω. Also find the resonant frequency of shunt arm. 14 Marks

UNIT-V

9 a) Define maximum power transfer and thevenin's theorem, and list out their applications. 7 Marks

b) Find thevenins and nortons equivalent circuits for the following circuit shown in Fig.3. 7 Marks

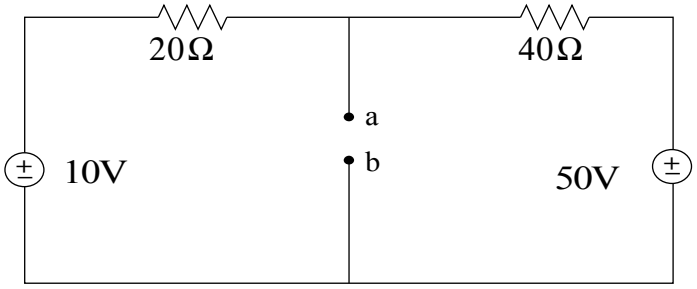

Fig. 3

(OR)

10 a) State and Explain Milliman's theorem with a suitable example. 8 Marks

b) Find current through 1Ω resistor for the Fig.4 using milliman's theorem. 6 Marks

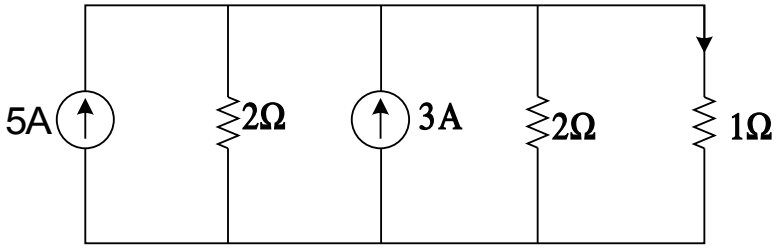

Fig.4

CODE No.:14BT30233 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC14) Supplementary Examinations November - 2019

BASICS OF ELECTRICAL AND MECHANICAL TECHNOLOGY

[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

PART-A

UNIT-I

1	a)	Explain in detail about the classification of elements in an electrical circuit	4 Marks
	b)	Derive an expression for determining the equivalent capacitance of two series connected capacitors C_1 and C_2.	4 Marks
	c)	Explain ohm's law, Kirchhoff's laws with examples.	6 Marks
		(OR)	
2	a)	Define the following terms: i) Current. ii) Potential. iii) Potential difference. iv) Power.	6 Marks
	b)	Write the steps to estimate internal wiring and draw the wiring layout for four storied hotel with lift arrangement.	8 Marks

UNIT-II

3	a)	Explain the principle of operation of three phase induction motor.	7 Marks
	b)	Explain the operation of incandescent lamp with suitable diagram.	7 Marks
		(OR)	
4		List out types of earthing and explain them in detail. Also explain its importance.	14 Marks

PART-B

UNIT-III

5		With a neat sketch, explain Arc welding process.	14 Marks
		(OR)	
6		With a neat sketch, explain the working of two stroke petrol engine.	14 Marks

UNIT-IV

7	a)	Explain the working principle of Vapor Absorption refrigeration system with a neat sketch.	7 Marks
	b)	Differentiate between Vapor Compression and Vapor Absorption systems.	7 Marks
		(OR)	
8	a)	Explain the following terms: i) Humidity. ii) Dew Point Temperature. iii) Psychrometric chart.	7 Marks
	b)	Explain the Winter Air Conditioning system with a neat sketch.	7 Marks

UNIT-V

9	a)	Explain the working principle of Multi stage reciprocating air compressor.	7 Marks
	b)	Explain the need of various earth moving equipments with neat sketches.	7 Marks
		(OR)	
10	a)	Explain the working principle of single stage compressor with neat sketch.	7 Marks
	b)	Write short notes on the following: i) Concrete mixer. ii) Bull dozers.	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations November - 2019

BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

[Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define the following. i) Electric Field. ii) Potential Difference. iii) Electric Current.	6 Marks
	b)	Derive and explain the relations of voltage, current and power with series and parallel resistive circuits.	8 Marks
		(OR)	
2	a)	Explain the following terms: i) Charge. ii) Electric Potential. iii) Potential difference. iv) Electric current.	8 Marks
	b)	State and Explain Ohm's law and list out its limitations.	6 Marks

UNIT-II

3	a)	Explain the following. i) Impedance. ii) Admittance. iii) Power factor. iv) Power triangle.	10 Marks
	b)	A 50Hz sinusoidal voltage wave has a maximum value of 350V. Calculate its instantaneous value 0.005 sec after the wave passes through zero in the positive direction.	4 Marks
		(OR)	
4		An RLC series circuit consists of R=800Ω, L=80mH and C=8pF. The applied voltage across the circuit is 100V, 50Hz. Determine: i) total impedance across the circuit. ii) current flowing through the circuit and power factor of the circuit.	14 Marks

UNIT-III

5	a)	Derive the torque equation of a DC motor.	7 Marks
	b)	Explain the construction and working principle of transformer.	7 Marks
		(OR)	
6	a)	From the fundamentals, derive the expression for the EMF equation of a single phase transformer.	7 Marks
	b)	A 50Hz, 4-pole, 3-phase induction motor has a rotor current of frequency 2Hz. Determine (i) the slip and (ii) speed of the motor.	7 Marks

UNIT-IV

7		Describe the moving coil permanent magnet instrument with neat circuit diagram and list out its merits and demerits.	14 Marks
		(OR)	
8		Explain the digital multi-meter with neat diagram and give the applications.	14 Marks

UNIT-V

9	a)	Define and explain forward current, peak inverse voltage and reverse current in a P-N junction diode.	7 Marks
	b)	What is a rectifier? Explain the operation of half wave rectifier.	7 Marks
		(OR)	
10	a)	Explain the need for biasing of transistor.	7 Marks
	b)	Discuss the RC phase shift oscillator with neat diagram.	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations November - 2019

BASIC ELECTRICAL ENGINEERING

[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)	State and explain Ohm's Law.	6 Marks
	b)	A voltage wave having a time variation of 30V/Sec is applied to a pure capacitor having a value of 35μF. Find (i) current during the period $0 \leq t \leq 1$ sec. (ii) charge accumulated across the capacitor at t = 1 sec.	8 Marks
		(OR)	
2	a)	Derive the expression for Equivalent inductance 'L_{eq} ' when three inductances L_1, L_2, L_3 are connected in Parallel.	8 Marks
	b)	What is the symbolic representation of ideal independent DC voltage source? Also draw its v-i characteristics.	6 Marks

UNIT-II

3	a)	Discuss the advantages of polyphase systems over single phase systems.	4 Marks
	b)	A balanced 3Φ delta connected load has per phase impedance of (25+j40)Ω. If 400V, 3Φ supply is connected to this load, find (i) phase current (ii) line current (iii) power supplied to the load.	10 Marks
		(OR)	
4	a)	Define poly phase system and write the advantages of poly phase system over single phase system.	7 Marks
	b)	Explain the star connected system and write its advantages.	7 Marks

UNIT-III

5	a)	What is the Principle of operation of DC generator?	6 Marks
	b)	Discuss about the constructional details of DC generator.	8 Marks
		(OR)	
6	a)	Derive the expression for condition of maximum efficiency of a DC generator.	8 Marks
	b)	What are the applications of DC generators and DC motors?	6 Marks

UNIT-IV

7	a)	Explain the working principle of Induction motor.	7 Marks
	b)	Discuss the operation and applications of AC servo motors.	7 Marks
		(OR)	
8	a)	Discuss about the constructional details of Cage rotor Induction motor with neat diagram.	8 Marks
	b)	Explain the principle of operation of Stepper Motor.	6 Marks

UNIT-V

9	a)	Give the classification of Instruments.	7 Marks
	b)	List the advantages and limitations of permanent magnet moving coil instruments.	7 Marks
		(OR)	
10	a)	Compare between moving coil and moving iron instruments.	7 Marks
	b)	What is UPS? Discuss its operation and applications.	7 Marks

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CODE No.:14BT30236 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations November - 2019

FOUNDATIONS OF ELECTRICAL 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)	Explain about various types of sources used in electrical circuit analysis.	7 Marks
	b)	Explain when the mesh analysis and super mesh analysis are used.	7 Marks
		(OR)	
2		State and prove Kirchhoff's laws.	14 Marks

UNIT-II

3	a)	Explain how form factor and peak factor can be determined for a given wave form.	7 Marks
	b)	A 35Ω resistance has a voltage v = 135 sin 270t (V). Find the power p and the rms power p_{rms} over one cycle.	7 Marks
		(OR)	
4	a)	What are the advantages of 3 phase system over single phase system?	7 Marks
	b)	Explain why **j** operator is used in circuit analysis.	7 Marks

UNIT-III

5	a)	Elucidate the constructional features of DC generator with neat diagram.	8 Marks
	b)	Explain various losses present in DC machine.	6 Marks
		(OR)	
6	a)	Derive EMF equation of a DC generator.	7 Marks
	b)	Explain various types of DC motors with neat diagrams.	7 Marks

UNIT-IV

7	a)	Explain the constructional details of single phase transformer	8 Marks
	b)	Discuss the phasor diagram of single phase transformer operating on no load.	6 Marks
		(OR)	
8	a)	Explain the principle of Rotating Magnetic Field of three phase Induction Motor.	8 Marks
	b)	Discuss about the principle operation of stepper Motor.	6 Marks

UNIT-V

9	a)	Differentiate between time variant and time invariant control systems.	7 Marks
	b)	Mention some examples for linear and nonlinear systems.	7 Marks
		(OR)	
10	a)	Obtain the mathematical model for any physical system.	7 Marks
	b)	By means of an example, explain the block diagram reduction technique.	7 Marks

CODE No.:14BT30301 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations November - 2019

STRENGTH OF MATERIALS

[Mechanical Engineering]

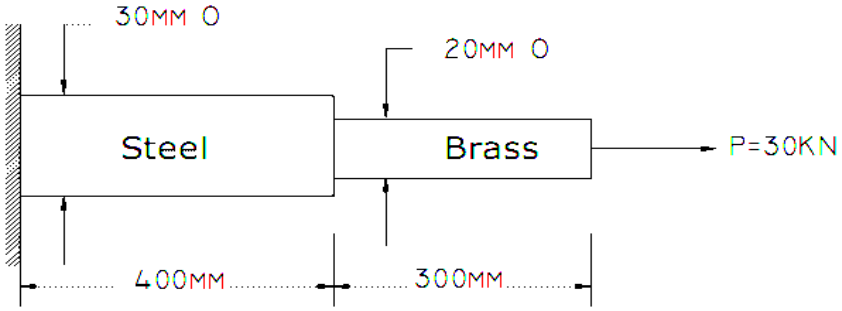
Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Define Resilience, Proof resilience and Modulus of resilience. 6 Marks

b) The Composite bar shown in figure is subjected to a tensile force of 30 KN. The extension observed is 0.372mm. Find the Young Modulus of brass, If Young Modulus of steel is $2x10^5$ N/mm^2. 8 Marks



(OR)

2 a) What is meant by Strain energy? Derive relation for strain energy due to shear. 6 Marks

b) Composite section made up of copper tube of 150-mm dia enclosed with steel tube 150-mm internal diameter and 12 mm thick. Length of assembly is 50cm is fastened at both ends. Now temperature of assembly is raised by 75°C. Find the stress develops in each material and change in length of assembly. Take $E_s = 2 \times 10^5$Mpa, $E_c = 1 \times 10^5$Mpa. 8 Marks

UNIT-II

3 a) Define statically determinate and statically indeterminate beams. Give examples. 4 Marks

b) A T-beam having flange 170mm x 30mm and web 30mm x 180mm is simply supported over a span of 7.5m. It carries a uniformly distributed load of 7kN/m including self weight over its entire span, together with a point load of 50kN at mid span. Find the maximum tensile and compressive stresses occurring in the beam section and sketch the stresses across the section. 10 Marks

(OR)

4 a) Is it possible to predict the location and mode of failure of a beam subjected to a given loading? Is it necessary to draw the SF and BM diagram before prediction the same? 4 Marks

b) A simply supported beam of length 10 m rests on supports 7m apart, the right hand end is overhanging by 3m and the left hand end is overhanging by 2m. The beam carries a uniformly distributed load of 7kN/m over the entire length. It also carries two point loads of 6kN and 8kN at each end of the beam. The load of 6kN is at the extreme left of the beam, whereas the load of 8kN is at the extreme right of the beam. Draw the SF and BM diagrams for the beam and find the points of contra flexure. 10 Marks

UNIT-III

5 a) A simply supported beam made of cast iron has a length of 1.0 m and a square cross section of 20mm size. The beam fails on applying a load of 40N at mid span. Find the maximum uniformly distributed load that can be applied safely to a 5 mm wide x 8 mm deep cross section and 1.0 m long cantilever made of the same material as that of the simply supported beam. 7 Marks

b) List the assumptions taken in the analysis of shear stress in beams. 7 Marks

(OR)

6 a) State the assumptions involved in deriving the torsion equation. 7 Marks

b) A solid shaft transmits 250kW at 100 r.p.m. If the shear stress is not to exceed 75MPa. 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. 7 Marks

UNIT-IV

7 a) State and prove the moment area theorem. 6 Marks

b) A cantilever of length 2m carries a uniformly distributed load 2KN/m over a length of 1m from the free end, and a point load of 1KN at the free end. Find the slope and deflection at the free end if E = 2.1 x 10^5N/mm^2 and I = 6.667 x 10^7 mm^4. 8 Marks

(OR)

8 A simply supported beam of 8 m length carries two point loads of 64KN and 48KN at 1.0m and 4.0m respectively from the left hand end. Find the deflection under each load and the maximum deflection. Take E=210 Gpa and I = 180 x 10^6 mm^4. 14 Marks

UNIT-V

9 a) Deduce the general equations for circumferential and radial stress developed in a thick spherical shell. Deduce the simplified expressions for their maximum values when acted upon by an internal pressure only. 7 Marks

b) A thin cylinder 1.5m internal diameter and 5.0m long is subjected to an internal pressure of 2N/mm^2. If the maximum stress is limited to 160N/mm^2, find the thickness of the cylinder. E = 200kN/mm^2 and Poisson's ratio = 0.3. Also find the changes in diameter, length and volume of the cylinder. 7 Marks

(OR)

10 a) What is mean by circumferential stress and longitudinal stress? Distinguish between thick and thin cylinders. 6 Marks

b) Steel cylindrical shell 3.0m long which is closed at its ends had an internal diameter of 1.5m and a wall thickness of 20mm. Calculate the circumferential and longitudinal stress induced and also the change in dimensions of the shell if it is subjected to an internal pressure of 1.0N/mm^2. Assume the modulus of elasticity and Poisson's ratio for steel as 200kN/mm^2 and 0.3 respectively. 8 Marks

CODE No.:14BT30302 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations November - 2019

MATERIALS SCIENCE AND METALLURGY

[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 primary bonding in materials.	7 Marks
	b)	Distinguish between edge and screw dislocations.	7 Marks
		(OR)	
2	a)	Define and explain grain and grain boundaries.	7 Marks
	b)	Describe any one method to determine grain size.	7 Marks

UNIT-II

3	a)	Explain the terms: i) Eutectic. ii) Eutectoid.	7 Marks
	b)	Draw the schematic microstructures of slowly cooled eutectoid steel and hypo-eutectoid steel.	7 Marks
		(OR)	
4	a)	Differentiate between peritectic transformation and peritectoid transformation.	7 Marks
	b)	Explain effect of alloying elements on iron-iron carbon system.	7 Marks

UNIT-III

5	a)	Describe how TTT' curves are useful in the heat treatment processes of steel.	7 Marks
	b)	Write short on the following. i) Process annealing. ii) Hardening.	7 Marks
		(OR)	
6	a)	"Hardening of steel is always followed by tempering" Give reasons.	7 Marks
	b)	What is carburizing? Why is it done?	7 Marks

UNIT-IV

7	a)	State the properties and applications of gray cast iron.	7 Marks
	b)	Write short notes on Titanium alloys.	7 Marks
		(OR)	
8	a)	Explain structure and properties of spheroidal cast iron.	7 Marks
	b)	Explain properties and applications of copper and its alloys.	7 Marks

UNIT-V

9	a)	Define composite. What are the different types of reinforcements used in composite? Explain.	7 Marks
	b)	Mention at least five applications and advantages of composite over metals.	7 Marks
		(OR)	
10	a)	What are the methods of manufacturing of metal powders? Explain any one technique with neat diagram.	7 Marks
	b)	Mention at least five applications and limitations of powder metallurgy technique.	7 Marks

CODE No.:14BT30303 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations November - 2019

THERMODYNAMICS

[Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	How will you find out whether a given quantity is a thermodynamic property? How are these properties classified? Give examples of each type.	7 Marks
	b)	Explain i) reversible process ii) an irreversible process. Write important criterion for a process to be reversible.	7 Marks
		(OR)	
2	a)	0.3 kg of a perfect gas occupies a volume of 0.2 m^3 at a pressure of 1 bar and a temperature of 27 ºC. Calculate the molar mass of the gas. When the gas is allowed to compress until the pressure is 3 bar and final volume is 0.1 **m^3.** Calculate the final temperature.	7 Marks
	b)	Define ideal gas. How does a real gas differ from an ideal gas? When is the relation pv = RT expected to be applicable.	7 Marks

UNIT-II

3	a)	What is a steady flow process? Write the steady flow energy equation and explain the various terms in it.	7 Marks
	b)	Represent schematically heat engine, heat pump, and refrigerator. Give their performance.	7 Marks
		(OR)	
4	a)	State and prove Carnot's theorem.	6 Marks
	b)	A heat engine is used to drive a heat pump. The heat transfers from the heat engine and from the heat pump are used to heat the water circulating through the radiators of a building. The efficiency of the heat engine is 27**%** and the COP of the heat pump is 4. Evaluate the ratio of the heat transfer to the circulating water to the heat transfer to the heat engine.	8 Marks

UNIT-III

5	a)	0.2 kg of air with p = 1.5 bar and temperature 27 ºC is compressed to a pressure of 15 bar according to the law $pv^{1.25}$ = C. Determine i) Initial and final parameters ii) work done on or by the air, iii) change in entropy.	6 Marks
	b)	Explain the Carnot cycle with the help of schematic diagram and derive an expression for its efficiency as applied to a heat engine.	8 Marks
		(OR)	
6	a)	Derive the Clausius inequality expression.	7 Marks
	b)	An electric motor of 5 kW is subjected to a braking test for one hour. The heat generated by frictional forces in the process gets dissipated to the surroundings at 300 K. Determine the resulting increase in entropy.	7 Marks

UNIT-IV

7	a)	Discus the P-V and T-S diagram with neat sketch for pure substance and define dryness fraction.	7 Marks
	b)	Calculate the internal energy per kg of super heated steam at a pressure of 10 and a temperature of 300ºC.Also find the change of internal energy if this steam expanded to 1.4 bar and dryness fraction 0.8.	7 Marks

(OR)

8	a)	Explain the Dalon's law of partial pressures for mixture of gases.	7 Marks
	b)	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.	7 Marks

UNIT-V

9	a)	Derive an expression for the thermal efficiency of sterling cycle and draw P-V and T- S diagrams.	7 Marks
	b)	The efficiency of an Otto cycle is 60% and $\gamma = 1.5$, what is the compression ratio?	7 Marks

(OR)

10		Derive an expression for the thermal efficiency of dual cycle and draw P-V and T-S diagrams.	14 Marks

CODE No.:14BT30401 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations November - 2019

PROBABILITY AND STOCHASTIC PROCESSES

[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) Define probability based on set theory and fundamental axioms 6 Marks

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", calculate joint probabilities and conditional probabilities. 8 Marks

Resistance(ohm)	Tolerance		
	5%	10%	Total
22	10	14	24
47	28	16	44
100	24	8	32
Total	62	38	100

Number of resistor in a box having given resistance and tolerance.

(OR)

2 a) Define joint and conditional probabilities. 4 Marks

b) When are two events said to be collectively exhaustive? Explain with examples 5 Marks

c) Estimate the probability of the card being either red or a king when one card is drawn from a deck of a regular 52 cards. 5 Marks

UNIT-II

3 a) Define random Variable, Find the characteristic function of the random variable X having density function $f(x) = e^{-x}, -\infty < x < \infty$. 7 Marks

b) A random variable x has p.d.f $f(x)$ given by $f(x) = \begin{cases} cxe^{x}; if\ x > 0 \\ 0; if x \le 0 \end{cases}$. Find the value of c and C.D.F of x. 7 Marks

(OR)

4 a) State four properties of conditional density function. 7 Marks

b) Find the MGF of a Binomial distribution and hence find mean and variance. 7 Marks

UNIT-III

5 a) Find the skew for Gaussian distributed random variable. 6 Marks

b) Explain about the monotonic transformations for a continuous random variable. 8 Marks

(OR)

6 a) Explain the physical significance of variance and standard deviation. 7 Marks

b) Find the variance of X for uniform probability density function. 7 Marks

UNIT-IV

7 a) Show that the random process (t) =A cos ($wt + \theta$) is a wide sense stationary process if A and ware constants and is a uniformly distributed random variable is $(0, 2\pi)$. 7 Marks

b) Distinguish between 'stationary' and weakly stationary stochastic processes. Given an example to each type. Show that Poisson process is an evolutionary process. 7 Marks

(OR)

8 a) Derive the relation between cross power spectrum and cross correlation function of random processes. 7 Marks

b) Given the power spectral density of a continuous process as $S_{xx}(w) = \left(w^2 + 9\right)/(w^4 + 5w^2 + 9)$. Find the autocorrelation function and mean square value of the process. 7 Marks

UNIT-V

9 a) Derive the relation between input and output ACF of an LTI system with impulse response h(t). 7 Marks

b) An amplifier with G_a = 40 dB and BN = 20 kHz is found to have T_0 = 100 K. Find T_e and Noise figure. 7 Marks

(OR)

10 a) Derive the equation for Noise figure of Cascaded system in terms of individual Noise Figures. 7 Marks

b) State and prove any three properties of Narrow band Noise processes. 7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations November - 2019

SEMICONDUCTOR 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 diode under forward and reverse bias.	10 Marks
	b)	An a.c. voltage of peak value 20.7V is connected in series with a silicon diode and a load resistance of 490Ω. The forward resistance of the diode is 10Ω. Calculate: i)peak current through the diode and ii) peak voltage output voltage. What will be these values if the diode is assumed to be ideal?	4 Marks
		(OR)	
2	a)	Explain (i) Avalanche breakdown and (ii) Zener breakdown with reference to Zener diodes and differentiate them. Give any three applications of Zener diodes.	7 Marks
	b)	Draw the circuit diagram of a full wave rectifier. Explain the operation of the circuit with relevant waveform. Mention any three applications of it	7 Marks

UNIT-II

3	a)	Sketch and explain the common base input and output characteristics. How do you draw these curves experimentally?	10 Marks
	b)	Describe the Base-Width modulation.	4 Marks
		(OR)	
4	a)	Explain the working of the voltage divider bias circuit. Derive an expression for its stability factor. Explain how it is superior to other bias arrangements.	10 Marks
	b)	Design an Emitter bias (or voltage divider bias) circuit for the following specifications: VCC = 12V, VCE = 2V, IC = 4mA, hFE = 80.	4 Marks

UNIT-III

5	a)	Analyze the CC amplifier using approximate hybrid model.	8 Marks
	b)	Describe the simplified hybrid model.	6 Marks
		(OR)	
6	a)	Derive the equations for voltage gain, current gain input impedance and output impedance for BJT using low frequency h-parametric CE model.	7 Marks
	b)	Determine the h-parameters from the characteristics of CB configuration. Mention its applications.	7 Marks

UNIT-IV

7	a)	Explain the pinch-off voltage,V-I characteristics of JFET .	6 Marks
	b)	With neat diagram, explain the operation of MOSFET in Enhancement mode.	8 Marks
		(OR)	
8	a)	Explain the common drain amplifier and derive expression for gain of the amplifier.	8 Marks
	b)	Write the comparisons of BJT and JFET.	6 Marks

UNIT-V

9	a)	Write the applications of UJT.	6 Marks
	b)	Explain the operation of varactor diode.	8 Marks
		(OR)	
10	a)	Describe the process of tunneling in a Tunnel diode and analyze it with the help of energy band diagrams.	8 Marks
	b)	Explain the principle of operation of Schkottky Barrier Diode.	6 Marks

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CODE No.:14BT30431 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations November - 2019

ELECTRONIC DEVICES AND CIRCUITS

[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)	Discuss the various break down mechanisms of semiconductor diodes.	6 Marks
	b)	A silicon diode at Room temperature conducts 5mA at 0.7 Volts. If the voltage increases to 0.8 Volts. Evaluate forward and reverse saturation currents.	8 Marks
		(OR)	
2	a)	Draw the circuit diagram of FWR with inductor filter and explain its operation.	10 Marks
	b)	Formulate the expression for ripple factor for the circuit FWR with capacitor filter.	4 Marks

UNIT-II

3	a)	Draw the circuit and explain the characteristics of BJT (input and output characteristics) in CE configuration.	9 Marks
	b)	Differentiate bias stabilization and compensation techniques.	5 Marks
		(OR)	
4	a)	A transistor operating in CB configuration has I_c = 2.96mA, I_E = 3.00mA and I_{CO} = 0.01mA. What current will flow in the collector circuit of this transistor when connected in CE configuration with a base current of 30μA?	7 Marks
	b)	Explain the working of a NPN transistor.	7 Marks

UNIT-III

5	a)	Explain in detail the working of JFET and draw its drain and transfer characteristics.	10 Marks
	b)	Compare JFET and MOSFET.	4 Marks
		(OR)	
6	a)	What are the differences between BJT and JFET?	6 Marks
	b)	Explain how FET acts as voltage variable resistor.	8 Marks

UNIT-IV

7	a)	Draw the circuit diagram of a current series feedback amplifier and derive expressions for voltage gain with and without feedback.	6 Marks
	b)	Derive an expression for frequency of oscillation of colpitt's oscillator.	8 Marks
		(OR)	
8	a)	Explain in detail about the different feedback topologies.	6 Marks
	b)	Derive an expression for frequency of oscillation for RC phase shift oscillator.	8 Marks

UNIT-V

9	a)	Explain the construction and working of Tunnel diode.	8 Marks
	b)	What are the applications of varactor diode?	6 Marks
		(OR)	
10	a)	Explain principle behind varactor diode and list out its applications.	7 Marks
	b)	Sketch and explain the working of tunnel diode.	7 Marks

CODE No.:14BT30501 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations November - 2019

DATA 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	Write an algorithm to read the elements of doubly linked list in reverse order.	14 Marks
	(OR)	
2	Write an algorithm for inserting and deleting an element at the beginning of a circular linked list.	14 Marks

UNIT-II

3	List the applications of queue and implement the queue using linked list.	14 Marks
	(OR)	
4	Write an algorithm to convert infix expression to postfix.	14 Marks

UNIT-III

5	Consider a binary search tree T whose keys are distinct. Show that if the right subtree of a node x in T is empty and x has a successor y, then y is the lowest ancestor of x whose left child is also an ancestor of x.	14 Marks
	(OR)	
6	For the set of keys {1, 4, 5, 10, 16, 17, 21}, draw binary search trees of height 2, 3, 4, 5, and 6.	14 Marks

UNIT-IV

7	Compare and contrast binary search trees and B trees.	14 Marks
	(OR)	
8	Explain depth-first search algorithm with an example.	14 Marks

UNIT-V

9	Illustrate the operation of quick sort on the array A={13,19,9,5,12,8,7,4,11,2,6, 8}.	14 Marks
	(OR)	
10	Derive the sequence of steps while inserting the keys 5, 28, 19, 15, 20, 33, 12, 17, 10 into a hash table with collisions resolved by chaining. Let the table have 9 slots, and the hash function be h(k)=k mod9.	14 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations November - 2019

DIGITAL LOGIC DESIGN

[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)	Express the following numbers into decimal. $(10110.0101)_2$, $(16.5)_{16}$ and $(26.24)_8$	8 Marks
	b)	Convert the hexadecimal number 68BE to binary and then from binary convert it to octal.	6 Marks

(OR)

2		Obtain the truth table for the following functions and express each function in sum of minterms and product of max terms: i) **(xy+z)(y+xz).** ii) **$(A^1+B)(B^1+C)$.** iii)**$Y^1z+wxy^1+wxz^1+w^1x^1z$.**	14 Marks

UNIT-II

3	a)	Simplified the Boolean Function. $F(A,B,C,D) = \Sigma(0,2,5,8,9,13,15)$ And don't care condition $D(A,B,C,D) = \Sigma(1,7,14)$	9 Marks
	b)	Implement the above simplified function using NAND, NOR Gates.	5 Marks

(OR)

4		Convert each of the following to the other Canonical form: i) F(x,y,z) = ∑(2,5,6) ii) F(A,B,C,D) = π(0,1,2,4,7,9,12)	14 Marks

UNIT-III

5		Construct a 8X1 multiplexer for the Boolean function F(A,B,C,D)=Σ(1,3,4,11,12,13,14,15).	14 Marks

(OR)

6		Explain about Multiplexers and De-Multiplexers in detail	14 Marks

UNIT-IV

7		How many flip-flops are required to construct mod-12 ring and Johnson counters? Explain in detail with state diagrams	14 Marks

(OR)

8		Define BCD counter and draw its state table.	14 Marks

UNIT-V

9	a)	Discuss about Sequential Programmable Devices.	6 Marks
	b)	Differentiate PAL and PLA in detail.	8 Marks

(OR)

10		Discuss in detail about various programmable logic devices.	14 Marks

CODE No.:14BT31002 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations November - 2019

SENSORS AND TRANSDUCERS

[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)	Classify the transducers. Explain in brief.	7 Marks
	b)	Derive the transfer function of first order system for an electrical system and obtain the step response of the system.	7 Marks

(OR)

2	a)	State the following static characteristics of the measuring system. Explain in brief: i) Linearity ii) Sensitivity iii) Hysteresis iv) Calibration	8 Marks
	b)	Write the transfer function of second order system and obtain the impulse response of the system when the damping ratio is less than one.	6 Marks

UNIT-II

3	a)	Describe the constructional details of a resistance potential divider and derive the expression for its output voltage when connected across a meter of finite impedance.	8 Marks
	b)	What are thermistors? Draw their resistance versus temperature characteristics and compare it with RTD.	6 Marks

(OR)

4	a)	A strain gauge is bonded to a beam 0.1m long and has a cross-sectional area 4cm². Young's modulus for steel is 207 GN/m². The strain gauge has an unstrained resistance of 240Ω and a gauge factor of 2.2. When a load is applied, the resistance of gauge changes by 0.013Ω. Calculate the change in length of the steel beam and the amount of force applied to the beam.	7 Marks
	b)	Demonstrate the principle of magentoresistor with an example.	7 Marks

UNIT-III

5	a)	Explain the LVDT with its advantages and disadvantages.	7 Marks
	b)	Write short notes on frequency response of Capacitive sensors.	7 Marks

(OR)

6	a)	Write the salient features of a Synchros.	7 Marks
	b)	Explain the construction and working of aTachogenerator.	7 Marks

UNIT-IV

7	a)	Describe the thermoelectric effects which govern the behavior of a thermocouple.	7 Marks
	b)	State Piezo-electric effect. Describe the properties of materials used for Piezo-electric sensors. Derive expressions for voltage and charge sensitivities.	7 Marks

(OR)

8	a)	Discuss about materials, radiation laws used in pyro-electric sensors. Also discuss its applications.	7 Marks
	b)	Demonstrate the working of Magnetostrictive Transducers and discuss any one of its application with a neat diagram.	7 Marks

UNIT-V

9	a)	List out techniques used for producing thin film sensors and describe about all of them in brief.	7 Marks
	b)	Demonstrate the working of Magnetic and Electric Incremental Position Encoders.	7 Marks

(OR)

10	a)	Describe the four micromachining techniques with neat diagrams and compare their advantages and uses.	7 Marks
	b)	Discuss in brief about fundamentals of ultrasonic based sensors and explain about working of ultrasonic level sensors, with a neat diagram.	7 Marks

CODE No.:14BT31201 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations November - 2019

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) State the Converse, Inverse and Contra positive of the statement "*If x^2 is greater than zero, then x is not equal to zero*". 6 Marks

b) Obtain the PCNF of **$(\sim P \rightarrow Q) \cap (Q \leftrightarrow P)$**. 8 Marks

(OR)

2 a) Symbolize the statement "*All men are giants*". 5 Marks

b) Explain the rules for Automatic Theorem proving. 9 Marks

UNIT-II

3 a) Let **m** be a positive integer greater than 1. Show that the relation R = {(a, b) : a^{o}b(mod m)} is an equivalence relation on the set of integers. 6 Marks

b) Design a Hasse diagram for the partial ordering {(A, B): A ≤ B} on the power set P (S), where S = {a , b , c }. 8 Marks

(OR)

4 a) Let A=B=R , the set of all real numbers and the function f:A→B, g:B→A be defined by $\boldsymbol{f}(x)=2x^3-1$, $\boldsymbol{g}(y)=\{((y+1)/2)1/3\}$. Show that each of ***f*** and ***g*** is inverse of the other. 7 Marks

b) Let f and g be functions from R to R defined by $\boldsymbol{f}(x) = ax+b$ and $\boldsymbol{g}(x)=cx+d$ show that (gof) = (fog). 7 Marks

UNIT-III

5 a) Show that the set Z of all integers is a group under * such that $a * b = a + b - 1$. 7 Marks

b) Prove that the inverse of an element in a group is unique. 7 Marks

(OR)

6 a) Define Isomorphism of Monoids with an example. 7 Marks

b) Prove that the set of all elements of a group $(G,*)$ such that $a * x = x * a$ for every $x \in G$, is a subgroup of *G*. 7 Marks

UNIT-IV

7 a) Prove the Pascals identity C(n, r) = C(n-1, r) + C(n-1, r-1). 7 Marks

b) Compute the number of integers between 1 and 1000 that are not divisible by 2, 3, 5 or 7. 7 Marks

(OR)

8 a) Solve the recurrence relation $a_n - 7a_{n-1} + 10a_{n-2} = 0$ *for* $n \geq 2$ $a_0 = 10$ *and* $a_1 = 41$ using generating functions. 7 Marks

b) Determine the number of non negative integral solutions of the equation $x_1+x_2+x_3+x_4+x_5 = 20$ where each $x_i \geq 2$. 7 Marks

UNIT-V

9 a) State the properties of the following graphs : 8 Marks

i) reflexive ii) symmetric iii) transitive iv) antisymmetric

b) If G is a connected plane graph then show that | V | - | E |+ | R | = 2. 6 Marks

(OR)

10 a) Define the following : 7 Marks

i) Minimal Spanning Tree ii)Chromatic number of a complete graph K.

b) Use Kruskal's algorithm and design an example of the Weighted graph. 7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations September - 2020

MATRICES AND NUMERICAL METHODS

[Civil Engineering, Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Test for consistency and then solve the system of equations 7 Marks
$x + 2y - z = 3,\ 3x - y + 2z = 1,\ 2x - 2y + 3z = 2,\ x - y + z = -1.$

b) State Cayley - Hamilton theorem and using it find the inverse of the matrix 7 Marks
$\begin{bmatrix} 1 & 0 & 2 \\ 0 & 1 & 2 \\ 1 & 2 & 0 \end{bmatrix}$.

(OR)

2 a) Find the values of 'a' and 'b' for which the equations $x + ay + z = 3$, $x + 2y + 2z = b$, $x + 5y + 3z = 9$ will have (i) unique solution (ii) infinite number of solutions and (iii) no solution. 7 Marks

b) Find the eigen values and the corresponding eigen vectors of the matrix 7 Marks
$\begin{bmatrix} 2 & 0 & 1 \\ 0 & 2 & 0 \\ 1 & 0 & 2 \end{bmatrix}$.

UNIT-II

3 a) Find the root of the equation $x\log_{10}x=1.2$, using false position method. 7 Marks

b) The area 'A' of a circle of diameter 'd' is given for the following values. 7 Marks

d	80	85	90	95	100
A	5026	5674	6362	7088	7854

Calculate the area of a circle of diameter 105.

(OR)

4 a) The following table gives corresponding values of x and *y*. Construct the difference table and then express *y* as a function of *x*. 7 Marks

x :	0	1	2	3	4
y :	3	6	11	18	27

b) By the method of least squares, fit a parabola $y = a + bx + cx^2$ to the following data. 7 Marks

x :	2	4	6	8	10
y :	3.07	12.85	31.47	57.38	91.29

UNIT-III

5 a) Evaluate $\int_0^6 \frac{dx}{x^2+1}$ using (i) Trapezoidal rule (ii) Simpson's 1/3 rule. Compare the result with the exact value. 7 Marks

b) Given that $\frac{dy}{dx} = 3x^2 + y$, y (0) = 4. Compute y (0.5) in steps of 0.1 using Euler's method. 7 Marks

(OR)

6 a) Solve the differential equation $dy/dx = x^2+y$, $y(0)=1$ by Euler method and compute $y(0.02)$, $y(0.04)$ and $y(0.06)$. 7 Marks

b) A solid of revolution is formed by rotating about the X-axis, the area between the X-axis, the lines x=0 and x=1 and a curve through the points with the following coordinate: 7 Marks

x	0.00	0.25	0.50	0.75	1.00
y	1.0000	0.9896	0.9589	0.9089	0.8415

UNIT-IV

7 a) Expand $f(x) = 3x^2 - 2$ as a Fourier series in the interval $(-3, 3)$. 7 Marks

b) Find the Fourier cosine transform of $f(x) = \frac{1}{x^z + 1}$ 7 Marks

(OR)

8 a) Obtain the half range sine series for the function $f(x) = \frac{\pi x}{8}(\pi - x)$ in the range $0 \le x \le \pi$. 7 Marks

b) Express $f(x) = \cos x$, $0 < x < \pi$ in half range sine series. 7 Marks

UNIT-V

9 A bar of 10cms. long with insulated sides has its ends A and B maintained at temperatures 50^0C and 100^0C respectively, until steady state condition prevail. The temperature of A is suddenly raised to 90^0C and at the same time that of B is lowered to 60^0C. Find the temperature distribution in the bar at time 't'. 14 Marks

(OR)

10 a) Form the partial differential equation by eliminating the arbitrary functions f_1 and f_2 from $z= f_1(y+2x)+f_2(y-3x)$. 4 Marks

b) Solve one dimensional heat equation by the method of separation of variables $\frac{\partial u}{\partial t} = c^2 \frac{\partial^2 u}{\partial x^2}$. 10 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations September – 2020

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 and Gamma functions and S. T $\left|\overline{\frac{1}{2}}\right| = \sqrt{\pi}$. 7 Marks

b) Show that when 'n' is a positive integer, $J_n(x)$ is the coefficient of z^n in the expansion of $e^{x(z-\frac{1}{z})/2}$ is ascending and descending powers of z. 7 Marks

(OR)

2 a) Show that. $\int_0^\infty \frac{x^{m-1}+x^{n-1}}{(1+x)^{m+n}}dx = 2\beta(m,n)$. 7 Marks

b) Prove that $J_n'(x) = \frac{1}{2}[J_{n-1}(x) - J_{n+1}(x)$. 7 Marks

UNIT-II

3 a) If $f(z)$ is analytic then show that $\left(\frac{\partial^2}{\partial x^2}+\frac{\partial^2}{\partial y^2}\right)|\text{Real } f(z)|^2 = 2|f'(z)|^2$. 7 Marks

b) Find the analytic function whose real part is $\frac{y}{x^2+y^2}$. 7 Marks

(OR)

4 a) If f(z) = u+iv is an analytic function, find f(z) if u-v = e^x(cos y – sin y). 7 Marks

b) Determine the analytic function w = u + iv, if v = log (x^2+y^2) + x-2y. 7 Marks

UNIT-III

5 a) Evaluate $\int_0^{1+i}(x-y+ix^2)$ dz along the real axis from z = 0 to z = 1 and then along a line parallel to imaginary axis from z = 1 to z = 1 +i. 7 Marks

b) Use Cauchy's and integral formula to evaluate $\oint_c \frac{e^{2z}}{(z+1)^4}$ dz where 'c' is the circle |z| = 2. 7 Marks

(OR)

6 a) Evaluate $\oint_c \frac{3^{z2}+7z+1}{(z+1)}$ dz where c is the circle |Z+il=1. 7 Marks

b) Expand f (z) = $\frac{(z-2)(z+2)}{(z+1)(z+4)}$ is the region (i) |z| < |, (ii) | z|> 4, (iii) 1<|z|<4. 7 Marks

UNIT-IV

7 a) Determine the poles of the function and the corresponding residues $\frac{z+1}{z^2(z-2)}$. 7 Marks

b) Evaluate $\int_0^{2\pi} \frac{Sin3\theta}{5-3\cos\theta} d\theta$ using Residue theorem. 7 Marks

(OR)

8 a) Evaluate $\int_C \frac{(2z+1)^2}{(4z^3+z)} dz$ where '*c*' is the circle | z | = 1. 7 Marks

b) Evaluate $\int_{-\infty}^{\infty} \frac{x^2}{(x^2+1)(x^2+4)} dx$ using residue theorem. 7 Marks

UNIT-V

9 a) Discuss the Transformation w = cos hz. 7 Marks

b) If $w = \frac{1+iz}{1-iz}$, find the image of | z | < 1. 7 Marks

(OR)

10 a) Discuss about the transformation w = Sin z. 7 Marks

b) Show that the transformation $w = \frac{2z+3}{2-4}$ changes the circle $x^2 + y^2 - 4x = 0$ into the straight line $4u + 3 = 0$. 7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations September – 2020

PROBABILITY AND STATISTICS
[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) Define random variable, discrete random variable, continuous random variable and conditional probabilities. 7 Marks

b) If x and y are continues random variable, then prove that $E(X+Y)=E(X)+E(Y)$. 7 Marks

(OR)

2 a) If *x* and *y* are continuous random variable, then prove that $E(XY)=E(X)E(Y)$. 7 Marks

b) A Probability cure y = f (x) has a range from 0 to $\propto$ if f (x) =e^{-x}, find the mean, variance and the third moment. 7 Marks

UNIT-II

3 a) If Mean = 70, Standard Deviation = 16, find: 7 Marks
i) p(38$\leq x\leq$ 46). ii) p(82$\leq$ x $\leq$ 94). iii) p(62$\leq x\leq$ 86).

b) Derive mean and variable of the Poisson Distribution. 7 Marks

(OR)

4 a) Find the probability that at most 5 defective components will be found in a lot of 200. If experience shows that 2% of such components are defective. Also find the probability of more than five defective components. 7 Marks

b) Explain briefly Area properties of normal curve. 7 Marks

UNIT-III

5 a) Explain briefly the following content. 7 Marks
i) Statistical quality control. ii) Specification limits, X, R, P and np.

b) Calculation co-efficient of correlation between *x* and *y*. 7 Marks

x	9	8	7	6	5	4	3	2	1
y	15	16	14	13	11	12	10	8	9

(OR)

6 a) Find the correction co-efficient between *x* and *y*. 7 Marks

x	21	17	15	13	12	10
y	15	14	13	11	10	9

b) If two regression co-efficient are 0.8 and 0.2 what would be the value of co-efficient of correlation. 7 Marks

UNIT-IV

7 a) A population consists of 2, 5, 12, 34. Consider all samples of size two, which can be drawn with replacement calculate 7 Marks
i) Population men
ii) Population standard deviation
iii) Mean of the means of sampling distribution

b) Explain briefly type-I and type-II errors with a suitable example. 7 Marks

(OR)

8 a) Define the Level of significance and critical Region. 7 Marks

b) In 64 randomly selected hours of production, the mean and standard deviation of the number of acceptance pieces produced by an automatic stamping machine are 1.038 and 0.146 at the 0.05 level of significance test whether the mean is greater than 1.00. 7 Marks

UNIT-V

9 a) The following tables give the number of aircraft accident that occurred during seven days of the week. Find whether the accidents are uniformly distributed over the week. 7 Marks

Days	Mon	Tue	Wed	Thu	Fri	Sat
No.of accidents	14	18	12	11	15	14

b) Explain briefly significance between F-Test and T-Test 7 Marks

(OR)

10 a) The gains in weight of two random samples of rats fed on two different diets A and B are given below. Examine whether difference is significant. 7 Marks

Diet A	13	14	10	11	12	16	10	8	-
Diet B	7	10	12	8	10	11	9	10	11

b) Two Independent samples of 8 and 7 items respectively had the following values of the variable. 7 Marks

Sample 1	9	11	13	11	16	10	12	14
Sample 2	11	13	11	14	10	8	10	-

Do the estimates of population variances differ significantly?
(Tabulated value 4.21 at 5 % L.O.S).

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations September - 2020

MECHANICS OF SOLIDS

[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Define stress, strain, hooks law, strain energy and poison's ratio. 7 Marks

b) Explain stress- strain curve diagram of mild steel. 7 Marks

(OR)

2 A circular rod of 150mm in diameter and 80mm long is subjected to a tensile force of 1500kN. Determine the modulus of rigidity, bulk modulus and change in length, diameter and volume if poison's ratio is 0.3 and young's modulus id 2×10^5 N/mm^2. 14 Marks

UNIT-II

3 Define the SF and BM at a section of a beam. Explain the utility of drawing SF and BM diagrams for a beam. Also obtain relationship between SF and BM. 14 Marks

(OR)

4 A simply supported beam of span 6m carries a clockwise couple of 5kN-m at 2m from left support and another anticlockwise couple of 10kN-m at 4m from left support. The beam carries a UDL of intensity 2kN/m between the couple. Sketch the SFD and BMD. 14 Marks

UNIT-III

5 Determine the allowable superimposed uniformly distributed load on a 4m span simply supported beam with symmetrical I section consisting of 150mm x 20mm flanges and 20mm x 150mm web, if the allowable bending stress is 150MPa and the unit weight of beam material is 78.5kN/m^3. Find the percentage of bending moment resisted by web and flanges. 14 Marks

(OR)

6 Sketch the variation of shear stress across the depth of a H section of 200mm x 10mm verticals and 200mm x 10mm horizontal. Flexural shear force action on the section is 100kN. 14 Marks

UNIT-IV

7 The stiffness of close coiled helical spring is 1.5N/mm of compression under a maximum load of 60 N. The maximum shear stress in the wire of the spring is 125N/mm^2. The solid length of the spring (when the coils are touching) is 50mm. Find the diameter of coil, diameter of wire and number of coils. $C = 4.5 \times 10^4$ N/mm^2. 14 Marks

(OR)

8 It is required to design a closed coiled helical spring which shall deflect 1mm under an axial load of 100N at a shear stress of 90Mpa. The spring is to be made of round wire having shear modulus of 0.8×10^5 Mpa. The mean diameter of the coil is 10 times that of the coil wire. Find the diameter and length of the wire. 14 Marks

UNIT-V

9 A thin cylinder of steel, having mean diameter of 200mm, thickness 20mm is subjected to an internal pressure of 8MPa. If length of the cylinder is 750mm, find the increase in diameter, increase in length and change in increase in the internal volume due to internal pressure. Take E=200GPa. 14 Marks

(OR)

10 Derive an expression for the shrink fit of a compound cylinder. 14 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations September – 2020

BUILDING MATERIALS AND CONCRETE TECHNOLOGY

[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the manufacturing methods of tiles.	7 Marks
	b)	Explain the various methods of seasoning of timber.	7 Marks
		(OR)	
2	a)	Explain the various methods for manufacturing methods of bricks.	7 Marks
	b)	Explain the concept of decay of timber.	7 Marks

UNIT-II

3	a)	Explain the manufacturing process of OPC.	7 Marks
	b)	Explain the properties of lime stone.	7 Marks
		(OR)	
4	a)	What are the operations involved in the mechanical treatment of steel?	7 Marks
	b)	Discuss the various aluminium alloys.	7 Marks

UNIT-III

5	a)	Explain the importance of various ingredients of cement concrete.	7 Marks
	b)	Define workability. What are the factors effecting workability?	7 Marks
		(OR)	
6	a)	List the various tests conducted on cement. Explain briefly the initial and final setting times of cement.	7 Marks
	b)	Define workability. What are the effects of time and temperature on workability? Discuss briefly.	7 Marks

UNIT-IV

7	a)	Describe the procedure for determination of split tensile strength of concrete.	7 Marks
	b)	How the compression strength is related to tensile strength of concrete?	7 Marks
		(OR)	
8	a)	Explain need and necessity of curing for concrete.	7 Marks
	b)	State relation between compression and tension of concrete.	7 Marks

UNIT-V

9	a)	Describe the procedure for determination of flexural strength of concrete.	7 Marks
	b)	What is the necessity of non-destructive testing of concrete? Explain the Pulse velocity method.	7 Marks
		(OR)	

10 Design a concrete mix to be used in structural elements by IS method for following requirements. 14 Marks

i) Characteristic compressive strength at 28 days, f_{ck}	25 N/mm^2
ii) Maximum size of the available aggregate	20 mm
iii) Shape of coarse aggregate	angular
iv) Degree of workability desired, compacting factor	0.85
v) Degree of quality control	good
vi) Type of exposure	moderate
Test data for concrete making materials	
Specific gravity of cement	3.15
Specific gravity of coarse aggregate	2.72
Specific gravity of fine aggregate	2.66
Water absorption (air dry to saturated surface dry) in coarse aggregate, per cent	0.5
Surface moisture coarse aggregate	nil
Fine aggregate, per cent	2
vii) Compressive strength of cement at 28 days,	51 N/mm^2
Sieve analysis	

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC14) Supplementary Examinations September – 2020

FLUID MECHANICS-I

[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Define the terms Specific weight, Capillarity, Viscosity and Specific volume and the specific gravity of a liquid is 3.0. What are its specific weight, specific mass and specific volume? 14 Marks

(OR)

2 Derive expressions for total pressure and centre of pressure for vertically immersed plane surface. A circular plate 2.5m diameter is immersed in water, its greatest and least depths below the free surface being 3m and 1m respectively, Find: i) Total pressure on one face of the plate. ii) The position of centre of pressure. 14 Marks

UNIT-II

3 The stream function in a two dimensional flow is $\psi = 3x-2y+5xy$. Verify whether the flow is irrotational. Determine the direction of stream line at a point (1, -2). Determine also the expression for the velocity potential. 14 Marks

(OR)

4 A 45^0 reducing bend is connected in a pipe line, the diameters at the inlet and outlet of the bend being 600mm and 300mm respectively. Find the force exerted by water on the bend if the intensity of pressure at inlet to bend is 8.829 N/cm^2 and rate of flow of water is 600 litres/s. 14 Marks

UNIT-III

5 A pipeline carrying oil of specific gravity 0.87., changes in diameter from 200mm diameter at a position A to 500mm diameter at a position B which is 4m at a higher level. If the pressure at A and B are 9.81 N/cm^2 and 5.886 N/cm^2 respectively and the discharge is 200 litres/s, determine the loss of head and direction of flow. 14 Marks

(OR)

6 Determine the rate of low of water through a pipe of diameter 20cm and length 50m when one end of the pipe is connected to a tank and other end of the pipe is open to the atmosphere. The pipe is horizontal and th height of water in the tank is 4m above the centre of the pipe. Consider all minor losses and take f = 0.009 in the formula $h_f = 4flv^2/2gD$. 14 Marks

UNIT-IV

7 Derive the Hagen-Poiseuille equation for loss of head of a viscous fluid flowing through a circular pipe. 14 Marks

(OR)

8 Describe the Reynolds's experiment with a neat sketch. Explain how would you distinguish between hydro dynamically smooth and rough boundaries. 14 Marks

UNIT-V

9	Explain the term dimensionally homogeneous equation. The efficiency ***n*** of a fan depends on the density **ρ**, the dynamic viscosity **μ** of the fluid, the angular velocity **ω**, diameter D of the rotor and the discharge Q. Express ***n*** in terms of dimensionless parameters.	14 Marks

(OR)

10	The pressure difference in a pipe of diameter and length due to turbulent flow depends on the velocity, viscosity, density and roughness. Using Buckingham's pi theorem, obtain an expression for pressure difference.	14 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations September – 2020

ELECTROMAGNETIC FIELDS

[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 Electric Field Intensity Due to volume charge distribution.	7 Marks
	b)	Derive the expression for Capacitance of a spherical Capacitor.	7 Marks
		(OR)	
2	a)	State and explain Gauss law.	7 Marks
	b)	Two dipoles with dipole moments -5a_z Rc/m and 9a_z Rc/m are located at points (0, 0, -2) and (0, 0, 3) respectively. Find the potential at the origin.	7 Marks

UNIT-II

3	a)	List the properties of conductors and dielectric materials.	6 Marks
	b)	Derive the conditions for tangential and normal components of electric field intensity and electric flux density at the boundary between conductor and dielectric material.	8 Marks
		(OR)	
4	a)	What is meant by boundary condition? Explain the significance of boundary conditions in electric fields.	7 Marks
	b)	Derive the expression for capacitance of a spherical capacitor.	7 Marks

UNIT-III

5	a)	State and explain Ampere's circuital Law.	7 Marks
	b)	Obtain the expression for MFI due to a Solenoid Current carrying wire by applying Biot-Savart's Law.	7 Marks
		(OR)	
6	a)	State and prove Stoke's Theorem.	7 Marks
	b)	Given magnetic field intensity H = 4 ax + 2 ay - 3 az A/m at a point in free space. Find the magnetic flux density.	7 Marks

UNIT-IV

7	a)	Explain the classification of magnetic materials.	7 Marks
	b)	Derive the expression for magnetic energy density in a magnetic field.	7 Marks
		(OR)	
8	a)	Calculate the self-inductance per unit length of an infinitely long solenoid.	7 Marks
	b)	Explain about the magnetic boundary conditions.	7 Marks

UNIT-V

9		Explain about the Faraday's laws of electromagnetic induction in detail. Also derive the relevant expressions of induced EMFs in different cases.	14 Marks
		(OR)	
10	a)	Explain the concept of reflection and refraction in magnetic materials.	7 Marks
	b)	State and explain about Faraday's law.	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations September – 2020

ELECTRIC CIRCUITS
[Electrical and Electronics Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

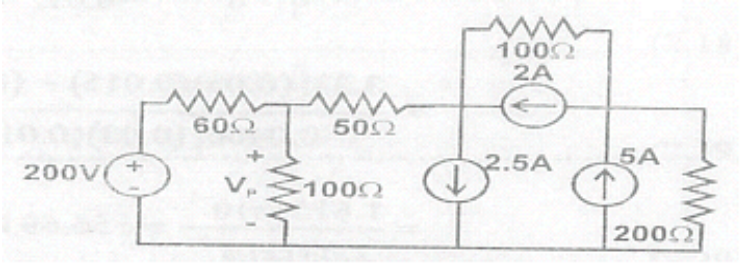
1 a) Obtain the expression for converting star connected resistive network into delta connected resistive network. 7 Marks

b) A circuit of three resistors 15Ω, 21Ω and 39Ω respectively joined in parallel is connected in series with the fourth resistance. The whole circuit is applied with 50V and is found that the power dissipated in 15Ω resist or is 35W. Determine the value of the fourth resistance and the total power dissipated in the circuit. 7 Marks

(OR)

2 a) State and Explain Kirchoff's current law and Kirchoff's voltage law. 6 Marks

b) Use nodal analysis to find the voltage drop 'V_p' across 100Ω shown in figure. 8 Marks



UNIT-II

3 a) Draw the current locus diagram for R-L network with sufficient equations. 6 Marks

b) A coil having resistance of 20Ω and inductance of 5mH is connected in series with capacitor and is applied a constant voltage and variable current source. If the maximum current of 0.5A at 500Hz is drawn, determine band width and half power frequencies. 8 Marks

(OR)

4 a) Derive the resonant frequency of parallel combination of series RC and RL circuits. 8 Marks

b) Distinguish between series and parallel Resonance. 6 Marks

UNIT-III

5 a) Derive the relation between phase and line values of a three phase delta connected balanced system. 7 Marks

b) Three inductive coils, each with a resistance of 15Ω and an inductance of 0.03H are connected in star fed from three phase, 400V, 50Hz supply. Calculate: 7 Marks

i) Phase current and line current. ii) Total power absorbed.

(OR)

6 a) Derive the relation between line and phase quantities in three phase balanced star connection. 7 Marks

b) If $Z_{RY} = 15\angle -30°$, $Z_{YB} = 20\angle 80°$ and $Z_{BR} = 10\angle 90°$ ohms are the impedances connected in the form of delta fed from three phase, 400V, 50Hz supply then determine the phase currents, line currents and the total power absorbed. Assume RYB sequence. 7 Marks

UNIT-IV

7 a) Two long single layer solenoids have the same length and the same number of turns but are placed co-axially one within the other. The diameter of the inner coil is 8cm and that of the outer coil is 10cm. Calculate the co-efficient of coupling. 8 Marks

b) Explain the importance of dot convention in coupled circuits. 6 Marks

(OR)

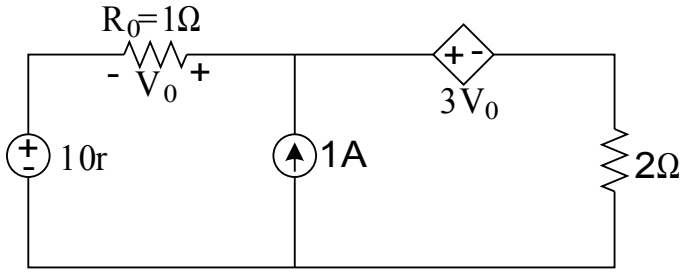
8 a) Derive the relation among self-inductance, Mutual inductance and coefficient of coupling. 7 Marks

b) Obtain the equation for the total inductance when two coils are connected in: 7 Marks
i) Series aiding and opposing. ii) Parallel aiding and opposing.

UNIT-V

9 a) State and explain maximum power transfer theorem with a suitable example. 7 Marks

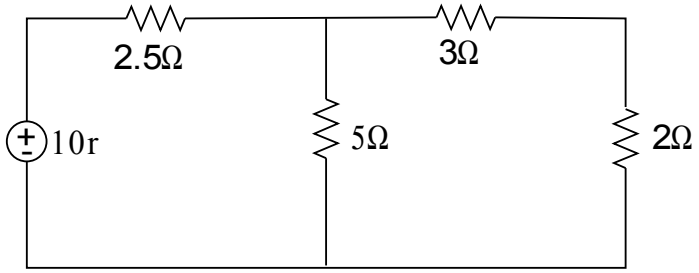
b) Obtain the current in 2Ω resistor in the following circuit by using thevenin's theorem. 7 Marks



(OR)

10 a) State and explain superposition theorem with a suitable example. 7 Marks

b) For the circuit shown in the following figure, if the resistance of 5Ω branch is increased to 6Ω, determine the compensation source and verify the results. 7 Marks



SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations September – 2020

ELECTRICAL TECHNOLOGY

[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)	With the help of neat diagram, explain various types of DC Generators.	8 Marks
	b)	Explain the procedure for conducting swineburne's test on a DC Motor.	6 Marks
		(OR)	
2	a)	With a neat sketch, explain the operation of a three point starter.	7 Marks
	b)	Explain different types of losses in DC Machines.	7 Marks

UNIT-II

3	a)	Derive the EMF equation of a Single Phase Transformer.	7 Marks
	b)	Explain, what is meant by regulation of a Transformer with the necessary equation.	7 Marks
		(OR)	
4	a)	Explain the construction and working principle of transformer.	7 Marks
	b)	The primary winding of a 50Hz single phase transformer has 480 turns and is fed from 6400V supply. The secondary winding has 20 turns. Find the peak value of flux in the core and secondary voltage.	7 Marks

UNIT-III

5	a)	Derive the expressions of Transient response of RL parallel circuit with DC excitation.	7 Marks
	b)	Determine the voltage at the terminals of a coil having R = 10Ω and L=15mH at the instant when the current is 10A and increasing at the rate of 5A/sec. Also find the stored energy in the inductor.	7 Marks
		(OR)	
6	a)	Mention the advantages of a poly phase system over a single phase system.	6 Marks
	b)	Phase voltage and current of a three phase star connected inductive load is 150V and 25A, power factor of the load is 0.707 lag. If the power is measured with two wattmeter method. Find the reading of each wattmeter?	8 Marks

UNIT-IV

7	a)	Derive the torque equation of 3-φ induction motor.	7 Marks
	b)	Explain about constructional details of squirrel cage and slip ring induction rotors.	7 Marks
		(OR)	
8	a)	Explain the classification of three phase alternators.	7 Marks
	b)	Derive the EMF equation of an alternator.	7 Marks

UNIT-V

9	a)	Explain the principle of operation of split phase induction motor.	7 Marks
	b)	Explain the principle of operation of capacitor induction motor.	7 Marks
		(OR)	
10		Explain the construction and principle operation of shaded pole induction motor with neat diagrams.	14 Marks

CODE No.:14BT30232 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations September – 2020

NETWORK ANALYSIS

[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) State and explain Kirchhoff's laws with suitable example. 6 Marks

b) Determine the current through each branch by network reduction technique shown in Fig. 1. 8 Marks

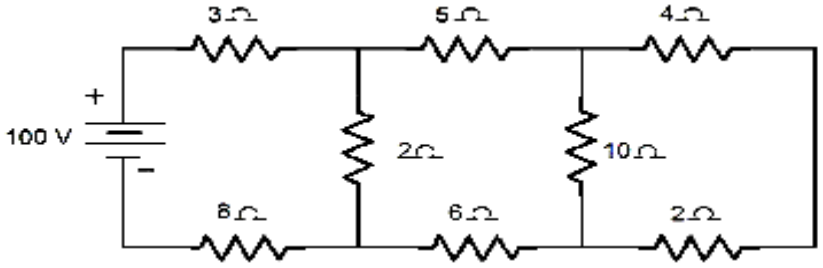


Fig.1

(OR)

2 a) Briefly explain about source transformation techniques. 7 Marks

b) Find the voltage across 10Ω resistor in Fig.2 as shown below. 7 Marks

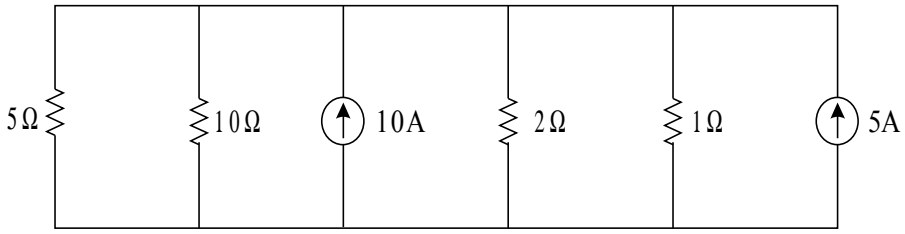


Fig.2

UNIT-II

3 a) Define resonance and list out its implications. 6 Marks

b) What is locus diagram? Draw and explain current locus diagram for a series RL circuit, with fixed resistance by deriving necessary expressions. 8 Marks

(OR)

4 Derive the expressions of resonant frequency, Quality factor and bandwidth of a series RLC resonance circuit with help of phasor diagrams. 14 Marks

UNIT-III

5 a) Distinguish between transient response and steady state response. 6 Marks

b) A DC voltage is applied to a coil having R=100 Ω and L=10 H. Calculate: 8 Marks

i) The value of the current at 0.1 sec after the switching ON.

ii) The time taken by the current to reach half of its final value.

(OR)

6 a) Obtain the Transient response of RC series circuit with DC excitation. 7 Marks

b) The circuit shown in Fig.3. Find the current transient at $t = 0$. 7 Marks

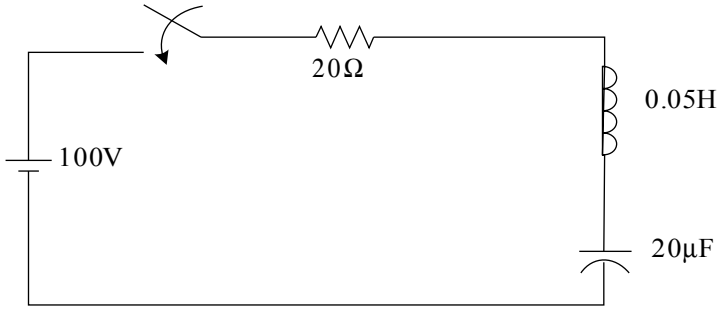


Fig. 3.

UNIT-IV

7 a) Derive the relations ofh- parameters interms of Y-parameters. 7 Marks

b) Explain about m-derived filter. 7 Marks

(OR)

8 a) Derive the relations of Y-parameters in terms of Z-parameters. 7 Marks

b) Explain about cascade connection of two port networks. 7 Marks

UNIT-V

9 a) State and explain compensation theorem with a suitable example. 7 Marks

b) Obtain the venin's equivalent circuit to the left of a-b in the circuit of Fig.4. Also find (V_o/V_1). 7 Marks

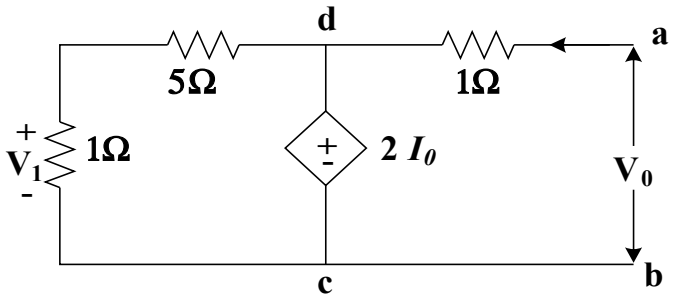


Fig.4

(OR)

10 a) State and explain Milliman's theorem with a suitable example. 8 Marks

b) Find current through 1Ω resistor for the Fig.5 using milliman's theorem. 6 Marks

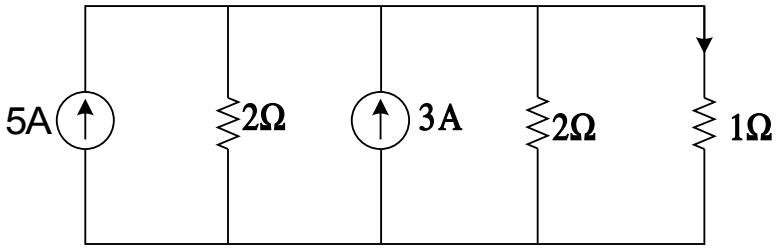


Fig.5

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations September – 2020

BASICS OF ELECTRICAL AND MECHANICAL TECHNOLOGY

[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

PART-A

UNIT-I

1 a) State and explain Ohm's law. 6 Marks

b) Define the following terms: 8 Marks
- i) Frequency
- ii) Time period
- iii) Amplitude
- iv) One cycle

(OR)

2 a) Define the following terms: 8 Marks
- i) Power factor
- ii) r.m.s value
- iii) Apparent Power
- iv) Potential difference

b) R_{ab}, R_{bc}, R_{ca} are connected in delta connection. Derive the expressions for equivalent star connection. 6 Marks

UNIT-II

3 a) Explain the principle of operation of Single phase transformer. 7 Marks

b) With neat diagram, explain the operation of fluorescent lamp. 7 Marks

(OR)

4 a) Write short notes on Rod earthing. 7 Marks

b) Explain the operation of single phase capacitor start induction motor with neat diagram. 7 Marks

PART-B

UNIT-III

5 a) Sketch and describe the working of Gas Welding. 7 Marks

b) Explain Brazing and List the Applications of Brazing. 7 Marks

(OR)

6 a) Explain the working principle of Two stroke engines with neat sketches. 7 Marks

b) List out the comparisons between Two Stroke and Four Stroke engines. 7 Marks

UNIT-IV

7 a) Explain the working principle of vapor absorption system with a sketch. 7 Marks

b) Write five desirable properties of a refrigerant. 7 Marks

(OR)

8 a) Explain vapor compression system of refrigeration with a neat sketch. 7 Marks

b) Define air conditioning? Explain the comfort air-condition system. 7 Marks

UNIT-V

9	a)	Give the classification compressors and explain the working principle of compressors.	7 Marks
	b)	Explain the need of various earth moving equipments with neat sketches.	7 Marks

(OR)

10	a)	Explain the working principle of Multi stage compressor with neat sketch.	7 Marks
	b)	Write short notes on the following: i) Excavators. ii) Power shovels.	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations September – 2020

BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

[Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define the following. i) Electric Field. ii) Potential Difference. iii) Electric Current.	6 Marks
	b)	Derive and explain the relations of voltage, current and power with series and parallel resistive circuits.	8 Marks
		(OR)	
2	a)	Explain the following terms: i) Charge. ii) Electric Potential. iii) Potential difference. iv) Electric current.	7 Marks
	b)	Find the equivalent resistance between the terminals X and Y in the circuit as shown in the figure.	7 Marks

UNIT-II

3	a)	Explain the following. i) Impedance. ii) Admittance. iii) Power factor. iv) Power triangle.	10 Marks
	b)	A 50 Hz sinusoidal voltage wave has a maximum value of 350V. Calculate its instantaneous value 0.005 sec after the wave passes through zero in the positive direction.	4 Marks
		(OR)	
4	a)	Derive the expressions of RMS value and average value of fundamental sinusoidal quantity.	8 Marks
	b)	A capacitor and resistor are connected in series with 240V, 50Hz supply. Find the value of C so that R absorbs 300W at 100V. Also find maximum charge and maximum energy stored in C.	6 Marks

UNIT-III

5	a)	Explain the construction and working principle of three phase induction motor.	10 Marks
	b)	List out the applications of DC motors.	4 Marks
		(OR)	
6	a)	Derive the torque equation of a DC motor.	7 Marks
	b)	Explain the construction and working principle of transformer.	7 Marks

UNIT-IV

7	a)	Explain the construction and working principle of dynamometer type wattmeter.	8 Marks
	b)	List out the functions of digital multi-meter.	6 Marks
		(OR)	
8	a)	Briefly explain about rectifier type instrument with neat diagram.	7 Marks
	b)	Briefly explain about electronic voltmeters and ammeters.	7 Marks

UNIT-V

9	a)	Draw and explain the equivalent circuit of the P-N junction diode.	7 Marks
	b)	Explain the rectifying action of the P-N junction diode with diagrams.	7 Marks
		(OR)	
10	a)	Briefly explain the necessity of biasing of transistor and also describe the single stage CE amplifier.	8 Marks
	b)	What is an oscillator? Explain about crystal oscillator.	6 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations September – 2020

BASIC ELECTRICAL ENGINEERING

[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)	State and explain Kirchhoff's laws with examples.	6 Marks
	b)	Derive the equations for equivalent resistances using star to delta and delta to star transformations.	8 Marks

(OR)

2	a)	Derive the expression for Equivalent inductance 'L_{eq} ' when three inductances L_1, L_2, L_3 are connected in Parallel.	8 Marks
	b)	What is the symbolic representation of ideal independent DC voltage source? Also draw its v-i characteristics.	6 Marks

UNIT-II

3		Three equal impedances each having a resistance of 25Ω and a reactance of 40Ω connected in star to a 400 V, three phase, 50Hz supply system, calculate: i) the line current. ii) power factor. iii) power consumed by the circuit.	14 Marks

(OR)

4	a)	Discuss the advantages of polyphase systems over single phase systems.	4 Marks
	b)	A balanced 3Φ delta connected load has per phase impedance of (25+j40) Ω. If 400V, 3Φ supply is connected to this load, find (i) phase current (ii) line current (iii) power supplied to the load.	10 Marks

UNIT-III

5	a)	Explain the principle of operation of DC motor.	7 Marks
	b)	Discuss about the various losses that occur in DC machine.	7 Marks

(OR)

6	a)	With suitable diagram, explain about the generation of DC voltage in DC generator.	8 Marks
	b)	Derive the expression for generated e.m.f. in a DC machine.	6 Marks

UNIT-IV

7		Describe the constructional details of a transformer with a neat sketch.	14 Marks

(OR)

8		Discuss the constructional details and principle of operation of three phase induction motor.	14 Marks

UNIT-V

9	a)	Discuss the classification of electrical instruments.	6 Marks
	b)	Explain the significance of controlling torque and damping torque relevant to the operation of indicating instruments.	8 Marks

(OR)

10	a)	Explain about the construction and operation of Repulsion type Moving Iron instruments.	8 Marks
	b)	Write short notes on Digital Multi meters.	6 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations September – 2020

FOUNDATIONS OF ELECTRICAL 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)	State and explain Ohms law. What are its limitations?	7 Marks
	b)	A capacitance of 40.0μF has a voltage described as follows: for $0 > t > 2$ms, $v = 35 \times 10^3 t$ (V). Determine i, p, and w at t = 1.5ms.	7 Marks
		(OR)	
2	a)	State and prove Kirchhoff's current law.	7 Marks
	b)	A 12V battery is connected in a circuit having three series-connected resistors having resistance's of 4Ω, 9Ω and 11Ω. Determine the current flowing through, and the p.d. across the 9Ω resistor. Find also the power dissipated in the 11Ω resistor.	7 Marks

UNIT-II

3	a)	Define the following terms: i) RMS value. ii) Form factor. iii) Average value. iv) Peak factor.	6 Marks
	b)	Calculate the current, power, power factor and voltage across the resistor of 8Ω in series with an inductor of 20H and a capacitor of 14 μF excited by an AC supply of 110 V.	8 Marks
		(OR)	
4	a)	Explain the sinusoidal response series R-C series circuit with phasor diagram.	5 Marks
	b)	A resistor carries two alternative currents having same frequency and phase and having the same peak value of 20A. One is sinusoidal and the other is rectangular in waveform. Find the RMS value of the resultant current	9 Marks

UNIT-III

5	a)	Mention the applications of various types of dc generator.	7 Marks
	b)	Derive the expression for emf equation of a dc generator.	7 Marks
		(OR)	
6	a)	Draw the output versus efficiency, torque and speed characteristics of various types of dc motor.	7 Marks
	b)	How many types of dc machines are available? Give applications for each.	7 Marks

UNIT-IV

7	a)	Explain the constructional details of a transformer.	7 Marks
	b)	How to get maximum efficiency for a transformer?	7 Marks
		(OR)	
8	a)	Explain the working principle of ac servomotor.	7 Marks
	b)	Explain the working principle of stepper motor.	7 Marks

UNIT-V

9	a)	Differentiate between open loop and closed loop control systems.	7 Marks
	b)	Mention some examples for time variant and time invariant systems.	7 Marks
		(OR)	
10	a)	Explain the classification of control systems.	7 Marks
	b)	What is the effect of feedback on the output of the given control system?	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations September – 2020

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) Define the terms: 6 Marks
i) Normal stress. ii) Tangential stress. iii) Ductility. iv) Brittleness.

b) A flat steel plate is of trapezoidal form has a uniform thickness (t). It's width at one end is 'a' and at the other end is 'b' and its length is 'L'. Determine its elongation under an axial pull 'P'. 8 Marks

(OR)

2 Draw the Mohr's stress circle for direct stresses of 65MN/m^2 (tensile) and 35MN/m^2 (compressive). Find the magnitude and direction of the resultant stress on planes makes angles of 20^0 and 65^0 with the plane of the first principal stress. Find also the normal and tangential stresses on these planes. Compare them with the analytical method. 14 Marks

UNIT-II

3 a) Derive the relation between bending moment and shear force in a beam. 4 Marks

b) For the simply supported beam having a span of 7m and supported at it ends subjected to UDL of intensity 15kN/m over a span of 3m and located at 1m from left end support, concentrated load of 20kN located at 1.5m from right end support. Draw the shear force diagram and bending moment diagram. Also, obtain the maximum bending moment. 10 Marks

(OR)

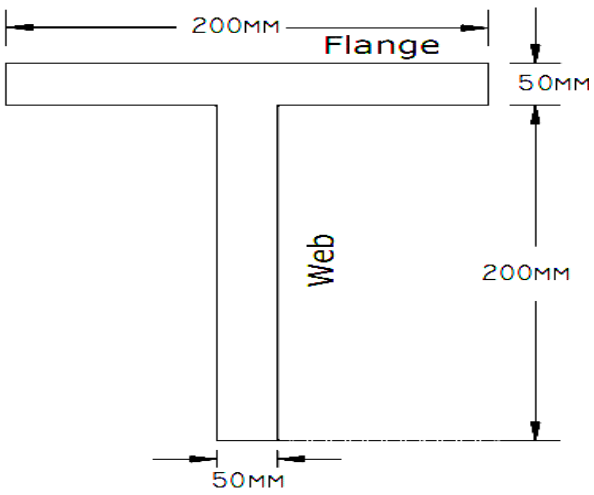
4 a) What are sagging and hogging bending moments? Explain. 4 Marks

b) A cantilever 1.5m long is loaded with a uniformly distribution load of 2 kN/m run over a length of 1.25m from the free end it also carries a point load of 3kN at a distance of 0.25m from the free end. Draw the shear force and bending moment diagram of the cantilever. 10 Marks

UNIT-III

5 a) What do you mean by the terms neutral axis and neutral surface? 4 Marks

b) A T-shaped cross-section of a beam shown in figure is subjected to a vertical shear force of 100kN. Calculate the shear stress at the neutral axis and at the junction of the web and the flange. Moment of inertia about the horizontal neutral axis is 0.0001134 m^4. 10 Marks



(OR)

6	a)	Define: Torsional stiffness and Polar Modulus.	4 Marks
	b)	A hallow shaft of 75mm external diameter and 50mm internal diameter twists through an angle of 0.6 degree in a length of 1200mm when subjected to an axial twisting moment of 1051Nm. Determine the deflection at the center of the shaft due to its own weight when placed in a horizontal position on supports 1200mm apart. The shaft weights 235N. Poison's ratio=0.3.	10 Marks

UNIT-IV

7	a)	State the assumption made deriving the equation for beam deflection.	4 Marks
	b)	A cantilever of length (l) carries a concentrated load P at its mid-span. If the free end be supported on a rigid prop, determine the reaction at the prop. Draw the shearing force and bending moment for the cantilever showing the values at the salient points.	10 Marks

(OR)

8		A beam 4m long is freely supported at the ends. It carries concentrated loads of 20kN each at points one metre from the ends. Calculate the maximum slope and deflection of the beam and slope and deflection under each load. Take E = 13,000 kN-m^2.	14 Marks

UNIT-V

9	a)	Show that the volumetric strain of a cylindrical shell is the sum of longitudinal strain and twice of hoop strain.	6 Marks
	b)	A closed cylindrical vessel made of steel plates 5mm thick with plane ends, carries fluid under pressure of 6N/mm^2. The diameter of the cylinder is 35cm and length is 85cm. Calculate the longitudinal and hoop stresses in the cylinder wall and determine the change in diameter, length and volume of the cylinder. Take E=2.1x10^5N/$mm^2$and 1/m = 0.286.	8 Marks

(OR)

10	a)	What is mean by circumferential stress and longitudinal stress? Distinguish between thick and thin cylinders.	6 Marks
	b)	An 800mm long closed-end copper tube of 72-mm internal diameter and 2mm thickness is filled with water under pressure. Find the change in pressure if additional volume of 4000mm^3 of water is pumped into the tube. Neglect any distortion of the end plates. Take E=102Gpa, K=2200Mpa and Poisson's ratio = 0.3.	8 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC14) Supplementary Examinations September - 2020

THERMODYNAMICS

[Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Distinguish between: i) Intensive and extensive properties ii) Homogeneous and heterogeneous systems.	7 Marks
	b)	Derive an expression for quasi-static work.	7 Marks
		(OR)	
2	a)	State the Zeroth law of thermodynamics. What is its importance? What do you understand by international scale of temperature?	7 Marks
	b)	What is thermodynamic equilibrium? Explain the significance of quasi-static process.	7 Marks

UNIT-II

3	a)	Energy is a property of a system. Prove it.	6 Marks
	b)	A blower handles 1 kg/s of air at 20°C and consumes a power of 15kW. The inlet and outlet velocities of air are 100 m/s and 150 m/s respectively. Find the exit air temperature, assuming adiabatic conditions. Take $\mathbf{c_p}$ of air is 1.005 kJ/kg-K.	8 Marks
		(OR)	
4	a)	What is PMM1 and write the limitations of First of thermodynamics.	4 Marks
	b)	A system exists with 0.2m^3 of a gas at 4 bar and 425K. It is expanded adiabatically to 1 bar. The gas is then heated at constant pressure till its enthalpy increases by 70 kJ. Calculate the total work done.	10 Marks

UNIT-III

5	a)	Define irreversibility. Show that irreversibility of a process is given by the product of temperature of surroundings and the net entropy change.	8 Marks
	b)	In a certain heat exchanger, 50kg of water is heated per minute from 50°C to 110°C by hot gases which enter the heat exchanger at 250°C. If the flow rate of gases is 100kg/min, estimate the net change of entropy.	6 Marks
		(OR)	
6	a)	Define: (i) Available energy. (ii) Availability. (iii) Effectiveness.	9 Marks
	b)	Define entropy and prove that it is a property of the system.	5 Marks

UNIT-IV

7	a)	Explain the process of steam generation (change of phase of water) at constant pressure. Show the various stages on p-v and T-s diagrams.	8 Marks
	b)	Derive the Gibbsian relations.	6 Marks
		(OR)	
8	a)	Enumerate the laws of perfect gases. Derive the equation of state.	7 Marks
	b)	Derive Clausius-Clapeyron's equation. Write the assumptions of this equation.	7 Marks

UNIT-V

9	a)	Derive the expression of the air standard efficiency of the dual cycle in terms of compression ratio, cut off ration and adiabatic index.	10 Marks
	b)	Sketch and describe the p-v and T-s diagrams of Otto cycle.	4 Marks
		(OR)	
10	a)	Derive an expression for the thermal efficiency of sterling cycle and draw P-V and T- S diagrams.	7 Marks
	b)	The efficiency of an Otto cycle is 60% and γ=1.5. What is the compression ratio?	7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations September - 2020

PROBABILITY AND STOCHASTIC PROCESSES

[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) Suppose that P(A) = 0.7 and P(B) = 0.5 and P[(A∩B)'] = 0.1. Find: i) P[(A∩B)]. ii) P[(A/B)]. iii) P[(B/A)]. 7 Marks

b) Define probability based on set theory and fundamental axioms. 7 Marks

(OR)

2 a) State and prove Baye's theorem. 6 Marks

b) A committee of five persons is to be selected randomly from a group of five men and ten women. i) Find the probability that the committee consists of 3 men 4 women. ii) Find the probability that the committee consists of all men. 8 Marks

UNIT-II

3 a) State and prove the properties of probability density function. 6 Marks

b) If the probability density function of a random variable is given by $F_X(x) = K(1-x^3); 0 < x < 1$ Find the value of K and $F_X(x)$. 8 Marks

(OR)

4 a) Find the Movement Generating Function of a uniform distribution and hence find its mean. 7 Marks

b) Derive mean and variance of binomial distribution. 7 Marks

UNIT-III

5 a) Find the skew for Gaussian distributed random variable. 7 Marks

b) Define conditional distribution and density function of two random variables X and Y. 7 Marks

(OR)

6 a) Find the characteristic function for a random variable with density function $f_X(\omega) = x$ for $0 \le x \le 1$. 8 Marks

b) Define and explain the characteristic function. 6 Marks

UNIT-IV

7 a) Show that the random process $(t)=A\cos(wt+\theta)$ is a wide sense stationary process if A and ware constants and is a uniformly distributed randomvariable is $(0,2\pi)$. 7 Marks

b) Distinguish between 'stationary' and weakly stationary stochastic processes. Given an example to each type. Show that poisson process is an evolutionary process. 7 Marks

(OR)

8 a) Explain about random processes. 6 Marks

b) State and prove mean Ergodic theorem. 8 Marks

UNIT-V

9 a) Define thermal noise and explain its relationship to the bandwidth and temperature. 7 Marks

b) An amplifier with gain = 30 dB and BN = 25 kHz is found to have T0 = 120 K. Find Te and Noise figure. 7 Marks

(OR)

10 a) Explain the difference between correlated and uncorrelated noise. 6 Marks

b) Discuss and explain Noise factor and Noise figure equivalent noise temperature. 8 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations September - 2020

SEMICONDUCTOR 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)	Mention five diode characteristic parameters usually mentioned in specification sheets and explain their significance.	4 Marks
	b)	Describe the breakdown mechanism s in Semiconductor diodes.	10 Marks
		(OR)	
2	a)	Draw the circuit diagram of FWR with inductor filter and explain the circuit operation.	7 Marks
	b)	A full wave rectified voltage of 18V peak is applied across 500mF capacitor filter. Calculate the ripple and DC voltages if the load makes a current of 100mA.	7 Marks

UNIT-II

3	a)	Explain how you would locate the operating point using the load line.	7 Marks
	b)	Explain the collector to base bias arrangement with necessary circuit diagram and derive at an expression for its stability factor.	7 Marks
		(OR)	
4	a)	Draw the circuit diagram of a collector to base bias circuit of CE amplifier and derive expression for S.	6 Marks
	b)	Explain why $\alpha < 1$ and $\beta > 1$ for a given transistor.	4 Marks
	c)	Discuss about the purpose of DC and AC load lines	4 Marks

UNIT-III

5	a)	Define h-parameters. How do you determine h-parameters from transistor characteristics?	4 Marks
	b)	Draw the circuit diagram of CB amplifier circuit and its h-parameter equivalent circuit. List the characteristics of a CB amplifier.	10 Marks
		(OR)	
6	a)	Analyse the CB amplifier using approximate hybrid model.	8 Marks
	b)	Write the concept of Millers theorem and mention applications.	6 Marks

UNIT-IV

7	a)	Explain the Drain and Transfer characteristics of a JFET.	7 Marks
	b)	With neat diagrams, explain the characteristics of MOSFET in enhancement mode.	7 Marks
		(OR)	
8	a)	Draw the circuit diagram of common source amplifier and derive expression for gain of the amplifier.	7 Marks
	b)	With neat structure, explain the principle of operation of depletion MOSFET.	7 Marks

UNIT-V

9	a)	Explain the working principle and characteristics of SCR.	7 Marks
	b)	Draw the equivalent circuit of UJT and explain the characteristics.	7 Marks
		(OR)	
10	a)	Draw the input characteristics of UJT and indicate the various regions. Mention any three application of UJT.	7 Marks
	b)	Using two transistor analogy, derive the expression for anode current of SCR. Mention its applications	7 Marks

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CODE No.:14BT30431 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations September – 2020

ELECTRONIC DEVICES AND CIRCUITS

[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)	Define the following terms of a half wave rectifier with resistive load: i) Ripple factor. i) Peak inverse voltage. iii) Rectification efficiency.	6 Marks
	b)	Explain the construction and working of Zener diode.	8 Marks
		(OR)	
2	a)	Define the following with respect to a diode. i) Cut-in voltage. ii) Reverse breakdown voltage. iii) Diffusion capacitance. iv) Transition capacitance. v) Intrinsic and Extrinsic semiconductors.	10 Marks
	b)	Distinguish between zener breakdown and avalanche breakdown.	4 Marks

UNIT-II

3	a)	Explain early effect and its consequences.	7 Marks
	b)	Explain the working of CE transistor configuration with input and output characteristics.	7 Marks
		(OR)	
4	a)	Explain the input/output characteristics of BJT in common base configuration.	6 Marks
	b)	List and explain various types of bias given to a BJT.	8 Marks

UNIT-III

5	a)	Explain the construction and working of Enhancement MOSFET.	8 Marks
	b)	Define Amplification factor and transconductance.	6 Marks
		(OR)	
6	a)	Draw the CS amplifier circuit diagram and explain the characteristics.	9 Marks
	b)	What are the applications of MOSFET?	5 Marks

UNIT-IV

7	a)	Analyze the effect of negative feedback on various characteristics of the amplifier.	8 Marks
	b)	An amplifier has an open loop gain of 90.When a negative feedback of feedback factor 0.6 is applied, calculate the overall gain.	6 Marks
		(OR)	
8	a)	With a neat sketch, explain the working of RC phase shift oscillator.	8 Marks
	b)	What is meant by feedback? What are the effects of negative feedback?	6 Marks

UNIT-V

9	a)	Explain the construction and working of Unijunction Transistor.	8 Marks
	b)	What are the advantages and disadvantages of Tunnel diode?	6 Marks
		(OR)	
10	a)	Explain the working principle and characteristics of SCR.	10 Marks
	b)	Draw the equivalent circuit of UJT and explain the characteristics.	4 Marks

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CODE No.:14BT30502 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations September – 2020

DIGITAL LOGIC DESIGN

[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 Decimal Number 2680 in. i) BCD ii) Excess -3 code iii) Octal iv) Binary	7 Marks
	b)	Perform the Subtraction on the following binary numbers using 2's complement. i) 11001-10111 ii) 11101-01100	7 Marks
		(OR)	
2	a)	Express the Boolean function $F=xy+x^1z$ in a product of max-term form.	5 Marks
	b)	Draw the logic diagram for the Boolean expression $F=x\ (y^1+z)(x^1+y+z^1)$ using AND, OR gates.	4 Marks
	c)	Express the Boolean function $F=A+B^1C$ in a sum of min-term form.	5 Marks

UNIT-II

3	a)	If F1 = Π 3, 4, 7, 8, 11, 14, 15 and F2 = Σ 1, 2, 4, 5, 7, 8, 10, 11, 12, 15 obtain minimal SOP expression for F1 • F2 and draw the circuit using NAND gates.	8 Marks
	b)	Draw the two-level NAND circuit for the following Boolean-expression: ($\overline{AB}+\overline{CD}$ E + BC (A + B) also obtain minimal SOP expression and draw the circuit using NAND gates.	6 Marks
		(OR)	
4		Simplify the following Boolean functions, using four variable maps. i) F(w, x, y, z) = ∑(1,4,5,6,12,14,15) ii) F(A,B,C,D) = ∑(1,5,9,10,11,14,15)	14 Marks

UNIT-III

5	a)	What is Multiplexer? Explain it.	5 Marks
	b)	Construct 16 x 1 Multiplexer using 4 x 1 multiplexers.	9 Marks
		(OR)	
6	a)	Design and explain BCD-Adder.	7 Marks
	b)	Draw and explain Magnitude Comparator with a neat sketch.	7 Marks

UNIT-IV

7	a)	Compare the merits and demerits of ripple and synchronous counters.	7 Marks
	b)	Design a 4-bit ripple counter using T flip-flops.	7 Marks
		(OR)	
8		Design a counter with the following repeated binary sequence: 0, 1, 2, 4, 6. Use D Flip-flops.	14 Marks

UNIT-V

9		Write short notes on: i) Read Only Memory. ii) Programmable Logic Array.	14 Marks
		(OR)	
10		Explain the following. i) RAM ii) Error detection and correction.	14 Marks

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CODE No.:14BT31002 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations September – 2020

SENSORS AND TRANSDUCERS

[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 the terms True value, Accuracy and Precision.	7 Marks
	b)	Discuss in detail the various dynamic characteristics of a measuring system.	7 Marks
		(OR)	
2	a)	Discuss the procedure for selection of a transducer.	5 Marks
	b)	With an example, explain the zero order system.	5 Marks
	c)	Define a transducer. Compare active and passive transducers.	4 Marks

UNIT-II

3	a)	Explain the construction and working of a Potentiometer.	7 Marks
	b)	List the types of Thermistor and explain any one in detail.	7 Marks
		(OR)	
4	a)	List the applications of Magnetoresistor.	7 Marks
	b)	Explain the working of a LDR.	7 Marks

UNIT-III

5	a)	Demonstrate the working of electromagnetic sensor based tachogenerator.	7 Marks
	b)	Discuss about frequency response of capacitive transducers.	7 Marks
		(OR)	
6	a)	Demonstrate the working principle of different configurations of variable reluctance sensors.	7 Marks
	b)	Demonstrate the working of capacitive sensors using change in overlapping area of plates. Also explain how it can be employed for measurement of angular displacement.	7 Marks

UNIT-IV

7	a)	Describe the construction, working, advantages and disadvantages of Thermocouples and also the methods of measurement of their output voltage.	8 Marks
	b)	Define Pyroelectric Effect with necessary equations. Explain the frequency response of pyroelectric sensors in voltage mode and current mode and draw the equivalent circuit of it.	6 Marks
		(OR)	
8	a)	State Photvoltaic Effect. Explain it with a neat diagram in a p-n junction and draw the equivalent circuit for a photovoltaic detector. Also discuss its applications.	7 Marks
	b)	Describe the different types of compensations used in thermocouples.	7 Marks

UNIT-V

9	a)	Demonstrate the working of incremental position encoders.	7 Marks
	b)	Identify the non contact type of senor for measurement of velocity. Explain.	7 Marks
		(OR)	
10	a)	Compare thick film and thin film sensors.	7 Marks
	b)	List the sensors for measurement of pressure. With a neat diagram, explain the working of fibre optic sensor for measurement of pressure.	7 Marks

CODE No.: 16BT3BS01 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November - 2019

PROBABILITY DISTRIBUTIONS AND STATISTICAL METHODS

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

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Define probability mass function and distribution function of a discrete random variable. CO1 7 Marks

b) A random variable X has the following probability function: CO4 7 Marks

X	0	1	2	3	4	5	6	7	8
P(x)	K/45	K/15	K/9	K/5	2K/45	6K/45	7K/45	8K/45	4K/45

Determine: (i) K (ii) Mean (iii) Variance and standard deviation.

(OR)

2 a) A box contains 4 white and 6 black balls. A man draws 2 balls and is given Rs. 140 for every white ball and Rs.70 for every black ball. What is his expectation? CO5 7 Marks

b) If the probability density function of a continuous random variable is given by CO4 7 Marks

$f(x) = Kx^3$, in $0<x<3$

$= 0$, else where

Find the value of K, Mean and Standard deviation of X.

UNIT-II

3 a) The mean and variance of a binomial variate X with parameters n and p are 16 and 8 respectively. Find P(X>1) and P(X<2). CO4, CO5 7 Marks

b) A car-hire firm has two cars which it hires out day by day. The number of demands for a car of each day is distributed as a Poisson distribution with mean 1.5. Calculate the proportion of days (i) on which there is no demand (ii) on which demand is refused. CO4 7 Marks

(OR)

4 a) Fit a binomial distribution to the following data. CO4 7 Marks

X	0	1	2	3	4	5
f	38	144	342	287	164	25

b) Define normal and standard normal distributions. State the properties of the normal distribution. CO1 7 Marks

UNIT-III

5 A machine is set to deliver packets of a given weight. 10 samples of size 5 each were recorded. Below are given relevant data: CO3 14 Marks

Sample No	1	2	3	4	5	6	7	8	9	10
Mean	15	17	15	18	17	14	18	15	17	16
Range	7	7	4	9	8	7	12	4	11	5

Calculate the values for the central line and control limits for the mean chart and range chart and comment on the state of control.

(OR)

6 The following table gives the scores obtained by 11 students in English and Telugu translation. Find the rank correlation coefficient CO2, CO5 14 Marks

Score in English	40	46	54	60	70	80	82	85	85	90	95
Score in Telugu	45	45	50	43	40	75	55	72	65	42	70

UNIT-IV

7	a)	Explain briefly about (i) Population and Sample (ii) Parameter and Statistic (iii) Sampling distribution of a statistic.	CO1	7 Marks
	b)	A population consists of 5 observations 2, 3, 6, 8 and 11. Consider all possible samples of size two which can be drawn without replacement from this population. Find (i) the mean and standard deviation of the population (ii) the mean of the sampling distribution of mean.	CO2, CO5	7 Marks

(OR)

8	a)	Explain briefly about the procedure for testing of hypothesis.	CO1	7 Marks
	b)	In a survey of buying habits, 400 women shoppers are chosen at random in a super market 'A' located in a certain section of city. Their average weekly food expenditure is Rs.250 with standard deviation of Rs.40. For 400 women shoppers chosen at random in super market 'B' in another section of the city, their average weekly food expenditure is Rs.220 with standard deviation of Rs.55. Test at 1% level of significance whether the average weekly food expenditure of the two populations of shopper are equal.	CO2, CO5	7 Marks

UNIT-V

9		The nicotine content in milligrams in two samples of tobacco were found to be as follows:	CO4	14 Marks

Sample A	24	27	26	21	25	-
Sample B	27	30	28	31	22	36

Can it be said that two samples came from same normal population at 5% level of significance?

(OR)

10		Visa Card USA studied how frequently consumers of various age groups use plastic cards (Debit and Credit cards) when making purchases (Associated Press, January 16, 2006). Sample data for 300 consumers shows the use of plastic cards by four age groups.	CO4	14 Marks

	Age Group			
Payment	18-24	25-34	35-44	45 and over
Plastic card	21	27	27	36
Cash or Cheque	21	36	42	90

Test for the independence between method of payment and age group. Use α =0.05. What is your conclusion?

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CODE No.: 16BT3BS02 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November - 2019

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)	Establish the relation between Beta and Gamma functions.	CO1 CO4	7 Marks
	b)	Show that $\int_0^{\frac{\pi}{2}} \sqrt{\sin\theta}\, d\theta \times \int_0^{\frac{\pi}{2}} \frac{1}{\sqrt{\sin\theta}} d\theta = \pi$.	CO4	7 Marks
		(OR)		
2	a)	Prove that $J_{\frac{1}{2}}(x) = \sqrt{\frac{2}{\pi x}} \sin x$.	CO4	7 Marks
	b)	Express $J_5(x)$ in terms of $J_0(x)$ and $J_1(x)$.	CO4	7 Marks

UNIT-II

3	a)	If f(z) is an analytic function with constant modulus, show that f(z) is constant.	CO4	7 Marks
	b)	Find the analytic function, whose real part is $\frac{\sin 2x}{\cosh 2y - \cos 2x}$.	CO4	7 Marks
		(OR)		
4	a)	Show that polar form of Cauchy Riemann equations are $\frac{\partial u}{\partial r} = \frac{1}{r}\frac{\partial v}{\partial \theta}, \frac{\partial v}{\partial r} = -\frac{1}{r}\frac{\partial u}{\partial \theta}$. Hence deduce that $\frac{\partial^2 u}{\partial r^2} + \frac{1}{r}\frac{\partial u}{\partial r} + \frac{1}{r^2}\frac{\partial^2 u}{\partial \theta^2} = 0$.	CO1 CO4	7 Marks
	b)	If *f(z)* is a regular function of *z*, Prove that $\nabla^2 \left|f(z)\right|^2 = 4\left|f'(z)\right|^2$.	CO4	7 Marks

UNIT-III

5	a)	State and prove Cauchy's Integral formula.	CO4	7 Marks
	b)	Construct Laurent's series about $z = 0$ for $f(z) = \frac{z^2 - 1}{z^2 + 5z + 6}$ in the region $2 < \left|z\right| < 3$.	CO2 CO3	7 Marks
		(OR)		
6	a)	Evaluate $\oint_C \frac{\cos \pi z}{z^2 - 1} dz$ around a rectangle with vertices $2 \pm i, -2 \pm i$ using Cauchy's integral formula.	CO3 CO4	7 Marks
	b)	Expand $f(z) = \frac{1}{z^2 - 3z + 2}$ in the region: (i) $\left|z\right| < 1$, (ii) $1 < \left|z\right| < 2$, (iii) $\left|z\right| > 2$.	CO3	7 Marks

UNIT-IV

7		Define the singularity of a function. Determine the poles of the function $f(z) = \frac{z^2 - 2z}{(z+1)^2(z^2+4)}$ and the residue at each pole, Hence evaluate $\oint_C f(z)dz$, where C is the circle $\lvert z \rvert = 10$.	CO1 CO4	14 Marks
		(OR)		
8		By integrating around a unit circle, evaluate $\int_0^{2\pi} \frac{\cos 3\theta}{5 - 4\cos\theta} d\theta$.	CO5	14 Marks

UNIT-V

9	a)	Show that $w = \frac{i - z}{i + z}$ maps the real axis of z – plane into the circle $\lvert w \rvert = 1$ and the half of the plane $y > 0$ into the interior of the unit circle $\lvert w \rvert = 1$ in the w-plane.	CO1 CO4	7 Marks
	b)	Find the bilinear transformation which maps the points $z = 1, i, -1$ onto the points $w = 0, 1, \infty$.	CO1 CO4	7 Marks
		(OR)		
10		Determine the region of the w-plane into which the following regions are mapped by the transformation $w = z^2$. i) first quadrant of the z – plane. ii) region bounded by $x = 1, y = 1, x + y = 1$. iii) the region $1 \le x \le 2$ and $1 \le y \le 2$. iv) circle $\lvert z - 1 \rvert = 2$.	CO3 CO4	14 Marks

CODE No.:16BT3HS01 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November - 2019

ENVIRONMENTAL STUDIES

[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)	What is the importance of Environmental Studies? Explain the need for public awareness.	CO1	7 Marks
	b)	Explain the effects of over exploitation of surface and ground water.	CO1	7 Marks
		(OR)		
2	a)	With the help of a case study, explain the benefits and problems of larger dams.	CO2	7 Marks
	b)	Explain the sources, harvesting and conversion of any two renewable energy resources.	CO1	7 Marks
		UNIT-II		
3	a)	Explain the structural and functional features of an ecosystem.	CO1	7 Marks
	b)	With a neat sketch, explain any biogeochemical cycle.	CO2	7 Marks
		(OR)		
4	a)	What is conservation of biodiversity? Explain various types.	CO2	7 Marks
	b)	What is a Hotspot? Write about the Hotspots of India.	CO2	7 Marks
		UNIT-III		
5	a)	Differentiate urban waste from industrial waste. Explain RRR technique of solid waste management.	CO4	7 Marks
	b)	Write a short note on sanitary landfill. Explain how a liquid waste is managed.	CO4	7 Marks
		(OR)		
6	a)	Classify the fresh water pollutants and explain their effects.	CO3	7 Marks
	b)	Explain the terms Eutrophication, Bio-magnification and BOD.	CO5	7 Marks
		UNIT-IV		
7	a)	Define Sustainability. What are the environmental ethics that are to be followed to attain sustainable development?	CO6	7 Marks
	b)	Write a detailed note on Acid Rains with the help of a case study.	CO6	7 Marks
		(OR)		
8	a)	Explain the functional features of wild life protection act in detail.	CO8	7 Marks
	b)	Write a detailed note on Water act.	CO8	7 Marks
		UNIT-V		
9	a)	What is Environmental Impact Assessment? What does it contain?	CO7	7 Marks
	b)	What is population explosion? Write the effects of population growth.	CO6	7 Marks
		(OR)		
10	a)	Write detailed note on Family Welfare Programme.	CO8	7 Marks
	b)	Explain the relation between the Environment and Human Health.	CO8	7 Marks

CODE No.:16BT3HS02 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November - 2019

MANAGERIAL ECONOMICS AND PRINCIPLES OF ACCOUNTANCY

[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define Elasticity of Demand.	CO1	2 Marks
	b)	Explain measurement of elasticity. If the quantity demanded for a product X is 2000 units at a price of Rs.200, if the price declines to Rs.90 and the quantity demanded increases to 1500 units, determine price elasticity of demand, justify your statement.	CO3, CO6	12 Marks
		(OR)		
2		Explain scientific approach of forecasting demand.	CO3	14 Marks

UNIT-II

3	a)	In an industry the requirement of a certain part are 150 units, the price of each unit is Rs.250, if the parts are manufactured with a fixed cost of Rs.40000 and variable cost per unit is Rs.50. Suggest a suitable option make or buy. Justify your statement.	CO1, CO3	10 Marks
	b)	List out the various assumptions underlying break – even analysis.	CO3	4 Marks
		(OR)		
4	a)	Define fixed and variable costs.	CO1	4 Marks
	b)	Explain cost – output relationship and its significance.	CO2	10 Marks

UNIT-III

5	a)	Illustrate monopolistic competition.	CO1	4 Marks
	b)	Explain role of time factor in determination of price.	CO1	10 Marks
		(OR)		
6		Explain price discrimination. List out the conditions to follow price discrimination and its advantages.	CO1, CO3	14 Marks

UNIT-IV

7	a)	Classify methods of Capital Budgeting.	CO1	4 Marks
	b)	Define payback method. What is the payback period for the project, if it costs Rs.100000 the annual cash inflows for 5 years are Rs.25000? List out advantages and limitations of payback period.	CO1, CO2, CO6	10 Marks
		(OR)		
8		Explain methods and sources of finance.	CO1, CO2	14 Marks

UNIT-V

9		Define Journal. Explain sub-divisions of a journal.	CO3	14 Marks
		(OR)		
10		Explain about trial balance and its significance. List out the errors that cannot be revealed by the trial balance.	CO3	14 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November – 2019

CONSTRUCTION PLANNING AND PROJECT MANAGEMENT

[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 steps involved in planning?	CO1	7 Marks
	b)	Enumerate the stages of planning by different agencies.	CO1	7 Marks
		(OR)		
2	a)	Discuss the need for legislation in the construction Industry.	CO8	7 Marks
	b)	Explain the salient features of the Minimum Wages Act and the payment of Wages Act with regard to fixing the terms of employment of construction labour.	CO8	7 Marks

UNIT-II

3	a)	What are the objectives of resource allocation?	CO9	7 Marks
	b)	What do you mean by resource leveling? What are the steps involved in it? Explain briefly.	CO9	7 Marks
		(OR)		
4	a)	Discuss any two types of excavating and earth moving equipment in detail. Give sketches.	CO5	7 Marks
	b)	Discuss the importance of manpower planning in construction Industry.	CO5	7 Marks

UNIT-III

5	a)	Define scheduling. What are the uses and advantages of scheduling?	CO1	7 Marks
	b)	In a carpenter shop, a conference table is planned to be made. The activities and their durations are: i) Make preliminary sketches and tracings 1 day ii) Make ammonia prints from tracings 1 day iii) Make the legs 3 days iv) Plane the table top 2 days v) Join the legs to table top 2 days vi) Polish and varnish 2 days Activity (ii) follows act (i), act (iii) and (iv) can be concurrent; act (v) must follow acts (iii) and (iv); act (vi) follows act (v). Prepare the bar chart and calculate the completion time.	CO4	7 Marks
		(OR)		
6	a)	What are the various methods of scheduling? Explain the method of preparing the bar chart with the help of a suitable example.	CO1	7 Marks
	b)	What is meant by controlling?	CO1	7 Marks

UNIT-IV

7	a)	Explain the importance of network analysis techniques for effective project management.	CO3	7 Marks
	b)	List the Fulkerson's rule for numbering events.	CO1	7 Marks
		(OR)		

8 a) What are the advantages and disadvantages of network analysis over other techniques? CO3 7 Marks

b) Prepare a network for a construction project with 12 activities A, B,…., L. The precedence relationships are as follows: CO3 7 Marks

i) A and B can be performed in parallel;
ii) A must be performed before C, D and E;
iii) F cannot be started until D is finished;
iv) G follows C and D;
v) F must be finished before H and I can be started;
vi) E and H precede J;
vii) G and I precede K;
viii) L depends on J and K being complete.

The project is complete when L and B are completed. Also number the events in the network appropriately.

UNIT-V

9 a) What do you mean by PERT? What is its significance? Explain briefly. CO1 7 Marks

b) A project has the following characteristics: CO2 7 Marks

Activity	Preceding Activity	Expected completion time (days)
a	None	4
b	a	2
c	a	4
d	b	10
e	d	8
f	d	9
g	d	4
h	b	8
i	c, e	2
j	g	1
k	f, i, j	2
l	k	10
m	h, g	6
n	m	10

i) Draw a PERT network for the project.
ii) Find various paths and critical path as well as project duration.

(OR)

10 a) Differentiate between CPM and PERT. CO1 7 Marks

b) The following table gives the activities in a construction project and other relevant information: CO2 7 Marks

Activity	1-2	1-3	2-3	2-4	3-4	4-5
Duration (days)	20	25	10	12	6	10

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November - 2019

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)	Explain Newton's law of Viscosity and differentiate dynamic viscosity from kinematic viscosity.	CO1	7 Marks
	b)	Pipes A and B are carrying water at a pressures of 100kN/m^2 and 200kN/m^2 respectively. Pipe B is located 2m above pipe A. Find the deflection of mercury in mercury U-tube differential manometer when both the limbs are connected to both the pipes.	CO2	7 Marks
		(OR)		
2	a)	Derive the expressions for magnitude and location of hydrostatic force exerted by a liquid on an inclined plane surface when it is submerged.	CO1	9 Marks
	b)	If the velocity distribution over a plate is given by u=0.67y –y^2 in which u is the velocity in meter per second at a distance y meter above the plate. Determine the shear stress at y=0.2m. Take dynamic viscosity of fluid as 8.5 poises.	CO2	5 Marks

UNIT-II

3	a)	Derive the Bernoulli's equation and list the assumptions made while deriving it.	CO1	8 Marks
	b)	In a two dimensional incompressible flow, the fluid velocity components are given by $\boldsymbol{u = x–4y; v = –y – 4x}$. Determine its velocity potential.	CO2	6 Marks
		(OR)		
4	a)	Derive the discharge equation of a triangular notch.	CO1	6 Marks
	b)	200 lit/s of water is flowing in a pipe having a diameter of 300mm. If the pipe is bent by 60^0, find the magnitude and direction of the resultant force on the bend. The pressure of the water flowing is 400kN/m^2. Take specific weight of water as 9.81kN/m^3.	CO5	8 Marks

UNIT-III

5	a)	What is equivalent pipe? How to find the diameter of the equivalent pipe replacing two pipes of different diameters and lengths connected in series?	CO1	6 Marks
	b)	Two reservoirs are connected by two pipes of same length laid in parallel. The diameters of the pipes are 100mm and 300mm respectively. If the discharge through 100mm diameter pipe is 0.01m^3/s, what will be the discharge through 300mm pipe? Assume that friction factor is same for both pipes.	CO2	8 Marks
		(OR)		
6	a)	State Buckingham's π – theorem. By using this method, show that the velocity through a circular orifice is given by $V = \sqrt{2gH}\ \ f\left\{\frac{D}{H}, \frac{\mu}{\rho VH}\right\}$ where H is the head causing the flow, D is the diameter of the orifice, μ is the viscosity, ρ is the mass density and g is acceleration due to gravity.	CO1	8 Marks
	b)	Write a short note on: i) Geometric similarity. ii) Kinematic similarity. iii) Dynamic similarity.	CO4	6 Marks

UNIT-IV

7	a)	Prove that for a trapezoidal channel of most economical section: i) Half of the top width = one of the length of side slopes. ii) Hydraulic mean depth = half of depth of flow.	CO1	7 Marks
	b)	Find the pre-jump depth in a rectangular channel of bed width 5m when the rate of water is $10m^3/s$ having Froude Number after the jump is 0.8. Also find (i) Loss of energy (ii) % loss of energy.	CO2	7 Marks

(OR)

8	a)	What is specific energy curve? Draw specific energy curve? Derive expressions for critical depth and critical velocity for a rectangular channel. Show that Froude number at critical depth is unity.	CO1	7 Marks
	b)	The discharge of water through a rectangular channel of width 6m, is $1m^3/s$ when depth of flow of water is 2m. Calculate: i) specific energy of flowing water. ii) critical depth and critical velocity. iii) value of minimum specific energy.	CO1	7 Marks

UNIT-V

9	a)	Derive the expression for hydraulic efficiency of a Pelton wheel and also find the condition for maximum hydraulic efficiency.	CO2	7 Marks
	b)	Design a pelton wheel for a head of 80m and speed 300 r.p.m. The wheel develops 103kW shaft Power. Take C_v= 0.98, speed ratio = 0.45 and overall efficiency is 0.80.	CO3	7 Marks

(OR)

10	a)	How will you obtain an expression for minimum starting speed of a centrifugal pump? Also draw the operating characteristic curves of the centrifugal pump.	CO1	6 Marks
	b)	A centrifugal pump has the following characteristics: Outer diameter of the impeller = 800mm; Width of the impeller vanes at outlet = 100mm; Vane angle at outlet = 40^0; Speed of the impeller = 550 r.p.m; Discharge = 0.98 m^3/s; Manometric head = 35m; A 500kW motor is used to drive the pump. Determine the manometric, mechanical and overall efficiencies of the pump. Assume water enters the impeller radially at inlet.	CO2	8 Marks

CODE No.:16BT30103 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November - 2019

MECHANICS OF SOLIDS

[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 relationship between the three elastic constants E,G and K.	CO1	7 Marks
	b)	A bar 24mm in diameter and 400mm in length is acted upon by an axial tensile load of 38KN. The elongation of the bar and the change in diameter are measured as 0.165mm and 0.0031mm respectively. Determine: i) Poisson's ratio. ii) The value of the three moduli.	CO1	7 Marks
		(OR)		
2		A bar of brass 25mm diameter is enclosed in a steel tube of 50mm external diameter and 27mm internal diameter. The bar and the tube are both initially 1m long and are rigidly fastened at both ends. Find the change in length of the assembly. $E_{STEEL} = 200x10^3$ MPa, α of steel = $11.6x10^{-6}$/ºC. $E_{BRASS} = 100x10^3$ MPa, α of brass = $18.7x10^{-6}$/ºC.	CO1	14 Marks

UNIT-II

3	a)	A cantilever has distributed load carrying intensity with zero at the fixed end ***w*** at the free end. The span of the beam is L. Draw the shear force and bending moment diagrams.	CO2	7 Marks
	b)	Derive the relationship between the rate of loading, shear force and bending moment starting from fundamentals.	CO2	7 Marks
		(OR)		
4	a)	A beam 5m long supported at the ends carries point loads of 140KN, 60KN and 80KN at distances 0.5m, 2.5m and 3.5m respectively from the left end. Find the maximum shear force and bending moment. Draw the shear force and bending moment diagrams.	CO2	7 Marks
	b)	A horizontal beam is simply supported at the ends and carries a uniform distributed load of 10KN/m between the supports placed 10m apart. Anticlockwise moments of 150KN-m and 100KN-m are applied to the left and right ends of the beam at the supports. Determine the position and magnitude of the maximum bending moment and draw shear force and bending moment diagrams.	CO2	7 Marks

UNIT-III

5		What are the assumptions in the theory of pure bending? Prove M/I = σ/Y = E/R.	CO2	14 Marks
		(OR)		
6		Obtain an expression for shearing stresses developed in a beam. State the assumptions on which the above is based. Show that for rectangular section distribution of shearing stress is parabolic.	CO2	14 Marks

UNIT-IV

7		A solid shaft of 200mm diameter has the same cross-sectional area as a hollow shaft of the same material with inside diameter of 150mm. Find the ratio of: i) Power transmitted by both the shafts at the same angular velocity. ii) Angles of twist in equal lengths of these shafts, when stressed to the same intensity.	CO3	14 Marks

(OR)

8	a)	Derive an equation for the deflection of an open coiled helical spring.	CO3	7 Marks
	b)	A closely coiled helical spring of mean diameter 140mm is made up of 12mm diameter steel wire. Calculate the direct axial load the spring can carry if the maximum stress is not to exceed 100MPa.	CO3	7 Marks

UNIT-V

9	a)	A cylindrical vessel whose ends are closed by means of rigid flange plates is made of steel plates 3mm thick. The internal length and diameter of vessel are 50cm and 25cm respectively. Determine the longitudinal and circumferential stresses in the cylindrical shell due to an internal fluid pressure of 3mpa also calculate the increase in length, diameter and volume of the vessel. Take E = 200GPa. and $\boldsymbol{\mu}$ = 0.3.	CO3	14 Marks

(OR)

10		An external pressure of 15MPa to a thick cylinder of internal diameter 150mm and external diameter 350mm, if the maximum hoop stress permitted on the inside wall is 35MPa. Calculate: i) The maximum internal pressure that can be applied. ii) The change in outside diameter if cylinder has the closed ends. Take E= 210GPa, μ=0.3	CO3	14 Marks

CODE No.:16BT30104 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November - 2019

SURVEYING

[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 principles of surveying? Explain in detail. CO2 7 Marks

b) A 20m chain was found to be 10cm too long after chaining distance of 1500mts. It was found 18cm too long at the end of days work after chaining a total distance of 2900mts. Find the true distance if the chain was correct before the commencement of work. CO2 7 Marks

(OR)

2 a) List out various obstacles in chaining. Explain any two cases for each obstacle in detail. CO4 7 Marks

b) Following bearings are taken with prismatic compass for a closed traverse. Compute the included angles and correct them. CO4 7 Marks

Line	AB	BC	CD	DE	EA
FB	$120^0 30'$	30^0	$330^0 30'$	$260^0 30'$	210^0
BB	300^0	209^0	$150^0 30'$	80^0	31^0

UNIT-II

3 a) What are various characteristics of contours and state the uses of contour maps. CO1 7 Marks

b) Explain in detail the procedure for solving two-point problem on field of plane table surveying. CO3 7 Marks

(OR)

4 a) What adjustments should be carried out in leveling? Explain in detail. CO6 6 Marks

b) Following is the page of an old field level book entered with pencil. Some of the entries are missed / erased, and have been marked with crosses. Find the missing entries. CO4 8 Marks

Station	B.S	I.S	F.S	Rise	Fall	R.L	Remarks
1	2.150					450.00	
2	1.645		X	0.500			
3		2.345			x		
4	X		1.965	X			
5	2.050		1.825		0.400		
6		x		X		451.730	BM2 Staff held against ceiling
7	-1.690		X	0.120			
8	X		2.100		x		
9			x	x		499.100	BM3
	8.445						

UNIT-III

5 a) Explain the temporary adjustments of vernier transit theodolite. CO6 7 Marks

b) Explain the method of measuring a horizontal angle between the points A and B by repetition method using a theodolite. CO1 7 Marks

(OR)

6 Explain the difference between tangential and stadia tacheometry. How will you determine the stadia constants? CO1 14 Marks

UNIT-IV

7	What are different types of curves? Explain the procedure to set out simple curve by Rankines method.	CO1	14 Marks

(OR)

8	From contour plan of a proposed reservoir area, the following data were found	CO3	14 Marks

Contour, m	100	105	110	115	120	125
Area of contour, hectares	3	8	13	17	23	29

Determine the capacity of the reservoir (either prismoidal or trapezoidal formula) if the FRL is 125m. The volume below the contour of 100 may be ignored.

UNIT-V

9	Write short note on the following: i) Electronic Theodolite. ii) Digital levels. iii) Total Station.	CO1	14 Marks

(OR)

10	a)	Explain the working principle of total station briefly.	CO5	7 Marks
	b)	What are various applications of total station? Explain briefly.	CO5	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November - 2019

DC 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)	Give the construction features and working principle of a DC generator. Draw the cross-sectional view of a 4 pole DC generator and label all the parts. Explain the function of each part.	CO1	7 Marks
	b)	The armature of a 6 pole DC generator has a wave winding containing 664Wb and the speed is 250 r.p.m. At what speed must the armature be driven to generate an EMF of 250V, if the flux/pole is reduced to 0.058Wb.	CO4	7 Marks

(OR)

2	a)	List various losses in a DC generator and explain how these losses are minimized.	CO1	6 Marks
	b)	A 110V shunt generator has a full load current of 100A, shunt field resistance of 55Ω and stray losses of 500W. If the full load efficiency is 88%, find armature resistance. Assuming voltage to be constant at 110 volts calculate the efficiency at full load and at 50% over load. Find load current corresponding to maximum efficiency.	CO4	8 Marks

UNIT-II

3	a)	Justify how the effect of armature reaction can be neutralized by using inter poles and compensating winding.	CO5	7 Marks
	b)	A 4-pole generator has wave wound armature with 722 conductors and it delivers 100A on full load. If the brush lead is 8^0, Calculate the armature demagnetizing and cross magnetizing ampere-turns per pole.	CO4	7 Marks

(OR)

4	a)	Describe clearly the process of commutation in a DC machine. What causes sparking at the commutator surface?	CO1	8 Marks
	b)	Describe methods of improving commutation.	CO1	6 Marks

UNIT-III

5	a)	State the requirements of voltage build up in self-excited DC generator.	CO1	7 Marks
	b)	Two shunt generators A and B operate in parallel and their load characteristics may be taken as straight lines. The voltage of A falls from 240V at no-load to 220V at full load at 200A, while that of B falls from 245V at no-load to 220V at 150A. Determine the current which each machine supplies to a common load of 300A and the bus-bar voltage at this load.	CO4	7 Marks

(OR)

6	a)	Describe the need for parallel operation and what are the conditions to be met while connecting DC generator parallel	CO1	6 Marks
	b)	A separately excited generator when running at 1200 r.p.m supplies a current of 200A at 125V to circuit of constant resistance. What will be the current when the speed drops to 1000 r.p.m, if the field current is unaltered? Armature resistance is 0.04Ω and the total voltage drop at the brushes is 2V. Ignore the change in armature reaction.	CO4	8 Marks

UNIT-IV

7	a)	Describe the methods of speed control of dc shunt motor.	CO1	7 Marks
	b)	A 4-pole 220V shunt motor has 540 lap wound conductors. It takes 32A from the supply mains and develops output power of 5.595kW. The field winding takes 1A. The armature resistance of 0·09Ω and flux per pole is 30mWb. Calculate (i) the speed and (ii) the torque developed in N-m.	CO4	7 Marks
		(OR)		
8	a)	Describe the operation of three point starter with a neat sketch.	CO1	7 Marks
	b)	The speed of a 37.3kW series motor working on 500V supply is 750 r.p.m at full load and at 90 % efficiency. If the load torque is made 350N-m and a 5Ω resistance is connected in series with the machine, calculate the speed at which the machine will run. Assume the magnetic circuit to be unsaturated and the armature and field resistance to be 0.5Ω.	CO4	7 Marks

UNIT-V

9	a)	Describe about Swinburne's test conducted on DC shunt machines and derive the relations for efficiency (both for generator and motor).	CO1	7 Marks
	b)	A 440V DC shunt motor takes 4A at no load. Its armature and field resistances are 0.4Ω and 220Ω respectively. Estimate the kW output and efficiency when the motor takes 60A on full load.	CO4	7 Marks
		(OR)		
10	a)	Describe with diagram the brake test on a DC shunt motor.	CO1	4 Marks
	b)	The Hopkinson's test on two similar machines gave the following full load results. Line current =48A; Line voltage =110V; Motor armature current=230A; The field currents are 3A and 3.5A. Armature resistance of each machine is 0.035Ω. Calculate the efficiency of each machine assuming a brush contact drop of 1V per brush.	CO4	10 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November - 2019

ELECTROMAGNETIC FIELDS

[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)	State Gauss's Law for static fields. Obtain an expression for the flux density due to an infinite line charge.	CO1	7 Marks
	b)	Point charges of 50nC each are located at A(1,0,0), B(-1,0,0),C(0,1,0) and D(0,-1,0) in free space. Find the total force on the charge at A.	CO4	7 Marks
		(OR)		
2	a)	Using Coulumbs law, derive the expression for flux density **D** due to an infinite sheet of charge placed in z=0 plane.	CO1	7 Marks
	b)	A ring of radius 6m is placed in yz plane. It is centered at the origin. Find the electric field intensity **E** at (8, 0, 0)m. The line charge density is 18 nC/m.	CO4	7 Marks

UNIT-II

3	a)	State current continuity equation and derive the corresponding equation.	CO1	7 Marks
	b)	Define dipole moment. Two dipoles with dipole moments -7 $\mathbf{a}_z$nC/m and 8 $\mathbf{a}_z$ nC/m are located at points (0, 0, 5) and (0, 0, –4). Find the potential at the origin.	CO4	7 Marks
		(OR)		
4	a)	Derive the expression for capacitance of a parallel plate capacitor.	CO4	7 Marks
	b)	Calculate the capacitance of a parallel plate capacitor having a dielectric ε_R=12, plate area of 120 cm^2 and a separation of 4mm.	CO3	7 Marks

UNIT-III

5	a)	Obtain Maxwell's fourth equation in point and integral form.	CO2	7 Marks
	b)	A current sheet $\overline{K} = 9\hat{a}_x$ A/m lies in z = 10 m plane and current filament is located at y = 0, z = 8 m. Determine I in current filament if $\overline{H} = 0$ at P (5, 0, 2) m.	CO4	7 Marks
		(OR)		
6	a)	Plane y=1 carries current **K**=100$\mathbf{a}_z$ mA/m. Find **H** at: i) (0, 0, 1). ii) (1,-3,5).	CO4	7 Marks
	b)	Explain about Toroid.	CO4	7 Marks

UNIT-IV

7	a)	Derive the expression for energy density in magnetic field.	CO1	7 Marks
	b)	Two infinitely long parallel filaments each carry 50 A in the $\mathbf{a}_z$ direction. If the filaments lie in the plane y = 0 and x=10 mm, find the vector force per meter length on the filament passing through the origin.	CO4	7 Marks
		(OR)		
8	a)	Calculate the self inductance per unit length of an infinitely long solenoid.	CO1	7 Marks
	b)	A very long solenoid with 2 x 2cm cross section has an iron core (μr=1000) and 400 turns/meter. It carries a current of 500mA. Find its self inductance /meter.	CO4	7 Marks

UNIT-V

9	a)	Explain the Farday's Law of electromagnetic induction.	CO1	7 Marks
	b)	A copper wire carries a conduction current of 1 ampere at 60 Hz .What is the displacement current in the wire? For copper assume $\varepsilon = \varepsilon 0$, $\mu = \mu 0$, $\sigma = 5.8 \times 10^7$mhos.	CO2	7 Marks

(OR)

10	a)	Explain the inconsistency of Ampere's circuit law and how it is modified for time varying fields.	CO1	7 Marks
	b)	Given the fields V = 80z cos x cos 3×10^8t kV and $\mathbf{A}$=26.7$\mathbf{z}$ sin x sin 3×10^8 t $\mathbf{a}_z$mWb/m in free space, find **E** and **H.**	CO4	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November - 2019

SIGNALS, SYSTEMS AND NETWORKS

[Electrical and Electronics Engineering]

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

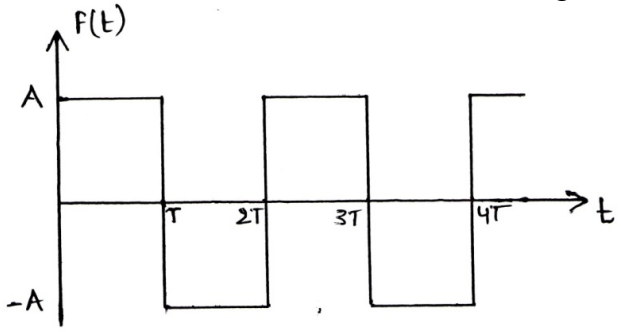
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Find whether $x(t) = Ae^{-\alpha t}\, u(t)$, $\alpha > 0$ is an energy signal or not.	CO2	7 Marks
	b)	Find the convolution of the following signals $x(t) = e^{-2t}\, u(t)$ and $h(t) = u(t+2)$.	CO2	7 Marks
		(OR)		
2	a)	Determine the unit step response of the following system whose impulse response is $h(t) = e^{-5t}\, u(t-2)$.	CO4	8 Marks
	b)	Define stability and derive the necessary and sufficient condition for stability.	CO1	6 Marks

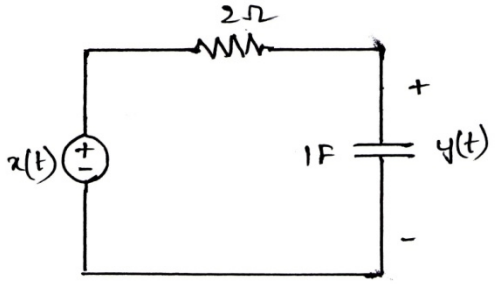
UNIT-II

3	a)	Verify the initial value theorem for the following functions: (i) $5e^{-4t}$ (ii) $2 - e^{5t}$	CO5	8 Marks
	b)	Find the Laplace transform of the waveform shown in figure.	CO2	6 Marks



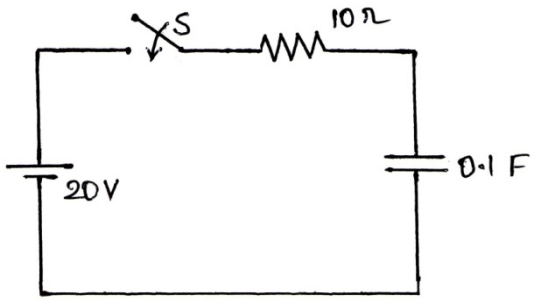
(OR)

4	a)	Compare Fourier transforms and Laplace transforms.	CO1	6 Marks
	b)	Determine the output voltage $y(t)$, if the input signal defined by $x(t) = 1 + 4\,(cost + cos2t + cos3t + cos4t)$ is applied to the circuit shown in figure using Fourier transforms.	CO5	8 Marks



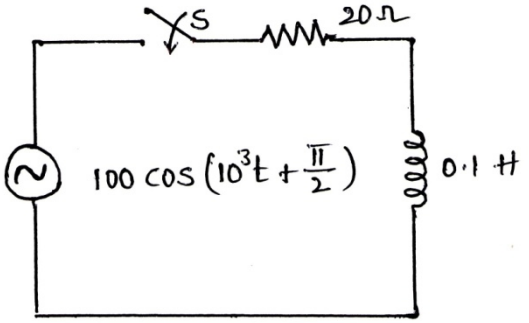
UNIT-III

5	a)	Derive the expressions for current and voltage across inductance of a series RL circuit for a DC excitation.	CO1	8 Marks
	b)	A series RC circuit consists of resistor of 10Ω and capacitor of 0.1F as shown in figure. A constant voltage of 20V is applied to the circuit at t = 0. Obtain the current equation and also determine voltage across resistor and capacitor.	CO6	6 Marks



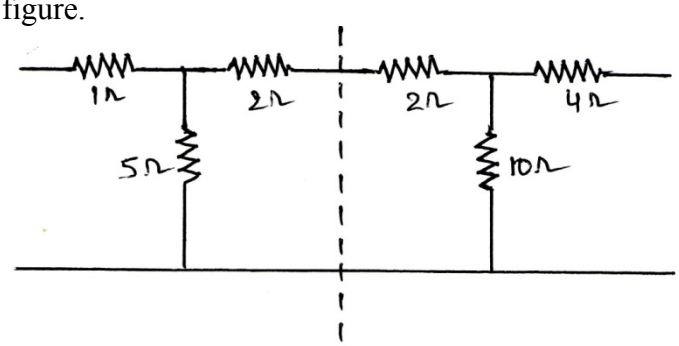
(OR)

6	a)	Derive the expression for current of a series RC circuit for a sinusoidal input.	CO1	8 Marks
	b)	In the circuit shown in figure, determine the complete solution for the current, when switch ***S*** is closed at $\underline{t}$ = 0. Applied voltage is $v(t) = 100\cos\left(10^3 t + \frac{\pi}{2}\right)$. Resistance R = 20 **Ω** and inductance L= 0.1 H.	CO6	6 Marks



UNIT-IV

7	a)	The impedance parameters of a two port network are $Z_{11} = 6\Omega$, $Z_{22} = 4\Omega$, $Z_{12} = Z_{21} = 3\Omega$. Compute the Y parameters, ABCD parameters and write the describing equations.	CO4	7 Marks
	b)	Calculate the overall transmission parameters for the cascaded network shown in figure.	CO4	7 Marks



(OR)

8	a)	Express ABCD parameters in terms of Z parameters and Y parameters.	CO4	7 Marks
	b)	Given $Z_{11} = 3\Omega$, $Z_{12} = 1\Omega$, $Z_{21} = 2\Omega$, $Z_{22} = 2\Omega$. Find the admittance matrix and also find the product of **Δ**Y and **Δ**Z.	CO4	7 Marks

UNIT-V

9	a)	Derive the design equations for m- derived low pass filter.	CO2	9 Marks
	b)	Design a low pass π-section filter and low pass T- section filter having a cut-off frequency of 2kHz to operate with a terminal load resistance of 500**Ω.**	CO3	5 Marks

(OR)

10	a)	Derive the expression for Impedance of a constant K-high pass filter.	CO2	8 Marks
	b)	Design a band elimination filter having a design impedance of 600**Ω** and cut-off frequencies f_1 = **2*kHz*** and f_2 = **6*kHz***.	CO3	6 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November - 2019

ELECTRICAL TECHNOLOGY

[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)	A 4-pole, long-shunt lap-wound generator supplies 25kW at a terminal voltage of 500V. The armature resistance is 0.03Ω, series field resistance is 0.04Ω and shunt field resistance is 200Ω. The brush drop may be taken as 1.0V. Determine the E.M.F. generated. Also calculate number of conductors if the speed is 1200 r.p.m. and flux per pole is 0.02Wb. Neglect armature reaction.	CO4	7 Marks
	b)	How the DC generators are classified. Explain with neat circuit diagrams.	CO1	7 Marks
		(OR)		
2	a)	Explain the flux and armature speed control methods of a DC motor and explain their merits and demerits.	CO5	7 Marks
	b)	Draw different types of characteristics of a DC shunt motor and explain.	CO2	7 Marks

UNIT-II

3		A 7kVA 200/1000V, 50Hz, single-phase transformer gave the following test results: O.C Test (L.V. Side): 2000V, 1.2A, 90W S.C Test (H.V. Side): 50V, 5A, 110W. i) Calculate the parameters of the equivalent circuit referred to the L.V side. ii) Calculate the output secondary voltage when delivering 3 kW at 0.8 p.f. lagging, the input primary voltage being 200V and also find the percentage regulation.	CO4	14 Marks
		(OR)		
4	a)	Derive the expression for induced E.M.F in a transformer in terms of frequency, maximum value of flux and number of turns on the windings.	CO2	7 Marks
	b)	In a 20kVA, 2000/200V, single-phase transformer, the iron and full-load copper losses are 350W and 400 W respectively. Calculate the efficiency at unity power factor on (i) full load (ii) half full-load.	CO4	7 Marks

UNIT-III

5	a)	Derive the expressions of phase and line quantities in delta connected network.	CO2	7 Marks
	b)	Three similar coils each having resistance of 10Ω and reactance 8Ω are connected in star across a 400V, 3 phase supply. Determine the line current, total power and reading of each wattmeters connected to measure power.	CO4	7 Marks
		(OR)		
6	a)	A balanced delta-connected load of (2+j3)Ω per phase is connected to a balanced three phase 440V supply. The phase current is 10A. Find the: i) Total active power. ii) Reactive power. iii) Apparent power in the circuit.	CO4	7 Marks
	b)	The two wattmeter method is used to measure power in a three-phase load. The wattmeter readings are 400W and -35W. Calculate: i) Total active power. ii) Power factor. iii) Reactive power.	CO4	7 Marks

UNIT-IV

7	a)	Explain the constructional details of the three phase induction motor.	CO1	7 Marks
	b)	Draw and explain the slip-torque characteristics of a 3-phase induction motor.	CO2	7 Marks

(OR)

8	a)	Discuss the constructional features of salient pole synchronous machines.	CO1	4 Marks
	b)	List out the applications of an alternator.	CO6	3 Marks
	c)	A 3-phase, 16-pole alternator has a star-connected winding with 144 slots and 10 conductors per slot. The flux per pole is 30mWb sinusoidally distributed. Find the frequency, the phase and line voltage if the speed is 375 r.p.m.	CO4	7 Marks

UNIT-V

9		Explain the construction features and principle of operation of a shaded pole Induction motor.	CO1	14 Marks

(OR)

10		Explain the working of Split phase capacitor–start induction motor with a neat diagram.	CO1	14 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November - 2019

ENGINEERING METALLURGY
[Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Enumerate various ores which yield ferrous metals.	CO1	6 Marks
	b)	State advantages and disadvantages of "Bessemer Process".	CO2	8 Marks
		(OR)		
2		Explain the construction and working of "Cupola Furnace".	CO4	14 Marks

UNIT-II

3		What is peritectic system? Explain the system with an equilibrium diagram.	CO2	14 Marks
		(OR)		
4		State Gibbs Phase rule and explain the term "invariant reaction" with an example.	CO3	14 Marks

UNIT-III

5	a)	Explain annealing process in detail.	CO3	8 Marks
	b)	Discuss the limitations of Austempering and Martempering.	CO3	6 Marks
		(OR)		
6		Sketch and compare TTT and CCT diagrams.	CO3	14 Marks

UNIT-IV

7		What is meant by carburizing? Explain method of carburizing.	CO3	14 Marks
		(OR)		
8		Explain about Transmission Electron Microscope with neat sketch.	CO5	14 Marks

UNIT-V

9	a)	What are the advantages and applications of powder metallurgy?	CO4	7 Marks
	b)	Define sintering. State and describe various stages and process variables of sintering.	CO4	7 Marks
		(OR)		
10		Briefly explain various methods of preparing metal powders.	CO6	14 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November - 2019

KINEMATICS OF MACHINERY

[Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

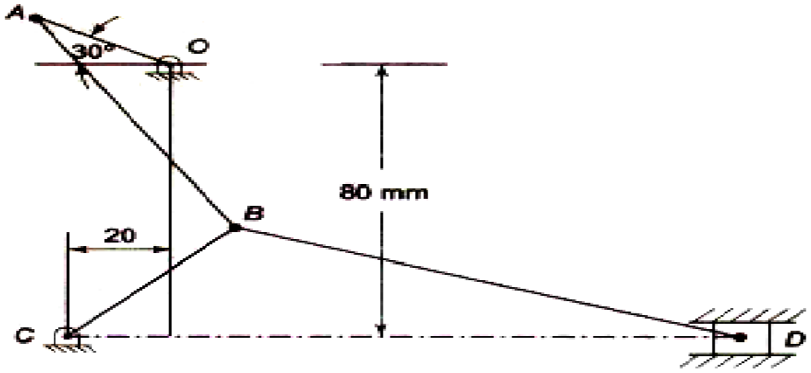
1	a)	Differentiate between the crank and slotted lever and Whitworth quick return mechanisms with neat sketches.	CO1	8 Marks
	b)	The Whitworth quick return motion mechanism has the driving crank 120mm long. The distance between fixed centres is 80mm. The line of stroke of the ram passes through the centre of rotation of the slotted lever whose free end is connected to the ram by a connecting link. Find the ratio of time of cutting to time of return.	CO1	6 Marks

(OR)

2	a)	i) "Various mechanisms can be created by changing the position of fixed link in a mechanism". Elaborate with examples. ii) Sketch and explain any two inversions of a slider crank chain.	CO1	8 Marks
	b)	Distance between two parallel shafts connected by oldham's coupling is 25mm. Determine maximum speed of sliding of tongue of intermediate piece in the slot in the flange if driving shaft is run at 250 r.p.m.	CO1	6 Marks

UNIT-II

3		The dimensions of the various links of the mechanism shown in figure are OA =30mm. AB = 75 mm, BC =45mm and BD = 110mm. The crank OA rotates at 150 r.p.m. Determine the velocity of slider D and angular speeds of links AB, BC and BD by Instantaneous centre method.	CO2	14 Marks



(OR)

4		In a four link mechanism, the dimensions of the links are AB=200mm, BC=400mm, CD=450mm and AD=600mm. At the instant when DAB=60°, the link AB has angular velocity of 36rad/sec in the clockwise direction. Determine (i) The velocity of point C, (ii) The velocity of point E on the link BC when BE =150 mm (iii) the angular velocities of links BC and CD (iv) acceleration of link BC.	CO2	14 Marks

UNIT-III

5	a)	Explain how Grass- Hopper mechanism and Watt mechanism generate approximate straight-line motion.	CO3	8 Marks
	b)	The angle between the axes of two shafts joined by Hooke's joint is 250. The driving shaft rotates at a uniform speed of 180 r.p.m, The driven shaft carries study load of 7.5 kW. Calculate the mass of the fly wheel of the driven shaft if its radius of gyration is 150mm and the out put torque of the driven shaft does not vary by more than 15% of the input shaft.	CO3	6 Marks

(OR)

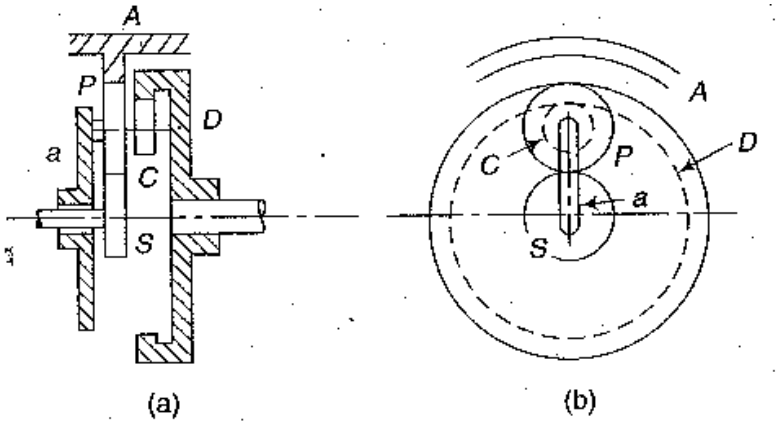
6	a)	Derive the condition for correct steering.	CO3	7 Marks
	b)	The Distance between the steering pivots of a Davis Steering gear is 1.3m. The wheel base is 2.75 metres. What will be the inclination of the track arms to the longitudinal axis of the vehicle if it is moving in a straight path?	CO3	7 Marks

UNIT-IV

7		A 20 involute pinion with 20 teeth drives a gear having of teeth module is 8mm and addendum of each gear is 10mm. (i) State whether interference occurs or not (ii) Find the length of path of approach and are of approach if pinion is the driver	CO4	14 Marks

(OR)

8		In a reduction gear shown in figure, the input S has 24 teeth; P and C constitute a compound planet having 30 and 18 teeth respectively. If all the gears are of the same pitch, find the speed ratio of the reduction gear. Assume A to be fixed.	CO4	14 Marks



UNIT-V

9		A cam operating a knife - edged follower has the following data. Follower moves outwards through 50mm during 120° of cam rotation. Follower dwells for the next 45°. Follower returns of its original position during next 90°. Follower dwells for the rest of the rotation. The displacement of the follower is to take place with outward and uniform acceleration and deceleration motion during the outward and the 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 200 r.p.m.	CO5	14 Marks

(OR)

10		A cam operating a roller follower with radius of 15mm has the following data. Follower moves outwards through 40mm during 90° of cam rotation. Follower dwells for the next 45°. Follower returns of its original position during next 90°. Follower dwells for the rest of the rotation. The displacement of the follower is to take place with cycloidal motion during the SHM during the return strokes. The least radius of the cam is 50mm. Draw the profile of the cam with radial follower, 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.	CO5	14 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November - 2019

MANUFACTURING TECHNOLOGY

[Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Sketch and describe the different types of moulding boxes you know.	CO1	7 Marks
	b)	Write short notes on the following, giving suitable sketches wherever necessary: i) Cope and drag patterns. ii) Skeleton patterns. iii) Match plate patterns.	CO2	7 Marks
		(OR)		
2	a)	What is a core? How many types of cores are there? Explain them with the help of sketches.	CO3	7 Marks
	b)	Explain about shrinkage allowance. How is it provided for patterns?	CO2	7 Marks

UNIT-II

3	a)	Sketch and explain the construction and operation of a hot chamber die casting machine.	CO3	7 Marks
	b)	Name the various defects which occur in sand castings and state their probable causes and remedies.	CO3	7 Marks
		(OR)		
4	a)	Write a short notes on the following casting defects: i) Misrun and cold shuts. ii) Sand inclusions. iii) Metal penetration.	CO4	7 Marks
	b)	What do you understand from destructive and non-destructive testing methods of inspecting the castings?	CO5	7 Marks

UNIT-III

5	a)	What is 'hot working'? What are the common hot working processes? What are the advantages of hot working over cold working of metals?	CO5	7 Marks
	b)	How many types of rolling mills are in commercial use? Sketch and describe the types of rolls used in rolling mills.	CO5	7 Marks
		(OR)		
6	a)	Differentiate between hot and cold working of metals.	CO4	7 Marks
	b)	Explain the working principle of drawing and how wires were drawn by drawing process.	CO4	7 Marks

UNIT-IV

7	a)	With a neat sketch, explain about submerged arc welding process.	CO1	7 Marks
	b)	Write short notes on types of flames used in gas welding process.	CO1	7 Marks
		(OR)		
8	a)	What is resistance welding? With a neat sketch, write about spot welding process.	CO4	7 Marks
	b)	Describe about ultrasonic welding process.	CO4	7 Marks

UNIT-V

9	a)	What are plastics? How do thermosetting plastics differ from thermoplastics?	CO5	7 Marks
	b)	What are the common properties of plastics?	CO1	7 Marks
		(OR)		
10	a)	Describe the following plastic processing methods with the help of neat sketches: i) Compression moulding. ii) Transfer moulding. iii) Injection moulding.	CO4	7 Marks
	b)	Describe about various materials which are added to the polymers to make them plastics.	CO5	7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November - 2019

STRENGTH OF MATERIALS

[Mechanical Engineering]

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

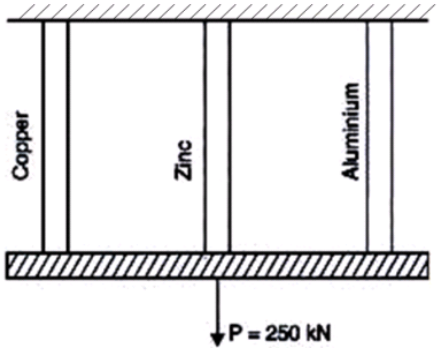
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Briefly explain the following: i) Types of stresses. ii) Hooke's law. iii) Poisson's ratio.	CO1	4 Marks
	b)	A tensile test was conducted on a mild steel bar. The following data was obtained from the test: Diameter of the steel bar = 20 mm; Gauge length of a bar =150 mm; Load at the elastic limit = 200 kN; Extension at a load of 100kN = 0.2 mm; Maximum load = 300 kN; Total extension = 50 mm; Diameter of the rod at the failure = 12.5 mm; Determine: i) Young's modulus, ii) Stress at the elastic limit, iii) Ultimate stress, iv) Percentage elongation and v) Percentage decrease in area.	CO4	10 Marks

(OR)

2	a)	Three bars made of Copper, Zinc and Aluminium are of equal length and have cross sectional areas 500mm², 750mm² and 1000mm² respectively. They are rigidly connected at their ends. If this composite bar is subjected to a load of 250kN as shown in figure, estimate the load carried by each rod and the stress induced in each rod. Take the values of E for Copper =1.3 x 10^5N/mm², E for Zinc =1 x 10^5N/mm² and E for Aluminium = 0.8 x 10^5N/mm².	CO2	9 Marks



	b)	A steel bar, 1m long is 40mm diameter for 0.4m of its length and 60mm diameter for the remainder. Determine the strain energy stored in the bar when the maximum stress is 200MPa. Take E = 200GPa.	CO2	5 Marks

UNIT-II

3		A beam 9m long is symmetrically supported over a 5m span. The overhanging ends at the left and right carry point loads of 80kN and 60kN respectively, while the length between supports carries a uniformly distributed load of 30kN/m. Draw the shear force, bending moment diagrams and also locate the position and magnitude of the maximum bending moment. Locate the positions of contraflexure.	CO6	14 Marks

(OR)

4	a)	What is point of contraflexure? How many points of contraflexure will normally be there in a doubly overhanging beam? Explain.	CO1	4 Marks
	b)	A beam 10m long and simply supported at each end has a uniformly distributed load of 1kN/m extending from the left end upto the centre of the beam. There is also an anti-clockwise couple of 15kN-m at a distance of 2.5m from the right end. Draw the SF and BM diagrams.	CO6	10 Marks

UNIT-III

5	a)	What do you mean by section modulus? Find the expression for section modulus for rectangular, circular and hollow circular sections in usual notation.	CO1	6 Marks
	b)	A beam of circular section of 100 mm diameter is subjected to a shear force of 5kN. Calculate: i) Average shear stress ii) Maximum shear stress. Also sketch the variation of shear stress along the depth of the beam.	CO2	8 Marks

(OR)

6	a)	A rectangular beam 200mm deep and 300mm wide is simply supported over a span of 8m. What uniformly distributed load per meter the beam may carry, if the bending stress is not to exceed 120 N/mm^2.	CO5	6 Marks
	b)	A hollow shaft having an internal diameter 60% of its external diameter transmits 450kW power at 120rpm. Determine the external diameter of the shaft if the shear stress is not to exceed 60MPa and the twist in a length of 2.5m should not exceed 1°. Take G = 80GPa.	CO5	8 Marks

UNIT-IV

7	a)	Briefly explain Macaulay's method.	CO1	4 Marks
	b)	A beam of length 6m is simply supported at its ends and carries two point loads of 48kN and 40kN at a distance of 1m and 3m respectively from the left support. Find deflection under each load and maximum deflection. Take E = 2 x 10^5 N/mm^2 and I = 8.5 x 10^7 mm^4.	CO4	10 Marks

(OR)

8	a)	Briefly explain the construction of Mohr's circle for plane stress.	CO6	6 Marks
	b)	A cantilever of length 2m carries a uniformly varying load of 25 kN/m at the free end to 75kN/m at the fixed end. If E = 1 x 10^5 N/mm^2 and I = 1 x 10^8 mm^4, determine the slope and deflection of the cantilever at the free end.	CO3	8 Marks

UNIT-V

9	a)	Find an expression for the change in volume of thin cylindrical shell subjected to uniform fluid pressure.	CO1	6 Marks
	b)	A cylindrical shell 90cm long, 20cm internal diameter and 8mm thickness is filled with a fluid at atmospheric pressure. If an additional fluid of 20cm^3 is pumped into the cylinder, find i) the pressure exerted by the fluid on the cylinder and ii) the hoop stress induced. Take E = 2x10^5N/mm^2 and ν = 0.3.	CO2	8 Marks

(OR)

10	a)	Distinguish between thin and thick cylindrical pressure vessels? Also give the expressions for the stresses induced in them due to fluid pressure.	CO1	6 Marks
	b)	A cylinder of a hydraulic ram is 20cm internal diameter. Determine the thickness required to withstand an internal pressure of 45MPa, if the maximum tensile stress and shear stress are limited to 95MPa and 80MPa respectively.	CO5	8 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November - 2019

THERMODYNAMICS

[Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Discuss about Thermodynamic Equilibrium.	CO1	6 Marks
	b)	A gas in a piston cylinder assembly undergoes an expansion process for which the relationship between pressure and volume is given by PVn=constant. The initial pressure is 0.3MPa, the initial volume is 0.1m^3, final volume is 0.2m^3. Determine the work for the process in kJ, if; i) n=1.5. ii) n=0. iii) n=1.	CO1	8 Marks
		(OR)		
2	a)	What is quasi-static process? What is its characteristic feature?	CO1	6 Marks
	b)	A gas contained within a piston–cylinder assembly undergoes three processes in series: **Process 1–2:** Constant volume from p1 =1 bar, V1 = 4m^3 to state 2, where p2 =2 bar. **Process 2–3:** Compression to V3 =2m^3, during which the pressure–volume relationship is pV= constant. **Process 3–4:** Constant pressure to state 4, where V4 =1m^3. Sketch the processes in series on p–V coordinates and evaluate the work for each process, in kJ.	CO1	8 Marks

UNIT-II

3	a)	Classify internal energy, enthalpy, work, pressure, volume and heat into point functions and path functions.	CO1	6 Marks
	b)	Air enters a compressor operating at steady state at a pressure of 1 bar, a temperature of 290 K and a velocity of 6m/s though an inlet with an area of 0.1m^2. At exit, pressure is 7 bar, the temperature is 450K and the velocity is 2m/s. Heat transfer from the compressor to the surrounding occurs at a rate of 3kJ/s. Calculate power input to the compressor.	CO2	8 Marks
		(OR)		
4	a)	State the Kelvin-Planck and Clausius statements of second law of thermodynamics.	CO2	6 Marks
	b)	A heat engine having an efficiency of 70% is used to drive a refrigerator having a coefficient of performance of 5. Find the ratio of the energy absorbed by the refrigerator for each kJ of energy absorbed from high temperature source by the engine.	CO2	8 Marks

UNIT-III

5	a)	Show that entropy is a property of the system.	CO3	6 Marks
	b)	An adiabatic vessel contains 3kg of water at 27^{0}C. By Paddle-wheel work transfer, the temperature of water is increased to 32^{0}C. If Cp of water = 4.187 kJ/kg K, find the entropy change of the universe.	CO3	8 Marks
		(OR)		
6	a)	State and prove Clausius theorem.	CO3	6 Marks
	b)	Two kg of water at 90^{0}C is mixed adiabatically with 3.5 kg of water at 20^{0}C in a constant pressure of 1 atmosphere. Find the increase in the entropy of the total mass of water due to the mixing process (Cp of water = 4.187 kJ/kg K).	CO3	8 Marks

UNIT-IV

7	a)	What do you understand by triple point?	CO4	6 Marks
	b)	A vessel of volume $0.04m^3$ contains a mixture of saturated water and saturated steam at a temperature of 250^0C. The mass of the liquid present is 9 kg. Find the pressure, mass, specific volume, enthalpy, entropy and the internal energy.	CO4	8 Marks

(OR)

8	a)	State Dalton's law of partial pressures.	CO4	6 Marks
	b)	Explain the measurement of quality of steam by separating and throttling calorimeter with a neat sketch.	CO4	8 Marks

UNIT-V

9	a)	Explain the working of compression ignition engine.	CO5	6 Marks
	b)	In an air standard Diesel cycle, the compression ratio is 15, and at the beginning of isentropic compression, the temperature is 15^0C and the pressure is 0.15MPa. Heat is added until the temperature at the end of the constant Pressure process is 140^0C. Calculate: i) the cut-off ratio. ii) the cycle efficiency.	CO5	8 Marks

(OR)

10	a)	Explain the working of Spark ignition engine.	CO5	6 Marks
	b)	An air-standard dual cycle with a compression ratio of 14 has the minimum temperature and pressure of 300K and 0.95 bar, respectively. The cylinder volume is 3 litres and 6.5 kJ of energy is added as heat of which one-third is added at constant volume and the rest at constant pressure. Calculate the maximum pressure in the cycle, the temperature of the gas before and after the constant pressure energy addition, the energy rejected as heat and thermal efficiency of the cycle. For air Cv = 0.717 kJ/kg.K.	CO5	8 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November – 2019

ELECTRONIC CIRCUIT ANALYSIS AND 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)	Draw the Common Emitter amplifier with an Emitter resistance and derive the expressions for A_V, A_I, R_i using simplified CE hybrid model.	CO2	10 Marks
	b)	Compare the transistor amplifiers in CE, CB and CC configurations in terms of A_V, A_I, R_i and R_O.	CO1	4 Marks

(OR)

2	a)	Derive the expression for the overall gain of a multistage amplifier in terms of the individual voltage gain.	CO2	8 Marks
	b)	A multistage amplifier consists of three stages. The voltage gains of three stages are 30, 50 and 80. Calculate the overall voltage gain in dB.	CO4	6 Marks

UNIT-II

3	a)	Derive the expression for Common Emitter current gain with resistive load at high frequencies.	CO1	7 Marks
	b)	At I_C = 1mA and V_{CE} = 10V, a certain transistor data shows $C_{b'c}$ = 3pF, h_{fe} = 200 and ωT=500Mrad/sec. Calculate g_m, $r_{b'e}$, $C_{b'e}$, and ω_β.	CO4	7 Marks

(OR)

4	a)	Draw the FET high frequency model for common drain amplifier configuration and derive the expressions for voltage gain, input impedance and output impedance.	CO2	8 Marks
	b)	Compare the high frequency model of FET with that of BJT and discuss about merits and demerits.	CO1	6 Marks

UNIT-III

5	a)	List the advantages and disadvantages of negative feedback amplifiers.	CO1	4 Marks
	b)	With the help of neat block diagram, derive the transfer function, input resistance and output resistance with feedback for voltage shunt feedback amplifier.	CO2	10 Marks

(OR)

6	a)	In the Colpitts oscillator, C_1 = 0.2μF and C_2 = 0.02μF. If the frequency of oscillator is 10KHz, find the value of inductor. Also find the required gain for oscillation.	CO4	4 Marks
	b)	Explain the operation and derive an expression for frequency of oscillations of RC phase shift oscillator using BJT.	CO2	10 Marks

UNIT-IV

7	a)	Distinguish between power amplifiers and voltage amplifiers. Discuss the second harmonic distortion method and determine the total harmonic distortion of a power amplifier.	CO1	8 Marks
	b)	A power transistor dissipates 4W. If $T_{j,max}=80^0$C, determine the maximum ambient temperature at which it can be operated. Assume thermal resistance to be 8^0C/W.	CO4	6 Marks

(OR)

8	a)	A class B push-pull amplifier is supplied with V_{CC} = 40V. The signal swings the collector voltage down to V_{min} = 10V. The total power dissipation in both transistors is 40W. Find the total power input, total power developed across the load, power rating of each transistor and overall efficiency.	CO4	10 Marks
	b)	What is meant by cross over distortion and suggest the methods to overcome this problem?	CO2	4 Marks

UNIT-V

9	a)	A single tuned transistor amplifier is used to amplify modulated RF carrier of 500KHz and bandwidth of 20KHz. The circuit has a total output resistance Rt = 40KΩ and output capacitance Co = 50pF. Calculate the values of inductance and capacitance of the tuned circuit.	CO4	8 Marks
	b)	Explain the frequency response of stagger tuned amplifier.	CO1	6 Marks

(OR)

10	a)	Draw the circuit diagram of a Double tuned amplifier and derive the expression for voltage gain.	CO2	10 Marks
	b)	Compare single tuned, double tuned and stagger tuned amplifiers.	CO1	4 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November - 2019

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) Show that all finite periodic signals are power signals. CO1 7 Marks

b) An arbitrary real valued continuous time signal $x(t)$ occupies the entire internal $-\infty < x(t) < \infty$. Show that the energy of the signal $x(t)$ is equal to the sum of the energy of the even component $x_e(t)$ and the energy of the odd component $x_0(t)$. CO2 7 Marks

(OR)

2 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. CO1 10 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.
[i.e; $|x(n)|<B_x$], 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) Prove that if $x(t) * h(t) = y(t)$ then, CO2 4 Marks

i) $x(at) * h(at) = \frac{1}{|a|} y(at)$

ii) $\left(\frac{d}{dt}x(t)\right) * h(t) = \frac{d}{dt}y(t)$

UNIT-II

3 a) Suppose we are given the following information about a signal $x(t)$: CO5 7 Marks

i) $x(t)$ is real.
ii) $x(t)$ is periodic with period T=6 and has Fourier coefficients X_n.
iii) $x_n=0$ for $n = 0$ and $n > 2$.
iv) $x(t)=-x(t-3)$.
v) $\frac{1}{6}\int_{-3}^{3} |x(t)|^2 dT = \frac{1}{2}$ (vi) X_1 is a positive real number.

Show that $x(t)=A\cos(Bt + C)$, and determine the values of the constants A, B and C

b) Find the Fourier series for the Full Wave rectifier. CO5 7 Marks

(OR)

4 a) Prove that the power spectral density of the periodic signal $x(t)$ with period T is $G_x(\omega) = 2\pi \sum_{n=-\infty}^{\infty} |X_n|^2 \delta(\omega - n\omega_0)$ Where X_n are the Fourier series coefficients of $x(t)$ and $\omega_0 = \frac{2\pi}{T}$. CO2 7 Marks

b) Find the Fourier Transform of the signal . CO5 7 Marks

i) $g(t)=A\,\mathrm{sinc}\left(\frac{t}{2\pi}\right)$. ii) $g(t) = \frac{1}{1+t^2}$

UNIT-III

5	a)	Find the autocorrelation function $R_{xx}(\tau)$ of sine wave signal $x(t) = A \sin(\omega_0 t+\varphi); \omega_0 = \frac{2\pi}{T}$	CO4	7 Marks
	b)	State and prove the properties of cross correlation for a periodic signal.	CO1	7 Marks
		(OR)		
6	a)	State and prove wiener khintchine theorem.	CO1	8 Marks
	b)	Derive the relation between convolution and correlation.	CO5	6 Marks

UNIT-IV

7	a)	State and prove final value theorem of Laplace Transform.	CO1	4 Marks
	b)	Find the Laplace Transform and plot its ROC for the signal i) $x(t)=\sin h(\omega_0 t)\, u(t)$; ii) $x(t)=t^n\, u(t)$	CO5	10 Marks
		(OR)		
8		Check whether the following LTI system is Causal (or) Anti causal using ROC Properties of Laplace Transform for i) $H(S) = \frac{1}{S^2 + 5S + 6}$ for $R\{S\} > -2$. ii) $H(S) = \frac{1}{S^2 + 5S + 6}$ for $R\{S\} < -3$ $\mathbf{2s}$ iii) $H(S)=(e\ ) / S+1$ for $R\{S\} > -1$.	CO5	14 Marks

UNIT-V

9	a)	Explain the relation between *Z*-transform and Laplace Transform using *Z*-plane to *S*-plane mapping.	CO1	7 Marks
	b)	Specify the Nyquist rate and Nyquist interval for each of the following signals: i) $x(t)=\sin c(200t)$; ii) $x(t)=\sin c^2(200t)$; iii) $x(t)=\cos(150\pi t)\sin(100\pi t)$.	CO1	7 Marks
		(OR)		
10	a)	Find the inverse *Z*-transform: i) $x(z) = \frac{1}{1 - 2z^{-1}}$ for $\lvert z\rvert>2$. ii) $x(z) = \frac{1}{1 - 1.5z^{-4}0.5z^{-2}}$ *for* $\lvert z\rvert > 1$ using contour integration method	CO5	8 Marks
	b)	Find the unilateral Z-transform of the following signals. i) $x(n+1)$. ii) $x(n+2)$.	CO5	6 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November - 2019

SWITCHING THEORY AND LOGIC DESIGN

[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)	Reduce the following Boolean expression i) $F = AB + \overline{AC} + A\overline{B}C(AB + C)$ ii) $F = (AB + C + D)(\overline{C} + D)(\overline{C} + D + E)$	CO5	8 Marks
	b)	Convert the given expression in the standard SOP form. i) $Y(A,B,C) = A+AB+ABC$ ii) $F(A,B,C) = AB + \overline{C}D + A\overline{B}C$	CO1	6 Marks
		(OR)		
2	a)	Apply De Morgan's theorem to reduce each of the following expressions. i) $\overline{\overline{A\overline{B} + ABC} + A(B + A\overline{B})}$ ii) $\overline{(A + \overline{B})(\overline{A} + B)}$ iii) $\overline{\overline{\overline{ABCD}}}$	CO4	7 Marks
	b)	Express the following Boolean functions to minterms and maxterms. i) $F(W,X,Y,Z) = \overline{W}\,\overline{X}Y\overline{Z} + \overline{W}\,\overline{X}YZ + \overline{W}X\overline{Y}\,\overline{Z} + \overline{W}X\overline{Y}Z + WX\overline{Y}Z$ ii) F(W,X,Y,Z) = $(W+X+\overline{Y}+Z)\ (W+\overline{X}+Y+Z)\ (\overline{W}+X+\overline{Y}+\overline{Z})$ $(\overline{W}+\overline{X}+Y+Z)\ (\overline{W}+\overline{X}+Y+\overline{Z})$	CO4	7 Marks

UNIT-II

3	a)	Using Karnuagh map, determine the minimal sums for each of the following Boolean functions. i) $F(W,X,Y,Z) = \Sigma m(2, 6, 7, 8, 9, 10, 12, 13) + dc(0, 1, 4)$ ii) $F(W,X,Y,Z) = \Sigma m(0, 2, 6, 8, 10) + dc(1, 4)$	CO2	9 Marks
	b)	Simplify the following using K- map and implement the same using NAND gates. $Y(A,B,C) = \sum(0, 2, 4, 5, 6, 7)$.	CO4	5 Marks
		(OR)		
4		Simplify the following Boolean expressions using K-map and implement it by using NOR gates.		
		i) $F(A,B,C,D) = A\overline{B}\,\overline{C} + AC + \overline{A}C\overline{D}$	CO4	7 Marks
		ii) $F(W, X, Y, Z) = \overline{W}\,\overline{X}\,\overline{Y}\,\overline{Z} + WX\overline{Y}\,\overline{Z} + \overline{W}\,\overline{X}YZ + WXYZ$	CO4	7 Marks

UNIT-III

5	a)	Design and implement a two bit comparator using logic gates.	CO6	7 Marks
	b)	Design a 1:8 demultiplexer using two 1:4 demultiplexers.	CO3	7 Marks
		(OR)		
6	a)	Construct the 4 bit parallel adder with look ahead carry generation.	CO6	7 Marks
	b)	Implement f (A,B,C,D) = $\sum(0, 1, 3, 5, 6, 8, 9, 11, 12, 13)$ using 8:1 MUX	CO2	7 Marks

UNIT-IV

7	a)	With the aid of external logic, convert D type flip-flop to a JK flip-flop.	CO5	7 Marks
	b)	Design a synchronous modulo-12 counter using NAND gates and JK flip flops.	CO3	7 Marks

(OR)

8	a)	Design a mod-10 Ripple counter using T flip flops and explain its operation.	CO3	7 Marks
	b)	Draw the schematic circuit of an edge-triggered JK flip flop with active low preset and active low clear using NAND gates and explain its operation.	CO3	7 Marks

UNIT-V

9	a)	Design a combinational circuit using PAL for the following function. $y\,(A,B,C,D) = \Sigma\,(0, 2, 3, 4, 5, 6, 7, 8, 10, 11, 15)$	CO3	7 Marks
	b)	Reduce the number of states in the following state table and tabulate the reduced state table.	CO2	7 Marks

PS	NS_1Z	
	x=0	*x*=1
A	D, 0	H, 1
B	F, 1	C, 1
C	D, 0	F, 1
D	C, 0	E, 1
E	C, 1	D, 1
F	D, 1	D, 1
G	D, 1	C, 1
H	B, 1	A, 1

(OR)

10	a)	Design a combinational circuit using ROM. The circuit accepts 3-bit binary number and generates its equivalent excess-3 code.	CO2	8 Marks
	b)	Compare PROM, PLA and PAL.	CO2	6 Marks

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CODE No.:16BT30441 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November - 2019

ANALOG ELECTRONIC 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)	Draw the circuit diagram of hybrid-pi model for a transistor in CE configuration and discuss about the circuit components.	CO1	7 Marks
	b)	Explain the principle of operation of a RC coupled amplifier and mention its advantages and disadvantages.	CO1	7 Marks
		(OR)		
2	a)	Derive an expression for short circuit current gain of CE amplifier and also derive an expression for f_T and f_β.	CO1	7 Marks
	b)	Derive the expressions of Gain Bandwidth product for voltage and current.	CO3	7 Marks

UNIT-II

3	a)	Implement a current series feedback circuit and calculate its input and output resistance.	CO6	8 Marks
	b)	An amplifier with 2.5kΩ input resistance and 50kΩ output resistance has a voltage gain of 100. The amplifier is now modified to provide 5% negative voltage feedback in series with the input. Calculate the voltage gain and the input resistance.	CO4	6 Marks
		(OR)		
4	a)	Write the construction and working of Wein's bridge oscillator and derive the expression of frequency.	CO1	7 Marks
	b)	A turned collector oscillator has a fixed inductance of 100μH and has to be tunable over the frequency band of 500KHz to 1,500KHz. Find the range of variable capacitor to be used.	CO4	7 Marks

UNIT-III

5	a)	Write the construction and working of transformer coupled class A power amplifier.	CO1	8 Marks
	b)	Compare transformer coupled class B push pull and complementary symmetry push pull amplifier.	CO2	6 Marks
		(OR)		
6	a)	Implement phase inverter circuit using transistors. Explain its advantages.	CO6	8 Marks
	b)	A transformer–coupled class A power amplifier draws a current of 200mA from a collector supply of 10V, when no signal is applied to it. Determine maximum output power, maximum collector efficiency and power rating of the transistor.	CO1	6 Marks

UNIT-IV

7	a)	Discuss the response of RC high pass circuit for a square wave input.	CO2	7 Marks
	b)	Explain about diode comparator with neat sketches.	CO1	7 Marks
		(OR)		
8	a)	Draw the basic circuit diagram of positive peak clamper circuit and explain its operation.	CO1	7 Marks
	b)	Explain the principle of clamping. Discuss the effects of source impedance, load resistance and cut-in voltage.	CO1	7 Marks

UNIT-V

9	a)	Sketch the circuit diagram of Schmitt trigger and explain its operation.	CO1	7 Marks
	b)	Explain the working of a collector coupled monostable multivibrator with neat sketch.	CO5	7 Marks

(OR)

10	a)	Show that an astable multivibrator can be used as a voltage-to-frequency converter.	CO1	7 Marks
	b)	Explain the operation of fixed bias bi-stable multivibrator circuit with neat sketches.	CO1	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November - 2019

COMPUTER ORGANIZATION

[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)	Describe different possibilities to represent the register block with at least one example for each.	CO2	7 Marks
	b)	With a neat block diagram, explain the hardware implementation of the control transfers. Give the timing diagram representation by taking one example.	CO2	7 Marks
		(OR)		
2	a)	In how many ways the computer instructions are categorized? Give the representation of instruction format and explain the addressing modes.	CO5	7 Marks
	b)	In how many ways control units can be connected to the basic computer system? Explain any one of the operation with timing diagram.	CO5	7 Marks

UNIT-II

3	a)	Define the interrupt and explain the operation of program control data transfer depending on the interrupt.	CO2	4 Marks
	b)	Sketch the timing diagram for SC is cleared to '0' at time T3 if control signal C7 is active C7T3: SC ← 0, C7 is activated with the positive clock transition associated with T1	CO2	10 Marks
		(OR)		
4	a)	What is the difference between a direct and indirect address instruction?	CO6	4 Marks
	b)	The register transfer statements for a register R and a memory in a computer is as follows. $X3'X1$:R ← $M[AR]$ $X1'X2$: $R \leftarrow AC$ $X1X3$: $M[AR] \leftarrow R$ Draw the hardware implementation of R and the memory in block diagram form with the help of Multiplexer.	CO6	10 Marks

UNIT-III

5	a)	Explain how data transfer takes place between I/O device and processor in a program controlled I/O.	CO1	7 Marks
	b)	Explain how multiple simultaneous interrupt request is handled by the processor.	CO1	7 Marks
		(OR)		
6	a)	Compare three types of mapping procedures mostly used in organization of cache memory.	CO5	7 Marks
	b)	Describe the concept of virtual memory in detail.	CO5	7 Marks

UNIT-IV

7	a)	Explain the Optical Disk Technologies in detail.	CO1	7 Marks
	b)	A block of data is to be transferred between I/O device and processor, explain how this can be accomplished using DMA operation.	CO1	7 Marks
		(OR)		
8	a)	Distinguish difference between RISC and CISC architectures.	CO5	8 Marks
	b)	Convert the Arithmetic expression A*B+C*D+E*F in Reverse polish notation.	CO5	6 Marks

UNIT-V

9	a)	Describe the operation of a 2 bit by 2 bit array multiplier with a neat example.	CO3	6 Marks
	b)	Draw a flowchart to explain how addition and subtraction of two fixed point numbers can be done. Also, draw a circuit using full adders for the same.	CO3	8 Marks

(OR)

10	a)	Explain the organization of the control unit to allow conditional branching in the micro-program.	CO2	7 Marks
	b)	How is a functional field micro instruction generated? Explain.	CO2	7 Marks

CODE No.: 16BT30502 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November - 2019

DATA 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)	Define data structure and explain the importance of data structures in real time applications.	CO1	6 Marks
	b)	Define doubly linked list and write a program for deleting an element from doubly linked list.	CO3	8 Marks
		(OR)		
2	a)	What are the differences between Stacks and Queues.	CO2	6 Marks
	b)	Explain the operations of Circular Linked List with examples.	CO3	8 Marks

UNIT-II

3	a)	Write a program to implement Stack operations using linked lists.	CO3	10 Marks
	b)	Briefly explain the applications of stacks and queues.	CO2	4 Marks
		(OR)		
4	a)	Write a program to implement Queue operations using linked lists.	CO3	8 Marks
	b)	Write an algorithm to perform insertion and deletion operations on a circular queue.	CO2	6 Marks

UNIT-III

5	a)	Write a program for tree traversal techniques.	CO3	7 Marks
	b)	Write a program to implement Min heap.	CO3	7 Marks
		(OR)		
6	a)	Write a program to find the key element in a BST.	CO3	7 Marks
	b)	Explain insertion and deletion operations in AVL tree with examples.	CO4	7 Marks

UNIT-IV

7	a)	Define B-tree and explain its properties.	CO1	6 Marks
	b)	Explain different types of graphs with suitable examples.	CO3	8 Marks
		(OR)		
8	a)	Explain insertion and deletion operations in a B-tree with suitable examples.	CO4	8 Marks
	b)	Discuss briefly simplified B-trees and its applications.	CO5	6 Marks

UNIT-V

9	a)	Write a program to implement Heap sort.	CO5	8 Marks
	b)	Explain different hash functions with examples.	CO5	6 Marks
		(OR)		
10	a)	Write a program to implement Shell sort.	CO4	8 Marks
	b)	Explain different collision resolution techniques in hashing with examples.	CO4	6 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November - 2019

PYTHON PROGRAMMING

[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)	Explain about program translation with an example.	CO1	5 Marks
	b)	Write a Python program that prompts the user for two integer values and displays the result of the first number divided by the second.	CO5	9 Marks
		(OR)		
2	a)	Write in detail about literals in Python.	CO1	7 Marks
	b)	What is a variable? Write about variable assignment in Python.	CO1	7 Marks
		UNIT-II		
3	a)	Write the difference between Definite vs. Indefinite Loops with an example.	CO2	5 Marks
	b)	What is a Dictionary? Write a python script using dictionaries for Temperature Display.	CO1	9 Marks
		(OR)		
4	a)	Explain Lists Traversal procedure with an example.	CO1	7 Marks
	b)	Explain the difference between the lists and tuples in Python.	CO2	7 Marks
		UNIT-III		
5	a)	Differentiate between local scope and global scope in Python.	CO1	5 Marks
	b)	Write a python script to solve towers of Hanoi problem using recursion.	CO3	9 Marks
		(OR)		
6	a)	Explain in detail about exception handling in Python.	CO1	7 Marks
	b)	List out various string methods used in Python.	CO1	7 Marks
		UNIT-IV		
7	a)	Explain the difference between a reference and dereferenced value.	CO2	7 Marks
	b)	Discuss about polymorphism. Explain its use with an example.	CO1	7 Marks
		(OR)		
8	a)	Define Encapsulation. Write in detail the usage of **Getters** and **Setters** methods with an example.	CO1	8 Marks
	b)	Describe automatic garbage collection in Python.	CO1	6 Marks
		UNIT-V		
9		Write a Python script creates a simple application window by adding Checkbuttons, Radiobuttons and Scales using Tkinter and explain the procedure.	CO5	14 Marks
		(OR)		
10		Explain the concept of Top-Level Window Menus, Frame, Menu button-Based Menus in TKinter.	CO1	14 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November - 2019

ELECTRICAL AND ELECTRONICS MEASUREMENTS

[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)	Derive the torque equation of Moving Iron Instrument.	CO1	7 Marks
	b)	Discuss the types of Moving Iron Instruments.	CO1	7 Marks
		(OR)		
2	a)	Analyze and brief about the performance of Ammeter when temperature changes.	CO2	7 Marks
	b)	A moving Coil instrument whose resistance is 25Ω gives a full scale deflection with a voltage of 25mV. This instrument is to be used with a series multiplier to extend its range to 10V. Calculate the error caused by 10^0C rise in temperature. The temperature coefficient of copper is 0.004/^{0}C and that of manganin 0.00015/^{0}C.	CO4	7 Marks

UNIT-II

3	a)	Discuss the construction and working principle of single phase Induction type energy meter.	CO1	7 Marks
	b)	A 220V, 5A **dc** energy meter is tested at its marked ratings. The resistance of the pressure coil is 8000Ω and that of current coil is 0.5Ω. Calculate the power consumed when testing the meter with phantom loading with current circuit excited by a 9V battery.	CO4	7 Marks
		(OR)		
4		Discuss how **emf** can be measured using Potentiometers.	CO1	14 Marks

UNIT-III

5	a)	Select a bridge which can measure the resistance of a copper wire and derive the bridge balancing condition.	CO5	7 Marks
	b)	Analyze the condition for balance of De-Sauty bridge for measurement of Capacitance.	CO2	7 Marks
		(OR)		
6	a)	Derive and analyze the bridge sensitivity equation of Wheatstone bridge.	CO2	7 Marks
	b)	Develop a system to sense the position or angle using variable resistance, where the resistance is varied with the help of a bridge.	CO6	7 Marks

UNIT-IV

7	a)	Select and brief about a device which is used for the measuring low frequencies in industries.	CO5	7 Marks
	b)	Design a simplified composite circuit used in digital frequency meter.	CO3	7 Marks
		(OR)		
8	a)	Analyze the performance of frequency synthesizer used for frequency measurement.	CO2	7 Marks
	b)	Design a circuit used for the time interval measurement.	CO3	7 Marks

UNIT-V

9	a)	Identify an instrument which eliminates the need for fast analog to digital converter.	CO5	7 Marks
	b)	With a neat sketch, explain the Harmonic Distortion Analyzers.	CO1	7 Marks
		(OR)		
10	a)	Classify Strip Chart Recorders and explain in detail.	CO1	7 Marks
	b)	Identify and brief with suitable diagram for the instrument used for recording(x-y axis) of biomedical signals.	CO5	7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November - 2019

SENSORS AND TRANSDUCERS

[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 and explain the following static characteristics of an instrument. i) Accuracy. ii) Linearity. iii) Stability. iv) Resolution.	CO1	8 Marks
	b)	Explain in detail about deflection and null type instruments.	CO6	6 Marks
		(OR)		
2		Describe the standard M.K.S system units and explain in detail about inductance and capacitance standards.	CO6	14 Marks
		UNIT-II		
3		Explain in detail about the static characteristics of transducers.	CO1	14 Marks
		(OR)		
4		Write a short notes on zero, first and second order system.	CO4	14 Marks
		UNIT-III		
5		What is strain gauge? Derive the expression for gauge factor of a strain gauge.	CO2	14 Marks
		(OR)		
6		Explain with a sketch, the construction details, principle of operation and signal conditioning circuits of a capacitive transducer used for differential pressure measurement,	CO5	14 Marks
		UNIT-IV		
7		Define the two sensitivity constants of piezo electric transducer. Derive the relation between the two constants. Also draw the equivalent circuit of piezo electric transducer.	CO3	14 Marks
		(OR)		
8		Draw the input and output characteristics of LVDT. Explain the phase adjustment circuits and null reduction techniques used for LVDT.	CO1	14 Marks
		UNIT-V		
9		Explain with a sketch, the working of an encoder that gives 4-bit digital output proportional to linear displacement. Mention the advantages of digital transducers.	CO5	14 Marks
		(OR)		
10		Explain with a sketch, the working of a fibre-optic displacement transducer. Draw its input and output characteristic.	CO4	14 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November - 2019

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 disjunctive normal form of $\sim (p \vee q) \leftrightarrow (p \wedge q)$.	CO1	7 Marks
	b)	Is $[(p \rightarrow q) \wedge (r \rightarrow s) \wedge (p \vee r)] \rightarrow (q \vee s)]$ a tautology or not? Justify.	CO5	7 Marks
		(OR)		
2	a)	Identify and explain the converse, opposite and contrapositive of the following conditional statement. If the triangle ABC is a right angle triangle then $\|AB\|^2 + \|BC\|^2 = \|AC\|^2$.	CO3	7 Marks
	b)	Write the proof by contradiction that $\sqrt{2}$ is irrational.	CO1	7 Marks

UNIT-II

3	a)	If the relations R and S are reflexive, show that R U S and R ∩ S are also reflexive.	CO2	7 Marks
	b)	Determine the value of $f^1g(x)$ and $hf(g(f^1))$ $(hf(x))$ for the functions f, g and $h : R \rightarrow R$(set of real numbers) defined by $f(x) = x + 2$, $g(x) = 3x + 2$ and $h(x) = 3x$.	CO4	7 Marks
		(OR)		
4	a)	Define distributive lattice. Prove that every chain is a distributive lattice.	CO1	7 Marks
	b)	For the poset { (3, 5, 9, 15, 24, 45), / }, find i) Maximal elements. ii) Minimal elements. iii) Least upper bound of {3, 5}, if it exists. iv) Greatest lower bound of {15, 45}, if it exists.	CO4	7 Marks

UNIT-III

5	a)	Examine whether a semi group with more than one idempotent can be a group or not. Justify your answer by giving an example.	CO2	6 Marks
	b)	Define the following. i) Group. ii) Sub group. iii) Semi group. iv) Isomorphism.	CO1	8 Marks
		(OR)		
6	a)	A binary operation * on the set R of real numbers is defined by $a*b = a + b + 2ab$, where $a,b \in R$. Examine whether $(R, *)$ is a semi-group or not.	CO2	7 Marks
	b)	Justify whether the set of positive integers N is a monoid with respect to the binary operation * defined by a*b = max{a, b} for all a, b ∈ N.	CO5	7 Marks

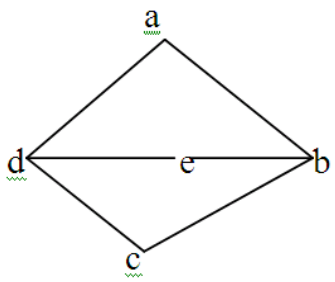
UNIT-IV

7	a)	Among 30 computer science students 15 know Java, 12 know C++ and 5 know both. How many students know i) At least one of the two languages. ii) Exactly one of the languages.	CO4	5 Marks
	b)	In how many ways can 20 students out of a class of 30 students be selected for an extra–curricular activity if; (i) Rama refuses to be selected (ii) Raja insists on being selected.	CO4	4 Marks
	c)	Find the coefficient of x^{20} in $(x + x^2 + x^3 + x^4 + x^5)(x^2 + x^3 + x^4 + \ldots..)^5$.	CO4	5 Marks
		(OR)		

8	a)	Solve the recurrence relation $u_n + 5u_{n-1} + 3u_{n-2} = 0$ for $n \geq 2$, $u_0 = 1$, $u_1 = 2$.	CO4	7 Marks
	b)	What is a recurrence relation? Explain it by giving an example. If $\{a_n\}$ is a sequence that satisfies the recurrence relation $a_n = a_{n-1} - a_{n-2}$ for $n = 2, 3, \ldots$ and $a_0 = 3$, $a_1 = 5$, then find a_2 and a_5.	CO2	7 Marks

UNIT-V

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



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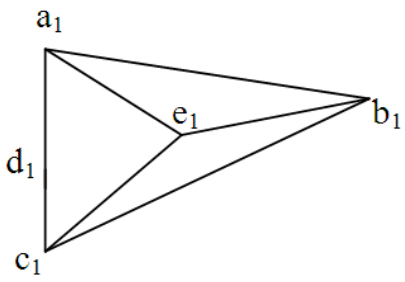

H

	b)	Define the Chromatic number of a graph. Discuss about the Chromatic number of the following graphs. i) Cyclic graph, C_n, $n \geq 3$. ii) Complete bipartite graph $K_{m,n}$ Where m and n are integers.	CO5	7 Marks

(OR)

10	a)	Analyze Breadth first search algorithm with an example.	CO4	7 Marks
	b)	Define Spanning tree**.** Explain Krushkal's algorithm with an example.	CO3	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November - 2019

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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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November - 2019

JAVA PROGRMMING

[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)	Describe in short features of Object Oriented Programming using Java.	CO1	8 Marks
	b)	What is an Object? How to allocate memory for objects?	CO2	6 Marks
		(OR)		
2	a)	Explain the concepts overriding and overloading.	CO1	7 Marks
	b)	Explain in brief	CO1	
		i) Garbage collection		3 Marks
		ii) Constructors		4 Marks

UNIT-II

3	a)	Explain with a suitable program how the package differs from interface.	CO3	6 Marks
	b)	Explain:	CO1	
		i) Abstract class		4 Marks
		ii) Multi-level Hierarchy		4 Marks
		(OR)		
4	a)	Describe interface with example.	CO1	7 Marks
	b)	Explain different types of Inheritance supported in Java.	CO1	7 Marks

UNIT-III

5		What is an exception? How the exceptions are handled in java. Explain in detail with an example.	CO3	14 Marks
		(OR)		
6	a)	What is Thread in java? How to implement Threads in java.	CO3	8 Marks
	b)	Write a Java program which divides two integers with exception handling.	CO3	6 Marks

UNIT-IV

7	a)	What is the role of layout manager in AWT or Swing?	CO4	5 Marks
	b)	What is an applet? How does applet differ from applications?	CO2	4 Marks
	c)	Explain how to read information from the applet parameters.	CO3	5 Marks
		(OR)		
8	a)	Explain any two AWT controls in java with suitable examples.	CO4	7 Marks
	b)	Which classes can an applet extend?	CO1	7 Marks

UNIT-V

9	a)	What are servlets filters?	CO1	7 Marks
	b)	Explain event classes.	CO1	7 Marks
		(OR)		
10	a)	What are the major tasks of servlets?	CO1	5 Marks
	b)	Explain servlet life cycle.	CO1	5 Marks
	c)	Explain the difference between PrintWriter and ServletOutputStream.	CO2	4 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations November - 2019

LINUX PROGRAMMING

[Information Technology]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What is the difference between LINUX and UNIX? "*Operating systems like UNIX provide security and services both for programs and users*". Justify this statement with suitable example.	CO1	7 Marks
	b)	Write a C program that prints out Today's Date and Time in a Unix/Linux environment. Differentiate getopt and getopt_long arguments in detail.	CO1	7 Marks

(OR)

2	a)	Explain GNU project and Free Software Foundation in Linux environment.	CO2	8 Marks
	b)	What is an environment variable? Explain the use of environment variables in Linux.	CO2	6 Marks

UNIT-II

3	a)	Explain the necessity of shell programming in Linux environment.	CO2	7 Marks
	b)	Write a shell script which receives two file names as arguments. It should check whether two files contents are same or not. If they are same the second file should be deleted, Use 'cmp' command to compare file.	CO1	7 Marks

(OR)

4	a)	Define Pipe. Describe about input and output redirection with an example.	CO1	6 Marks
	b)	Write shell scripts on Prime and Fibonacci series by using control structures.	CO1	8 Marks

UNIT-III

5	a)	Explain the following commands with examples: i) Creating a Directory. ii) Copying a file from one directory to another. iii) Moving the Files between Directories. iv) Deleting a Directory and a File.	CO3	6 Marks
	b)	Explain about File descriptors and i-node in detail.	CO2	8 Marks

(OR)

6	a)	Discuss in detail about Low level File I/O System Calls.	CO3	8 Marks
	b)	Write a C Program to create a message queue with read and write permissions and write three messages to it with different priorities.	CO4	6 Marks

UNIT-IV

7	a)	Differentiate thread and process. Write a program to implement orphan process.	CO5	6 Marks
	b)	Explain the following with example: i) Process Creation. ii) Process Termination. iii) Signal Function. iv) Reliable Signals.	CO5	8 Marks

(OR)

8	a)	What is a Zombie process? Write a program to illustrate the working of zombie process.	CO5	7 Marks
	b)	What are Signals that are not ignored and blocked? Explain the reason behind it with a suitable example.	CO5	7 Marks

UNIT-V

9	a)	Compare the IPC functionality provided by pipes and message queues. What are the advantages and drawbacks of each? Explain briefly.	CO6	8 Marks
	b)	What is a FIFO? Why FIFO's are called as named pipes?	CO6	6 Marks

(OR)

10	a)	What is a Socket? Develop a client and server system calls used for UDP Protocol.	CO6	7 Marks
	b)	Explain socket system calls for connection oriented and connectionless protocol.	CO5	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations September - 2020

PROBABILITY DISTRIBUTIONS AND STATISTICAL METHODS

[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) The daily consumption of electric power (in millions of KW-hours) is a random variable having the probability density function CO4 7 Marks

$$f(x) = \begin{cases} \frac{1}{9} x e^{-\frac{x}{3}}, x \geq 0 \\ 0, \quad x < 0 \end{cases}$$

If the total production is 12 million KW- hours, determine the probability that there is power cut (shortage) on any given day.

b) If X and Y are discrete random variables and K is a constant, show that: CO1 7 Marks

i) $E(X + K) = E(X) + K$. ii) $E(X + Y) = E(X) + E(Y)$.

(OR)

2 a) Two dice are thrown. Let X the random variable assign to each point (a, b) in S the maximum of its numbers. Find the probability distribution, the mean and variance of X in the distribution. CO4 7 Marks

b) If X is a continuous random variable and K is a constant, show that: CO4 7 Marks

(i) Var $(X + K)$ = Var(X). ii) Var $(KX) = K^2$ Var (X).

UNIT-II

3 a) If X is a normal variate, find the area A CO4 8 Marks

i) To the left of z = -1.78
ii) To the right of z = -1.45
iii) Corresponding to -0.80≤ z ≤1.53
iv) To the left of z = -2.52 and to the right of z = 1.83.

b) Two dice are thrown five times. Find the probability of getting 7 as sum: CO1 6 Marks

i) at least once. ii) two times. iii) $P(1 < X < 5)$.

(OR)

4 a) Construct a Poisson distribution satisfying the following data and also find the expected frequencies CO3 7 Marks

x	0	1	2	3	4
f	30	62	46	10	2

b) Estimate the mean and standard deviation of a normal distribution in which 7% of terms are under 35 and 89% are under 63. CO4 7 Marks

UNIT-III

5 a) Calculate the co-efficient of correlation between X and Y from the following data. CO4 7 Marks

X	1	2	3	4	5	6	7	8	9
Y	12	11	13	15	14	17	16	19	18

b) The ranks of 16 students in Mathematics and Statistics are as follows. (1,1) (2,10) (3,3) (4,4) (5,5) (6,7) (7,2) (8,6) (9,8) (10,11) (11,15) (12,9) (13,14) (14,12) (15,16) (16,13). Calculate the rank correlation coefficient for proficiencies of this group in Mathematics and Statistics. CO4 7 Marks

(OR)

6 a) If θ is the angle between two regression lines and S.D of Y is twice the S.D of X and r = 0.25, find tan θ. CO4 7 Marks

b) Design a control chart for c, i.e the number of defectives from the following data pertaining to the number of imperfections in 20 pieces of cloths of same length in a certain make of polyester and infer whether the process is in a state of control. CO4 7 Marks

2, 3, 5, 8, 12, 2, 3, 4, 6, 5, 6, 10, 4, 6, 5, 7, 4, 9, 7, 3.

UNIT-IV

7 a) A random sample of size 65 from a normal population has the mean 7.5 and the standard deviation 2.4. Does this information support or refuse the claim that the mean of the population is 10.5? Verify. CO2 7 Marks

b) Write about: i) Null hypothesis. ii) Type-I and type-II errors. CO1 7 Marks

(OR)

8 a) Basing on a sample of 100 tyres, the average life of a tyre was found to be 21,431 miles with a SD of 1295 miles. Test the null hypothesis that $\mu = 22000$ miles against the alternative hypothesis $\mu < 22000$ miles ($Z=-1.645$ at 0.005 level). CO4 7 Marks

b) From the following data on performance of two operators, test by appropriate statistical technique whether the means differ significantly from each by taking $\alpha=0.05$. CO5 7 Marks

Operator-A: n=100, mean=210, SD=11.

Operator-B: n=150, mean=220, SD=11.

UNIT-V

9 a) Two horses A and B were tested according to the time (in seconds) to run a particular track with the following results. CO2 7 Marks

Horse A	28	30	32	33	33	29	34
Horse B	29	30	30	24	27	29	

Discuss whether the two horses have the same running capacity.

b) A die is thrown 264 times with the following results. Show that the die is biased. CO1 7 Marks

[Given $\chi^2_{0.05} = 11.07$ for 5 degrees of freedom]

No. appeared on the die	1	2	3	4	5	6
Frequency	40	32	28	58	54	52

(OR)

10 a) The life time of electric bulbs for a random sample of 10 from a large consignment gave the following data. CO2 7 Marks

Item :	1	2	3	4	5	6	7	8	9	10
Life in thousand hours:	1.2	4.6	3.9	4.1	5.2	3.8	3.9	4.3	4.4	5.6

Analyze whether we can accept the hypothesis that the average life time of bulbs is 4000 hrs.

b) Pumpkins were grown under two experimental conditions. Two random samples of 11 and 9 pumpkins show the sample standard deviations of their weights as 0.8 and 0.5 respectively. Assuming that the weight distributions are normal, test the hypothesis that the true variances are equal. (at 95% level of confidence) CO4 7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

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 Show that the relation. $\Gamma(n)\Gamma(1-n) = \dfrac{\pi}{\sin n\pi}$ and hence deduce the values of $\Gamma\left(\dfrac{1}{2}\right)$ and $\Gamma\left(\dfrac{1}{4}\right)\Gamma\left(\dfrac{3}{4}\right)$. CO4 14 Marks

(OR)

2 a) Show that $J_{5/2}(x) = \sqrt{\dfrac{2}{\pi x}}\left[\dfrac{3-x^2}{x^2}\sin x - \dfrac{3}{x}\cos x\right]$. CO4 7 Marks

b) Prove that $\dfrac{d}{dx}[xJ_1(x)] = xJ_0(x)$. CO4 7 Marks

UNIT-II

3 Separate the real and imaginary parts of log z and compute the value of p such that the function $f(z) = \dfrac{1}{2}\log(x^2+y^2) + i\tan^{-1}\left(\dfrac{px}{y}\right)$ be an analytic function. CO1, CO4 14 Marks

(OR)

4 Construct an analytic function $f(z) = u + iv$, if $u - v = \dfrac{\cos x + \sin x - e^{-y}}{2\cos x - e^{y} - e^{-y}}$ and $f\left(\dfrac{\pi}{2}\right) = 0$ CO3 14 Marks

UNIT-III

5 Show that the integral $\int_C \dfrac{x\,dx - y\,dy}{\sqrt{x^2+y^2}}$ is independent of any path of integration which does not pass through the origin and justify your answer. CO4 14 Marks

(OR)

6 a) Determine the value of $f(2)$ if $f(a) = \int_c \dfrac{2z^2 - z - 2)}{(z-a)}dz$ where c is the circle $|z| = 2.5$ using Cauchy's Integral formula. CO4 7 Marks

b) Construct Laurent's series for $f(z) = \dfrac{1}{z^2 - 3z + 2}$ in the regions $0 < |z-1| < 1$ and $1 < |z| < 2$. CO3 7 Marks

UNIT-IV

7 Evaluate $\int_c \dfrac{1}{(z^2+4)^2}dz, C: |z-i| = 2$ applying residue theorem. CO4 14 Marks

(OR)

8		Show that $\int_0^{2\pi} \frac{\cos 2\theta}{1 - 2a\cos\theta + a^2} d\theta = \frac{2\pi a^2}{1 - a^2} (a^2 < 1)$ by complex variable technique.	CO4	14 Marks

UNIT-V

9	a)	Prove that the transformation $w = 1/z$ maps circles onto circles and if the circle passes through origin show that it will be mapped on to a straight line	CO4	7 Marks
	b)	Making use of the transformation $w = z + 3 + 2i$, establish an image for the circle $\|z\| = 2$.	CO4	7 Marks

(OR)

10	a)	Define a bilinear transformation and applying the transformation $w = 1/z$, find the image of the infinite strip $\frac{1}{4} < y < \frac{1}{2}$ of z - plane.	CO1, CO4	7 Marks
	b)	Define invariant point of a bilinear transformation and hence analyze the transformation $w = \frac{2i - 6z}{iz - 3}$ and identify the invariant points	CO1, CO2	7 Marks

CODE No.: 16BT3HS01 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

ENVIRONMENTAL STUDIES

[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)	State the significance and scope of the environmental education.	CO1	7 Marks
	b)	Analyze the contribution of different disciplines contribute to environmental studies.	CO2	7 Marks
		(OR)		
2	a)	Analyze the environmental impacts of groundwater usage.	CO2	7 Marks
	b)	Explain soil erosion. List the strategies to control soil erosion.	CO3	7 Marks

UNIT-II

3	a)	Analyze biogeochemical cycle.	CO2	8 Marks
	b)	Define biodiversity. Write down the different levels of biodiversity.	CO1	6 Marks
		(OR)		
4	a)	Summarize the models of energy flow in an ecosystem.	CO2	7 Marks
	b)	Analyze the major features of a stream that differ from that of a lake.	CO2	7 Marks

UNIT-III

5	a)	Explain and give examples for primary and secondary air pollutants.	CO1	7 Marks
	b)	State the appropriate techniques to control soil pollution.	CO5	7 Marks
		(OR)		
6		What are point and non-point sources of water pollution? Explain how you will manage to reduce the water pollution.	CO3	14 Marks

UNIT-IV

7		What do you mean by sustainable development? What are the major solutions to attain sustainability?	CO7	14 Marks
		(OR)		
8	a)	How the urban problems can be solved related to energy.	CO4	8 Marks
	b)	Summarize the protection laws for forest resources.	CO8	6 Marks

UNIT-V

9	a)	State the impact behind the increased population growth in the less developed nations compared with developed nations.	CO2	7 Marks
	b)	Explain doubling time with reference to population growth.	CO1	7 Marks
		(OR)		
10		Write a report based on the visit in an industrial area.	CO9	14 Marks

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CODE No.: 16BT3HS02 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

MANAGERIAL ECONOMICS AND PRINCIPLES OF ACCOUNTANCY
[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

	UNIT-I		
1	Define Managerial Economics and explain it's scope.	CO1	14 Marks
	(OR)		
2	State "Law of Demand". Explain assumptions of law of demand and changes in demand with graphs.	CO3	14 Marks
	UNIT-II		
3	Define "Production Function" and elucidate on "Factors of Production".	CO1	14 Marks
	(OR)		
4	Differentiate between: i) Opportunity Costs ***Vs*** Outlay Costs ii) Seperable Costs ***Vs*** Joint Costs.	CO1, CO2	14 Marks
	UNIT-III		
5	Define "Market" and explain essentials of a market structure.	CO1	14 Marks
	(OR)		
6	"At times companies resort to differentiating a homogeneous product". Justify with suitable examples.	CO2, CO3	14 Marks
	UNIT-IV		
7	Define "Accountancy" and discuss concepts and conventions of accounting.	CO1	14 Marks
	(OR)		
8	Write Journal entries for the following transactions in the books of Mr. Rao. Jan. 1 Mr. Rao commenced a business with Rs. 1, 68,000/- Jan. 4 Bought goods from Dayanand Rs. 46, 800/- Jan. 9 Cash withdrawn from bank for personal use Rs. 1, 400/- Jan. 10 Sold old furniture for Rs. 16,600/- Jan. 18 Sold goods to Charishma Rs. 68, 200/- Jan. 21 Commission paid to Harshika Rs. 3, 860/- Jan. 24 Cash deposited into Bank Rs. 24,100/- Jan. 31 Salaries paid through cheque Rs. 26,700/-	CO2, CO3, CO6	14 Marks
	UNIT-V		
9	Define "Balance Sheet". Elucidate various elements of Balance Sheet.	CO1	14 Marks
	(OR)		

10 The following Trial Balance is extracted from the books of Mr. Rajesh as on March 31, 2017. Prepare Trading and Profit and Loss account for the year ended 31.3.2017 and a Balance Sheet as on that date: CO4, CO5, CO6 14 Marks

Drawings	72,000	Capital	4,00,000
Buildings	60,000	12% Bank Loan	60,000
Furniture and fittings	30,000	Sales	4,00,000
Motor Van	1,00,000	Commission	30,000
Interest on Bank loan	3,600	Creditors	40,000
Purchases	3,00,000		
Opening Stock	1,00,000		
Establishment Exp	60,000		
Wages	8,000		
Insurance	4,000		
Debtors	1,12,400		
Cash at Bank	80,000		
	9,30,000		9,30,000

Adjustments:

a) Closing stock was Rs. 1, 28,000/-

b) Outstanding wages Rs. 2,000/- and Prepaid Insurance Rs. 1,200/-

c) Depreciate buildings @ 5%, Furniture @ 15% and Motor Van @ 20%.

CODE No.:16BT30101 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

CONSTRUCTION PLANNING AND PROJECT MANAGEMENT

[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Enumerate the stages of planning by different agencies.	CO1	7 Marks
	b)	List out of the salient features of Minimum Wages Act of 1948.	CO8	7 Marks
		(OR)		
2	a)	Enumerate the general requirements of buildings for safety against fire.	CO6	7 Marks
	b)	Write the significance of selection of environmentally sustainable technology for the project planning.	CO7	7 Marks

UNIT-II

3		Discuss different types of earth moving and excavating equipment with neat sketches.	CO1	14 Marks
		(OR)		
4	a)	Explain ABC classification of materials and Inventory of materials.	CO1	7 Marks
	b)	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. Classify the items using ABC analysis for effective monitoring of materials.	CO9	7 Marks

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

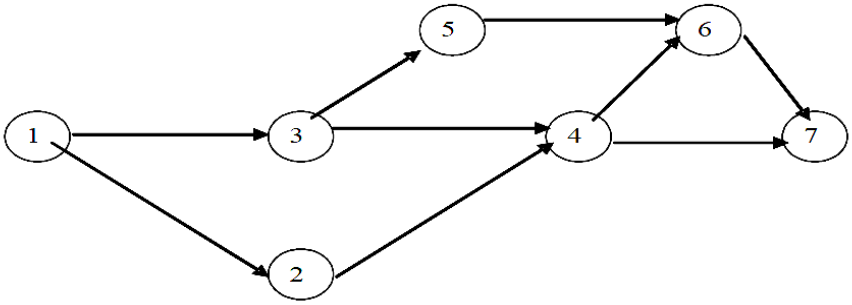
UNIT-III

5	a)	What are the shortcomings of bar charts? How are these removed?	CO1	7 Marks
	b)	What is a Gantt bar chart? Explain how you control the project period with the help of a suitable example for the project management.	CO5	7 Marks
		(OR)		
6	a)	List out the factors affecting scheduling.	CO4	7 Marks
	b)	How decision making plays an important role in project management?	CO1	7 Marks

UNIT-IV

7 a) Prepare work breakdown structure for a tunneling project by defining the precedence relationship. CO3 7 Marks

b) For the network shown in figure below, prepare a table showing a list of predecessors, immediate predecessors, successors and immediate successors to each of the events. CO3 7 Marks



(OR)

8 a) Explain the steps involved in the development of network. CO1 7 Marks

b) Develop a network diagram for the project having 9 activities with the following inter-relationships: CO3 7 Marks

i) C follows D but precedes F. ii) C follows B but precedes H.
iii) G follows F but precedes I. iv) E follows A but precedes I.
v) D follows A. vi) H and I terminate at the same time.
vii) A and B start at the same time.

UNIT-V

9 a) Define and differentiate between CPM and PERT. CO2 6 Marks

b) Draw the network and design the critical path and calculate the EST, EFT, LST and LFT of the project whose activities are as follows. CO3 8 Marks

Activity	**Duration (in Days)**	**Preceding Activity**
A-B	7	-
B-C	10	A-B
B-D	15	A-B
C-D	7	B-C
C-E	12	B-C
D-E	3	B-D,C-E
E-F	5	C-E,D-E

(OR)

10 From the data given in table, prepare the network diagram and decide the completion period and the critical path schedule. CO3 14 Marks

Activity Item	Duration (in days)	Activity Immediately	
		Preceding	Following
A	4	None	C,D
B	5	None	D
C	7	A	E,F
D	6	A,B	G
E	8	C	None
F	5	C	None
G	6	D	None

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

FLUID MECHANICS AND HYDARULIC MACHINERY

[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Derive an expression for total pressure and centre of pressure when the plane is immersed inclined.	CO1	7 Marks
	b)	A circular opening 2.5m diameter in a vertical side of tank is closed by a disc of 2.5m diameter which can rotate about a horizontal diameter. Determine the force on the disc and the torque required to maintain the disc in equilibrium in vertical position when the head of water above horizontal diameter is 3.5m.	CO2	7 Marks
		(OR)		
2	a)	A square aperture in the vertical side of a tank has one diagonal vertical and is completely covered by a plane plate hinged along one of the upper sides at the aperture. The diagonals of the aperture are 2.4m long and the tank contains a liquid of specific gravity 1.2. The centre of aperture is 1.8m below the free surface. Calculate the thrust exerted on the plate by the liquid and the position of its centre of pressure.	CO2	7 Marks
	b)	A trapezoidal 2m wide at the bottom and 1m deep has side slopes 1:1. Determine total pressure and centre of pressure on the vertical gate closing the channel when it is full of water.	CO2	7 Marks

UNIT-II

3	a)	Differentiate between Venturimeter and Orificemeter and the following data relate to an Orificemeter: diameter of the pipe is 254mm, diameter of orifice is 120mm, specific gravity of oil is 0.88, and reading of differential manometer is 400mm of mercury. Determine rate of flow of oil.	CO2	7 Marks
	b)	Derive an expression to determine velocity at a point. A submarine fitted with a Pitot tube moves horizontally in sea. It axis is 12m below the surface of water. The Pitot tube fixed in front of the submarine and along its axis is connected to the two limbs of U-tube containing mercury the reading of which is found to be 200mm. Find the speed of the submarine. Take specific weight of sea water is 1.025 times fresh water.	CO5	7 Marks
		(OR)		
4	a)	Define hydraulic coefficients. A large tank has a sharp edged circular orifice of 930mm^2 area at a depth of 3m below constant water level. The jet issues horizontally and in a horizontal distance of 2.4m, it falls by 0.53m, the measured discharge is 4.3lit/s. Determine coefficients of velocity, contraction and discharge for the orifice.	CO2	7 Marks
	b)	Classify mouthpiece. A canal of trapezoidal section has bed width of 8m and bed slope of 1 in 4000. If the depth of flow is 2.4m and side slopes of the channel are 1 horizontal to 3 vertical, determine the average flow velocity and the discharge carried by the channel. Also compute the average shear stress at the channel boundary. Take Chezy's constant = 55.	CO2	7 Marks

UNIT-III

5	a)	Define Buckingham pi theorem. The thrust force P developed by a propeller depends on the angular velocity **ω**, speed of advance V, diameter D, dynamic viscosity **μ**, mass density **ρ**, elasticity of fluid medium which can be denoted by the speed of sound C with unit m/s. Obtain an expression for P by Buckingham pi theorem.	CO2	7 Marks
	b)	Discharge Q through a turbine is a function of the turbine speed **n**, head H, diameter D of the runner, density **ρ**, and viscosity **μ** of the fluid and acceleration due to gravity g. Find the expression for Q using Buckingham method.	CO2	7 Marks

(OR)

6	a)	Explain Froude model law. A 1**:**64 model is constructed of an open channel in concrete which has Manning's N = 0**.**014. Find the value of N for the model.	CO4	7 Marks
	b)	List different model laws with scale ratios. In the model test of a spillway the discharge and velocity of flow over the model were 2**.**5 cumec and 1**.**5m/s respectively. Calculate the velocity and discharge over the prototype which is 36 times the model size.	CO4	7 Marks

UNIT-IV

7	a)	Describe various methods used for determining the length of surface profile.	CO1	7 Marks
	b)	A wide channel laid to a slope of 1 in 1000 carries a discharge of 3.5 cumec per meter width at a depth of 1**.**6m. Find out the Chezy's constant C. Consider the flow to be uniform. If the actual depth varies from 1**.** m at an upstream location to 1**.**7m at a location 300m downstream or in other words the flow is gradually varied, what will be the value of Chezy's coefficient C.	CO6	7 Marks

(OR)

8	a)	Differentiate rapidly varied and gradually varied flow. In a rectangular channel of width 24m and depth of flow 6 m, the rate of flow of water is 86**.**4 cumec. If the bed slope of the channel is 1 in 4000 find the slope of the free water surface. Take Chezy's constant C = 60.	CO2	7 Marks
	b)	Define standing wave and derive an expression to obtain the relationship between conjugate depths. Calculate the possible depth of flow at which a discharge of 25 cumec be carried in a rectangular channel 4m wide with a specific energy equal to 3m.	CO2	7 Marks

UNIT-V

9	a)	Define centrifugal pump and explain various components of a centrifugal pump with a neat sketch.	CO2	7 Marks
	b)	Classify centrifugal pumps and describe the working of a centrifugal pump. Derive an expression for minimum starting speed of a centrifugal pump.	CO2	7 Marks

(OR)

10	a)	List losses with efficiencies of a centrifugal pump and A centrifugal pump works against a total he4ad of 35m delivering 0**.**3 cumec. The manometric efficiency is 75%. The pump runs at 1000 r.p.m. The velocity of flow at outlet is 3m/s and outlet vane angle is 30 degrees. Find the diameter of the impeller and width of impeller at outlet.	CO1	7 Marks
	b)	Derive an expression for specific speed of a centrifugal pump and A centrifugal pump having an outlet diameter equal to two times the inner diameter and running at 1200 r.p.m. works against a total head of 7**.**5cm. The velocity of flow through the impeller is constant and equals to 3m/s. The vanes are set back at an angle of 30 degrees at outlet. If the outer diameter of the impeller is 60cm and width at outlet is 5cm, determine vane angle at inlet, work done per second by impeller and manometric efficiency.	CO2	7 Marks

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CODE No.:16BT30103 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

MECHANICS OF SOLIDS
[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	A bar ABCD 950 mm long is made up of 3 parts AB, BC and CD of lengths 250mm, 450mm, and 250mm respectively. AB and CD are cylindrical having diameters 25mm and 15mm respectively. The rod BC is square section 30mm x 30mm. The rod is subjected to a pull of 26kN. Find: i) The stresses in the 3 parts of the rod and ii) The extension of the rod. Take E=2 x 10^5 N/mm^2.	CO5	7 Marks
	b)	Derive the expression for the extension of the tapering rod with circular cross section.	CO1	7 Marks
		(OR)		
2		Derive the relationship between Modulus of Elasticity, Modulus of rigidity and Bulk Modulus.	CO1	14 Marks

UNIT-II

3		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.	CO2	14 Marks
		(OR)		
4		A beam AB 10m long is simply supported at its ends A and B, it carries uniformly distributed load of 20kN/m for a distance of 4m from the left end A and a concentrated load of 40kN and 20kN at a distance of 2m from either ends of the beam respectively. Determine the maximum shear force and bending moment. Draw SFD and BMD	CO2	14 Marks

UNIT-III

5		List out the assumptions made in the theory of bending. Derive the bending equation.	CO1	14 Marks
		(OR)		
6	a)	A rectangular strut is 20cm wide and 15 cm thick. It carries a load of 60kN at an eccentricity of 2cm in a plane bisecting the thickness. Find the maximum and minimum intensities of stress in the section	CO4	7 Marks
	b)	The T shaped beam with flange having a width of 200mm and a depth of 50mm and web having a width 50mm and depth 200mm is subjected to vertical shear force of 100kN. Calculate the shear stress at the neutral axis and at the junction of the web and the flange. Moment of inertia about the horizontal neutral axis is 1.134x10^8 mm^4.	CO4	7 Marks

UNIT-IV

7	a)	In a tensile test, The test piece 20mm in diameter, 200mm gauge length stretched 0.0975mm under a pull of 50,000 N. In a torsion test the same rod twisted 0.025 radian over a length of 200mm, when a torque of 400N-m was applied. Evaluate the Poisson's Ratio and the three elastic moduli for the material.	CO1	10 Marks
	b)	A 50mm diameter shaft is subjected to a torque of 3kN-m. Find: i) The maximum shear stress induced in the shaft. ii) Angle of twist per meter length of the shaft. iii) The shear stress at a distance of 10mm from the axis of the shaft. Take C= $8x10^4$ N/mm^2.	CO5	4 Marks

(OR)

8	a)	Mention some of the functions of the springs. Derive the shear stress and deflection of a close coiled helical spring with axial load for a circular section.	CO1	7 Marks
	b)	An open coiled helical spring made from wire of circular cross section is required to carry a load of 120N. Wire diameter is 8mm and mean coil radius is 48mm. If the helix angle of spring is 30° and the number of turns is 12, calculate i) Axial deflection. ii) Angular rotation of free end with respect to the fixed end of the spring. Take C= 80GN/m^2 and E= 200GN/m^2.	CO6	7 Marks

UNIT-V

9		Derive the change in dimension of thin cylindrical shell due to an internal pressure.	CO1	14 Marks

(OR)

10		Mention the assumptions in Lame's theory. Derive Lame's equation for radial and circumferential stress of thick cylinder.	CO4	14 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

SURVEYING
[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Differentiate Surveyor's compass and Prismatic Compass. CO2 6 Marks

b) The reduced bearings of the lines of a traverse are given below. Find the Whole circle bearings of lines. CO2 8 Marks

Line	Bearings
AB	N 60° 25' E
BC	S 85° 30' E
CD	S 25° 45' W
DE	S 64° 30' E
EF	N 82° 45' W
FA	N 28° 14' W

(OR)

2 a) Explain in detail about errors in Compass survey. What are the precautions to be taken in a compass survey? CO6 6 Marks

b) The following bearings were observed while traversing with Compass. CO2 8 Marks

Line	FB	BB
AB	45° 45'	226° 10'
BC	96° 55'	277o 05'
CD	29° 45'	209° 10'
DE	324° 48'	144° 48'

Mention which stations were affected by local attraction and determine the Corrected bearings.

UNIT-II

3 a) Describe the methods of leveling. CO1 6 Marks

b) The following consecutive readings were taken with a dumpy level: 1.895, 1.500, 1.865, 2.570, 2.990, 2.020, 2.410, 2.520, 2.960, 3.115. The level was shifted after fourth, sixth and ninth readings. The R.L. of the first point was 30.500. Rule out a page of your answer book as a level book, and fill columns. Use collimation system and apply the usual checks. Indicate the highest and lowest points. CO3 8 Marks

(OR)

4 a) Explain in detail the temporary adjustments of a auto level. CO1 7 Marks

b) The following consecutive readings were taken with a dumpy level and 5m leveling staff on continuously sloping ground at a common interval of 15 m. The first point is having an elevation of 85.275m. Rule out a page of level field book and enter the readings. Calculate (i) the reduced levels of the points by rise and fall method and (ii) the gradient of the line joining the first and last point. CO3 7 Marks

0.415, 1.025, 2.085, 2.925, 3.620, 4.595, 0.715, 2.115, 3.090, 4.405.

UNIT-III

5	a)	Explain the principle of stadia method of tachometric surveying.	CO1	6 Marks
	b)	What is tacheometry. Explain the methods of tacheometric measurements.	CO1	8 Marks

(OR)

6		A tachometer was set up at a station A and the readings on a vertically held staff at B were 2.255, 2.605 and 2.955m, the line of sight being at an inclination of + 80 241. Another observation on the vertically held staff at B.M. gave the readings 1.640, 1.920 and 2.200m, the inclination of the line of sight being + 10 61. Calculate the horizontal distance between A and B, and the elevation of B if the R.L. of B.M. is 418.685m. The constants of the instrument were 100 and 0.3.	CO2	14 Marks

UNIT-IV

7		Two straight lines AB and BC intersect at chainage (370 + 00) the deflection angle being 90. Find the chainages of the beginning and end points of 20 left hand curve joining two lines. Give the tables of deflection angles for every chain length of 30m.	CO2	14 Marks

(OR)

8		The following are the areas of contour surveyed in a valley of reservoir. Claculate the capacity between the contour R.L. 130 and R.L. 154 by i) Trapezoidal Rule., ii) Prismoidal rule.	CO2	14 Marks

Contour (m)	**130**	**134**	**138**	**142**	**146**	**150**	**154**
Area (sq.m)	**12600**	**68400**	**223020**	**456050**	**669060**	**829100**	**999500**

UNIT-V

9		Explain in detail about the sources of errors in total station and EDM.	CO5	14 Marks

(OR)

10		How electronic distance measurement can be classified and explain its uses on total station.	CO5	14 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

DC 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)	List and explain the various parts of DC machine that constitute its magnetic circuit with neat diagrams.	CO1	7 Marks
	b)	A 4 pole short shunt wave wound generator supplies 20kW load at terminal voltage of 250V, Ra = 0.1Ω, Rse= 0.2Ω, Rsh= 100Ω, flux for pole = 0.05Wb. Assume the total brush drop to be 2V. Find: i) the emf generated. ii) number of conductors in each parallel path if the speed is 1200 r.p.m.	CO4	7 Marks
		(OR)		
2	a)	Name various losses of DC machines. Where these losses occurs in the machine? How can you minimize these losses?	CO1	7 Marks
	b)	An 8 pole DC shunt generator with 778 wave connected armature conductors and running at 500 r.p.m. Supplies a load of 12.5Ω resistances at terminal voltage of 50V. The armature resistance is 0.24Ω and the field resistance is 250Ω. Find the armature current, the induced EMF and the flux per pole.	CO4	7 Marks

UNIT-II

3	a)	Derive the expression for cross magnetizing and demagnetizing AT per pole.	CO2	8 Marks
	b)	A 4 pole, wave wound, DC machine running at 1500 r.p.m. has a commutator of 30cm diameter. If armature current is 150A, thickness of brush 1.25cm and the self-inductance of each armature coil is 0.07mH, calculate the average **emf** induced in each coil during commutation. Assume linear commutation.	CO4	6 Marks
		(OR)		
4	a)	List the various methods of improving commutation. Describe any one method in detail.	CO1	7 Marks
	b)	Define commutation in DC machines. Discuss why commutation is not linear in DC machines.	CO1	7 Marks

UNIT-III

5	a)	DC differential compound generator is suitable for arc welding purposes. Justify.	CO5	6 Marks
	b)	Explain clearly why an equalizer connection makes it possible for two compound generators to operate in parallel in stable equilibrium.	CO1	8 Marks
		(OR)		
6		Five DC shunt generators are running in parallel, each having an armature resistance of 0.1Ω, running at the same speed and excited to give equal induced emfs. Each generator supplies an equal share of a total load of 250kW at a terminal voltage of 500V into a load of fixed resistance. If the field current of one generator is raised by 4%, the others remaining unchanged calculate the power output of each machine and their terminal voltages under these conditions. Assume that the speeds remain constant and flux is proportional to field current.	CO4	14 Marks

UNIT-IV

7	a)	Write significance of back **emf** in case of DC motors.	CO1	7 Marks
	b)	Select and describe the suitable speed control method for DC shunt motor which is used to control the speed in both the directions smoothly.	CO5	7 Marks
		(OR)		
8	a)	Explain why a starter is required for starting of DC motor. Also explain the working principle of 3-point starter with neat diagram.	CO1	7 Marks
	b)	A 500V DC shunt motor is to have a starter with 5 sections. The maximum permissible current is 100A and the armature resistance is 0.5 Ω. Design a starter with values of each section resistance.	CO3	7 Marks

UNIT-V

9	a)	Explain why testing of DC machine is carried out. Suggest various tests to be conducted on DC machines under different situations.	CO1	7 Marks
	b)	A 200V DC shunt motor develops an output of 17.158kW when taking 20.2kW. The field resistance is 50Ω and armature resistance 0.06Ω. Compute the efficiency and power input when the output is 7.46kW.	CO4	7 Marks
		(OR)		
10	a)	Determine stray losses of DC machine with the help of a retardation test without the knowledge of moment of inertia.	CO1	5 Marks
	b)	On which type of DC machines Swinburne's test is conducted? Justify your answer.	CO1	4 Marks
	c)	A 250 V, 14.92 kW shunt motor has a maximum efficiency of 88% and a speed of 700 r.p.m. when delivering 80% of its rated output. The resistance of its shunt field is 100Ω. Determine the efficiency and speed when the motor draws a current of 78A from the mains.	CO4	5 Marks

CODE No.: 16BT30202 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

ELECTROMAGNETIC FIELDS
[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 an expression for Electric field intensity due to an infinite line charge.	CO1	7 Marks
	b)	Calculate the total flux leaving the cubical surface formed by the six planes x, y, z = ±5m when i) Two point charges, 0.1 μC at A(1, -2, 3)m and 0.5 μC at B(-1, 2, -2)m ii) A uniform line charge of 5 μC/m at x=-2m, y=3m.	CO3	7 Marks

(OR)

2	a)	Explain the terms electric field intensity and electric flux density. Obtain relation between them.	CO1	7 Marks
	b)	Four concentrated charges Q_1 = 0.3μC, Q_2 = 0.2μC, Q_3 = 0.3μC and Q_4 = 0.2μC are located at the vertices of a plane rectangle. The length and breadth of the rectangle is 5cm and 2cm respectively. Find the magnitude and direction of resultant force on Q_1.	CO3	7 Marks

UNIT-II

3	a)	Explain the boundary conditions between conductor and free space for electric fields.	CO1	7 Marks
	b)	Two extensive homogeneous isotropic dielectrics meet on plane z = 0. For z > 0, $\varepsilon_{r1} = 4$ and for z < 0, $\varepsilon_{r2} = 3$. A uniform electric field: $\vec{E_1} = 5\vec{a_x} - 2\vec{a_y} + 3\vec{a_z}$ exists for z ≥ 0. Determine i) $\vec{E_2}$ for z≤0. ii) The angles $\vec{E_1}$ and $\vec{E_2}$ make with the interface. iii) The energy densities in both dielectrics. iv) The energy within a cube of side 2m centered at (3, 4, -5)m.	CO3	7 Marks

(OR)

4	a)	State and explain ohm's law in point form.	CO1	7 Marks
	b)	Using the principle of conservation of charge, derive the equation of continuity for electric current in point form.	CO4	7 Marks

UNIT-III

5	a)	Using Ampere's circuital Law, obtain an expression for Magnetic field intensity due to infinitely long straight current carrying conductor.	CO4	7 Marks
	b)	Using ampere's law, compute $\vec{H}$ in the cylindrical region $0 < \rho < 0.5m$, the current density is $\vec{J} = 4.5e^{-2\rho}\,\vec{a_z} A/m^2$ and zero elsewhere.	CO3	7 Marks

(OR)

6	a)	State and prove Ampere's circuital law in integral form.	CO1	7 Marks
	b)	A surface current density $\vec{K} = 30\vec{a}_x A/m$ flows in $y = 0$ plane throughout the region **$-5 < Z < 5m$, $-\infty < x < \infty$.** Find $\vec{H}$ at (0, 15, 0) in free space.	CO3	7 Marks

UNIT-IV

7	a)	Derive the Lorentz force equation.	CO1	7 Marks
	b)	Two long straight parallel wires in air 2m apart carry currents I_1 and I_2 in same direction. The field intensity $\vec{H}$ at midway is 7.5 AT/m. If the force on each wire per unit length is 2.5×10^{-4} N, Determine the values of I_1 and I_2.	CO3	7 Marks

(OR)

8	a)	Obtain an expression for force between two straight long and parallel current carrying conductors. Comment on type of force developed between them.	CO2	7 Marks
	b)	Calculate the force on a straight conductor of length 30cm carrying a current of 5A in $\vec{a}_z$ direction and the magnetic field $\vec{B} = 3.5 \times 10^{-3}(\vec{a}_x - \vec{a}_y)$. Tesla where $\vec{a}_x$ and $\vec{a}_y$ are unit vectors.	CO3	7 Marks

UNIT-V

9	a)	Derive Maxwell's equations for time varying fields.	CO1	7 Marks
	b)	Do the fields $\vec{E} = E_m \sin x \sin t \ \vec{a}_y$ V/m and $\vec{H} = \left(\frac{E_m}{\mu_0}\right)\cos x \cos t \ \vec{a}_z A/m$ satisfy Maxwell's equation?	CO2	7 Marks

(OR)

10	a)	List the real time applications of time varying fields.	CO5	4 Marks
	b)	A lossy dielectric has $\mu_r = 1.5$, $\varepsilon_r = 1$, $\sigma = 2 \times 10^{-8}$ s/m and $\vec{E} = 100 \sin \omega t \ \vec{a}_z V/m$.	CO3	10 Marks

i) Determine at what frequency the conduction and displacement currents are equal and derive the expression used.

ii) Calculate instantaneous displacement current density at that frequency.

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations September - 2020

SIGNALS, SYSTEMS AND NETWORKS

[Electrical and Electronics Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

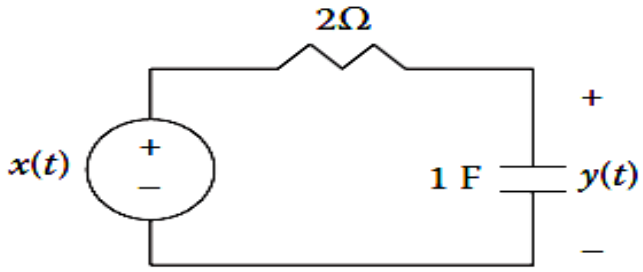
1	a)	Define causality of the system and also test the causality of the system given by $y(t) = ax(2t) + x(t^2)$.	CO2	7 Marks
	b)	Define period of a signal also investigate whether the signal is periodic or non-periodic $y(t) = 3\cos\left(17\pi t + \frac{\pi}{3}\right) + 2\sin(19\pi t) - \frac{\pi}{3}$.	CO2	7 Marks

(OR)

2	a)	Determine the unit step response of the following system whose impulse response is $h(t) = e^{-5t}u(t-2)$.	CO4	7 Marks
	b)	Determine the complete response of the system defined by the differential equation $\frac{d^2y(t)}{dt} + 5\frac{dy(t)}{dt} + 4y(t) = \frac{dx(t)}{dt}$ with $y(0) = 1$ and $\left.\frac{dy(t)}{dt}\right\|_{t=0} = 1$ for the input $x(t) = e^{-2t}u(t)$.	CO3	7 Marks

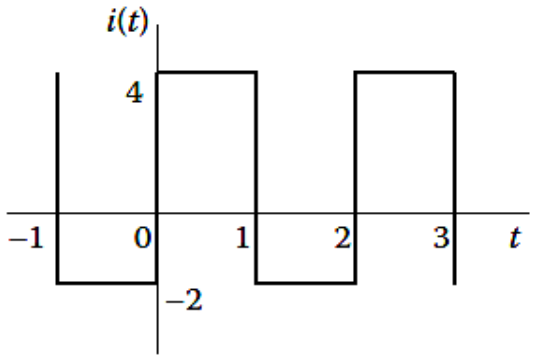
UNIT-II

3	a)	Distinguish between Fourier series and Fourier transforms.	CO2	6 Marks
	b)	Determine the output voltage $y(t)$, if the input signal is defined by $x(t) = 1 + 4(\cos t + \cos 2t + \cos 3t + \cos 4t)$ by is applied the circuit show in the Figure using Fourier transforms.	CO5	8 Marks



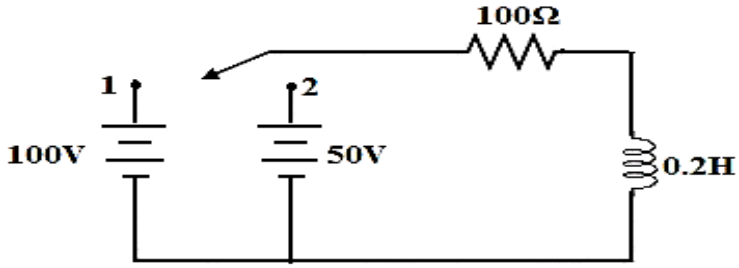
(OR)

4	a)	Enumerate the properties of Fourier transforms.	CO1	6 Marks
	b)	The periodic current waveform shown in Figure is applied across a 2kΩ resistor. Find the percentage of the total average power dissipation caused by the DC component.	CO4	8 Marks



UNIT-III

5	a)	What are initial conditions? Explain the procedure to evaluate initial conditions.	CO1	6 Marks
	b)	In the circuit shown, theswitchisclosedonposition1at t=0 there by applying the $100V$ source to the $R-L$ branch, and at t = 500 micro seconds, the switch is moved to position 2. Obtain the equations for the current in both intervals using Laplace transforms approach.	CO4	8 Marks

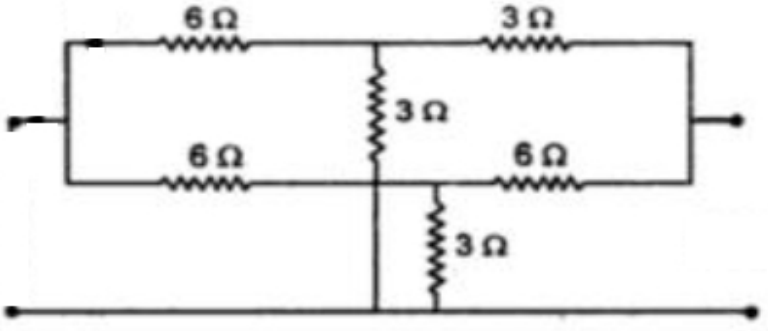


(OR)

6	a)	An electronic triggering circuit consists of resistance R and 2 microfarad capacitor are connected in series across a $200V$ direct supply. Across the capacitor there is a neon lamp that strikes at $120V$. Calculate R to make the lamp strike 5 sec after the switch has been closed. If R = 5 Meg Ohm, how long will it take the lamp to strike?	CO4	7 Marks
	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.	CO4	7 Marks

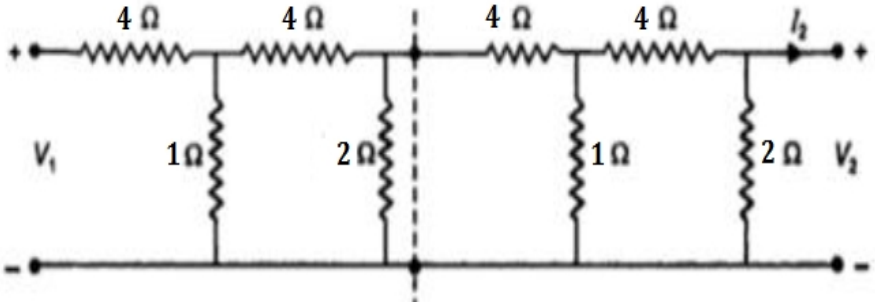
UNIT-IV

7	a)	The Z parameters of a two port network are Z_{11}=6Ω, Z_{22}=4Ω, Z_{12}=Z_{21}= 3Ω. Compute Y and ABCD Parameters and write the describing equations.	CO4	7 Marks
	b)	Find the admittance parameters for the network shown in Figure.	CO4	7 Marks



(OR)

8	a)	Express ABCD parameters in terms of hybrid parameters for a generalized network.	CO4	7 Marks
	b)	Find the Transmission parameters of the network shown in Figure.	CO4	7 Marks



UNIT-V

9	a)	Derive the expression for design impedance of a constant *k* filter.	CO2	7 Marks
	b)	A T-section high pass filter has an inductance of 100mH and a capacitance of 0.025μF. Determine the cut-off frequency and nominal design impedance.	CO4	7 Marks

(OR)

10	a)	Derive the design equations for a Low pass T-section filter.	CO2	7 Marks
	b)	Design constant low pass T-section and π-section filter to be terminated with 500Ω and having cut-off frequency 5kHz. Find its characteristic impedance and attenuation constant at 25kHz.	CO3	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

ELECTRICAL TECHNOLOGY

[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 load characteristics of DC shunt generator.	CO1	7 Marks
	b)	With a neat sketch, explain the working of a three-point starter for DC shunt motor.	CO1	7 Marks
		(OR)		
2		Select suitable test to predetermine the efficiency of DC machine.	CO5	14 Marks

UNIT-II

3	a)	Derive the condition for maximum efficiency of a transformer.	CO2	7 Marks
	b)	A single phase transformer has 500 primary and 1000 secondary turns. The net cross sectional area of the core is 50cm^2. If the primary winding is connected to a 50 Hz supply at 400 V. Calculate the peak value of the flux density in the core and voltage induced in the secondary winding.	CO4	7 Marks
		(OR)		
4	a)	Explain the different types of losses in single phase transformer.	CO1	4 Marks
	b)	Consider a 20 kVA, 2200/220 V, 50 Hz transformer. The O.C./S.C. test results are as follows : O.C. test : 220 V, 4.2 A, 148 W (L.V. side) S.C. test : 86 V, 10.5 A, 360 W (H.V. side) Determine: i) Core loss. ii) Equivalent resistance referred to both primary and secondary. iii) Equivalent reactance referred to both primary and secondary. iv) Regulation of transformer at 0.8 p.f. lagging current. v) Efficiency at full-load and half of the full-load at 0.8 p.f. lagging current.	CO4	10 Marks

UNIT-III

5	a)	A 400 V, three phase balanced supply is fed to a star connected three phase load which has a resistance of 8Ω and a capacitive reactance of 10Ω in each phase. Find: i) the line current, total volt-amperes, active and reactive power. ii) Draw the phasor diagram showing phase voltages, line voltages and currents.	CO4	7 Marks
	b)	Derive the relation between line and phase quantities of voltages and currents in a star connected system.	CO2	7 Marks
		(OR)		
6	a)	With a neat sketch, prove that two wattmeters are enough to measure reactive power of a three phase unbalanced system.	CO2	7 Marks
	b)	Three similar coils connected in star takes a total power of 1.5kW at a power factor of 0.2 lagging from a three phase, 400V, 50Hz supply. Calculate resistance and inductance of each coil.	CO4	7 Marks

UNIT-IV

7	a)	Derive the torque equation of three phase induction motor and prove that starting torque is maximum at $R_2=X_2$.	CO2	7 Marks
	b)	A three phase induction motor is wound for 4 poles and is supplied from 50-Hz system. Calculate i) The synchronous speed. ii) The rotor speed, when slip is 4%. iii) Rotor frequency when rotor runs at 600 r.p.m.	CO4	7 Marks

(OR)

8	a)	Explain the construction of alternators based on rotor construction. Also, list out their applications.	CO6	10 Marks
	b)	Find the no. of armature conductors in series per phase required for the armature of a three phase 50Hz 10 pole alternator. The winding is star connected to give a line voltage of 11000V. The flux per pole is 0.16wb, assume $k_p=1$ and $k_d=0.96$.	CO2	4 Marks

UNIT-V

9	a)	Explain the construction of universal motor with neat sketch.	CO1	7 Marks
	b)	Explain the working of shaded-pole motor and mention its applications.	CO1	7 Marks

(OR)

10	a)	Compare three phase induction motor with single phase induction motor.	CO1	4 Marks
	b)	Explain the working principle of operation of resistance split phase induction motor.	CO1	7 Marks
	c)	List out the applications of single phase induction motor.	CO6	3 Marks

CODE No.: 16BT30301 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

ENGINEERING METALLURGY
[Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Briefly describe the working principle of electric furnace.	CO6	7 Marks
	b)	Compare blast furnace with cupola furnace.	CO1	7 Marks
		(OR)		
2		Explain the process involved in cupola furnace.	CO3	14 Marks
		UNIT-II		
3		Explain Iron-Iron carbide diagram in detail with a neat diagram.	CO4	14 Marks
		(OR)		
4		What is binary isomorphous system? Explain with neat diagram.	CO2	14 Marks
		UNIT-III		
5	a)	Define the term Heat treatment and explain various stages in a heat treatment process.	CO3	8 Marks
	b)	Normalized Steels are stronger than annealed steels. Explain.	CO3	6 Marks
		(OR)		
6	a)	Explain about CCT Diagram.	CO3	7 Marks
	b)	Write about Sub Zero Treatment.	CO3	7 Marks
		UNIT-IV		
7	a)	What is Carburizing? Why is it done?	CO3	7 Marks
	b)	Compare and contrast any two Surface Hardening methods.	CO3	7 Marks
		(OR)		
8		Write and explain the steps in metallographic specimen preparation.	CO5	14 Marks
		UNIT-V		
9		Mention various methods for production of metal powders and explain in detail.	CO6	14 Marks
		(OR)		
10		Discuss about the following terms. i) Blending. ii) Compacting. iii) Hot and cold isostatic pressing.	CO4	14 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

KINEMATICS OF MACHINERY
[Mechanical Engineering]

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

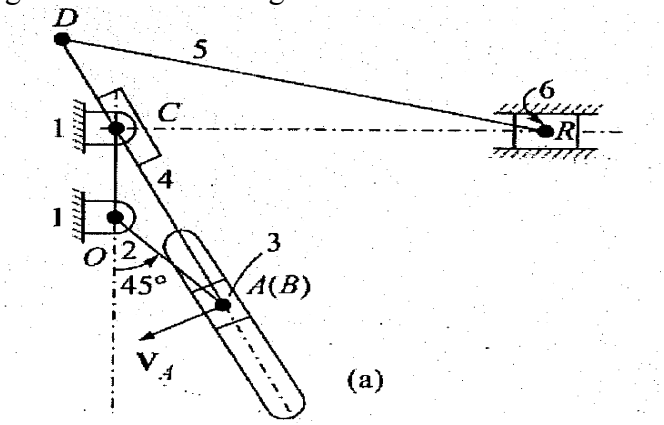
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	What is an inversion? Explain any two inversions of single slider crank chain	CO1	14 Marks
	(OR)		
2	Sketch and explain any two inversions of four bar chain.	CO1	14 Marks

UNIT-II

3	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 of : i) The mid-point of link BC. ii) A point on link CD, 100 mm from the pin connecting the links CD and AD.	CO2	14 Marks
	(OR)		
4	A whit-worth quick return motion mechanism shown in figure below. OA is crank rotating at 30 r.p.m. in clockwise direction. OA=150mm. OC = 100mm, CD = 125mm and DR=500mm Determine the acceleration of the sliding block R and the angular acceleration of the slotted lever CA.	CO2	14 Marks



UNIT-III

5	What are the straight line mechanisms? Derive the condition of exact straight line motion.	CO1	14 Marks
	(OR)		
6	Derive an expression for the ratio of shafts velocities for Hooke's joint and draw the polar diagram depicting the salient features of driven shaft speed.	CO1	14 Marks

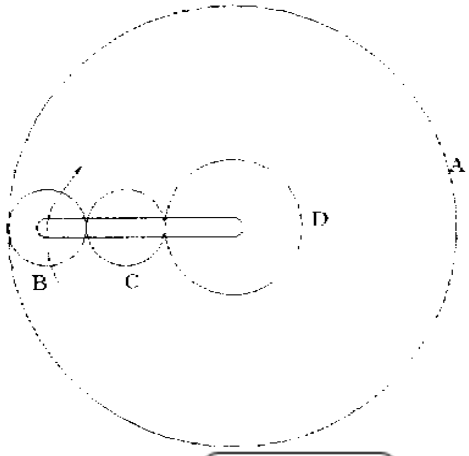
UNIT-IV

7 Two mating involute spur gears of 20^0 pressure angle have a gear ratio 2. The number of teeth on pinion is 20 and its speed is 250 r.p.m. The module pitch of the teeth is 12mm. If the addendum on each wheel is such that the path of approach and the path of recess on each side are half the maximum possible length each, find: CO3 14 Marks

i) The addendum for pinion and gear wheel.
ii) The length of arc of contact.
iii) The maximum velocity of sliding during approach and recess. Assume pinion to be driver.

(OR)

8 An epi-cyclic gear train as shown in figure is composed of affixed annular wheel A having 150 teeth. The wheel A is meshing with wheel B which drives wheel D through an idle wheel C, D being concentric with A. The wheels B and C are carried on an arm which revolves clockwise at 100 r.p.m. about the axis of A and D. If the wheel B and D have 25 and 40 teeth respectively, determine the number of teeth on C and speed sense of rotation of wheel C. CO4 14 Marks



UNIT-V

9 A cam is to be designed for knife edge follower with the following data: CO5 14 Marks

i) Cam lift = 40mm during 90^0 of cam rotation with SHM.
ii) Dwell for next 30^0
iii) During the next 60^0 of cam rotation, the follower returns to its original position with uniform acceleration
iv) Dwell during the remaining 180^0

Draw the profile of the cam when the line of stroke is offset by 20mm from the axis of the cam shaft. The radius of the base circle of the cam is 40mm. Determine the maximum velocity and acceleration of the follower during its ascent and descent, if the cam rotates at 240 r.p.m.

(OR)

10 A cam rotating at uniform speed of 300 r.p.m. operates a reciprocating follower through a roller of 15mm diameter. Minimum radius of cam is 30mm. The follower is to have an outward stroke of 30mm with uniform acceleration and retardation motion during 120^0 of cam rotation, the follower is to dwell for 30^0 and is to return to its initial position with SHM during 90^0 of cam rotation. The follower is to dwell for the remaining portion. The follower axis passes through the cam centre. Draw the cam profile. CO6 14 Marks

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CODE No.: 16BT30303 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

MANUFACTURING TECHNOLOGY
[Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Discuss the properties of moulding sand.	CO2	7 Marks
	b)	What is core and explain how to make a core?	CO3	7 Marks
		(OR)		
2	a)	What are the factors which govern the selection of a proper material for pattern making?	CO2	7 Marks
	b)	Describe the steps involved in the preparation of green sand mould with cope and drag pattern.	CO1	7 Marks

UNIT-II

3	a)	Briefly explain cold-chamber die casting process with a neat sketch.	CO4	7 Marks
	b)	Describe continuous casting process.	CO4	7 Marks
		(OR)		
4	a)	Discuss the casting defects and their inspection methods.	CO4	7 Marks
	b)	What are the tests carried out to determine the quality of casting?	CO4	7 Marks

UNIT-III

5	a)	Explain the principle of operation of drop forging and press forging processes.	CO5	7 Marks
	b)	Describe the explosive forming process.	CO5	7 Marks
		(OR)		
6	a)	Compare the main characteristics of the hot working and cold working.	CO1	7 Marks
	b)	List various operations generally performed in a sheet metal workshop.	CO4	7 Marks

UNIT-IV

7	a)	What are the qualities of flame is used for welding? How can you distinguish three types of welding flames and for what applications these are used?	CO4	7 Marks
	b)	Briefly explain the principle of operation, advantages, limitations and applications of Laser beam welding.	CO4	7 Marks
		(OR)		
8	a)	Explain the process of thermit welding. Where would you recommend it?	CO5	7 Marks
	b)	Briefly explain the common welding defects; causes and remedies for them.	CO4	7 Marks

UNIT-V

9	a)	Which type of plastic is used for manufacturing electrical switches? Why?	CO2	7 Marks
	b)	Compare the thermoplastics and thermosetting plastics.	CO5	7 Marks
		(OR)		
10	a)	Explain the transfer moulding process with neat sketch.	CO1	7 Marks
	b)	Write short notes on the following:	CO5	7 Marks
		i) Calendaring. ii) Casting of plastics.		

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

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) Explain clearly the different types of stresses and strains. CO1 7 Marks

b) A brass bar having a cross-sectional area of 1000mm^2 is subjected to axial forces as shown in fig 1. Find the total change in length of the bar. Take E= 1.05 x 10^{5}N/mm^2. CO2 7 Marks

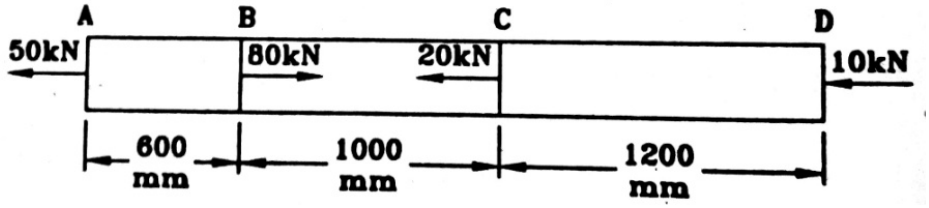

Fig.1

(OR)

2 A compound tube consists of a steel tube 140mm internal diameter and 160mm external diameter and an outer brass tube 160mm internal diameter and 180mm external diameter. The two tubes are of the same length. The compound tube carries an axial load of 900kN. Find the stresses and the load carried by each tube and the amount it shortens. Length of each tube is 140mm. Take E for steel as 2 x 10^{5}N/mm^2 and for brass as 1 x 10^5 N/mm^2. CO2 14 Marks

UNIT-II

3 Draw BM and SF diagrams for the beam shown in Fig 2, indicating the values at all salient points. CO6 14 Marks

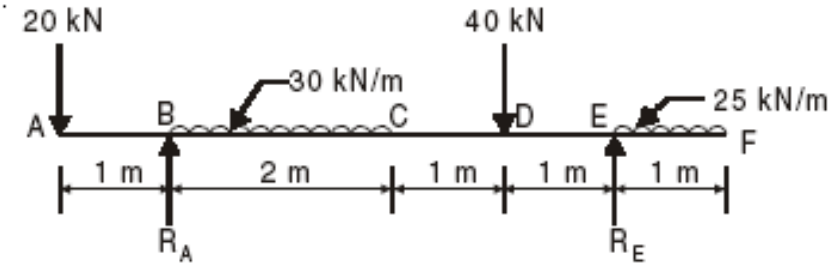

Fig.2

(OR)

4 a) Discuss in brief about sagging and hogging bending moments. CO1 4 Marks

b) A beam AB 10m long is simply supported at its ends A and B. It carries a uniformly distributed load of 20kN/m for a distance of 5m from the left end A and a concentrated load of 40kN at a distance of 2m 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. CO6 10 Marks

UNIT-III

5 A steel shaft ABCD having a total of 2400mm is contributed by three different sections as follows. The portion AB is hollow having outside and inside diameters 80mm and 50mm respectively. BC is solid and 80mm diameter. CD is also solid and 70mm 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 50MPa and shear modulus 0.82×10^5MPa. CO3 14 Marks

(OR)

6 An 'I' section beam consists of two flanges 150 x 20mm and a web of 310 x 10mm. Find the magnitude of maximum shear stress when it is subjected to a shear force of 40kN and draw the shear stress distribution diagram over the depth of the section. CO3 14 Marks

UNIT-IV

7 For the simply supported beam shown in Fig 3. Find: CO5 14 Marks

i) The slope at each end.
ii) Deflection at C and D.
iii) Maximum deflection. Take E= 200 kN/mm^2 and I = 6.50×10^8 mm^4

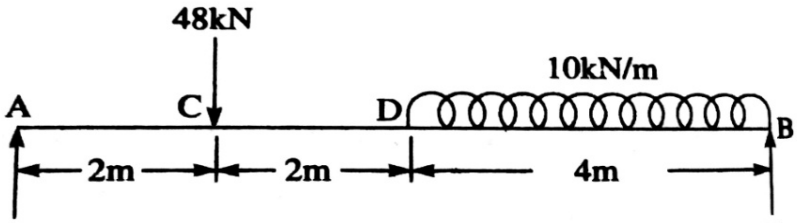

Fig.3

(OR)

8 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. CO1 7 Marks

b) A beam of length 6 m is simply supported at the ends and carries two point loads of 48kN and 40kN at a distance of 1 m and 3m respectively from the left support. Compute the slope and deflection under each load. Assume EI = 17000 kN–m^2. CO5 7 Marks

UNIT-V

9 A cylindrical thin drum 80cm in diameter and 3m long has a shell thickness of 1cm. If the drum is subjected to an internal pressure of 2.5N/mm^2, determine: CO4 14 Marks

i) Change in diameter.
ii) Change in length.
iii) Change in volume. Take E = 2×10^5 N/mm^2 and Poisson's ratio = 0.25.

(OR)

10 a) A cylindrical air receiver for a compressor is 2 m in internal diameter and made of plates 12mm thick. If the hoop stress is not to exceed 90N/mm^2 and the axial stress is not to exceed 60N/mm^2, find the maximum safe air pressure. CO4 7 Marks

b) A pipe of 200mm internal diameter and 100mm thickness contains a fluid at a pressure of 6N/mm^2. Find the maximum and the minimum hoop stress across the section. CO5 7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

THERMODYNAMICS

[Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Classify the thermodynamic systems. Give example for each type with Justification.	CO1	7 Marks
	b)	Briefly explain the path function and point function. .	CO1	7 Marks
		(OR)		
2	a)	List the Thermal Equilibrium and define Zeroth Law of Thermodynamics.	CO1	7 Marks
	b)	A mass of 1 kg of air contained in a closed vessel at 1 bar, 300 K is stirred with a constant torque of 1 N-m at a speed of 1000 RPM till the volume doubles at constant pressure. The initial and final temperatures were found to be the same. If 10 kJ of heat is absorbed during the experiment, calculate its duration.	CO2	7 Marks

UNIT-II

3	a)	Discus the First Law of Thermodynamics applied to a process in a closed system. Make necessary assumptions.	CO1	7 Marks
	b)	Two streams of air, one at 1 bar, 27^0C and velocity of 30 m/s and the other at bar, 227^0C and velocity of 50 m/s mix in equal proportion in a chamber from which heat at the rate of 100kJ/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 27^0C and its Cp = 1.005 kJ/kgK.	CO2	7 Marks
		(OR)		
4	a)	State and prove Carnot's theorem.	CO1	7 Marks
	b)	A heat engine drives a heat pump. The heat delivered by the heat engine as well as by the pump is used to heat the water circulating through the heat radiators of a building. The efficiency of the heat engine is 27% and the coefficient of performance of heat pump is 4. Calculate the ratio of heat transferred to the circulating water to the heat taken by the heat Engine.	CO3	7 Marks

UNIT-III

5	a)	Discuss the principle of entropy increases.	CO1	6 Marks
	b)	1 kg of ice at -10^0C is exposed to the atmosphere which is at 25^0C. The ice melts and comes in contact with the atmosphere. i) Determine the entropy increase of the universe. ii) What is the minimum amount of work necessary to convert the water back into ice at 10^0C? Cp of ice is 2.093kJ/kgK and the latent heat of fusion of ice is 333kJ/kg.	CO3	8 Marks
		(OR)		
6	a)	Derive an expression for availability in non - flow system	CO1	7 Marks
	b)	Air expands through a turbine from 50kPa, 520^0C to 10kPa, 30^0C. During expansion 10KJ of heat is lost to the surroundings which is at 98kPa, 20^0C, neglecting KE and PE changes determine per kg of air: i) The decrease in availability. ii) The maximum work. iii) The irreversibility.	CO4	7 Marks

UNIT-IV

7	a)	Discus the P-V and T-S diagram with neat sketch for pure substance and define dryness fraction.	CO1	7 Marks
	b)	Calculate the internal energy per kg of super heated steam at a pressure of 10 and a temperature of 300^0C. Also find the change of internal energy if this steam expanded to 1.4 bar and dryness fraction 0.8.	CO4	7 Marks

(OR)

8	a)	Explain the Dalton's law of partial pressures for mixture of gases.	CO1	7 Marks
	b)	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.	CO2	7 Marks

UNIT-V

9	a)	Derive an expression for the thermal efficiency of stirling cycle and draw P-V and T-S diagrams.	CO1	7 Marks
	b)	The efficiency of an Otto cycle is 60% and γ=1.5, what is the compression ratio?	CO5	7 Marks

(OR)

10		Derive an expression for the thermal efficiency of Dual cycle and draw P-V and T-S diagrams.	CO1	14 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

ELECTRONIC CIRCUIT ANALYSIS AND DESIGN

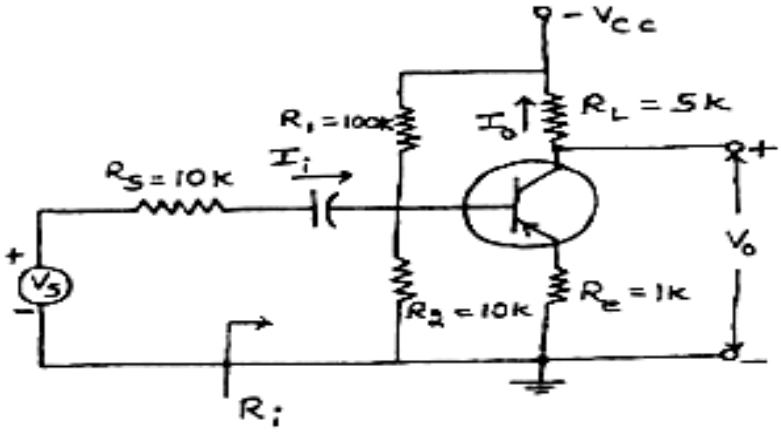
[Electronics and Communication Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the principle of operation of a direct coupled amplifier and mention its advantages and disadvantages.	CO1	7 Marks
	b)	For the transistor amplifier shown below, compute A_i, A_v, A_{vs} and R_i. Assume h_{ie} = 1100Ω, h_{fe} = 50, h_{re} = 2.5 x 10^{-4} and h_{oe} = 24uA/V	CO4	7 Marks



(OR)

2	a)	Three identical non-interacting amplifier stages have an overall gain of 0.3dB down at 20kHz compared to mid band gain. Calculate the uppercut-off frequencies of the individual stages.	CO4	8 Marks
	b)	Describe the working of a cascade amplifier with neat diagram.	CO1	6 Marks

UNIT-II

3	a)	Draw the small signal high frequency CE model of a transistor. Explain about each component.	CO1	7 Marks
	b)	Obtain the expressions for the voltage gain in the low frequency, medium frequency and high frequency ranges in the case of single stage amplifier.	CO2	7 Marks

(OR)

4	a)	Draw and explain the CE Hybrid - Pi model.	CO1	6 Marks
	b)	Why is hybrid - Π model called a trans-conductance model? Justify by the relevant proofs.	CO2	8 Marks

UNIT-III

5	a)	Apply voltage series feedback to the Emitter follower to increase input impedance and to decrease output impedance.	CO6	7 Marks
	b)	Define Piezoelectric effect. Draw an **ac** equivalent circuit of a Crystal.	CO1	7 Marks

(OR)

6	a)	Explain principle and operation of the Wien Bridge Oscillator and derive expression for frequency of oscillation.	CO1	6 Marks
	b)	Apply Voltage-Shunt feedback concept for a CE amplifier and show $R_{if} = \frac{R_i}{1 + R_i\beta}$.	CO6	8 Marks

UNIT-IV

7	a)	Design a class B power amplifier to obtain the maximum conversion efficiency is 78.5%.	CO3	8 Marks
	b)	Discuss how amplification takes place in a power amplifier.	CO1	6 Marks
		(OR)		
8	a)	What is heat sink? What is its function? Explain.	CO1	7 Marks
	b)	Design a class A power amplifier to obtain the maximum conversion efficiency is 25%.	CO3	7 Marks

UNIT-V

9	a)	What is stagger tuning? Suggest possible applications.	CO1	7 Marks
	b)	Select a tuned amplifier to operate in the radio frequency and explain its operation.	CO5	7 Marks
		(OR)		
10	a)	Define class C amplifier. Sketch a tuned class C amplifier with an LC tank circuit as load. Derive its efficiency.	CO1	7 Marks
	b)	Select a parallel resonance circuits and explain how it used as a tuned circuit.	CO5	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations September - 2020

SIGNALS AND SYSTEMS

[Electronics and Communication Engineering]

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

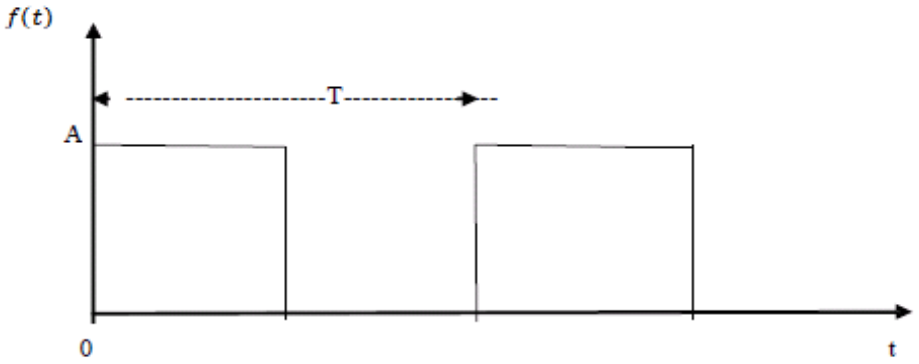
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

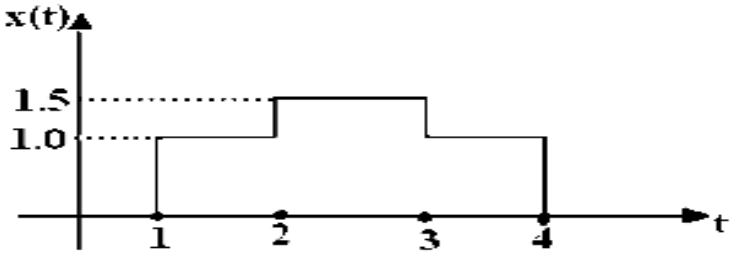
1	a)	Comment on energy and power of the signal x(t) ,where x(t) is the product of unit step and ramp signals.	CO3	7 Marks
	b)	Briefly explain the applications of signals and systems in real time world.	CO6	7 Marks
		(OR)		
2	a)	Find the even and odd components of: i) x (t) = cos t + sin t. ii) $x(t)= e^{j2t}$	CO3	7 Marks
	b)	Define the following Elementary signals. i) Real Exponential Signal. ii) Continuous time version of a sinusoidal signal.	CO1	7 Marks

UNIT-II

3	a)	Express the f(t) as linear combination of sinusoids using appropriate technique.	CO5	10 Marks



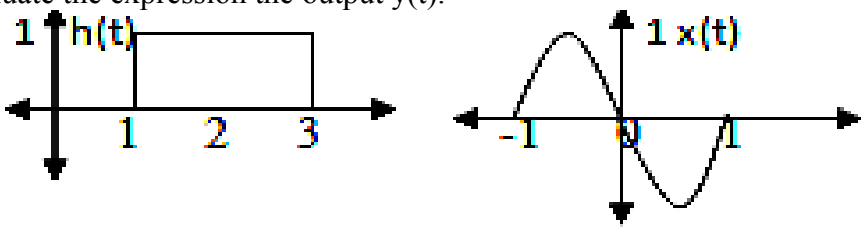
	b)	What are the Dirichlet conditions? Derive the formulae for Fourier Coefficients.	CO1	4 Marks
		(OR)		
4	a)	Analyze the signal in frequency domain by applying appropriate methods.	CO5	9 Marks



	b)	Explain how input and output signals are related to impulse response of LTI system.	CO1	5 Marks

UNIT-III

5	a)	Examine how convolution and correlation of a signal are related in the context of signal processing.	CO3	7 Marks
	b)	Explain how convolution helps to detected periodic signal in presence of noise	CO2	7 Marks
		(OR)		

6	a)	Consider an LTI system with impulse response h(t) shown below. If the signal x(t) shown below is given as input to this system, using convolution evaluate the expression the output y(t). 	CO3	9 Marks
	b)	Making use of convolution property in frequency domain prove parsevals theorem	CO2	5 Marks
		UNIT-IV		
7	a)	Determine the Laplace transform and sketch the pole-zero plot of the following signals i) $X(t)=e^{-2t}\cos(2t)$. ii) $te^{-t}u(t)$	CO4	8 Marks
	b)	State and prove the time differentiation and frequency integration property of Laplace transforms.	CO1	6 Marks
		(OR)		
8	a)	Obtain the inverse transform of $F(s) = x = \frac{1}{s(s-3)(s+10)}$ using partial fraction method.	CO4	8 Marks
	b)	State the properties of the ROC of Laplace Transform.	CO1	6 Marks
		UNIT-V		
9	a)	The signal $g(t) = 20\ Cos(50\pi t)\ Cos(60\pi t)$ is sampled at the rate of 100 samples per second. (i) Determine the spectrum of sampled signal. (ii) Specify cut-off frequency of the ideal reconstruction filter to recover g(t) from its samples. (iii) What is the Nyquist rate for g(t).	CO4	9 Marks
	b)	Discuss effect of under sampling.	CO2	5 Marks
		(OR)		
10	a)	State parsevals relation for convolution theorem in Z Domain	CO4	7 Marks
	b)	Bring out the relationship between DTFT and Z transform.	CO2	7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Supplementary Examinations September - 2020

SWITCHING THEORY AND LOGIC DESIGN

[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)	Reduce the following Boolean expression. **i) F=A[B+C'(AB+AC')']** **ii) F=(A+(BC)')' (AB'+ABC)**	CO5	8 Marks
	b)	Show that following Boolean expression using theorems. **i) AB+AB'C+BC'=AC+BC'** **ii) AB'C+B+BD'+ABD'+A'C=B+C**	CO4	6 Marks
		(OR)		
2	a)	Apply DeMorgan's theorem to each of the following expressions. **i) AB+CD=((AB)'.(CD)')'** **ii) (A+B)(C+D)=((A+B)'+(C+D)')'** **iii) [[(P+Q)'(R+S)'(T+V)'(X+Y)']']'**	CO4	7 Marks
	b)	Express following boolean functions to minterms and maxterms. **i) F=A'B'C+A'B'C+A+BC+AB'C+ABC.** **ii) F=A+BC'+ABD'+ABCD.**	CO5	7 Marks

UNIT-II

3	a)	Explain briefly about SOP and POS forms with example.	CO1	7 Marks
	b)	Express the standard sum of products for the following expression. **F(A, B, C, D) = (AB)′D + ABC′D′ + A′BD + ABCD′.**	CO2	7 Marks
		(OR)		
4	a)	Explain the process of tabulation method.	CO1	5 Marks
	b)	Simplify the Boolean function using K-map in POS forms $F=\sum m$ **(0, 1, 2, 4, 7, 8, 12, 14, 15, 16, 17, 18, 20, 24, 28, 30, 31).**	CO2	9 Marks

UNIT-III

5	a)	Construct a 4 to 16 line decoder using 2 to 4 line decoder.	CO3	7 Marks
	b)	Demonstrate usage of shift registers in digital systems.	CO6	7 Marks
		(OR)		
6	a)	Design suitable multiplex for the following function $F = (A \oplus B \oplus)$.	CO3	7 Marks
	b)	Draw and explain decimal adder.	CO6	7 Marks

UNIT-IV

7	a)	Explain the operation of Bidirectional shift register with neat block diagram.	CO1	7 Marks
	b)	Design a Mod-6 synchronous counter using T Flip-Flops.	CO3	7 Marks
		(OR)		
8	a)	Explain the operation of universal shift register with neat block diagram.	CO1	7 Marks
	b)	Convert D Flip-Flop into T Flip-Flop.	CO2	7 Marks

UNIT-V

9	a)	Define the following terms: i) PROM. ii) PLA. iii) PAL.	CO1	7 Marks
	b)	Design PAL for the Boolean function **F1(X,Y,Z) = X′Y′Z+XZ′+YZ′, F2(X,Y,Z)=X′Y′+XY, F3(X,Y,Z)=YZ′.**	CO3	7 Marks
		(OR)		
10	a)	Implement Boolean function using PAL ***Y*(*A*,*B*,*C*,*D*)=Σ*m*(2, 3, 8, 9, 10, 12, 13),** ***Z*(*A*,*B*,*C*,*D*)=Σ*m*(1, 3, 4, 6, 9, 12, 14).**	CO2	7 Marks
	b)	Design PLA for the Boolean function ***F*1(*X*,*Y*,*Z*)=*X′Y′Z*+*XZ′*+*YZ′*, *F*2(*X*,*Y*,*Z*)=*X′Y′*+*XY*, *F*3(*X*,*Y*,*Z*)=*YZ′*.**	CO3	7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

ANALOG ELECTRONIC 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)	Explain the principle of operation of a direct coupled amplifier and mention its advantages and disadvantages.	CO1	8 Marks
	b)	List the classification of BJT amplifiers.	CO2	6 Marks
		(OR)		
2	a)	What is an effect of bypass and coupling capacitor in BJT amplifier?	CO1	7 Marks
	b)	Derive the expressions of Gain Bandwidth product for voltage and current.	CO3	7 Marks

UNIT-II

3	a)	Implement a voltage series feedback circuit and calculate its input and output resistance	CO6	8 Marks
	b)	Calculate the gain, input impedance and output impedance of voltage series feedback amplifier having gain A = -300, R_{in}= 1.5k ohms and R_{out}=50k ohms, β= 0.05	CO4	6 Marks
		(OR)		
4	a)	Explain the principle of operation and derive the expression for frequency of oscillation of Wien Bridge Oscillator.	CO1	6 Marks
	b)	An Hartley oscillator is designed with L_1= 20 μH; L_2= 2mH. Determine range of capacitances if frequency is varied between 950kHz and 2050kHz	CO4	8 Marks

UNIT-III

5	a)	Suggest the methodology that can be applied to eliminate cross over distortion in class-B push pull power amplifier.	CO6	7 Marks
	b)	Compare simple series fed and Transformer coupled class A power amplifier.	CO2	7 Marks
		(OR)		
6	a)	Implement phase inverter circuit using Transistors. Explain its advantages.	CO6	8 Marks
	b)	Compare Transformer coupled class B push pull and complementary symmetry push pull amplifier.	CO2	6 Marks

UNIT-IV

7	a)	Apply an appropriate technique on a simple RC Circuit to convert a square wave to periodical ramp Signal.	CO5	7 Marks
	b)	Obtain the response of RC High Pass Circuit for a square wave input for different Time Constants and evaluate %Tilt.	CO2	7 Marks
		(OR)		
8	a)	Apply appropriate technique on a simple RC Circuit to convert square Signal to Spikes.	CO5	7 Marks
	b)	Discuss in detail about Diode Comparator with neat sketches.	CO1	7 Marks

UNIT-V

9	a)	Design a Schmitt trigger circuit with Vcc=12v, UTP=5v, LTP=3v, Ic=2mA, using two silicon NPN transistors with h_{fe}=100 and I2=0.1I_{c2}.	CO3	7 Marks
	b)	Explain UTP and LTP voltages in Schmitt trigger.	CO1	7 Marks
		(OR)		
10	a)	Explain the operation of fixed bias Bistable Multivibrator circuit with neat sketches.	CO1	8 Marks
	b)	Design a one-shot circuit to produce a pulse with a gate width of 5ms. Assume the data required.	CO3	6 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations September - 2020

COMPUTER ORGANIZATION

[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)	An 8-bit register contains the binary value 10011100. What is the register value after arithmetic shift right? Starting from the initial number 10011100 determine the register value after an arithmetic shift left and state whether there is an over flow.	CO2, CO4	4 Marks
	b)	Design register selection circuit to select one of the four 4-bit registers content on to bus with explanation.	CO3	10 Marks

(OR)

2	a)	Explain the process of multiplication of two floating point numbers with a flow chart.	CO1	7 Marks
	b)	Design a 4-bit arithmetic logic shift unit. Draw logic diagram of one stage of an arithmetic logic shift unit along with the function table.	CO3	7 Marks

UNIT-II

3	a)	Consider a 16-bit processor in which the following appears in main memory, starting at location 200:	CO2, CO4	7 Marks

200	Load to AC	Mode
201	500	
201	Next Instruction	

The first part of the first word indicates that this instruction loads a value into an accumulator. The Mode field specifies an addressing mode and, if appropriate, indicates a source register; assume that when used, the source register is R1, which has a value of 400. There is also a base register that contains the value 100. The value of 500 in location 201 may be part of the address calculation. Assume that location 399 contains the value 999; location 400 contains the value 1000, and so on. Determine the effective address and the operand to be loaded for the following address modes:

i) Direct. ii) Immediate. iii) Indirect.
iv) PC relative. v) Displacement. vi) Register.
vii) Register indirect.

	b)	Represent the following signed numbers in binary using 8 bits. +83, -83, +68, -68. Perform the subtraction (-68) – (+83) in binary. Interpret the results and indicate if there is an overflow.	CO5	7 Marks

(OR)

4	a)	A computer uses a memory unit with 256K words of 32 bits each. A binary instruction code is stored in one word of memory. The instruction has four parts: an indirect bit, an operation code, a register code part to specify one of 64 registers, and an address part.	CO2, CO5	7 Marks

i) How many bits are there in the operation code, the register code part, and the address part?
ii) Draw the instruction word format and indicate the number of bits in each part.
iii) How many bits are there in the data and address inputs of the memory?

	b)	Describe about the Stored Program Organization with a neat diagram.	CO1	7 Marks

UNIT-III

5	a)	Differentiate between Programmed I/O and Interrupt-initiated I/O modes of transfer.	CO2	7 Marks
	b)	Discuss in detail the daisy-chain priority interrupt method. Draw the diagram showing the internal logic needed.	CO1	7 Marks
		(OR)		
6	a)	Compare the Strobe Control and Handshaking techniques for Asynchronous Data Transfer.	CO2	7 Marks
	b)	A DMA Controller transfers 16-bit words to memory using cycle stealing. The words are assembled from a device that transmits characters at a rate of 2400 characters per second. The CPU is fetching and executing instructions at an average rate of 10^6 instructions per second. By how much will the CPU be slowed down because of the DMA transfer?	CO2, CO4	7 Marks

UNIT-IV

7	a)	The access time of a cache memory is 100ns and that of main memory 1000ns. It is estimated that 80% of the memory requests are for read and the remaining 20% for write. The hit ratio for read accesses only is 0.9. A write-through procedure is used. What is the average access time of the system considering only memory read cycles? What is the average access time of the system for both read and write requests? What is the hit ratio taking into consideration the write cycles?	CO2, CO4	7 Marks
	b)	Compare Static and Dynamic memory systems.	CO2	7 Marks
		(OR)		
8	a)	Consider an SDRAM whose cells are arranged in 8K (=8192) rows. Suppose that it takes 4 clock cycles to access (read) each row. Considering clock rate at 133 MHz, how much time does it take to refresh all rows? Considering 64 ms time interval for accessing the memory, what is the refresh overhead?	CO2, CO5	4 Marks
	b)	Discuss the Data cache organization and operational concepts.	CO1	10 Marks

UNIT-V

9	a)	Explain about inter processor communication and synchronization.	CO1	7 Marks
	b)	Write a short note on Instruction pipeline process.	CO1	7 Marks
		(OR)		
10	a)	What is Flynn's classification of computers? Compare in detail.	CO1	7 Marks
	b)	Compare the non-pipelined and pipelined units in terms of speedup ratio.	CO2	7 Marks

CODE No.: 16BT30502 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

DATA 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		Explain the following operation in a singly linked list with example. i) Create a list adding nodes at the front. ii) Delete a node at a given position.	CO2	14 Marks
		(OR)		
2	a)	List out the advantages of doubly linked list over singly linked list.	CO2	6 Marks
	b)	Write the procedure to insert a given value into an ordered doubly linked list into its proper position.	CO2	8 Marks
		UNIT-II		
3	a)	Define Circular queue. Explain the operations of Circular Queue using linked list with examples.	CO1	9 Marks
	b)	Compare and Contrast the Queue and Circular Queue.	CO2	5 Marks
		(OR)		
4	a)	Explain the relevance of stack implementation with recursive function evaluation.	CO3	10 Marks
	b)	Discuss about the exceptional conditions of stack.	CO4	4 Marks
		UNIT-III		
5	a)	Explain the way of representing Generic Trees.	CO1	7 Marks
	b)	Design a tree and write an algorithm for finding the sum of all the elements of the tree.	CO3	7 Marks
		(OR)		
6		Define BST? Explain with suitable algorithm for inserting a node at different instances. Illustrate with suitable example.	CO1	14 Marks
		UNIT-IV		
7		Describe in detail about breadth first traversal of a graph with suitable example.	CO1	14 Marks
		(OR)		
8	a)	List the Various graph storage structures with example	CO1	10 Marks
	b)	List the applications of Graphs and graph traversals.	CO1	4 Marks
		UNIT-V		
9	a)	Explain how the following values are stored in a hash table 25, 42, 96, 101, 102, 162, 197	CO3	7 Marks
	b)	Define the process of handling collisions.	CO1	7 Marks
		(OR)		
10	a)	Discuss about the following terminology. i) Hash Function. ii) Load Factor.	CO2	7 Marks
	b)	"Double hashing reduces clustering in a better way". Justify it.	CO2	7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Supplementary Examinations September - 2020

PYTHON PROGRAMMING
[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 a python script that prompt the user for two integer values and display the result of the first number divide by the second with exactly two decimal places displayed.	CO5	7 Marks
	b)	Explain basic Input and Output functions in Python.	CO1	7 Marks
		(OR)		
2	a)	Write a short notes on: i) Implicit line joining. ii) Explicit line joining.	CO2	7 Marks
	b)	Write a python script to calculate factorial of given number.	CO5	7 Marks

UNIT-II

3		Write a python script to find the largest number among four numbers and display them in ascending order using if-else construct.	CO5	14 Marks
		(OR)		
4	a)	Explain the difference between the lists and tuples in python.	CO2	7 Marks
	b)	Write a python script to create a list and add n number of user-defined values to the list and display the same on to the console screen.	CO5	7 Marks

UNIT-III

5		Write a program segment that: i) Opens and reads a text file. ii) Copy data to other file. iii) Display text in the file. Display how many lines of text are in the file.	CO6	14 Marks
		(OR)		
6		Define an Exception and explain the Exception handling mechanisms supported by Pyhton.	CO1	14 Marks

UNIT-IV

7	a)	Explain the concept of fundamental turtle attributes and behavior.	CO1	7 Marks
	b)	Outline objects and object references.	CO1	7 Marks
		(OR)		
8		Explain encapsulation, inheritance and polymorphism.	CO1	14 Marks

UNIT-V

9	a)	List and explain the types of menus available in GUI programming.	CO3	7 Marks
	b)	Write a python script to create a window with top-level window menu.	CO5	7 Marks
		(OR)		
10	a)	Write a brief note on Standalone Container classes.	CO1	7 Marks
	b)	List and explain the uses of Lambda.	CO2	7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

SENSORS AND TRANSDUCERS

[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)	Discuss the standard MKS system of units and its advantages over CGS system of units.	CO6	7 Marks
	b)	A set of independent ten measurements were made to determine the weight of a lead shot. The weights in grams were: 1.570, 1.597, 1.591, 1.562, 1.577, 1.580, 1.564, 1.586, 1.550, 1.575. Determine the: i) Arithmetic mean. ii) Average deviation. iii) Standard deviation. iv) Variance.	CO3	7 Marks
		(OR)		
2	a)	Explain the terms: i) Static error. ii) Static Correction. iii) Relative error. iv) Percentage Relative error.	CO1	8 Marks
	b)	An ammeter reads 6.7A and the true value of current is 6.54A. Determine the error and correction for this instrument.	CO3	6 Marks

UNIT-II

3	a)	What is dynamic response? Define the following terms: i) Speed of response. ii) Measuring Lag. iii) Fidelity. iv) Dynamic error.	CO1	7 Marks
	b)	A temperature sensing device can be modeled as a first order system with a time constant of 6s. It is suddenly subjected to a step input of 25°C-150°C. What temperature will be indicated in 10s after the process has started?	CO3	7 Marks
		(OR)		
4		Derive the equations for time response of a first order system when subjected to unit step input. Draw the response curves and find the steady error in each case.	CO2	14 Marks

UNIT-III

5		Select an appropriate sensor for the measurement of linear displacement and describe its constructional details and derive the expression for its output voltage when connected across a meter of finite impedance.	CO5	14 Marks
		(OR)		
6		Apply the capacitive principle for the measurement of displacement with differential arrangement, show how its response can be made linear.	CO5	14 Marks

UNIT-IV

7		Describe the properties of materials used for piezo-electric transducers. Derive expressions for voltage and charge sensitivities.	CO1	14 Marks
		(OR)		
8		Explain the principle of working and constructional details of a Photo-voltaic cell. Explain why it is very useful for space applications.	CO1	14 Marks

UNIT-V

9	What is micromachining? With a neat diagram, explain the micro sensor technology.	CO1	14 Marks
	(OR)		
10	Select and discuss with neat diagrams an appropriate sensor based on echo principle.	CO4	14 Marks

CODE No.: 16BT31201 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

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 converse and the contrapositive of the implication " If it is raining then I get wet".	CO1	7 Marks
	b)	Show that $(\neg P \wedge (\neg q \wedge r) \vee (q \wedge r) \vee (p \wedge r) \Leftrightarrow r$.	CO1	7 Marks
		(OR)		
2	a)	Construct the PCNF of $(p \rightarrow (q \wedge r)) \wedge (\neg p \rightarrow (\neg q \wedge \neg r))$, Without using the truth tables.	CO3	7 Marks
	b)	Prove that $\sqrt{2}$ is irrational by giving a proof by contradiction.	CO4	7 Marks

UNIT-II

3	a)	Show that $(N, \leq)$ is a poset, on the set of all natural numbers N and define $m \leq n$ if n-m is a non negative integers.	CO1	7 Marks
	b)	Design the Hasse diagram on the set S = {a, b, c} and whose power set P(S) = {φ,{a},{b},{c},{a,b},{a, c},{b, c}, {a,b, c}}is a poset with respect to the relation inclusion $\subseteq$.	CO4	7 Marks
		(OR)		
4	a)	Examine R is a partial order relation or not, on N, where N be the set of all natural numbers with the relation R as follows: a R b if and only if a divides b.	CO2	7 Marks
	b)	Design a Hasse diagram of $D = \{1, 2, 4, 5, 10, 20\}$.	CO4	7 Marks

UNIT-III

5	a)	Define monoid. Give an example.	CO1	7 Marks
	b)	Illustrate Isomorphism of Algebric Strctures with examples.	CO2	7 Marks
		(OR)		
6	a)	Prove that f(e) = e', where e, e' are the identities of G and G' respectively and if f is a homomorphism from a group (G,∗) into (G' , .).	CO4	7 Marks
	b)	Prove that $f(a^{-1}) = (f(a))^{-1}$ for all $a \in G$, if f is a homomorphism from a group (G, ∗) into (G' , .).	CO4	7 Marks

UNIT-IV

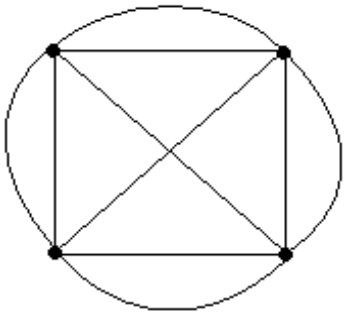
7	a)	What is the minimum number of students required in discrete mathematics class to be sure that at least six will receive the same grade, if there are five possible grades?	CO1	7 Marks
	b)	Determine the coefficient of x^{10} in $(x + x^2 + x^3 + \ldots)^3$.	CO4	7 Marks
		(OR)		
8	a)	How many arrangements of the letters of the word PHOTOGRAPH are there with exactly 5 letters between the two Hs ?	CO1	7 Marks
	b)	Solve the recurrence relation $F(n) - F(n-1) - F(n-2) = 0$, $F(0) = 1$, $F(1) = 1$.	CO4	7 Marks

UNIT-V

9	a)	Define a Hamilton Path in G**.** Give an example.	CO1	7 Marks
	b)	Design a complete bipartite graph of K2, 3 and K3, 3.	CO4	7 Marks

(OR)

10	a)	Test whether the graph G is Eulerian or not.	CO5	7 Marks



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	b)	Show that the complete bipartite graph *n n K,* has the Hamiltonian cycle. When *n n K*, has Eulerian circuit. Justify your answer.	CO1	7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

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)	Illustrate about FCFS Scheduling and Round Robin Scheduling Algorithms.	CO1	7 Marks
	b)	Explain in detail about context switching.	CO1	7 Marks
		(OR)		
2	a)	Briefly explain different states of a process.	CO1	7 Marks
	b)	Differentiate between long term and short term scheduler.	CO1	7 Marks

UNIT-II

3	a)	What is deadlock? List out necessary conditions an OS must satisfy for a deadlock to occur.	CO3	7 Marks
	b)	List down different methods to handle deadlock. Explain them briefly.	CO3	7 Marks
		(OR)		
4	a)	Explain critical section problem. What are the requirements that critical section problem must satisfy?	CO2	7 Marks
	b)	Elucidate about monitors. Compare with semaphores with their relative advantages and disadvantages.	CO2	7 Marks

UNIT-III

5	a)	For the following page reference calculate the page faults that occur using FIFO and LRU for 3 and 4 page frames respectively 5, 4, 3, 2, 1, 4, 3, 5, 4, 3, 2, l, 5.	CO2	7 Marks
	b)	Explain internal and external fragmentation with examples.	CO2	7 Marks
		(OR)		
6	a)	What is the cause for thrashing? How does the system detect thrashing?	CO2	7 Marks
	b)	Explain the need for page replacement with an example.	CO4	7 Marks

UNIT-IV

7		Suppose that a disk has 50 cylinders named 0 to 49. The R/W head is currently serving at cylinder 15. The queue of pending requests are in order: 4 40 11 35 7 14 starting from the current head position, what is the total distance traveled (in cylinders) by the disk arm to satisfy the requests using algorithms FCFS, SSTF, LOOK and C-LOOK (Illustrate with figure in each case).	CO1	14 Marks
		(OR)		
8	a)	List out the allocation methods of disk space.	CO1	7 Marks
	b)	Explain the operations that can be performed on a directory.	CO1	7 Marks

UNIT-V

9	a)	Elucidate about conflicting trends of I/O devices.	CO5	7 Marks
	b)	What does each row and column represent in an access matrix?	CO5	7 Marks
		(OR)		
10	a)	Discuss about protection. Distinguish between policies and mechanisms.	CO5	7 Marks
	b)	Explain briefly Access matrix with domains as objects.	CO5	7 Marks

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CODE No.: 16BT41202 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations September – 2020

JAVA PROGRAMMING

[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 the steps involved in creating and executing a java program?	CO1	7 Marks
	b)	Design a program to implement Money class. This class should have fields for initializing a rupee and paisa value. The paisa value will be in the range from 0 – 99 with the paisa being the same sign as that of rupees. The class should have all reasonable constructors, addition and substraction methods, and a main() method that provides a thorough test of all the methods in the class.	CO6	7 Marks
		(OR)		
2	a)	Java compiled and interpreted. Justify?	CO4	5 Marks
	b)	Create a class Rectangle. The class has two attributes, length and width, each of which defaults to 0. It has methods that calculate the perimeter and area of the rectangle. It has set and get methods for both length and width. The set methods should verify that length and width are floating – point numbers larger than 0.0 and less than 20.0.	CO3	9 Marks

UNIT-II

3	a)	Explain final keyword with all its usages. Support explanation with a program.	CO1	7 Marks
	b)	Explain the various forms of implementing interfaces.	CO1	7 Marks
		(OR)		
4	a)	What are Nested Interfaces? Explain with a suitable example.	CO1	7 Marks
	b)	Create a class within the package "AmountInWords" to convert the amount into words. (Consider the amount to be nor more than 100000.)	CO3	7 Marks

UNIT-III

5	a)	Explain the steps in creating a thread using runnable interface.	CO1	6 Marks
	b)	Design a java program that demonstrates how a high-priority thread using sleep makes way for the lower-priority threads to execute.	CO3	8 Marks
		(OR)		
6	a)	What is a try-with-resources block and how it is used?	CO1	4 Marks
	b)	Consider a Student examoination database system that prints the marksheet of students. Input the following from the command line: i) Student's name. ii) Marks in six subjects. These marks should be between 0 to 100. If the marks are not in the specified range, raise a RangeExceprion, else find the total marks and print the percentage of the student.	CO6	10 Marks

UNIT-IV

7	a)	Design a program that shows a screen sot with an applet running inside the applet viewer. The applet should display your name.	CO5	6 Marks
	b)	Explain the difference between with a suitable example: i) Vector and ArrayList. ii) Enumeration and Iterator.	CO1	8 Marks

(OR)

8	a)	Explain the use of overriding the following methods for an applet. init() start() stop() destroy() paint()	CO1	6 Marks
	b)	Create a collection class named Queue to implement the FIFO order of queues.	CO3	8 Marks

UNIT-V

9	a)	How is the concept of inner classes used for event handling?	CO2	7 Marks
	b)	What is the difference between doGet () and doPost () or GET and POST?	CO1	7 Marks

(OR)

10	a)	What do you mean by HTTP servlet request and response? What is the procedure for initializing a servlet?	CO1	7 Marks
	b)	What is the advantage of having anonymous classes while handling events in Java?	CO1	7 Marks

CODE No.: 16BT50502 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-16) Supplementary Examinations September - 2020

LINUX PROGRAMMING
[Information Technology]

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

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Specify the address format of sockets.	CO1	2 Marks
	b)	Examine the process of naming socket, creating socket queue and accepting connections.	CO2	12 Marks
		(OR)		
2	a)	Write a program to connect to a network socket via loop back.	CO6	7 Marks
	b)	Discuss netstat command with example.	CO1	7 Marks
		UNIT-II		
3	a)	Write a shell program for finding the pascals triangle.	CO4	7 Marks
	b)	Compare the following commands. i) expr. ii) export. iii) eval. iv) exec.	CO2	7 Marks
		(OR)		
4	a)	Write a shell script to check whether the given number is prime or not using function.	CO3	7 Marks
	b)	Demonstrate signal handling using shell script.	CO1	7 Marks
		UNIT-III		
5	a)	Write a shell script to display files which has read, write and execution permissions.	CO3	7 Marks
	b)	Discuss the following system calls: i) fopen. ii) fread. iii) fwrite. iv) fclose.	CO1	7 Marks
		(OR)		
6	a)	Discuss the following system calls: i) fflush. ii) fseek.	CO1	7 Marks
	b)	Write a C program that takes one or more file or directory names as input and reports file type and time of last access of a file.	CO3	7 Marks
		UNIT-IV		
7	a)	Design a program that simulates alarm clock.	CO4	7 Marks
	b)	Explain briefly about signal sets and sigactionflags.	CO1	7 Marks
		(OR)		
8	a)	Describe the signal references to indicate abnormal termination of a program.	CO1	7 Marks
	b)	Write a program that accepts filename as an argument and will respond with an error.	CO4	7 Marks
		UNIT-V		
9	a)	Write a simple socket client program to create socket which connects to server socket.	CO6	7 Marks
	b)	Define socket. Describe in detail about socket connections.	CO1	7 Marks
		(OR)		
10	a)	What do you mean by datagram sockets? List its attributes.	CO1	7 Marks
	b)	Illustrate the process of socket creation and discuss the system calls related to it.	CO5	7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC10) Supplementary Examinations December - 2019

FLUID MECHANICS – II

[Civil Engineering]

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

Answer any FIVE questions
All questions carry equal marks

1. a) Distinguish among different types of drag with the help of a neat sketch.
b) The velocity distribution in the boundary layer is given as
$\frac{v}{V} = \frac{3}{2}\eta - \frac{1}{2}\eta^2$ in which $\eta = (y/\delta)$. Compute θ/δ.

2. a) Define most economical section of a channel and derive the conditions required for trapezoidal channel section.
b) Draw a neat sketch and explain specific energy curve.

3. a) Derive the differential equation for steady gradually varied flow in open channels and list the assumptions.
b) The discharge of water through a rectangular channel of width 6m, is 18m3.s when depth of flow of water is 2m. Calculate (i) specific energy of the flowing water, (ii) critical depth and critical velocity and value of minimum specific energy.

4. a) Derive an expression for the force exerted by a jet of water on a moving vane in the direction of jet.
b) A jet of water of diameter 50 mm strikes with a velocity of 25 m/s a fixed curved plate tangentially at one end at an angle of 30^0 to the horizontal. Calculate the resultant force of the jet on the plate if the jet is deflected through an angle of 50^0.

5. a) Explain the working a Francis turbine with a neat sketch.
b) A 150 mm diameter jet of water strikes the bucket of a Pelton wheel and is deflected through an angle of 165^0 by the buckets. The head available at the nozzle is 350 m. Taking coefficient of velocity as 0.96, speed ratio as 0.46 and loss of velocity of jet due to friction, while passing through the buckets as 12%, find the power developed by the machine.

6. a) What are 'Characteristic curves of a turbine'? Explain the different types of characteristic curves.
b) What is cavitation? On what factors does the cavitation in water turbines depend? What are the methods to avoid cavitation?

7. a) Explain different operating characteristic curves of a centrifugal pump with neat sketches.
b) Two geometrically similar pumps are running at the same speed of 1200 rpm. The first one has an impeller diameter of 0.35 m and lifts water at 20 lps against a head of 18 m. Determine the size of the impeller and head developed by the second pump to deliver half of the discharge.

8. a) Explain the terms load factor and utilization factor. Explain their practical applications with examples.
b) Differentiate between i). Storage and pondage ii). Base load plant and peak load plant.

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CODE No.:10BT40103 SVEC-10

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC10) Supplementary Examinations December - 2019

REINFORCED CEMENT CONCRETE STRUCTURES - I

[Civil Engineering]

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

Answer any FIVE questions
All questions carry equal marks

1. a) Explain the behavior of under reinforced and over reinforced beam sections.
b) A reinforced concrete beam of section 300mm x 450mm is reinforced with 4 bars of 12mm diameter. Determine the moment of resistance of the section. Use M20 grade concrete and Fe415 steel reinforcement. Adopt working stress method of design.

2. a) Explain the concept of limit state method of design.
b) Distinguish between factor of safety and partial safety factor.
c) Derive the expression for limiting depth of neutral axis of a rectangular section.

3. a) Find the design constants in limit state method for M20 grade concrete when Fe 500 grade steel is used.
b) A T-beam section has 1250mm wide flange which is 100mm thick. The width of the web portion is 500mm and is reinforced with 8-20mm∅ bars at an effective cover of 50mm. If M20 concrete mix and Fe415 grade steel are used, what is the flexural strength of the beam?

4. A continuous beam with simple supports has two spans each 5.7m c/c. The beam is subjected to a characteristic dead load of 20kN/m and characteristic live load of 25kN/m. Design the beam and draw the reinforcement detailing.

5. a) Explain in brief the design procedure for shear reinforcement.
b) A rectangular beam of size 230 x 600mm overall is subjected a sagging moment of 32kNm, a shear force of 32kN and a torsional moment of 12kNm at service loads. Design the reinforcement required at the section if materials used are M15 concrete and mild steel reinforcement.

6. Design the footing for a column 450mm x 450mm subjected to an axial load of 2500kN. Assume the bearing capacity of soil is 225kN/m^2. Use M 20 concrete and Fe415 steel.

7. a) Briefly explain the design of two way slab as per IS code provisions.
b) Design a two way slab 4m x 6m continuous on all the edges and supported on 300mm wide beams to serve as an office floor. Adopt M20 grade concrete and Fe415 grade steel.

8. a) Briefly explain span/depth ratio method of checking for deflection in R.C. beams.
b) A simply supported T-beam has an effective flange width of 900mm, thickness of flange 10mm, breadth of web 250mm and an effective depth of 450mm. There are 4bars of 25mm∅ in tension and 3bars of 20mm∅ in compression. Check the safety of the beam for deflection. Assume M15 concrete and MS reinforcement.

CODE No.:10BT40104 SVEC-10

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC10) Supplementary Examinations December - 2019

CONSTRUCTION, PLANNING AND PROJECT MANAGEMENT

[Civil Engineering]

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

Answer any FIVE questions
All questions carry equal marks

1. a) Explain the advantages, disadvantages and construction of a cavity wall.
b) Describe the various types of timber partition walls.

2. a) Explain the requirements of a good staircase.
b) Explain the requirements of a good roof.

3. a) Explain the methods of Termite - proofing.
b) Explain the various methods of pointing.

4. a) What do you mean by organization and give different types of organizations.
b) Explain the project organization for any project managers authority.

5. a) Explain the objectives of Material Management and their costs.
b) Explain the Earth Moving equipment and Earth Compaction equipment.

6. a) Explain the methods of planning and programming problems.
b) Explain the Milestone charts.

7. a) Explain the Elements of Network.
b) Explain the planning for network construction.

8. From the data of table given, prepare the network diagram, decide the completion period and complete the critical path method schedule:

Activity Item	Duration in Days	Activities immediately	
		Preceding	Following
A	3	None	B,C
B	2	A	D,E
C	3	A	E
D	5	B	E
E	6	D,C	F,G
F	5	D,E	None
G	4	E	None

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC10) Supplementary Examinations December - 2019

ELECTRONIC CIRCUIT ANALYSIS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

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

Answer any FIVE questions
All questions carry equal marks

1. a) What are the different types of feedback topologies? Explain with diagrams.
b) An amplifier has Aυ - 1000 ± 100. Determine the feed back needed to keep the gain with in ± 0.1%. Find $A_{\upsilon f}$.

2. Derive expressions for lower and upper cutoff frequencies of multi stage amplifier.

3. a) Derive the expression hybrid Π conductance's g_{ce}, $g_{bb'}$ of a Transistor.
b) Explain how hybrid Π parameters, g_m and g_{ce} vary with I_c, V_{ce} and temperature.

4. a) Differentiate between cascaded and folded cascade configurations.
b) Discuss effects of different type of Loads to common source MOS amplifier.

5. a) An amplifier has A_{vf}=500. If the gain without feedback changes by 20 % and gain with feedback should not vary more than 2%, determine open loop gain and feedback ratio.
b) Draw the circuit diagram of a current series feedback amplifier. Derive expressions to show the effect of negative feedback on input and output impedances, bandwidth, distortion of amplifier.

6. Derive the expression for the frequency of oscillations and the minimum gain required for sustained oscillations of RC phase shift oscillator.

7. a) Derive the power conversion efficiency of class-B amplifier.
b) Derive an expression for THD.

8. a) Derive the expression for Q-factor in case of a capacitive coupled single tuned amplifier. Hence deduce the expression for Gain and Bandwidth in terms of effective Q-factor.
b) Why stability is required in case of tuned amplifiers? What are various stabilization techniques? Explain any one in detail with neat circuit diagram.

CODE No.:10BT40501 SVEC-10

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC10) Supplementary Examinations December - 2019

COMPUTER ARCHITECTURE AND ORGANIZATION

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

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

Answer any FIVE questions
All questions carry equal marks

1. a) Give differences between Multiprocessor and Multi computers.
b) Write about the performance of the computer system.

2. a) What are the phases of an Instruction Cycle? Draw the flow chart for initial configuration of Instruction Cycle.
b) Give brief description about the Memory Stack. Convert 6*7+8*9 into postfix and evaluate using Stack.

3. a) Differentiate Hardwired control with Micro-programmed control. Is it possible to have a hardwired control associated with a Micro programmed control ? Justify.
b) Explain the addressing sequencing for micro instructions.

4. a) Explain data hazards and Instruction hazards in detail.
b) Explain about Vector processing in detail.

5. a) Write short notes on RAID.
b) Explain about performance considerations in memory system.

6. a) What is Input-Output processor (IOP) and explain about Intel 8089 IOP?
b) Explain Peripheral component Interconnect (PCI).

7. Explain about inter processor communication and synchronization.

8. Explain in detail about the CISC architecture.

CODE No.:10BT40502 **SVEC-10**

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC10) Supplementary Examinations December - 2019

OBJECT ORIENTED PROGRAMMING

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

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

Answer any FIVE questions
All questions carry equal marks

1. a) What are the benefits of Object Oriented Programming?
b) Discuss about friend functions with example.

2. a) Explain various types of Inheritance.
b) Describe Pure Virtual function with an example. Write a C++ program using this pointer.

3. a) Explain about various features of java.
b) How does "String" class differ from "StringBuffer" class?

4. a) Differentiate abstract class and interface with suitable example.
b) Explain the use of ***super*** and ***this*** key words in JAVA.

5. a) Define a package. What is the necessity of packages?
b) Give the classification of exceptions.

6. a) What is thread? Differentiate thread and process.
b) What is applet? Discuss life cycle methods of an Applet.

7. a) Write a java program for handling mouse events.
b) Distinguish between Grid layout and Grid bag layout.

8. a) Explain about MVC architecture.
b) Explain container class with an example.

CODE No.:10BT41201 SVEC-10

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC10) Supplementary Examinations December - 2019

DATA COMMUNICATIONS

[Information Technology]

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

Answer any FIVE questions
All questions carry equal marks

1. a) Comparison between serial and parallel data transmission.
b) Define modulation ,bit rate, signal to noise ratio baud.
c) Determine the band width required for M-ary FSKsystem.
Draw the geometrical representation of M-ary FSK signals and find out distance between the signals.

2. a) Describe a transverse electromagnetic wave.
b) Comparison between optical fibre cables to metallic transmission lines.

3. a) Explain the difference between linear and nonlinear PCM codes for a single -channel PCM system with a sample rate fs= 6000 samples per see and a seven -bit compressed PCM code determine the line speed.
b) Explain the concept of WDM.

4. a) What are the different types of electromagnetic polarizations and compare them and list the applications for which each type of polarization is suitable.
b) Describe the following:
i) Space wave propagation
ii) Duct Propagation.

5. a) Explain the difference between a TLP and a DLP .
b) Describe the various types of Cross talk.

6. a) Define the following terms:
i) Frequency Reuse; ii) Interference; iii) Roaming; iv) Hand off.
b) Explain the concepts of personal communication systems and outline the advantages and disadvantages of PCS compared to standard?

7. a) Explain the concept of checksum and LRC codes.
b) Explain modem synchronization and list its function.

8. a) Explain about voice-band data communication modems. Draw the block diagram of voice-band modem and explain each block in detail.
b) Write short note on probability of error and bit error rate.

CODE No.:10BT50504 SVEC-10

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC10) Supplementary Examinations December - 2019

OPERATING SYSTEMS

[Information Technology]

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

Answer any FIVE questions
All questions carry equal marks

1. a) What is an operating system? Explain different functions of an operating system.
b) Write about different types of memory.

2. Discuss the following.
a) Process control block. b) Scheduling queues. c) Threads.

3. a) Show the Dining -Philosophers solution using monitors.
b) Discuss about the atomic transactions.

4. a) What is a deadlock? Explain necessary conditions for a deadlock to occur.
b) Write about banker's algorithm for deadlock avoidance.

5. a) Write the similarities of paging and framing. Explain the structure of a page table.
b) Write short notes on thrashing.

6. a) Explain different disk space allocation methods.
b) Explain different disk free space management methods.

7. a) How stable storage is implemented?
b) What are the services provided by the kernel I/O sub system?

8. a) How access matrix can be used for providing protection?
b) Write and explain various misused methods of system threats.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC10) Supplementary Examinations December - 2019

THEORY OF COMPUTATION

[Information Technology]

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

Answer any FIVE questions
All questions carry equal marks

1. a) Prove, if M is an NFA, then there exists a DFA M' such that L(M) =L(M').
b) Construct a NFA for the following regular expression (a*/b*).a.b.b.

2. a) Write the process of converting a given NFA-ε into its equivalent NFA.
b) Draw an NFA- ε for recognizing the language generated by the following regular expression and convert it into its equivalent NFA.
$(a + b)^* (aa + aba)$

3. a) Identify the language L = { 0^n1^n| n ≥ 1} is regular or not and explain your answer .
b) Prove that if L is Regular language, so is LR.

4. a) Find CFG with no useless symbols equivalent to.
S→AB/CA
B→BC/AB
A→a
C→aB/b
b) Briefly explain Greibach normal forms for CFG's.

5. a) Eliminate " ε -productions from the grammar G given as
A→aBb | bBa
B→ aB | bB |ε "
b) Convert the following grammar to Greibach Normal Form
S →ABA | AB | BA | AA |B
A → aA |a
B → bB |a

6. a) What are the methods accepted by PDA? Explain with examples.
b) Construct a PDA to accept $a^x b^y w a^x b^y$.

7. a) How will you recognize a language in a Turing Machine(TM)?
b) Design a Deterministic Turing Machine (DTM) to accept the language
L ={ $a^i b^i c^i$ | i >=0 }.

8. Prove the directed Hamilton-circuit problem in NP-complete.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC10) Supplementary Examinations October – 2020

ELECTRO MAGNETIC WAVES AND TRANSMISSION LINES

[Electronics and Communication Engineering]

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

Answer any FIVE questions
All questions carry equal marks

1. a) Explain the terms polarization and dielectric constant with reference to dielectric materials.
b) Four point charges of 0.2μC each are placed at the corners of a plane rectangle of sides 10cm and 15cm. Determine the total force on any one of the charge.

2. a) In a cylindrical conductor of radius 2mm, the current density varies with distance from the axis according to $J = 10^3 e^{-400r} A/m^2$. Find the total current I.
b) Establish Poisson's and Laplace's equations from Gauss's law.

3. a) Determine the field strength '**H**" at a point on the axis of an infinite solenoid of radius '**R**' and '**n**' turns / meter.
b) Find the energy stored in the field in establishing a current of 'I' amps in a solenoid of 'n' turns.

4. a) Can time varying magnetic field exist within a conductor? Explain.
b) If the magnetic flux density $B=20 \sin \omega t$, *for* $r < 2$ and $B = 0$ *for* $r > 2$ calculate induced Electric field intensity for $r < 2$ and $r > 2$.

5. a) Derive the general wave equation.
b) Discuss about the plane waves in lossy dielectrics.

6. a) Discuss about Brewster angle, total internal reflection and surface impedance.
b) The electric field of a plane wave is given by $E = 5\sin((10^8)t - 4x)\bar{a}_x$. Determine direction of propagation, ***f***, **β** and **λ**.

7. a) Derive an expression for input impendence of a transmission line terminated with a load of Z_R.
b) Characteristic Impendence of a uniform transmission line is 2KΩ/m at 800Hz and propagation constant is $0.054\angle 87^0$ /m find the primary constants.

8. Write short notes on the following.
i) Types of Transmission lines.
ii) Quarter wave transformer.
iii) Distortion less Condition in Transmission lines.
iv) Reflection coefficient and VSWR in transmission lines.

CODE No.:10BT40502 **SVEC-10**

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC10) Supplementary Examinations October – 2020

OBJECT ORIENTED PROGRAMMING

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

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

Answer any FIVE questions
All questions carry equal marks

1. a) Explain the OOPs concepts with necessary examples.
b) What is constructor? Discuss different types of constructors with suitable examples.

2. a) Explain the concept of templates. Write a C++ program to perform Bubble Sort using the function template concepts.
b) Explain about the concept of Function Overloading with an example.

3. a) What is the need of "this" keyword? Explain with an example.
b) What is garbage collection? Explain the use of finalize() method.

4. a) What is multiple inheritance? Explain how does Java support multiple inheritance?
b) Illustrate the difference between class and interface.

5. a) Differentiate exception and error? Explain the keywords used in exception handling in JAVA.
b) What is the need of packages in JAVA? Explain how to create and access packages.

6. a) Explain about demon threads in JAVA.
b) Write short notes on java Applets.

7. a) Describe about various layout managers.
b) Write a program to implement calculator.

8. a) Discuss about JApplet, JFrame and JComponent.
b) Write a Java Program to display the following 3 by 3 Magic Square (Total = 15) using JTable.

2	9	4
7	5	3
6	1	8

CODE No.:10BT50504 SVEC-10

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC10) Supplementary Examinations October – 2020

OPERATING SYSTEMS

[Information Technology]

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

Answer any FIVE questions
All questions carry equal marks

1. a) Explain different services of an operating system.
b) Discuss about time sharing and multiprocessor systems.

2. a) What is a process? Explain process states.
b) Explain multithreading models.

3. a) What is critical section problem? What are the requirements to be satisfied for critical. Section problem to be solved?
b) Write about monitors for process synchronization.

4. a) What is a deadlock? Explain necessary conditions for a deadlock to occur.
b) Write about banker's algorithm for deadlock avoidance.

5. a) Explain about FIFO and optimal page replacement algorithms.
b) Write short notes on segmentation.

6. a) Explain the two - level directory and three level structured directory.
b) Give short notes on UNIX file system and Windows file system.

7. a) Explain and compare the C-LOOK and C-SCAN disk scheduling algorithms.
b) Explain the services provided by a Kernel I/O sub system.

8. a) How firewalls are used for protection?
b) Explain different schemes of protection.

CODE No.:14BT3BS03 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations December - 2019

PROBABILITY AND STATISTICS

[Civil Engineering, Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Define the following with an example: 8 Marks
i) Mutually exclusive events.
ii) Classical definition of probability.
iii) Conditional probability.

b) If X and Y are any two random variables, then prove that: 6 Marks
E(X + Y) = E(X) + E(Y) provided E(X) and E(y) exist.

(OR)

2 a) State and prove addition theorem of probability for any two events A and B. 7 Marks

b) Let X denote the number of heads in a single toss of 4 fair coins. Determine: 7 Marks
i) $P(X < 2)$ ii) $P(1 < X \leq 3)$

UNIT-II

3 a) Out of 800 families with 5 children each, how many would you expect to have i) 3 boys ii) 5 girls iii) either 2 or 3 boys iv) At least one boy. Calculate by assume equal probability for boys and girls. 7 Marks

b) If X is a normal variate with mean 30 and standard deviation 5. Estimate the probabilities when i) $26 \leq X \leq 40$ ii) $X \geq 45$. 7 Marks

(OR)

4 a) Average numbers of accidents on any day on a national high way is 1.8. Compute the probability that the number of accidents are: 7 Marks
i) at least one. ii) at most one.

b) 20% of items produced from a factory are defective. Calculate the probability that in a sample 5 chosen at random. 7 Marks
i) None is defective. ii) One is defective. iii) $P(1 < x < 4)$.

UNIT-III

5 a) The following data shows the values of sample mean ($\bar{X}$)and range (R) for 10 samples for 6 each. Calculate the values for central line and the control limits for Mean – Chart and Range - Chart. Sketch the control charts and comment on the state of control. 7 Marks

Sample No.	1	2	3	4	5	6	7	8	9	10
Mean ($\bar{X}$)	43	49	37	44	45	37	51	46	43	47
Range (R):	5	6	5	7	7	4	8	6	4	6

b) Show that the coefficient of correlation lies between -1 and +1. 7 Marks

(OR)

6 a) The following figures give the number of defectives in 20 samples, containing 2000 items 425, 430, 216, 341, 225, 322, 280, 306, 337, 305, 356, 402, 216, 264, 126, 409, 193, 280, 326, 389. Calculate the values for central line and the control limits for P -Chart. 7 Marks

b) Calculate the rank correlation coefficient for the following data 7 Marks

X	68	64	75	50	64	80	75	40	55	64
Y	62	58	68	45	81	60	68	48	50	70

UNIT-IV

7 a) Define Null Hypothesis, Alternative Hypothesis, Level of significance and critical region. 7 Marks

b) A population consists of 2, 5, 12, 34.Consider all samples of size two, which can be drawn with replacement. Calculate: 7 Marks

i) The population means.
ii) The population Standard deviation
iii) The Mean of the means of sampling distribution.
iv) The standard deviation of the means of sampling distribution of means.

(OR)

8 a) Write a short notes on Type-I and Type-II errors. 7 Marks

b) In 64 randomly selected hours of production, the mean and the standard deviation of the number of acceptance pieces produced by an automatic stamping machine are 1.038 and 0.146. At the 0.05 level of significance test whether the mean is greater than 1.000. 7 Marks

UNIT-V

9 a) 200 digits were chosen at random from a set of tables. The frequencies of the digits are shown below: 7 Marks

Digit	0	1	2	3	4	5	6	7	8	9
Frequency	18	19	23	21	16	25	22	20	21	15

Use the Chi square test to assess the correctness of the hypothesis that the digits were distributed in equal number in the tables from which these were chosen.

b) Scores obtained in a shooting competition by 10 soldiers before and after training as below: 7 Marks

Before	67	24	57	55	63	54	56	68	33	43
After	70	38	58	58	56	67	68	75	42	38

Test whether the training is useful at 0.05 level of significance.

(OR)

10 a) A dice is thrown 60 times with the following results. Test the goodness of fit at 5% level. 7 Marks

Face	1	2	3	4	5	6
Frequency	8	7	12	8	14	11

b) The nicotine contents in milligrams in two samples of tobacco were to found as follows: Can it be said that the two samples have come from the same normal population. 7 Marks

Sample A	24	27	26	21	25	-
Sample B	27	30	28	31	22	36

CODE No.:14BT40101 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations December - 2019

STRUCTURAL ANALYSIS - I

[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Derive the expressions for finding out normal and tangential stresses on an oblique plane in a rectangular element subjected to normal stress p_1 and p_2 and shear stress q. Also prove that no shear stress acts on principal planes. 14 Marks

(OR)

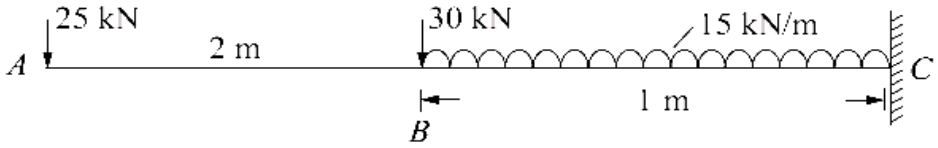
2 Derive the expressions for finding out principal stresses, principal planes and maximum shear stress of a shaft under both B.M and Torque. 14 Marks

UNIT-II

3 Derive the expressions for slope and deflection of a cantilever of length 'L' and uniform 'EI' carrying a gradually varying load from zero at the free end to 'w' at the fixed end. Hence find the maximum values of its slope and deflection. 14 Marks

(OR)

4 Compute the maximum slope and deflection for the beam shown in figure, using Moment-Area method. EI=16,000kNm^2. 14 Marks



UNIT-III

5 What are the assumptions made in the Euler's theory? Derive the critical load formula for a long column with both the ends as fixed. 14 Marks

(OR)

6 Determine the section of a cast-iron hollow cylindrical column 3.6m long with both ends firmly built-in, if it carries an axial load of 780kN. The ratio of internal to external diameter is 5/8. Use a factor of safety of 3. Assume the crushing strength of the material as 540MPa and Rankine's constant = 1/1800 for both ends pinned case. 14 Marks

UNIT-IV

7 A fixed beam AB of length 5m is carrying a point load of 20kN at C. Find the fixed end moments if AC = 2m and CB = 3m. Draw the S.F and B.M diagrams. If EI = 2400kN-m^2, find the location and magnitude of maximum deflection and deflection at C. 14 Marks

(OR)

8 A continuous beam ABC is simply supported at A, B and C and having AB = 5m, BC = 3m. The span AB carries a point load of 4kN at 2m away from the support A. The span BC is carrying a u.d.l of 2kN/m. Find the reactions and bending moments at supports A, B and C. Also draw the S.F and B.M diagrams. 14 Marks

UNIT-V

9	a)	Derive an expression for Distortional strain energy per unit volume in terms three principal stresses.	7 Marks
	b)	Design the diameter of a circular shaft subjected to combined bending and twisting with bending moment of 10kN-m and twisting moment of 28kN-m. The safe stress in direct tension is 250MPa and μ=0.3.	7 Marks

(OR)

10		A 90mm x 60mm x 10mm unequal angle is placed with the larger leg as vertical. It is subjected to a sagging B.M. of 700N-m on the horizontal axis. Determine the stresses induced at the outer corner points.	14 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations December - 2019

FLUID MECHANICS - II

[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Define displacement thickness, momentum thickness and energy thickness of a boundary layer and explain the effect of pressure gradient on boundary layer separation with a neat sketch.	14 Marks
		(OR)	
2		What is meant by separation of boundary layer and how do you control the same.	14 Marks

UNIT-II

3	a)	Derive dynamic equation for gradually varied flow.	7 Marks
	b)	When does a hydraulic jump occurs? Also give its applications.	7 Marks
		(OR)	
4		Explain the term hydraulic jump with a neat sketch and a hydraulic jump forms at the downstream end of spillway carrying 17.93m^3/s discharges. If the depth before jump is 0.80m, determine the depth after the jump and energy loss.	14 Marks

UNIT-III

5		Obtain an expression for the force exerted by a jet of water on an inclined fixed plate in the direction of the jet and a jet of water of diameter 50mm moving with a velocity of 40m/s, strikes a curved fixed symmetrical plane at the centre. Find the force exerted by the jet of water in the direction of the jet, if the jet is defected through an angle of 120° at the outlet of the curved plate.	14 Marks
		(OR)	
6		A jet of water having a velocity of 15m/s strikes a curved vane which is moving with a velocity of 5m/s. The vane is symmetrical and is so shaped that the jet is defected through 120°. Find the angle of the jet at inlet of the vane so that there is no shock. What is the absolute velocity of the jet at outlet in magnitude and direction and the work done per unit weight of water? Assume the vane to be smooth.	14 Marks

UNIT-IV

7	a)	Give the working proportions of a Pelton wheel.	7 Marks
	b)	Give the necessity of governing of turbines.	7 Marks
		(OR)	
8		Derive an expression for specific speed of a turbine and a Kaplan turbine develops 9000kw under a net head of 7.5m and speed ratio and flow ratios are 2.2 and 0.66 respectively. Diameter of boss is 0.35 times the external diameter of the wheel. The overall efficiency of the turbine is 86%. Determine diameters of runner and boss, speed of the turbine and specific speed of the runner.	14 Marks

UNIT-V

9		Obtain an expression for the work done by the impeller of a centrifugal pump on water and explain the various efficiencies of a centrifugal pump.	14 Marks
		(OR)	
10		Explain with neat sketches, the characteristic curves of a centrifugal pump and explain the working procedure of a gear pump.	14 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations December - 2019

SIGNALS AND NETWORKS

[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 different test signals. Obtain relationship between the unit step function and the unit ramp function. 7 Marks

b) Determine whether each of the following systems defined below is: 7 Marks
i) causal. ii) linear. iii) stable.
(I) $y(n) = log_{10} | X(n) |$; (II) $y(n) = X(n) \sum f(n - 2k)$.

(OR)

2 a) Determine the impulse response of the following casual system. 7 Marks
$Y(n) - Z\cos\theta\, y(n-2) + y(n-3) = X(n)$.

b) The sequence $x[n] = (-1)^n$ is obtained by sampling the continuous-time sinusoidal signal $x(t) = \cos \omega_O t$ at 1ms intervals, i.e., $\cos(\omega_O nT) = (-1)^n$, $T=10^{-3}$ s. 7 Marks
Determine three distinct possible values of ω_O.

UNIT-II

3 a) Classify the pass band and stop band filters in detail. 8 Marks

b) Design a band elimination filter having a characteristic impedance of 600Ω and cut of frequencies of f_1=2 kHz and f_2=6 kHz. 6 Marks

(OR)

4 a) Explain the general configuration and parameters of a constant k, T-section and π-section low pass filter. 8 Marks

b) Design a m-derived low pass filter having cut off frequency of 1kHz with design impedance of 600Ω and resonant frequency 2000Hz. 6 Marks

UNIT-III

5 a) The switch ' S' is closed in position '1' sufficiently long time and then it is kept in position '2' as shown in Figure 1. Compute the value of V_L and i_L: 7 Marks
i) the instant just prior to the switch changing.
ii) the instant just after the switch changes.

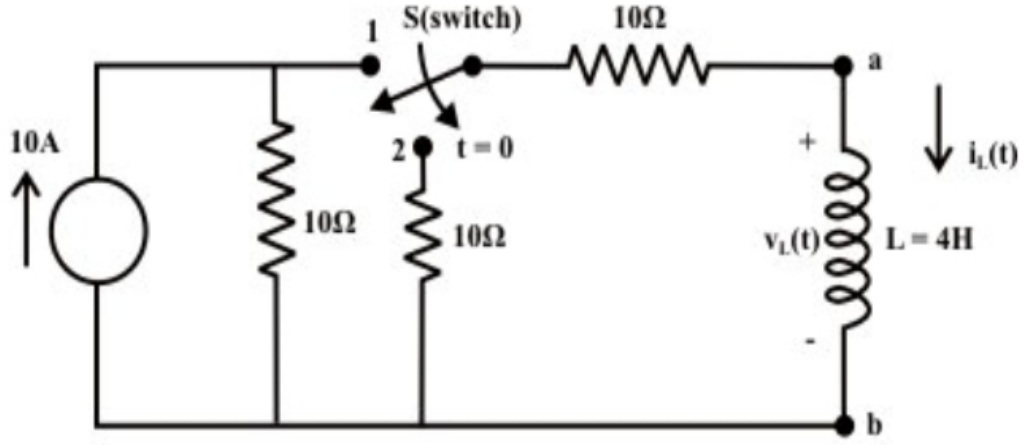


Figure 1

b) A series RLC circuit with R=10Ω, L=0.1H and C=20μF has a constant voltage of 100V applied at time t=0. Determine the transient current i(t). Assume zero initial 7 Marks

conditions.

(OR)

6 a) Derive the equation for the transient current i(t) in a series R-L circuit excited by a sinusoidal voltage source $v(t) = V_m \sin\omega t$, at time t=0. Assume zero initial current in inductor. 7 Marks

b) A series R-C circuit with R = 50Ω and C=10μF has a sinusoidal voltage V= 50sin100t V applied at t =0. Determine the current, voltage across resistor and voltage across capacitor. The initial charge on capacitor is zero. 7 Marks

UNIT-IV

7 a) Following short circuit currents and voltages are obtained experimentally for two port network: 7 Marks

(i) With output short circuited I_1=5mA, I_2= -0.3mA,V_1=25v.

(ii) With input short circuited I_1= -5mA, I_2=10mA,V_1=30v.

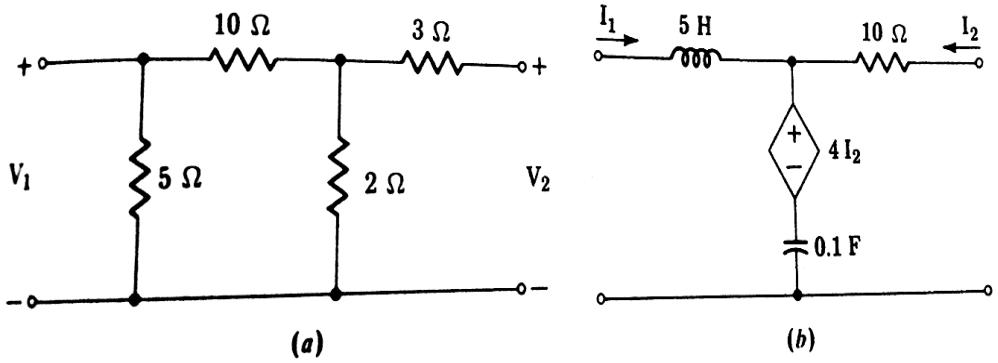
Determine Y parameters.

b) Obtain transmission parameters in terms of hybrid parameters. 7 Marks

(OR)

8 i) Find Z_{11}, Z_{12}, Z_{21} and Z_{22} for the network of figure a . 14 Marks

ii) Find the four open circuit impedance parameters as functions of s for the network of figure b.



UNIT-V

9 a) Explain the properties of Hurwitz polynomials. 6 Marks

b) Test the following polynomial for Hurwitz property 8 Marks
$2s^6+s^5+13s^4+6s^3+5s^2+10s+30$.

(OR)

10 a) Write properties of positive real functions. 7 Marks

b) Find first and second cauer forms of Z(s) = S(S + 3) / (S + 2) (S + 4). 7 Marks

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CODE No.:14BT40203 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations December - 2019

ELECTRICAL AND ELECTRONIC 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) Explain the principle, construction and working of the PMMC instruments. 7 Marks

b) Explain the terms: 7 Marks

i) Static error. ii) Static error correction.

iii) Relative error. iv) Percentage relative error.

(OR)

2 Briefly describe the different types of errors considered in the measurements and give the ways of their compensation. 14 Marks

UNIT-II

3 a) Explain measurement of reactive power in three phase balanced and un-balanced loads. 7 Marks

b) Explain working principle of LPF Wattmeter. 7 Marks

(OR)

4 a) Explain principle of operation of single phase energy meter with diagram. 7 Marks

b) Describe how single phase energy meter is tested and calibrated with the help of R.S.S watt-hour meter. 7 Marks

UNIT-III

5 a) Draw the equivalent circuit and phasor diagram of a potential transformer and derive the expression for ratio and phase angle errors. 7 Marks

b) Explain the methods of turns compensation used in current transformers to reduce ratio error. 7 Marks

(OR)

6 Describe the constructional details and working of a single phase electro-dynamometer type of power factor meter. 14 Marks

UNIT-IV

7 a) Explain the loss of charge method for measurements of insulation resistance of cables. 7 Marks

b) Draw the circuit of Kelvin double bridge used for measurement of low resistance and derive the condition for balance. 7 Marks

(OR)

8 a) Explain how a simple AC bridge circuit operates and derive an expression for the unknown parameters. 7 Marks

b) Define the term Null as it applies to bridge measurement and write two conditions that must be satisfied to make an AC bridge balance. 7 Marks

UNIT-V

9 Write short notes on the following: 14 Marks

i) Digital frequency meter. ii) Dual slope digital volt meter.

(OR)

10 a) Explain the Lissajous Patterns for the measurement of Phase and Frequency. 8 Marks

b) List the applications of Oscilloscopes. 6 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations December - 2019

TRANSFORMERS AND INDUCTION 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 relevant phasor diagrams, explain the operation of a single phase transformer operating on lagging and leading power factor loads.	8 Marks
	b)	Classify various types of transformers and explain them in brief.	6 Marks

(OR)

2	a)	Derive the EMF equation of a transformer. Hence derive transformation ratio.	7 Marks
	b)	Discuss the effect of variations of frequency and voltage on iron loss. How will you minimize the hysteresis and eddy current loss that occur in a practical transformer?	7 Marks

UNIT-II

3	a)	Write a short note on All day efficiency of the transformer.	4 Marks
	b)	Find the All day efficiency of single phase transformer having maximum efficiency of 98 % at 15 KVA at UPF and loaded as follows: 12 hours - 2 KW at 0.5 power factor lagging 6 hours - 12 KW at 0.8 power factor lagging 6 hours - no load	10 Marks

(OR)

4	a)	What are the advantages of Sumpner's test? Give the related calculation to find the efficiency of a transformer.	7 Marks
	b)	Derive the equations for the currents supplied by each transformer when two transformers are operating in parallel with equal voltage ratios.	7 Marks

UNIT-III

5	a)	What are the various three-phase transformer connections? Explain the star-star and star-delta connections with neat diagrams.	8 Marks
	b)	What is meant by Scott connection of transformers? Explain its significance and applications.	6 Marks

(OR)

6	a)	With neat phasor diagram, explain the voltage regulation of three-phase transformer.	7 Marks
	b)	An ideal 3-Ø step down transformer connected in delta/star delivers power to a balanced 3-Ø load of 120kVA at 0.8 pf. The input line voltage is 11kV and the turn's ratio of transformer (phase to phase) is 10. Determine the line voltage line currents, phase voltages, phase currents on both primary and secondary sides.	7 Marks

UNIT-IV

7	a)	The speed of the rotor field, with respect to stator is always equal to synchronous speed at all possible speeds of Induction motor. Explain.	5 Marks
	b)	Obtain the relation between full load torque and maximum torque of a three phase induction motor.	3 Marks
	c)	An 8-pole, 50 Hz, 3-Ø slip ring induction motor has effective resistance of 0.08Ω/phase. The speed corresponding to maximum torque is 650 rpm. What is the value of resistance to be inserted in rotor circuit to obtain maximum torque at starting?	6 Marks

(OR)

8		Derive the torque equation of IM. From this; derive the condition for maximum torque. Find the ratio of Maximum torque to Full load torque and maximum torque to staring torque.	14 Marks

UNIT-V

9		Explain the step by step procedure to draw circle diagram of an induction motor.	14 Marks

(OR)

10	a)	Describe static slip power recovery scheme of speed control with neat sketch.	7 Marks
	b)	Discuss the phenomenon of crawling and cogging in an induction motor.	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC14) Supplementary Examinations December - 2019

FLUID MECHANICS AND HYDRAULIC MACHINERY

[Mechanical 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 equation of viscosity and give examples of its application.	7 Marks
	b)	How does vapor pressure affect fluid flow?	7 Marks

(OR)

2		A U-tube containing mercury has its right limb open to atmosphere. The left limb is full of water and is connected to a pipe containing water under the pressure, the centre of which is in level with the free surface of mercury. Find the pressure of water in the pipe above atmosphere, if the difference of level of mercury in the limbs is 5.08cm.	14 Marks

UNIT-II

3		Distinguish between the following: i) Steady and unsteady flow. ii) Uniform and Non-Uniform flow. iii) Compressible and Incompressible flow	14 Marks

(OR)

4		A pipe bend tapers from a diameter of 500mm at inlet to a diameter of 250mm at outlet and the flow is turned through 75^0.The pressures at inlet and outlet are 3.5 N/m^2 and 2.5 N/m^2.If the pipe is converging oil of specific gravity 0.85, calculate the magnitude and direction of the resultant force on the bend when the oil flow rate is 0.5 m^3/s. The bend is in a horizontal plane.	14 Marks

UNIT-III

5	a)	Develop the expression for the force exerted by jet on stationary curved vane striking it at the centre.	7 Marks
	b)	A jet of water 75mm in diameter having velocity of 20m/s strikes a series of flat plates arranged around the periphery of a wheel such that each plate appears successively before the jet. If the plates are moving at a velocity 5m/sec., compute the force exerted by jet on the plate, the work done per second on the plate and efficiency of the jet.	7 Marks

(OR)

6	a)	Derive Darcy Weisbach equation.	7 Marks
	b)	An oil of specific gravity 0.9 and viscosity 0.06 poise is flowing through a pipe of diameter 200 mm at the rate of 60 litres/s. find the head lost due to friction for a 500 m length of pipe. Find the power required to maintain this flow.	7 Marks

UNIT-IV

7 a) Explain why a Pelton wheel turbine is called an Impulse turbine with a neat sketch. 7 Marks

b) A reaction turbine works at 450rpm under a head of 120m Its diameter at inlet is 1.2m and the flow area is 0.4m^2 .The angle made by absolute and relative velocities at inlet are 200 and 600 respectively with the tangential velocity. Determine: 7 Marks

i) The volume flow rate.
ii) The power developed.
iii) The hydraulic efficiency.

(OR)

8 a) Define specific speed. Give its range for different turbines. 7 Marks

b) Explain unit speed, unit discharge and unit power of a hydraulic turbine. Derive expressions for each of them. 7 Marks

UNIT-V

9 Describe the working principle of centrifugal pump with neat sketches. 14 Marks

(OR)

10 Explain the concept of pumped storage plants and storage requirements. 14 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC14) Supplementary Examinations December - 2019

ELECTRONIC CIRCUIT ANALYSIS AND DESIGN

[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 with suitable circuit diagram, the operation of transformer coupled transistorized amplifier.	8 Marks
	b)	Explain the essential difference between the RC coupled and direct coupled amplifier.	6 Marks
		(OR)	
2	a)	Give the equation of overall upper and lower cut off frequencies of multistage amplifiers.	10 Marks
	b)	Why capacitive coupling is used to connect a signal source to an amplifier?	4 Marks

UNIT-II

3	a)	Draw neatly the circuit diagram of a common source JFET amplifier and explain its working.	8 Marks
	b)	The output of CE amplifier is 180^0 out of phase with the input. Explain the reason.	6 Marks
		(OR)	
4	a)	Draw the circuit diagram of a common gate amplifier. Derive the expression for voltage gain and input resistance.	9 Marks
	b)	What are half power frequencies? Why it is named so?	5 Marks

UNIT-III

5	a)	With a neat sketch explain the working of RC phase shift oscillator.	6 Marks
	b)	Draw the circuit diagram of a voltage series feedback amplifier and derive expressions for voltage gain with and without feedback.	8 Marks
		(OR)	
6	a)	Explain the working of Colpitt's oscillator.	7 Marks
	b)	The distortion in an amplifier is found to be 10%. When the feedback ratio of a negative feedback amplifier is 0.06. When the feedback is removed, the distortion becomes 5%. Find the open loop gain and closed loop gain.	7 Marks

UNIT-IV

7	a)	Draw the circuit for a push-pull amplifier and discuss its working.	7 Marks
	b)	Derive an expression for the efficiency of class B - power amplifiers.	7 Marks
		(OR)	
8	a)	Discuss the effect of nonlinear region of i_B-V_{BE} characteristic of each transistor used in complementary - symmetry class-B power amplifiers in detail.	7 Marks
	b)	The power amplifier supplies 4 watts for 8 Ω load. The zero-signal D.C Collector current is 35mA and it rises to 40mA when the signal is applied. Determine the percent second harmonic distortion.	7 Marks

UNIT-V

9		Draw the circuit of class-C Tuned amplifier. Explain its operation and derive that the efficiency of the amplifier is 100% making necessary assumptions.	14 Marks

(OR)

10	a)	Why parallel resonance circuits are used in tuned amplifiers? Explain.	6 Marks
	b)	Draw the equivalent circuit of capacitance coupled single tuned amplifier and derive the equation for voltage gain?	8 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC14) Supplementary Examinations December - 2019

ELECTROMAGNETIC THEORY AND TRANSMISSION LINES

[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)	State and prove Gauss's Law. List the limitations of Gauss's Law.	7 Marks
	b)	Derive expression for the electric field for dipole charge distributions.	7 Marks
		(OR)	
2	a)	Define electric potential and give the relation between E and V.	7 Marks
	b)	Explain the following terms: i) Homogeneous and isotropic medium. ii) Line, surface and volume charge distributions.	7 Marks

UNIT-II

3	a)	Distinguish between scalar and vector magnetic potential.	7 Marks
	b)	Explain about magnetic energy.	7 Marks
		(OR)	
4	a)	Explain the characteristics of scalar and vector magnetic potentials.	7 Marks
	b)	Define Magnetic flux density and vector magnetic potential.	7 Marks

UNIT-III

5	a)	What is the inconsistency in Ampere's Law? How it is rectified by Maxwell?	7 Marks
	b)	Explain how the concept of displacement current was introduced by Maxwell to account for the production of magnetic fields in the empty space.	7 Marks
		(OR)	
6	a)	Explain the concept of Displacement current which was introduced by Maxwell for the generation of Magnetic fields in space.	7 Marks
	b)	Given $\vec{E} = 10\sin(wt - \beta z)\,\vec{ay}\,V/m$ in free space, determine $\vec{D}, \vec{B}$ and $\vec{H}$.	7 Marks

UNIT-IV

7	a)	Derive Uniform plane wave equation.	7 Marks
	b)	Derive the general solution of Uniform plane wave equation.	7 Marks
		(OR)	
8	a)	Obtain the relation between E and H in a uniform plane wave.	7 Marks
	b)	A Uniform plane wave propagating in a medium has $E=2e^{-\alpha z}\sin(10^8 t-\beta z)a_y$ V/m. If the medium is characterized by $\in_r=1$, $\mu_r=20$ and $\sigma=3$ S/m, find α, β and H.	7 Marks

UNIT-V

9	a)	Describe the losses in transmission lines.	7 Marks
	b)	Define the following. i) Infinite line. ii) Insertion loss. iii) Lossy and loss less lines. iv) Phase and group velocities.	7 Marks
		(OR)	
10	a)	Explain the principle of impedance matching with quarter wave transformer.	7 Marks
	b)	A low transmission line of 100Ω characteristic impedance is connected to a load of 400Ω. Calculate the reflection coefficient and standing wave ratio. Derive the relationships used.	7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC14) Supplementary Examinations December - 2019

SIGNALS AND SYSTEMS

[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) A discrete-time system s described by the following input-output relation $y(n) = n\,x(n)$ is this system: (i) static or dynamic? (ii) linear or non-linear? 7 Marks

b) A discrete-time LTI system is described by the following difference equation relating its input and output $y(n) - a\,y(n-1) = 2\,x(n)$. Find the unit-sample response and step response of the system. 7 Marks

(OR)

2 a) Define the terms: 7 Marks
i) Impulse response function of an LTI system.
ii) Unit sample response sequence of an LSI system.

b) For what range of values of the parameter α are the systems defined by the following difference equations stable? 7 Marks

$$y(n) - 2ay(n-1) + a^2 y(n-2) = x(n)$$

UNIT-II

3 a) Consider full rectified sine have with peak amplitude '1' and time period is '1' expand this function in terms of exponential Fourier series. Also sketch the spectrum. 7 Marks

b) Derive the relation between Trigonometric and exponential Fourier series coefficients. 7 Marks

(OR)

4 a) State and prove Parseval's power theorem. 7 Marks

b) Find the Fourier transform of $f(t) = Cos\ \pi t$; $-\frac{1}{2} \le t \le \frac{1}{2}$ and $f(t) = 0$; otherwise. 7 Marks

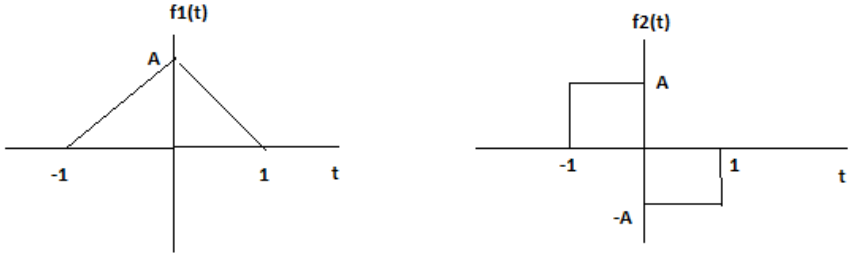
UNIT-III

5 a) Find the auto-correlation function and the energy spectral density of the signal? $x(t) = e^{-t}u(t)$. 7 Marks

b) Derive the relation between auto-correlation and power spectral density. 7 Marks

(OR)

6 a) Determine the cross correlation function of the pair of functions shown in figure. 7 Marks



b) Explain why over-sampling is resorted to in certain applications. 7 Marks

UNIT-IV

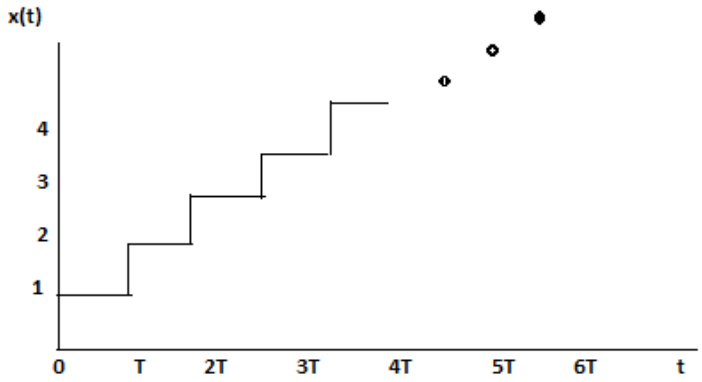
7 a) State and prove the final value theorem of Laplace transform. 7 Marks

b) Find the inverse Laplace Transform. 7 Marks

$X(s) = \dfrac{-3}{(s+1)(s-1)}$; ROC: $-2 < \sigma < 1$.

(OR)

8 a) Find the unilateral Laplace Transform of the signal shown in fig. 7 Marks



b) Determine and plot the magnitude and phase response of the discrete time differentiator given by the following difference equation. Use the normalized frequency (f / fs) for the plots. $Y(n) = x(n) - x(n-1)$. 7 Marks

UNIT-V

9 a) State and prove the final value theorem of ***Z***-transform. 7 Marks

b) Determine the ***Z***-transform and its ROC for the signal: $x(n) = (1/5)^n u(-n)$. 7 Marks

(OR)

10 a) For the system with $H(z) = \dfrac{z(z-0.5)}{z^2 - z + 0.1875}$, with determine and plot its magnitude and phase responses. 7 Marks

b) Using partial fraction expansion method, determine $x(n)$, $n \geq 0$ if its unilateral ***Z***-transform $X(z)$ is given by $X(z) = \dfrac{1}{(z+1)^2(z-0.5)}$. 7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC14) Supplementary Examinations December - 2019

SWITCHING THEORY AND LOGIC DESIGN

[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 Canonical and Standard forms with suitable examples.	6 Marks
	b)	Implement the INVERTER gate, OR gate and AND gate using; i) NAND gate. ii) NOR gate.	8 Marks
		(OR)	
2	a)	Explain basic laws of Boolean algebra with examples.	7 Marks
	b)	Simplify the expression Z= AB'C' + AB'C + ABC using Boolean laws.	7 Marks

UNIT-II

3	a)	Simplify following using K map X= A'B+A'B'C+ABC'+AB'C'.	7 Marks
	b)	Convert SOP to equivalent POS for the expression A'B'C+A'BC+AB'C+ABC.	7 Marks
		(OR)	
4		Simplify the following Boolean function using Quine Mc'Clusky method: $F(A, B, C, D)= \sum m(0, 1, 6, 7, 8, 9, 13, 14, 15)$.	14 Marks

UNIT-III

5	a)	What is an encoder? Construct 8x3 encoder using logic gates and truth table.	6 Marks
	b)	Design a combinational circuit to produce 2's complement of a 4-bit binary number.	8 Marks
		(OR)	
6	a)	Construct a 16x1 Multiplexer using 4x1 Multiplexers.	6 Marks
	b)	Design 4 bit binary to gray code converter.	8 Marks

UNIT-IV

7	a)	Write the truth tables and excitation tables of S-R, J-K, T and D flip-flops.	6 Marks
	b)	Design a 3-bit synchronous counter with control bit M=0 for UP counter and M=1 DOWN counter.	8 Marks
		(OR)	
8	a)	Explain the operation of parallel shift register with parallel load using neat logic diagram.	7 Marks
	b)	Explain Universal counter with neat diagram.	7 Marks

UNIT-V

9	a)	Describe the design procedure for asynchronous sequential circuits.	6 Marks
	b)	Find a circuit that has no static hazards and the Boolean function $F(A, B, C, D) = \sum m(1, 3, 5, 7, 8, 9, 14, 15)$	8 Marks
		(OR)	
10		Explain the analysis procedure of asynchronous circuit with an illustration.	14 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations December - 2019

ANALOG ELECTRONIC 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)	Draw the circuit diagram and hybrid model of CE amplifier with emitter resistance and derive the current gain, input impedance and voltage gain.	7 Marks
	b)	Derive the current gain of a CE amplifier with resistive load at high frequencies.	7 Marks
		(OR)	
2	a)	Derive the BJT simplified hybrid model for small signal analysis.	7 Marks
	b)	Draw the circuit diagram and equivalent high frequency model of emitter follower.	7 Marks

UNIT-II

3		Discuss the effect of negative feedback in amplifiers on: i) Stability of gain A_{vf} for changes in device parameters. ii) Bandwidth of the amplifier with derivations of relevant mathematical expressions.	14 Marks
		(OR)	
4	a)	Discuss and explain the basic circuit of an LC oscillator and derive the condition for the oscillations.	10 Marks
	b)	Explain the concept of feedback in oscillators.	4 Marks

UNIT-III

5	a)	Define conversion efficiency and derive the maximum efficiency of a Class-A large signal amplifier.	7 Marks
	b)	Describe the higher order harmonic distortion in power amplifiers.	7 Marks
		(OR)	
6	a)	Derive the expression for maximum collector power dissipation Pc (Max) in the case of Class-B power amplifiers.	6 Marks
	b)	In transformer coupled Class-A power amplifier, show that the conversion efficiency is 50%.	8 Marks

UNIT-IV

7		Explain the following. i) Storage and transition times of the diode as a switch. ii) Switching times of the transistor.	14 Marks
		(OR)	
8	a)	Derive the expression for percentage tilt for a square wave output of RC high pass circuit.	8 Marks
	b)	Compare series diode clipper and shunt diode clipper.	6 Marks

UNIT-V

9		Draw the circuit diagram for schmitt trigger and explain its operation. Give the applications of the above circuit. Derive the expressions for UTP and LTP.	14 Marks
		(OR)	
10	a)	Explain the working of a bistable multivibrator circuit with the help of neat waveforms. What are its applications?	8 Marks
	b)	Derive an expression for the period of oscillations of astable multivibrator.	6 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC14) Supplementary Examinations December - 2019

DATA COMMUNICATIONS

[Information Technology]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain in detail about different protocols and standards used for data communication.	7 Marks
	b)	Write short notes on network classifications.	7 Marks
		(OR)	
2	a)	With a neat sketch, explain the components of a communication net work.	5 Marks
	b)	Define noise. Explain about Electrical noise and Signal to noise ratio.	9 Marks

UNIT-II

3	a)	Explain the different types of metallic transmission lines in details.	7 Marks
	b)	Discuss about different types of optical fibre transmission.	7 Marks
		(OR)	
4	a)	What is a transmission line? Compare balanced and unbalanced transmission lines.	8 Marks
	b)	What is an optical communication system? Explain an optical fiber communication system with a neat block diagram.	6 Marks

UNIT-III

5	a)	With neat sketch, explain various digital line encoding formats.	7 Marks
	b)	Explain how statistical TDM is different from conventional TDM.	7 Marks
		(OR)	
6	a)	Explain the concept of pulse code modulation with a neat block diagram.	6 Marks
	b)	Discuss in details T_1 and T_2 carrier system.	8 Marks

UNIT-IV

7	a)	Describe various Transmission Parameters in detail.	7 Marks
	b)	Explain in detail about units of Powers Measurement.	7 Marks
		(OR)	
8	a)	Explain about Cordless Telephones and Electronic Telephones.	7 Marks
	b)	What is a crosstalk? What the three types of crosstalk are in telephone systems? Compare near-end crosstalk and far-end crosstalk.	7 Marks

UNIT-V

9	a)	Explain the concept of frequency allocation in 2^{nd} generation of cellular telephone systems.	8 Marks
	b)	Explain in detail about Error-Correction mechanisms.	6 Marks
		(OR)	
10	a)	Sketch the frequency spectrum of first generation cellular system.	4 Marks
	b)	Explain the different data communications character codes.	10 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations December - 2019

COMPUTER ORGANIZATION

[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)	Draw the flow chart for division of two unsigned binary numbers (using non restoring division)	7 Marks
	b)	Multiply (-12) with (17) using booth's multiplication algorithm.	7 Marks
		(OR)	
2	a)	Design one stage of arithmetic logic shift unit and show the function table.	7 Marks
	b)	Draw the flow chart for multiplication of signed binary numbers (using Booth's method).	7 Marks

UNIT-II

3		What are the differences between a direct and an indirect address instruction? How many references to memory are needed for each type of instruction to bring an operand into a processor registrar? Explain.	14 Marks
		(OR)	
4	a)	A computer has 32-bit instructions and 12-bit addresses. Suppose there are 250 two-address instructions. How many one-address instructions can be formulated?	7 Marks
	b)	Draw and explain the micro program sequences for a control memory.	7 Marks

UNIT-III

5		List Various I/O techniques and explain any two in detail.	14 Marks
		(OR)	
6		What do you mean by initialization of DMA controller? How DMA Controller works? Why does DMA have priority over the CPU when both request a memory transfer?	14 Marks

UNIT-IV

7	a)	Distinguish between Special and Temporal locality principles in cache memory.	7 Marks
	b)	List different types of Random Access Memories (RAM) and explain any one in detail.	7 Marks
		(OR)	
8	a)	Discuss in detail about secondary storage Optical Disks.	7 Marks
	b)	A cache has 4 sets and what would be the address of cache line to transfer 12^{th} block of Main Memory if the cache using Direct mapping management technique.	7 Marks

UNIT-V

9	a)	Explain Arithmetic Pipelining processing with an example.	7 Marks
	b)	Discuss Flynn classification for Multiple Processor Organizations.	7 Marks
		(OR)	
10	a)	Explain in detail about Inter Process Synchronization.	7 Marks
	b)	Suppose an unpipelined processor with a 25-ns cycle time is divided into 5 pipeline stages with latencies of 5,7,3,6 and 4ns. If the pipeline latch latency is 1ns, what is the cycle time of the resulting processor?	7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC14) Supplementary Examinations December - 2019

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)	What are the Advantages of a DBMS?	6 Marks
	b)	Draw an ER-diagram corresponding to customers and loans and explain various rotations used in it.	8 Marks
		(OR)	
2	a)	What are the main five functions of a database administrator? Explain.	7 Marks
	b)	Construct an ER-diagram to a model online book store.	7 Marks

UNIT-II

3	a)	What are the integrity constraints? How are these constraints expressed in SQL?	7 Marks
	b)	What is relational algebra? State and explain various fundamental operations in it with suitable examples.	7 Marks
		(OR)	
4	a)	Write short notes on querying a relational data.	7 Marks
	b)	Discuss the selection and projection set operators.	7 Marks

UNIT-III

5	a)	What is meant by SQL? Explain about nested queries and NULL values in SQL.	7 Marks
	b)	Discuss about complex integrity constraints in SQL.	7 Marks
		(OR)	
6		Explain in detail about all functional dependencies based normal forms with suitable examples.	14 Marks

UNIT-IV

7	a)	List the ACID properties. Explain usefulness of each.	7 Marks
	b)	Discuss about multiple granularity.	7 Marks
		(OR)	
8	a)	Describe the concepts serializability and recoverability.	7 Marks
	b)	What is the time stamp based protocols? Explain any one of them.	7 Marks

UNIT-V

9	a)	Explain heap file with un clustered tree index.	7 Marks
	b)	Explain data on external storage.	7 Marks
		(OR)	
10	a)	Explain hash based indexing with a suitable example.	7 Marks
	b)	Discuss about indexed sequential access methods.	7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC14) Supplementary Examinations December - 2019

OBJECT ORIENTED PROGRAMMING

[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 the significance and use of the keywords 'this' and 'super'.	7 Marks
	b)	Write a program to perform matrix multiplication using arrays. Use for each version of the for loop.	7 Marks
		(OR)	
2	a)	Write a Java program using recursion to display the factorial of a number.	7 Marks
	b)	With an example, explain the properties of final data member, static data member, final method and static method in Java.	7 Marks

UNIT-II

3	a)	Define interface. In what way it is different from class? Describe the similarities between classes and interfaces.	7 Marks
	b)	Describe the various forms of implementing interfaces.	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 String Reversal and implement the method.	14 Marks

UNIT-III

5	a)	Explain the life cycle of a thread.	7 Marks
	b)	Write a Java program to check whether the thread is alive or not.	7 Marks
		(OR)	
6	a)	Explain the exception hierarchy.	7 Marks
	b)	What is exception? Explain any four common exceptions that occur commonly in a Java program. Describe how they are handled.	7 Marks

UNIT-IV

7	a)	Explain the difference between Applets and Applications.	7 Marks
	b)	Write short note on: i) Life Cycle of an Applet. ii) Types of Applets.	7 Marks
		(OR)	
8	a)	Explain the process of passing parameters in an Applet using suitable code.	7 Marks
	b)	Write short note on Graphics Class.	7 Marks

UNIT-V

9	a)	Explain the process of loading the driver and establishing the connection in database connectivity.	7 Marks
	b)	Write short note on the Servlet API.	7 Marks
		(OR)	
10	a)	Explain about different types of JDBC drivers.	7 Marks
	b)	Explain the process of creation and compiling of Servlet Source Code.	7 Marks

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CODE No.:14BT50501 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC14) Supplementary Examinations December - 2019

THEORY OF COMPUTATION

[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	Show the equivalence of DFA's and NFA's.	14 Marks
	(OR)	
2	Show that if L is accepted by an NFA with ∈-transitions, then L is accepted by an NFA without ∈-transitions.	14 Marks

UNIT-II

3	Construct finite automaton equivalent to the regular expression **10 + (0 + 11)0*1**.	14 Marks
	(OR)	
4	Prove or disprove the following for the regular expressions r, s, and t. i) (rs + r)*r = r(sr + r)* ii) (r + s)* = r* + s*	14 Marks

UNIT-III

5	Construct a PDA accepting the language of palindromes over the alphabet {a,b}. Prove the equivalence of acceptance by final state and empty stack in PDA.	14 Marks
	(OR)	
6	State and prove closure properties and decision algorithms for CFL.	14 Marks

UNIT-IV

7	Draw a transition diagram for a Turing machine accepting the following language: **{ $a^n b^n c^n$ | n>0}**.	14 Marks
	(OR)	
8	Explain different types of Turing machines and state universal Turing machine.	14 Marks

UNIT-V

9	Show that it is undecidable whether a TM halts on all inputs.	14 Marks
	(OR)	
10	Prove that the union of two recursive languages is recursive and the union of two recursively enumerable languages is recursively enumerable.	14 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC14) Supplementary Examinations October – 2020

PROBABILITY AND STATISTICS

[Civil Engineering, Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Define the following with an example. 8 Marks
i) Mutually exclusive events. ii) Classical definition of probability.
iii) Conditional probability.

b) If X and Y are any two random variables, then prove that: 6 Marks
E(X + Y) = E(X) + E(Y) provided E(X) and E(y) exist.

(OR)

2 a) State and prove addition theorem of probability for any two events A and B. 7 Marks

b) Let X denote the number of heads in a single toss of 4 fair coins. Determine: 7 Marks
i) $P(X < 2)$. ii) $P(1 < X \leq 3)$.

UNIT-II

3 a) Out of 800 families with 5 children each, how many would you expect to have 7 Marks
(i) 3 boys (ii) 5 girls (iii) either 2 or 3 boys (iv) atleast one boy? Assume equal probabilities for boys and girls.

b) If X is a poisson variate, then prove that mean = variance = λ. 7 Marks

(OR)

4 a) 20% of items produced from a factory are defective. Find the probability that in a sample of 5 choosen at random: 7 Marks
i) Name is defective. ii) one is defective. iii) $P(1 < x < 4)$.

b) 1000 students have written an examination that mean of test is 35 and standard deviation is 5. Assuming the distribution to be normal, find: 7 Marks
i) How many students marks lie between 25 and 40?
ii) How many students get more than 40?
iii) How many students below 20?

UNIT-III

5 a) The following figures give the number of defectives in 20 samples, containing 2000 items 425, 430, 216, 341, 225, 322, 280, 306, 337, 305, 356, 402, 216, 264, 126, 409, 193, 280, 326, 389. Estimate the values for central line and the control limits for P –Chart. 7 Marks

b) The following are the marks obtained by 8 students in Economics and Statistics 7 Marks

Economics (X)	78	56	36	66	25	75	82	62
Statistics (Y)	84	44	57	58	60	68	62	58

Compute the spearman Rank correlation coefficient between X and Y.

(OR)

6 a) The number of defective bulbs in 20 samples, containing 1000 items are 125, 130, 116, 141, 125, 122, 180, 106, 137, 145, 156, 102, 116, 164, 126, 109, 133, 180, 126, 189. Calculate the values for central line and the control limits for P-Chart. 7 Marks

b) Following are rank obtained by 10 students in two subjects. To what extent the knowledge of the students in two subjects is related. 7 Marks

Statistics	1	2	3	4	5	6	7	8	9	10
Maths	2	4	1	5	3	9	7	10	6	8

UNIT-IV

7 a) The average marks scored by 32 boys are 72 with a S.D. of 8. While that for 36 girls is 70 with a S.D. of 6. Does this indicate that the boys perform better than girls at level of significance 0.05? 7 Marks

b) In a sample of 500 from a village in Rajasthan, 280 are found to be wheat eaters and the rest rice eaters. Can we assume that both articles are equally popular? 7 Marks

(OR)

8 a) Write a short notes on Type-I and Type-II errors 7 Marks

b) In 64 randomly selected hours of production, the mean and the standard deviation of the number of acceptance pieces produced by an automatic stamping machine are 1.038 and 0.146. At the 0.05 level of significance test whether the mean is greater than 1.000. 7 Marks

UNIT-V

9 A group of 5 patients treated with medicine 'A' weigh 42, 39, 48, 60 and 41 Kgs. Second group of 7 patients from the same hospital treated with medicine B weigh 38, 42, 56, 64, 68, 69 and 62 Kgs. Do you agree with the claim the medicine B increases the weight significantly? 14 Marks

(OR)

10 Fit a Poisson distribution to the following data test for its goodness of fit at a level of significance 5%. 14 Marks

x :	0	1	2	3	4
y :	419	352	154	56	19

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC14) Supplementary Examinations October – 2020

STRUCTURAL ANALYSIS - I

[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Derive the expression for stresses on an inclined plane of block subjected to normal stress and shear stress along the two planes at right angles. 14 Marks

(OR)

2 Explain clearly, the Mohr's circle method of finding out stresses in a rectangular element subjected to normal stresses p_1 and p_2 and shear stress q. Using the same method, find out the principal planes and principal stresses. 14 Marks

UNIT-II

3 Derive the expressions for slope and deflection of a cantilever of length 'L' and uniform 'EI' carrying a gradually varying load from zero at the free end to 'w' at the fixed end. Hence find the maximum values of its slope and deflection. 14 Marks

(OR)

4 A simply supported rectangular R.C beam is of length 3m and cross section 100mm x 200mm. It carries a point load of 20kN at a distance of 1m from the left support. Find the maximum slope and maximum deflection under the point load. Take E = 1×10^4 N/mm^2. 14 Marks

UNIT-III

5 What are the assumptions made in the Euler's theory? Derive the critical load formula for a long column with both the ends as fixed. 14 Marks

(OR)

6 A 4.6m long circular column having pinned ends has 240mm external diameter and 20mm thickness. The column carries a load of 180kN at an eccentricity of 22mm from its longitudinal axis. Determine (i) stresses in the extreme fibres of the cross-section and (ii) maximum eccentricity so as to have no tension anywhere in its cross section. The modulus of elasticity of the material is 80GPa. 14 Marks

UNIT-IV

7 A fixed beam AB of span 14m carries a concentrated load 210kN and a clockwise moment of 180kNm at distances of 4m and 8m respectively from the left end support. If the left end support sinks by 16mm, determine the fixed end moments. Draw shears force and bending moment diagrams. Take E= 6400kNm^2. 14 Marks

(OR)

8 A three span continuous beam ABCD is having equal spans of 'l' each. It carries a uniformly distributed load w/unit length over the entire beam. The beam is freely supported on all the supports, which are at the same level. Draw Shear force and Bending moment diagrams for the beam. 14 Marks

UNIT-V

9	a)	What is Shear centre? Write the short note on Shear centre. **.**	7 Marks
	b)	A channel section has flanges of size 10cm *10cm and web size of 2cm *14cm. Determine the shear centre of the channel section**.**	7 Marks

(OR)

10	a)	Derive the formula to find shear centre for a symmetrical channel section from first principles.	7 Marks
	b)	Find the approximate location of shear centre for a symmetrical channel section having overall depth of 260mm. Thickness of web and flanges is 20mm.	7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations October – 2020

FLUID MECHANICS - II

[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	A flat plate 2m x 2m is immersed in water flowing with a velocity of 5m/s. Find the forces of drag and lift as 0.05 and 0.2 respectively.	7 Marks
	b)	What is Von Karman momentum integral equation and where can it be applied?	7 Marks

(OR)

2		Explain the terms: boundary layer, boundary layer theory and boundary layer thickness. What is separation of boundary layer? Explain with a neat sketch.	14 Marks

UNIT-II

3		Derive the conditions for the rectangular channel of the best section and find the critical depth and critical velocity of the water flowing through a rectangular channel of width 5m, when discharge is $15m^3/s$.	14 Marks

(OR)

4	a)	What is meant by most economical section and derive the condition for a trapezoidal channel section to be most economical?	7 Marks
	b)	What are critical, sub critical and super critical flows?	7 Marks

UNIT-III

5		A jet of water having a velocity of 15m/s, strikes a curved vane which is moving with a velocity of 5m/s in the same direction as that of the jet at inlet. The vane is so shaped that the jet deflected through 135^0. The diameter of jet is 100mm. Assuming the vane to be smooth, find force exerted by the jet on the vane in the direction of motion, Power exerted on the vane and Efficiency of the vane.	14 Marks

(OR)

6	a)	Derive the expression for force exerted by a jet on a stationary vertical plate.	7 Marks
	b)	Water is flowing through a pipe at the end of which a nozzle is fitted. The diameter of the nozzle is 120mm and the head of water at the centre nozzle is 100m. Find the force exerted by the jet of water on a fixed vertical plate. The co-efficient of velocity is given as 0.95.	7 Marks

UNIT-IV

7		A Pelton wheel is to be designed for the following specifications. Power=735.75 kW shaft power, Head = 200m, speed = 800 r.p.m., overall efficiency = 0.86 and jet diameter is not to extend one-tenth the wheel diameter. Determine: i) Wheel diameter. ii) The number of jets required. iii) Diameter of the jet. Take Co-efficient of velocity as 0.98 and speed ratio as 0.45.	14 Marks

(OR)

8	a)	Under what headings the turbines can be classified.	7 Marks
	b)	A pelton wheel has to be designed for the following data: Power to be developed= 6000kW. Net head available = 300m; Speed = 550 r.p.m.; Ratio of jet diameter to wheel diameter = 1/10; and overall efficiency = 85%. Find the number of jets, diameter of the jet, diameter of the wheel and the quantity of water required.	7 Marks

UNIT-V

9 a) Water is to be pumped out of a deep well under a total head of 95m. A number of identical pumps of design speed 1000 r.p.m. and specific speed 900 r.p.m., with a rated capacity of 150 litres/second are available. How many pumps will be needed and how should they be connected. 7 Marks

b) When do you go for multi stage pumps? 7 Marks

(OR)

10 Explain with neat sketches the working procedures of: 14 Marks

i) Jet pump. ii) Airlift pump.

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations October – 2020

SIGNALS AND NETWORKS

[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) Check the properties: linear, Time-Invariance, Causality for the systems given below. 7 Marks
(i) $Y(t) = X(t)\cos(t+1)$. (ii) $Y(n) = X(n) + 3u(n+1)$.

b) State and prove sampling theorem. 7 Marks

(OR)

2 a) Determine the stability for the following system and test the causality. 7 Marks
$h(n) = 4^n\, u(2-n)$.

b) Compute the response of an LTI system described by its impulse response 7 Marks
$h[n] = \begin{cases} a^n, & 0 \le n \le 6 \\ 0, & otherwise \end{cases}$ to the input signal $x[n] = \begin{cases} 1, & 0 \le n \le 4 \\ 0, & otherwise \end{cases}$

UNIT-II

3 a) Derive the design equations for constant K high pass filter. 7 Marks

b) Derive Z_{OT} and $Z_{O\pi}$ for low pass filter section 7 Marks

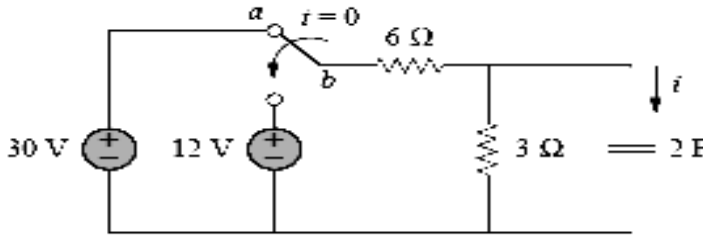
(OR)

4 a) Classify the pass band and stop band filters in detail. 8 Marks

b) Design a constant KLPF with a cut-off frequency of 1 KHZ, $R_O = 60\ \Omega$. 6 Marks

UNIT-III

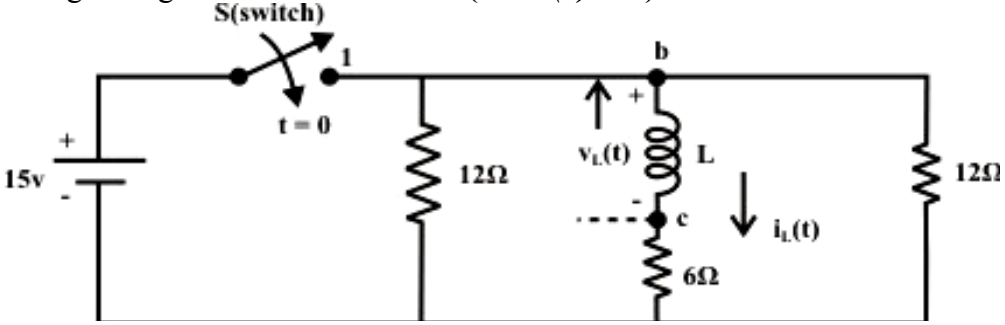
5 a) The switch shown in figure below has been in position *a* for a long time. At $t = 0$, it moves to position *b*. Calculate *i(t)* for all $t > 0$. 7 Marks



b) A series RLC circuit with R = 100Ω, C = 100μF and L = 0.1H has a constant voltage 200V applied at t = 0. Find the current transients, assuming zero initial charge on the capacitor. 7 Marks

(OR)

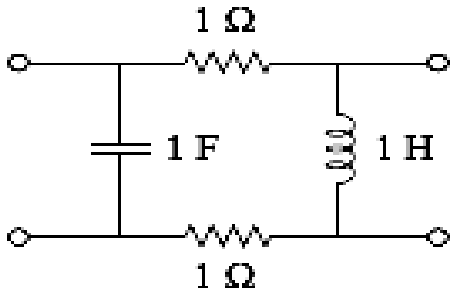
6 In the circuit shown in fig. the switch was initially open and no current was flowing in inductor (L). The switch was closed at $t = 0$ and then re opened at **$t = 2\tau$ sec**. At, t = 0, $di_L(t)/dt$ was 50*A/s*. Find: (i) The value of L (ii) The current $i_L(t)$ and voltage v_{bc} (t) expressions for **$t \ge 0$.** Assume, no current was flowing through the inductor at **$t = 0$ (i. e $i_L(0) = 0$)** 14 Marks



UNIT-IV

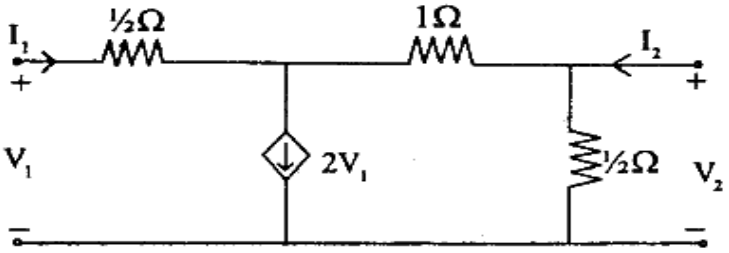
7 a) Explain inter connection of two-port network. 7 Marks

b) Find the *y* parameters of the two-port in figure shown below in terms of ***s.*** 7 Marks



(OR)

8 a) Find Z parameters of the network shown below 7 Marks



b) Express Y-parameters in terms of h-parameters. 7 Marks

UNIT-V

9 a) Write the testing procedure of real functions. 7 Marks

b) Investigate whether the following function is Hurwitz or not? 7 Marks

$P(s)= S^6-5s^5+12s^4+15s^3-10s^2+15s.$

(OR)

10 a) Explain the properties of Hurwitz polynomials. 6 Marks

b) Test the following polynomial for Hurwitz property 8 Marks

$2s^6+s^5+13s^4+6s^3+5s^2+10s+30.$

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CODE No.:14BT40203 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC14) Supplementary Examinations October – 2020

ELECTRICAL AND ELECTRONIC 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)	Explain the significance and classification of measurement system.	7 Marks
	b)	Explain the dynamic characteristics of measurement system.	7 Marks
		(OR)	
2	a)	What are static characteristics and how do they differ from dynamic characteristics.	7 Marks
	b)	Explain the construction and working of PMMC type instruments.	7 Marks

UNIT-II

3	a)	Explain measurement of reactive power in three phase balanced and un-balanced loads.	7 Marks
	b)	Explain working principle of LPF Wattmeter.	7 Marks
		(OR)	
4	a)	Describe the constructional details of an Electrodynamometer type wattmeter and derive the expression for torque when the instrument is used on **a.c.**	7 Marks
	b)	Explain working principle of single phase energy meter with diagram.	7 Marks

UNIT-III

5	a)	Explain construction and working principle of current transformer.	7 Marks
	b)	A 1000/5 A, 50Hz current transformer has a secondary burden comprising a non inductive impedance of 1.6Ω. The primary winding has one turn. Calculate flux in the core and ratio error at full load. Neglect leakage reactance and assume the iron loss in the core to be 1.5W at full load. The magnetizing **mmf** is 100A.	7 Marks
		(OR)	
6	a)	Explain construction and working principle of potential transformer.	7 Marks
	b)	A potential transformer, ratio 1000/100 volt, has the following constants: Primary resistance=94.5Ω, Secondary resistance = 0.86Ω, Primary reactance=66.2Ω, Total equivalent reactance = 110Ω, No load current = 0.02A at 0.4 power factor, Calculate: i) Phase angle error at no load. ii) Burden in VA at unity power factor at which the phase angle will be zero.	7 Marks

UNIT-IV

7	a)	Explain the loss of charge method for measurements of insulation resistance of cables.	7 Marks
	b)	Draw the circuit of Kelvin double bridge used for measurement of low resistance and Derive the condition for balance.	7 Marks
		(OR)	
8	a)	Derive the equations of balance for an Anderson's bridge. Draw the phasor diagram for conditions under balance.	8 Marks
	b)	Derive the equations of balance for Schering bridge. Draw the phasor diagram for	6 Marks

under balance condition.

UNIT-V

9	a)	Explain the Horizontal Deflection Plates in an Oscilloscope.	7 Marks
	b)	Write short notes on CRO probes.	7 Marks
		(OR)	
10	a)	Explain the Lissajous Patterns for the measurement of Phase and Frequency.	8 Marks
	b)	List the applications of Oscilloscopes.	6 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC14) Supplementary Examinations October – 2020

TRANSFORMERS AND INDUCTION 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)	Classify various types of transformers based on their construction and explain them with applications.	7 Marks
	b)	What are the various losses of a transformer? Derive the condition for getting maximum efficiency of a transformer.	7 Marks

(OR)

2	a)	What are the various methods to reduce the leakage flux in transformer?	6 Marks
	b)	Draw the phasor diagram of a single phase transformer with load having a leading power factor and explain.	8 Marks

UNIT-II

3	a)	Explain how O.C and S.C tests are conducted on a single phase transformer with neat diagram.	7 Marks
	b)	Explain the operating principle of auto transformer and derive an expression for the saving in copper when compared to an ordinary transformer.	7 Marks

(OR)

4	a)	Explain how Sumpner's test is conducted on a pair of transformers with a neat diagram.	7 Marks
	b)	Two single phase transformers with equal turns have impedance of (0.5+j3)Ω and (0.6+j10)Ω with respect to the secondary. If they operate in parallel, determine how they will share total load of 100KW at 0.8 power factor lagging.	7 Marks

UNIT-III

5	a)	Draw the phasor diagrams and winding connection of a three-phase transformer for: i) Group 1: phase displacement of zero degrees. ii) Group 2: phase displacement of 180 degrees.	7 Marks
	b)	Determine the values of Z_P, Z_s and Z_t of three winding transformer.	7 Marks

(OR)

6	a)	A three phase transformer has 400 turns on the primary and 40 turns on the secondary. The supply voltage is 3300V. Find the secondary voltage on no load when the windings are connected in (i) star-delta (ii) delta-star.	8 Marks
	b)	Explain the desirable conditions for the parallel operation of 3 phase transformers.	6 Marks

UNIT-IV

7	a)	Derive the condition for getting maximum torque of 3 phase induction motor.	8 Marks
	b)	Draw the equivalent circuit of double cage 3 phase induction motor and explain each parameter.	6 Marks

(OR)

8	a)	Compare slip-ring and squirrel-cage induction motor.	4 Marks
	b)	Explain air-gap power, internal mechanical power developed and shaft power. Deduce a relationship between them.	6 Marks
	c)	Derive the expression for maximum torque of three phase induction motor.	4 Marks

UNIT-V

9	a)	Describe static slip power recovery scheme of speed control with neat sketch.	7 Marks
	b)	Discuss the phenomenon of crawling and cogging in an induction motor.	7 Marks

(OR)

10	a)	Explain star-delta starting method of 3 phase induction motor.	7 Marks
	b)	Explain different speed control methods on stator side of 3 phase induction motor.	7 Marks

CODE No.:14BT40301 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations October - 2020

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)	Define 'Machine' and 'Mechanism'. How are these different from each other? Distinguish between structure and a machine?	5 Marks
	b)	Sketch slider crank chain and its various inversions, stating actual machines in which these are used in practice.	9 Marks

(OR)

2		Explain any two inversions of a double slider crank chain.	14 Marks

UNIT-II

3		In a slider crank mechanism, the crank is 480mm long and rotates at 20 rad/s in the counter-clockwise direction. The length of the connecting rod is 2500mm. When the crank turns 60^0 from the inner-dead centre, locate all instantaneous centres. Also determine (i) velocity of slider and (ii) angular velocity of connecting rod.	14 Marks

(OR)

4		The crank of a slider crank mechanism is 15cm and the connecting rod is 60cm long. The crank makes 300rpm in the clockwise direction. When it has turned 45^o from the inner dead centre position, determine: i) Acceleration of the mid-point of the connecting rod. ii) Angular acceleration of the connecting rod.	14 Marks

UNIT-III

5	a)	List out various mechanisms used to draw exact straight lines.	7 Marks
	b)	Discuss with a neat sketch of the straight line motion Hart mechanism. Prove that it produces an exact straight line motion.	7 Marks

(OR)

6	a)	Explain condition for correct steering with neat sketch.	7 Marks
	b)	Describe the working of Ackerman steering gear with neat sketch.	7 Marks

UNIT-IV

7	a)	Construct the displacement curve and deduce expressions for the velocity and acceleration of the follower when it moves with SHM.	7 Marks
	b)	Derive the relations for velocity and acceleration for a convex cam with a roller follower.	7 Marks

(OR)

8	6.	Draw the profile of a cam for the following data in which the roller follower moves with uniform acceleration and retardation motion during ascent and descent.	14 Marks

Minimum radius of cam	= 25mm
Roller radius	= 8mm
Lift	= 32mm
Offset of follower axis	= 12mm towards right
Angle of ascent	= 60^o
Angle of descent	= 90^o
Angle of dwell between ascent and descent	= 45^o
Speed	= 200r.p.m.

UNIT-V

9	a)	Derive a relation for minimum number of teeth on the gear wheel and the pinion to avoid interference.	7 Marks
	b)	A three start worm has a pitch diameter of 80mm and a pitch of 20mm. It rotates at 600 r.p.m and drives a 40 tooth worm gear. If coefficient of friction is 0.05, find (i) the helix angle of the worm (ii) the speed of the gear (iii) the centre distance (iv) the efficiency and maximum efficiency.	7 Marks

(OR)

10	a)	Calculate (i) length of path of contact, (ii) arc of contact (iii) the contact ratio when a pinion having 23 teeth drives a gear having teeth 57. The profile of the gears is involute with pressure angle 20^0, module 8mm and addendum equal to one module.	7 Marks
	b)	Derive an expression for the minimum number of teeth required on the wheel in order to avoid interference in involute gear teeth.	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations October – 2020

FLUID MECHANICS AND HYDRAULIC MACHINERY

[Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain briefly the following terms: i) Viscosity. ii) Surface tension. iii) Capillarity.	7 Marks
	b)	What should be the diameter of a droplet of water, if pressure inside is to be 0.0018 Kg(f)/cm^2 greater than the outside? Given the values of surface tension of water in Contact with air at 20^{0}C as 0.0075Kg (f)/m.	7 Marks

(OR)

2	a)	Describe with a neat sketch U-tube manometer and how it is used for the measurement of the pressure.	7 Marks
	b)	A plate 0.0254mm distant from a fixed plate, moves at 61cm/s and requires a force of 0.2Kg (f)/m^2 to maintain this speed. Determine the dynamic viscosity of the fluid between the plates.	7 Marks

UNIT-II

3		Distinguish between: i) Steady and unsteady flow. ii) Uniform and Non-Uniform flow. iii) Compressible and Incompressible flow.	14 Marks

(OR)

4	a)	Briefly explain the classification of flows.	7 Marks
	b)	Define the Bernoulli's equation for rotational flow mentioning the assumptions.	7 Marks

UNIT-III

5	a)	Explain hydraulic gradient line and total energy gradient line.	7 Marks
	b)	Two reservoirs are connected by a pipe 2250mts long and 0.225mts in diameter, the difference in water level being 7.5mts. Determine the flow through pipes in lits/min.	7 Marks

(OR)

6	a)	Obtain an expression for force exerted by a jet of water on inclined (fixed and moving) flate plate in the direction of jet.	7 Marks
	b)	A nozzle of 50mm diameter delivers a stream of water at 20m/s perpendicular to a plate that moves away from the jet at 5m/s find: i) the force on the plate. (ii) work done. iii) the efficiency of jet.	7 Marks

UNIT-IV

7	a)	Explain briefly the principles on which pelton wheel works.	7 Marks
	b)	Design a pelton wheel which is required to develop 1500kW, when working under a head of 160m at a speed of 420 r.p.m. the overall efficiency may taken as 85% and assume other data required.	7 Marks

(OR)

8	a)	Elaborate on Cavitation and water hammer.	7 Marks
	b)	Write classification of surge tanks and state its applications.	7 Marks

UNIT-V

9		Write a detailed account about the classification of pumps.	14 Marks

(OR)

10		Explain the concept of pumped storage plants and storage requirements.	14 Marks

CODE No.:14BT40401 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations October – 2020

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)	Describe the generation of DSB-SC using Ring modulator.	8 Marks
	b)	Calculate the net modulation index and power associated with AM Signal $\mathbf{V(}t\mathbf{)=8\cos 2\pi 10^6 }t\mathbf{+4\cos 2\pi 10^6 }t\mathbf{\cos 2\pi 10^4 }t\mathbf{+2\cos 2\pi 10^6 }t\mathbf{\cos 3\pi 10^4 }t$.	6 Marks
		(OR)	
2	a)	Describe the detection of AM waves using square-law detector and envelope detector with neat diagrams.	7 Marks
	b)	Explain the generation and detection of DSB-SC Signals.	7 Marks

UNIT-II

3	a)	Derive the time domain representation of VSB.	8 Marks
	b)	Draw a neat circuit diagram of a of ring modulator and describe its functioning with suitable diagrams	6 Marks
		(OR)	
4	a)	Explain how VSB signal can be demodulated by envelop detector.	8 Marks
	b)	Why do you prefer VSB modulation scheme in TV signals.	6 Marks

UNIT-III

5	a)	Prove that narrow band FM offers no improvement in SNR over AM.	8 Marks
	b)	Evaluate the bandwidth requirement for the transmission of FM signal having a frequency deviation 75 KHz and an audio bandwidth of 10KHz.	6 Marks
		(OR)	
6	a)	Sketch the FM and PM waveforms assuming the message signal to be a square wave.	7 Marks
	b)	Distinguish between angle modulation and amplitude modulation systems.	7 Marks

UNIT-IV

7	a)	Draw the block diagram of a TRF receiver and identify the various limitations.	7 Marks
	b)	Classify the different AM radio transmitters based on the frequency range.	7 Marks
		(OR)	
8	a)	Prove that Figure of Merit of DSB-SC and SSB are superior to that of AM.	8 Marks
	b)	Distinguish high level and low level AM transmitters. With neat block diagram, explain the principle and operation of low level AM transmitter.	6 Marks

UNIT-V

9	a)	Differentiate different types of Pulse Modulation schemes.	7 Marks
	b)	Explain the generation and detection of PAM signals with neat schematics.	7 Marks
		(OR)	
10	a)	Describe the generation and demodulation of PWM signals.	7 Marks
	b)	Explain the need and operation of frequency division multiplexing with a neat diagram.	7 Marks

CODE No.:14BT40402 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations October – 2020

ELECTRONIC CIRCUIT ANALYSIS AND DESIGN

[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)	What are different types of coupling used in cascading of amplifier and explain?	7 Marks
	b)	Derive the expression for the bandwidth of multistage amplifier.	7 Marks
		(OR)	
2	a)	Give the equation of overall upper and lower cut off frequencies of multistage amplifiers.	10 Marks
	b)	Why capacitive coupling is used to connect a signal source to an amplifier?	4 Marks

UNIT-II

3	a)	A transistor amplifier in CE configuration is operating at high frequency with the following specifications: f_T = 6 MHz, g_m= 0.04 mhos, hfe= 50, rbb_0= 100Ω, Rs = 500Ω, CC = 10pF, R_L= 100Ω. Compute the voltage gain, upper 3 dB cut off frequency and gain bandwidth product.	7 Marks
	b)	Sketch the FET amplifier equivalent circuit looking into the drain and find its gain and output impedance.	7 Marks
		(OR)	
4		Obtain the expressions for the voltage gain in the low frequency and high frequency ranges in the case of single stage amplifier FET amplifier.	14 Marks

UNIT-III

5	a)	Explain in detail about the different feedback topologies.	8 Marks
	b)	A transistor Colpitt's oscillator uses a tank circuit with L = 30 mH, C_1 = 200 PF and C_2 = 200 PF. What is the frequency of oscillators?	6 Marks
		(OR)	
6	a)	Derive the expressions for voltage gain, input impedance and output impedance of a voltage shunt feedback Amplifier.	8 Marks
	b)	Explain the effect of negative feedback on amplifier bandwidth.	6 Marks

UNIT-IV

7	a)	With the help of a neat diagram, explain the operation of a complementary symmetry configured class B power amplifier.	9 Marks
	b)	Compare series fed and Transformer coupled class A amplifier.	5 Marks
		(OR)	
8		Explain the following: i) Thermal stability and heat sinks. ii) Transistor power consumption. iii) Distortion in power amplifiers.	14 Marks

UNIT-V

9	a)	Explain the working of a single-tuned amplifier.	6 Marks
	b)	Derive an expression for the resonance frequency of a parallel resonant circuit	8 Marks
		(OR)	
10	a)	Explain the working of a double-tuned amplifier.	7 Marks
	b)	Explain in brief, the function of the tank circuit in a tuned-voltage amplifier.	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations October – 2020

ELECTROMAGNETIC THEORY AND TRANSMISSION LINES

[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)	Discuss the salient features and applications of Gauss's law.	7 Marks
	b)	Derive the expression for electric field due to volume charge density.	7 Marks
		(OR)	
2	a)	Explain Gauss law and its application with one example.	7 Marks
	b)	Derive expression for the electric field for symmetrical charge distributions	7 Marks

UNIT-II

3	a)	State Ampere's Circuit law and derive its differential form.	7 Marks
	b)	What is the magnetic field, $\vec{H}$ in Cartesian coordinates due to Z-directed current element? Find $\vec{J}$ if I = 2A.	7 Marks
		(OR)	
4	a)	Explain Ampere's circuital law and its application with one example.	7 Marks
	b)	Illustrate two Maxwell's equations in magneto statics.	7 Marks

UNIT-III

5	a)	Explain about inconsistency of Ampere's law.	7 Marks
	b)	State Maxwell's equations in differential form and integral form.	7 Marks
		(OR)	
6	a)	Explain the concept of displacement current.	7 Marks
	b)	State and prove electrostatic boundary conditions.	7 Marks

UNIT-IV

7	a)	Derive wave equations for a conducting medium.	7 Marks
	b)	Derive the propagation characterization of electromagnetic waves in free space.	7 Marks
		(OR)	
8	a)	Derive Uniform plane wave equation.	7 Marks
	b)	Derive the general solution of Uniform plane wave equation.	7 Marks

UNIT-V

9	a)	Explain how transmission lines can be used as circuit elements.	7 Marks
	b)	Discuss about single stub matching.	7 Marks
		(OR)	
10	a)	Derive the characteristic impedance of a transmission line in terms of its line constants	7 Marks
	b)	Sketch the voltage and current distribution along matched, open and short circuited transmission lines.	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations October – 2020

SIGNALS AND SYSTEMS

[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 concept of Unit Impulse and Unit Step functions. 6 Marks
b) Explain how the signals and systems are classified. 8 Marks

(OR)

2 a) Show that the sinusoidal signal **x(t) = cos (ωt + θ)** is periodic and that its fundamental period is **2π/ω.** 7 Marks
b) Sketch the signal ***f(t) = r(t) – r*(t–1) – *r*(t–2) – *r*(t – 3).** 7 Marks

UNIT-II

3 a) What is exponential Fourier spectrum? Explain with necessary equations. 7 Marks
b) State the properties of Fourier series. 7 Marks

(OR)

4 a) Find Fourier Transform of the function $x(t) = e^{-3t}[u(t+2) - u(t-3)]$. 5 Marks
b) Prove frequency and time shifting properties of Fourier Transform. 9 Marks

UNIT-III

5 a) Explain briefly reconstruction of signal from its samples. 8 Marks
b) Derive the relation between correlation and power spectral density. 6 Marks

(OR)

6 a) With neat sketches, explain Sampling theorem for low pass Signals. 9 Marks
b) Determine the minimum Sampling rate and Nyquist interval of x(t)= sin(200πt)+sin(100πt). 5 Marks

UNIT-IV

7 a) Find Laplace transforms and sketches their ROC of : 7 Marks
(i) x(t) = u(t-5) (ii) $x(t) = e^{j\omega t}u(t)$
b) State and prove the following properties of Laplace transform. 7 Marks
(i) Convolution property. (ii) Time differentiation.

(OR)

8 a) Solve the second-order linear differential equation **y''(t) + 5y'(t) + 6y(t) = x(t)** with initial conditions **y(0) = 2, y'(0) =1**, and **x(t) = e^-t u(t).** 7 Marks
b) Find the inverse Laplace transform of **X(s) = (-5s-7)/(s+1)(s-1)(s+2).** 7 Marks

UNIT-V

9 a) State and prove the final value theorem of Z-transform. 7 Marks
b) Determine the Z-transform and its ROC for the signal: ***x*(*n*) = (1/5)^*n* *u*(– *n*)**. 7 Marks

(OR)

10 a) Explain geometric evaluation of Fourier Transform from pole-zero plot. 7 Marks
b) Determine the signal x(n) whose Z-transform is given by 7 Marks
$X(z) = \log(1 - 1\, az^{-1}; |z| > |a|$

CODE No.:14BT40405 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations October – 2020

SWITCHING THEORY AND LOGIC DESIGN

[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 Canonical and Standard forms with suitable examples.	6 Marks
	b)	Implement the INVERTER gate, OR gate and AND gate using i) NAND gate. ii) NOR gate.	8 Marks
		(OR)	
2	a)	i) How do you obtain the dual of an expression? Give one example. ii) Express the function as sum of minterms F(A,B,C,D)=$\bar{B}$D + $\bar{A}$D+BD	6 Marks
	b)	Simplify the following Boolean Functions to minimum number of literals. i) F = $\bar{A}$B($\bar{D}$+$\bar{C}$D)+B(A+$\bar{A}$CD) ii) W = $\bar{X}\bar{Z}$+$\bar{Y}\bar{Z}$+Y$\bar{Z}$+XYZ	8 Marks

UNIT-II

3		Simplify the following Boolean expression using K-Map and implement using NAND gates f = ∑m(0,1,2,3,5,7,8,9,10,12,13).	14 Marks
		(OR)	
4		Using Quine-McCluskey method minimize the function f(W,X,Y,Z)=∑m(0,1,5,7,8,10,14,15).	14 Marks

UNIT-III

5	a)	Design a combinational circuit for 4-bit Adder/Subtractor.	6 Marks
	b)	Design a BCD to Excess-3 code converter.	8 Marks
		(OR)	
6	a)	Construct a 16 x 1 Multiplexer using 4 x 1 Multiplexers.	6 Marks
	b)	Design 4 bit binary to gray code converter.	8 Marks

UNIT-IV

7	a)	Draw an asynchronous decade counter and explain its operation.	7 Marks
	b)	Design and explain the function of 4-bit bidirectional shift register.	7 Marks
		(OR)	
8	a)	Design a decade asynchronous counter with timing diagrams.	8 Marks
	b)	Explain 4 bit Ring and Twisted ring counter with their truth tables.	6 Marks

UNIT-V

9	a)	Explain the operation of ROM with neat logical diagram.	6 Marks
	b)	Tabulate the PLA programming table for the two Boolean functions F_1(A,B,C) =∑(1,2,4,6) F_2(A,B,C) =∑(0,1,6,7) minimize the number of product terms.	8 Marks
		(OR)	
10	a)	What is ROM? List and explain different types of ROMs.	6 Marks
	b)	Design a combinational circuit using a PROM. The circuit accepts a 3-bit binary number and generates its equivalent XS-3 code.	8 Marks

CODE No.:14BT40431 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations October – 2020

ANALOG ELECTRONIC 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)	Derive the BJT simplified hybrid model for small signal analysis.	7 Marks
	b)	Derive the CE short circuit current gain at high frequencies.	7 Marks
		(OR)	
2	a)	Draw the small signal equivalent circuit for an emitter follower stage at high frequencies.	8 Marks
	b)	Explain the significance of Miller's theorem in transistor circuit analysis.	6 Marks

UNIT-II

3	a)	Describe the general characteristics of negative feedback amplifiers.	7 Marks
	b)	Explain the Barkhausein criteria for sustained oscillations.	7 Marks
		(OR)	
4	a)	Show that the gain of Wien bridge oscillator using BJT amplifier must be at least 3 for the oscillations to occur.	10 Marks
	b)	Explain the concept of feedback in oscillators.	4 Marks

UNIT-III

5	a)	Distinguish between Class-A, Class-B and Class-AB amplifiers with neat diagrams.	7 Marks
	b)	Explain the operation of a class-B push-pull amplifier with neat diagrams.	7 Marks
		(OR)	
6	a)	Derive the conversion efficiency of a Class -A transformer coupled amplifier.	7 Marks
	b)	Describe the second harmonic distortion in power amplifiers.	7 Marks

UNIT-IV

7	a)	Explain the response of RC low pass circuit for exponential input signal.	8 Marks
	b)	Explain negative peak clipper with and without reference voltage.	6 Marks
		(OR)	
8	a)	Explain how clipping at two independent levels can be achieved.	8 Marks
	b)	Explain positive peak voltage limiters below reference level.	6 Marks

UNIT-V

9	a)	Design a monostable circuit that produces a pulse width of 10msec.	8 Marks
	b)	What is an astable multivibrator? Explain. How does this differ with the other multivibrators?	6 Marks
		(OR)	
10	a)	Explain the triggering of bistable multivibrator circuit using diodes.	7 Marks
	b)	Draw the circuit diagram of a Schmitt trigger circuit and explain its operation and application as a comparator.	7 Marks

CODE No.:14BT40502 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations October – 2020

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)	Explain DDL and DML commands in detail with examples.	7 Marks
	b)	What are the various responsibilities of a DBA?	7 Marks
		(OR)	
2	a)	Explain about various constraints used in ER-model.	6 Marks
	b)	Discuss in detail about various attributes used in E-R model with suitable examples.	8 Marks

UNIT-II

3	a)	Explain the basic Relational Algebra operations with the symbol used and an example for each.	8 Marks
	b)	What is the input to a relational query? What is the result of evaluating a query?	6 Marks
		(OR)	
4	a)	List out and explain different relational algebraic operations with example.	8 Marks
	b)	Define a View. Explain how SQL support views.	6 Marks

UNIT-III

5	a)	Differentiate between independent and correlated nested queries.	6 Marks
	b)	Explain the following with examples. i) EXIST. ii) IN. iii) CONCATENATE. iv) UNION.	8 Marks
		(OR)	
6	a)	What is Functional Dependency? Explain its concept.	6 Marks
	b)	State 1NF, 2NF and 3NF and explain with examples.	8 Marks

UNIT-IV

7	a)	Why the concurrency control is needed? Explain it.	6 Marks
	b)	Explain the concept of Testing for serializability.	8 Marks
		(OR)	
8	a)	Discuss about two phase commit protocol.	6 Marks
	b)	Illustrate dead lock and conflict serializability with suitable example.	8 Marks

UNIT-V

9	a)	Describe difference methods of defining indexes on multiple keys.	8 Marks
	b)	Explain in detail about external hashing techniques.	6 Marks
		(OR)	
10	a)	Why is a B+ tree a better structure than a B-tree for implementation of an indexed sequential file? Explain this with an example.	7 Marks
	b)	Explain indexed sequential access method.	7 Marks

CODE No.:14BT41201 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations October – 2020

OBJECT ORIENTED PROGRAMMING

[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)	Write a java program using any five String library functions.	7 Marks
	b)	Define constructor. Describe its special properties.	7 Marks
		(OR)	
2	a)	Explain the access control defined in java.	7 Marks
	b)	Explain the 'this' key word and garbage collection.	7 Marks

UNIT-II

3	a)	Explain about various Member Access Rules.	7 Marks
	b)	Discuss about the importance of Packages.	7 Marks
		(OR)	
4	a)	What is an Interface? Explain the process of implementing an Interface with suitable Java Code.	7 Marks
	b)	How does the Interfaces are extended? Explain with suitable program.	7 Marks

UNIT-III

5	a)	List the various priorities of a thread. Write a Java program to change the priority of a thread.	7 Marks
	b)	Illustrate with an example program to demonstrate inter process communication using threads.	7 Marks
		(OR)	
6	a)	Define package. Create a simple package and describe its usage.	7 Marks
	b)	Explain logging in java with all its levels.	7 Marks

UNIT-IV

7	a)	Explain about Delegation Event Model.	7 Marks
	b)	Write Java program that demonstrates User Interface Components labels and buttons.	7 Marks
		(OR)	
8	a)	Explain the methods of an Applet Skeleton in detail.	7 Marks
	b)	Create an Applet to control and resize the image from min to max dimension on click of a mouse.	7 Marks

UNIT-V

9	a)	Write short note on Javax.Servlet Package.	7 Marks
	b)	Write a Java program of a servlet to print Hello World.	7 Marks
		(OR)	
10	a)	Describe how Exceptions are handled in servlets.	7 Marks
	b)	Write a Java program to connect with Database.	7 Marks

CODE No.:14BT50201 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations October – 2020

CONTROL SYSTEMS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

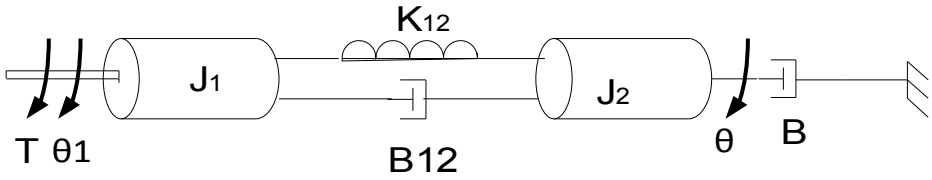
Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) What are the effects of feedback on sensitivity and external noise? 7 Marks

b) For the mechanical system, draw the electrical analogous circuits based on Torque-Voltage and Torque-Current analogy along their equations. 7 Marks



(OR)

2 Construct the signal flow graph for the given set of algebraic equations and find the overall gain using Mason's gain formula. 14 Marks

$$x_2 = a_{12}x_1 + a_{22}x_2 + a_{32}x_3 + a_{42}x_4 + a_{52}x_5$$

$$x_3 = a_{23}x_2$$

$$x_4 = a_{34}x_3 + a_{44}x_4$$

$$x_5 = a_{35}x_3 + a_{45}x_4$$

UNIT-II

3 a) Determine the step, ramp and parabolic error constants for the system with unity feedback. $G(s) = \frac{K}{s^2(s+1))}$. 7 Marks

b) Derive the response of a standard under damped second order system for unit step input. 7 Marks

(OR)

4 a) Derive the step response equation for standered first order system. 7 Marks

b) Consider the unit step response of a unity feedback control system whose open loop transfer function is $G(s) = \frac{1}{s(s+1)}$. Obtain the rise time, peak time, maximum over shoot and settling time(2% criterian). 7 Marks

UNIT-III

5 a) Determine the range of values of K such that the characteristic equation $s^3 + 3(K+1)s^2 + (7K+5)s+(4K+7) = 0$ has roots more negative than $s = -1$. 7 Marks

b) Explain about the effects of adding zeroes to G(s)H(s) on the root loci. 7 Marks

(OR)

6 The open loop transfer function of a feedback system is **G(s)H(s)=K/s(s+4)(s^2+4s+20)**. Obtain root locus plot and determine range of K for which the system is stable. 14 Marks

UNIT-IV

7 a) What are the advantages of frequency domain analysis? 7 Marks

b) What are compensating networks? Explain about lag-lead network. 7 Marks

(OR)

8 Consider a unity feedback system having an open loop transfer function $G(S) = \frac{K}{S(1+0.5S)(1+4S)}$ sketch the Bode plot and determine the value of 'k' so that gain margin is 20 db and phase margin is 30^0. 14 Marks

UNIT-V

9 a) What are the advantages of state model representation? 7 Marks

b) $[\dot{x}] = \begin{bmatrix} 0 & 1 \\ -1 & -2 \end{bmatrix}[x] + \begin{bmatrix} 0 \\ 1 \end{bmatrix} \quad u, y = \begin{bmatrix} 1 & 0 \end{bmatrix}\begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$ with initial conditions $x(0) = \begin{bmatrix} 0 \\ 1 \end{bmatrix}$. 7 Marks

Calculate STM, complete solution $x(t)$ and $y(t)$.

(OR)

10 a) Define the terms state variable and state transition matrix. 6 Marks

b) Obtain the state space representation in Phase variable and Jordan form for the system whose transfer function is given by **T(s)=(s+1)/s(s+4)(s+5)**. 8 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Regular Examinations December 2020

ENVIRONMENTAL STUDIES

[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)	Discuss various disciplines that contribute to environmental studies.	CO1	7 Marks
	b)	Demonstrate the role of public in environmental protection.	CO1	7 Marks
		(OR)		
2	a)	Discuss causes and over utilization of water resources.	CO2	7 Marks
	b)	Explain the role of individuals in sustainable use of natural resources.	CO2	7 Marks

UNIT-II

3	a)	Demonstrate the structure and function of grass land ecosystem.	CO2	7 Marks
	b)	Discuss various levels of bio diversity.	CO2	7 Marks
		(OR)		
4	a)	What is an ecological pyramid? Compare the ecological pyramids of grass land and forest eco system.	CO2	7 Marks
	b)	Demonstrate the various methods for conservation of bio diversity.	CO2	7 Marks

UNIT-III

5	a)	What are non biodegradable materials? Discuss the causes and effects of soil pollution.	CO3	7 Marks
	b)	Discuss the primary and secondary air pollutants.	CO3	7 Marks
		(OR)		
6	a)	What is solid waste? Explain the control measures of solid waste.	CO5	7 Marks
	b)	What is E-Waste? Discuss the management of E-Waste.	CO4	7 Marks

UNIT-IV

7	a)	Discuss the causes and effects due to Ozone layer depletion.	CO7	7 Marks
	b)	What is urbanization? Explain its impact on energy resources.	CO7	7 Marks
		(OR)		
8	a)	Explain the major solutions for sustainable development.	CO5	7 Marks
	b)	Explain briefly the salient features of water protection act.	CO8	7 Marks

UNIT-V

9	a)	Explain the role of information technology in environmental studies.	CO9	7 Marks
	b)	What is population growth?	CO6	7 Marks
		(OR)		
10	a)	What is the role of Human right commission?	CO7	7 Marks
	b)	Report the local environmental issues and their remedial measures.	CO9	7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Regular Examinations, December - 2020

ELECTRONIC CIRCUIT ANALYSIS AND DESIGN

[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)	Draw the h-parameter equivalent circuit of the generalized transistor amplifier and explain the significance of each parameter.	CO1	7 Marks
	b)	Draw and explain the n-stage cascaded amplifier with necessary expressions.	CO1	7 Marks
		(OR)		
2	a)	Draw the h-parameter equivalent circuit of CE amplifier with R_E and derive the expressions for A_i, R_i, A_v, R_o.	CO2	9 Marks
	b)	Explain the need of cascading transistor amplifiers.	CO6	5 Marks

UNIT-II

3	a)	Derive the Expressions for transconductance, input conductance, feedback conductance of transistor hybrid-π model at high frequencies.	CO2	9 Marks
	b)	A BJT has the following parameters measured at I_C=1mA, h_{ie}=3kΩ, h_{fe}=100, f_T=4MHz, C_C=2pF, and C_e=18pF. Find $r_{b'e}$, $r_{bb'}$, g_m, and f_H for R_L=1kΩ.	CO4	5 Marks
		(OR)		
4	a)	Obtain the expression for CE short circuit current gain of an amplifier at high frequencies.	CO2	8 Marks
	b)	Derive the expression for output resistance, input capacitance of common source amplifier at high frequencies.	CO2	6 Marks

UNIT-III

5	a)	Derive the expression for voltage gain, input resistance, output resistance of voltage shunt feedback amplifier.	CO2	7 Marks
	b)	Draw the RC phase shift oscillator with BJT, Explain its operation and derive the expression for frequency of oscillations.	CO1	7 Marks
		(OR)		
6	a)	Explain the effect of negative feedback on amplifier characteristics with necessary expressions.	CO5	7 Marks
	b)	Draw the Piezo electric crystal oscillator and explain its operation.	CO1	7 Marks

UNIT-IV

7	a)	With neat diagram explain the working of class-A transformer coupled power amplifier and derive the expression for efficiency.	CO1	8 Marks
	b)	A complementary push-pull amplifier has capacitive coupled load R_L= 8Ω, supply voltage +12V or -12V. Calculate i) $P_{ac(max)}$ ii) Power dissipation of each transistor iii) Efficiency.	CO4	6 Marks
		(OR)		
8	a)	Derive the expression for total harmonic distortion in power amplifiers using 3-point method.	CO2	6 Marks
	b)	Explain the working of series fed class-A power amplifier and derive the expression for efficiency.	CO1	8 Marks

UNIT-V

9	a)	Explain the frequency response of double tuned amplifier with neat diagram.	CO1	7 Marks
	b)	Compare single tuned, double tuned, stagger tuned amplifiers.	CO1	7 Marks
		(OR)		
10	a)	Write a short notes on effect of cascading single and double tuned amplifiers on bandwidth.	CO5	7 Marks
	b)	A single tuned amplifier is used to amplify modulated RF carrier of 600KHz and band width of 15KHz. The circuit has a total output resistance R_t =20KΩ, and output capacitance C_0=50pF. Calculate values inductance and capacitance of tuned circuit.	CO3	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Regular Examinations, December – 2020

SIGNALS AND SYSTEMS

[Electronics and Instrumentation Engineering]

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

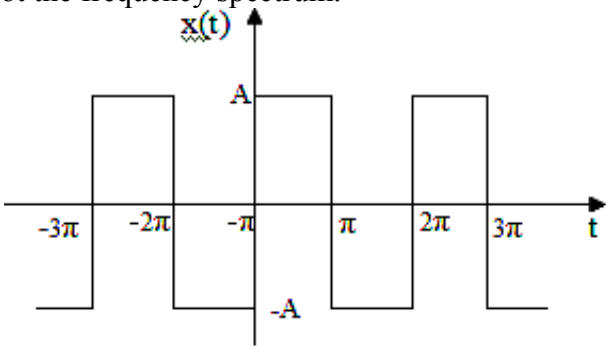
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Check whether the following signals are periodic or not. If periodic, find the fundamental period. i) $x(t) = e^{j8\pi t}$; ii) $x(t) = \cos 2t + \sin\sqrt{3}t$; iii) $x(n) = \sin\left(\frac{2\pi n}{3}\right) + \cos\left(\frac{2\pi n}{5}\right)$	CO4	8 Marks
	b)	Test whether the following signals are causal or non-causal: i) $x(t) = u(t+2) - u(t-2)$; ii) $x(t) = 3\sin c(2t)$; iii) $x(n) = u(n+4) - u(n-2)$	CO1	6 Marks
		(OR)		
2	a)	Classify the Continuous time systems and explain with examples.	CO1	8 Marks
	b)	Check whether the following systems are Time invariant or Time variant i) $y(t) = t^2 x(t)$; ii) $y(t) = e^{2x(t)}$; iii) $y(n) = nx(n)$.	CO3	6 Marks

UNIT-II

3	a)	Obtain the Exponential Fourier series for the waveform as shown in figure below and plot the frequency spectrum.	CO2	7 Marks



	b)	State and prove the following properties of continuous time Fourier series i) Linearity; ii) Time Shift; iii) Time Reversal.	CO2	7 Marks
		(OR)		
4	a)	Find the Fourier transform of the following functions and plot magnitude and phase spectra i) $sgn(t)$; ii) $\cos w_0 t$	CO2	8 Marks
	b)	State and prove i) Differentiation in time and ii) Convolution properties of continuous Time Fourier Transform.	CO2	6 Marks

UNIT-III

5	a)	State and prove the properties of Energy Spectral Density.	CO2	7 Marks
	b)	Find Auto Correlation function and Energy Spectral Density of $x(t) = \sin w_0 t$	CO4	7 Marks

(OR)

6	a)	Find the Convolution of signals: $x_1(t) = e^{-2t}u(t)$ and $x_2(t) = e^{-4t}u(t)$.	CO3	7 Marks
	b)	Derive the relationship between Convolution and Correlation.	CO1	7 Marks

UNIT-IV

7	a)	Find the inverse Laplace Transform of $X(s) = \frac{1}{(s+4)(s-2)}$ for i) ROC: $-4 < Re(s) < 2$; ii) $Re(s) > 2$.	CO3	7 Marks
	b)	State and prove the following properties of Laplace Transform: i) Time Scaling; ii) Time Shift; iii) Initial Value theorem.	CO4	7 Marks

(OR)

8	a)	Explain the properties of ROC of Laplace Transform.	CO1	7 Marks
	b)	Find the system function and impulse response of the system described by the differential equation $\frac{d^2y(t)}{dt^2} + 5\frac{dy(t)}{dt} + 6y(t) = x(t)$.	CO4	7 Marks

UNIT-V

9	a)	A signal $x(t) = 2\cos 400\pi t + 6\cos 640\pi t$ is ideally sampled at $f_s = 500$ Hz. If the sampled signal is passed through an ideal low pass filter with cutoff frequency of 400Hz, what frequency components will appear in the output. Sketch the output spectrum and find output signal.	CO5	8 Marks
	b)	What is aliasing? Explain. How it is avoided?	CO1	6 Marks

(OR)

10	a)	Determine all possible values of x(n) for $X(z) = \frac{1+2z^{-1}+z^{-2}}{1-\frac{3}{2}z^{-1}+\frac{1}{2}z^{-1}}$.	CO3	8 Marks
	b)	State and prove time shifting and convolution properties of Z- transform.	CO5	6 Marks

CODE No.:16BT30403 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Regular Examinations, December – 2020

SWITCHING THEORY AND LOGIC 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)	Convert the following number from given base to other three bases Decimal 623.72 to binary, octal and hexa decimal	CO1	7 Marks
	b)	Determine the value of base if $(172)_x = (598)_8$	CO1	3 Marks
	c)	Perform the following subtraction using 1's and 2's, complement method. 55 + (-77) Find the result in sign-magnitude.	CO1	4 Marks

(OR)

2	a)	Convert each of the following to the other canonical form: i) $F(X,Y, Z) = \Sigma_m (2, 5, 6)$ ii) $F(A, B, C, D) = \Pi_m (0, 1, 2, 4, 7, 9, 12)$.	CO5	7 Marks
	b)	If the Hamming code sequence 1100110 is transmitted and due to an error in one position, is received as 1110110, locate the position of the error bit using parity checks and give the method for obtaining the correct sequence.	CO1	7 Marks

UNIT-II

3	a)	Minimize the following function in standard POS form using K-map. $f(A, B, C, D) = \Sigma_m (0, 1, 2, 3, 5, 7, 8, 9, 11, 14)$	CO5	4 Marks
	b)	Simplify the following Boolean function using Quine-McCluskey method $F(A, B, C, D) = \Sigma_m (1, 2, 3, 5, 9, 12, 14, 15) + d (4, 8, 11)$	CO1	10 Marks

(OR)

4		Reduce the following function using K-map technique and indicate the prime implicants. $F(A,B,C,D,E) = \Sigma_m (0, 1, 3, 4, 5, 6, 7, 10, 11, 12, 13, 14, 15, 18, 19, 20, 21, 22, 23, 26, 27)$	CO5	14 Marks

UNIT-III

5	a)	Design a 16:1 MUX using: i) 3:1 MUX and OR gate ii) 8:1 and 2:1 MUX	CO2	7 Marks
	b)	Design a 4-bit Gray to Binary converter using truth table, K-maps and logic circuits.	CO4	7 Marks

(OR)

6	a)	Design Half-Adder using appropriate decoder and relevant basic gates.	CO4	5 Marks
	b)	Implement BCD to seven segment display.	CO6	9 Marks

UNIT-IV

7	a)	Write a short notes on: i) State diagram ii) State table iii) Stated reduction iv) State assignment.	CO5	4 Marks
	b)	Design a sequence generator using D flip-flop to generate the sequence 101100110.	CO2	10 Marks

(OR)

8	a)	Draw a neat circuit diagram of clocked J-K flip flop using NAND gates. Give its truth table and explain race-around condition.	CO2	7 Marks
	b)	Design a 3-bit synchronous counter using J-K flip flops. Use K-maps.	CO2	7 Marks

UNIT-V

9	a)	Realize the following equations with a suitable PLA. Draw the logic diagram using PLA: i) $F_1(A,B,C,D) = A\overline{B}D + \overline{A}B\overline{D}$ ii) F_2 (A,B,C,D) = $A + B\overline{D}$	CO3	7 Marks
	b)	A 3-I/P, 4-O/P combinational circuit has the following O/P functions. A(X,Y,Z) = Σ_m(1,2,4,6) B(X,Y,Z) = Σ_m(1,3,6,7) C(X,Y,Z) = Σ_m(1,2,4,6,7) D(X,Y,Z) = Σ_m(1,2,3,5,7 Implement the circuit using a suitable PAL.	CO3	7 Marks

(OR)

10	a)	Implement the following functions on PLA $f(w, x, y, z) = \Sigma_m$ (0, 2, 6, 7, 8, 9, 12, 13)	CO3	7 Marks
	b)	Design an Excess-3 to BCD code converter using a PAL.	CO3	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Regular Examinations, December - 2020

CONCRETE TECHNOLOGY

[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 Plasticizers and explain the action of plasticizers.	CO6	7 Marks
	b)	What are super plasticizers and explain the effect of super plasticizers on properties of concrete.	CO6	7 Marks
		(OR)		
2	a)	Explain about various field tests on cement.	CO1	4 Marks
	b)	List out various laboratory tests on cement. Describe setting times of cement in detail.	CO1	10 Marks

UNIT-II

3		Define the term "curing" and briefly discuss various methods of curing.	CO1	14 Marks
		(OR)		
4		List out the factors affecting workability. Write a detailed note on Compaction factor test and Kelly ball test.	CO1	14 Marks

UNIT-III

5		List out various Non-destructive testing methods and explain Rebound hammer method.	CO5	14 Marks
		(OR)		
6	a)	Define the term "Shrinkage" and explain various types of shrinkage.	CO1	7 Marks
	b)	Write down the codal provisions for NDT.	CO5	7 Marks

UNIT-IV

7	a)	Explain the factors to be considered in the choice of mix proportioning.	CO2	7 Marks
	b)	Write a short note on durability of concrete.	CO4	7 Marks
		(OR)		
8		Design a concrete mix of M45 grade for a roof slab. Type of cement used is OPC 43 grade. Maximum size of aggregate available is 20mm crushed angular aggregate. Take a standard deviation of 5 N/mm^2. The specific gravities of fine aggregate and coarse aggregate are 2.7 and 2.8 respectively. Fineness modulus of fine aggregate is 2.76. Workability is 125mm slump. The Water absorption of coarse aggregate is 0.5% and water absorption of fine aggregate is 3%. Free moisture content in coarse aggregate is 0% and free moisture content in fine aggregate is 1.5%. Method of placing concrete is pumping. Grading of coarse aggregate conforming to Table 2 of IS 383. Grading of fine aggregate confirming to grading zone II. Design the concrete mix using Indian standard method of concrete mix design. Assume any missing data suitably.	CO3	14 Marks

UNIT-V

9		Write the applications, properties and types of Light weight aggregate concrete.	CO1	14 Marks
		(OR)		
10		Write a short note on the following: i) No-fines concrete ii) High performance concrete.	CO1	14 Marks

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CODE No.:16BT40102 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Regular Examinations, December-2020

ENGINEERING GEOLOGY

[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	Discuss the importance of geology in civil engineering. Mention any two examples on failure of civil engineering structures due to lack of geological investigations.	CO1	14 Marks

(OR)

2	Define weathering. Discuss the effects of weathering on engineering properties of rocks.	CO1	14 Marks

UNIT-II

3	Define a Mineral and demonstrate the significance of physical properties in mineral identification.	CO2	14 Marks

(OR)

4	What is rock cycle? Demonstrate the structural characters exhibited by sedimentary rocks.	CO2	14 Marks

UNIT-III

5	Discuss the classification of faults and their effects on civil engineering structures.	CO2	14 Marks

(OR)

6	How to conduct the electrical resistivity method? Describe its application in civil engineering.	CO3	14 Marks

UNIT-IV

7	Discuss the following:		
	i) Types of Aquifers	CO6	7 Marks
	ii) Cone of Depression	CO6	7 Marks

(OR)

8	What are landslides? Demonstrate the causes and effects of land slides.	CO5	14 Marks

UNIT-V

9	Analyze the dam failures caused by geological factors.	CO7	14 Marks

(OR)

10	Demonstrate the geological considerations for the selection of tunnel site.	CO5	14 Marks

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CODE No.:16BT40103 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Regular Examinations, December-2020

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)	Explain briefly about each component in hydrological cycle with a neat sketch.	CO1	7 Marks
	b)	There are four rain gauge stations existing in the catchment of a river. The average annual rainfall values of these stations are 810, 630, 410 and 550 mm respectively. Determine (i) Optimum number of rain gauges in the catchment if it is desired to limit the error in the mean value of rainfall in the catchment to 10**%**. (ii) How many more rain gauges will there be required to be installed?	CO4	7 Marks

(OR)

2		Precipitation station X was inoperative for part of a month during which a storm occurred. The respective storm total at three surrounding stations A, B and C were 108, 90 and 123 mm. The normal annual precipitation amount of stations X, A, B and C are respectively. 978, 1122, 940 and 1210mm. Estimate a storm precipitation for station X.	CO3	14 Marks

UNIT-II

3		Explain the process of infiltration. With neat the help of neat sketch, explain Horton's model of infiltration equation.	CO5	14 Marks

(OR)

4		The rainfall rates for successive 30 min intervals up to 4 hours are given below. If surface runoff is 3.6 cm. Determine **Pi** and **W**-index.	CO4	14 Marks

Time period (minutes)	0	30	60	90	120	150	180	210	240
Rainfall Rate (cm/hr)	0	1.3	2.8	4.5	3.9	2.8	2	1.8	0.9

UNIT-III

5		State Dupuit's assumptions for obtaining general equations governing ground water flow. Derive an expression for the confined aquifer.	CO2	14 Marks

(OR)

6	a)	What is runoff? What are the factors that affect the runoff from the catchment area?	CO1	7 Marks
	b)	Describe rainfall runoff relationship and explain various formulas used to estimate runoff.	CO1	7 Marks

UNIT-IV

7		Describe the features of hydrograph with a neat sketch. Mention the various methods used to separate the base flow.	CO4	14 Marks

(OR)

8 Given below are the observed flows from a storm of 6 hr duration on a stream with a drainage area of 320 sq km. Assuming constant base flow 16 cumecs. Derive and plot 6 hr unit hydrograph. How many cm of rainfall excess does above storm hydrograph represents. CO5 14 Marks

Jan 1				Jan 2`				Jan 3			
00am	6am	Noon	6pm	00am	6am	Noon	6pm	00am	6am	Noon	6pm
16	112.2	256.7	200.5	153	117.5	88.5	69.8	56.7	43.5	32.6	0

UNIT-V

9 Write the notes on reservoir sedimentation? How do you estimate the probable life of a reservoir? CO6 14 Marks

(OR)

10 What do you understand by Soil erosion? Explain the different methods to estimate the soil erosion and give example each. CO7 14 Marks

CODE No.:16BT40105 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Regular Examinations, December-2020

WATER SUPPLY ENGINEERING

[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 objectives of water supply system? How do you achieve these objectives?	CO1	7 Marks
	b)	The analysis of water sample from a well showed the following results in mg/L: $Ca^{++} = 72$, $Mg^{++} = 50$, $Na^{+} = 120$, $K^{+} = 32$ $HCO_3^{-} = 220$, $SO_4^{--} = 172$, $Cl^{-} = 140$ Determine total hardness, carbonate hardness and non-carbonate hardness for the given sample.	CO2	7 Marks

(OR)

2	a)	Explain the following tests used for the bacteriological analysis of the given water sample: i) Presumptive test ii) Confirmed test iii) Completed test.	CO1	9 Marks
	b)	What are the ill effects of the following parameters, if they are present in excess of permissible limits in water supplies? i) Chlorides ii) Fluoride iii) Iron and manganese iv) Nitrates and v) Turbidity.	CO1	5 Marks

UNIT-II

3	a)	Distinguish between gravity and pumping methods of conveyance of water.	CO1	6 Marks
	b)	Estimate the population for the year 2051 from the following population data using Geometric increase method and Incremental increase method.	CO2	8 Marks

Year	1961	1971	1981	1991	2001	2011
Population In Lakhs	8.08	10.15	12.05	17.1	20.8	26.0

(OR)

4	a)	Describe various factors affecting per capita consumption of water.	CO1	7 Marks
	b)	Draw a neat diagram of a river intake and explain its salient features.	CO1	7 Marks

UNIT-III

5	a)	Draw the flow sheet of a conventional water treatment plant. State the functions of each unit.	CO1	4 Marks
	b)	A settling tank handles 2.5 million litres of water per day. The tank is 18 m long 6 m wide and 4.5 m deep. The depth includes 0.5 m of free board and 1 m for sludge accumulation. Determine the following parameters for the tank: i) Average flow velocity ii) Detention time iii) Surface overflow rate	CO3	6 Marks
	c)	Give recommended permissible and desirable limits for the following water quality parameters as per IS 10500:2012 i) pH ii) Hardness iii) Nitrates iv) Fluorides.	CO7	4 Marks

(OR)

6	a)	Describe breakpoint chlorination with a neat sketch. What are the advantages of breakpoint chlorination?	CO6	5 Marks
	b)	Distinguish between slow sand filters and rapid gravity filters.	CO1	5 Marks
	c)	Explain the principle of coagulation.	CO1	4 Marks

UNIT-IV

7	a)	Explain various distribution networks with neat sketches. Discuss advantages, disadvantages and suitability of each method.	CO1	9 Marks
	b)	Describe the following types of valves used in pipe networks : i) Sluice valve ii) Reflex valve.	CO6	5 Marks

(OR)

8	a)	Explain any one method of removal of hardness from water. Discuss the merits and demerits of that method.	CO4	8 Marks
	b)	Describe any two methods for the removal of colour from water.	CO4	6 Marks

UNIT-V

9	a)	Draw a sketch of service connection from the street main to a residential building and state the functions of each fitting used.	CO3	7 Marks
	b)	Describe any two methods for detecting leakages from water distribution pipes.	CO5	7 Marks

(OR)

10		Describe various water piping systems that may be used in buildings with neat sketches. State merits and demerits of each system.	CO5	14 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Regular Examinations December 2020

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)	Define and explain any five static characteristics of an instrument.	CO1	7 Marks
	b)	What are the essential requirements of indicating instruments?	CO1	7 Marks
		(OR)		
2	a)	Describe the construction and working of PMMC instrument. Derive the equation for deflection if the instruments is spring controlled.	CO2	7 Marks
	b)	A milli-ammeter of 2.5 ohms resistance, it reads upto 100 milli-amperes Calculate the resistance which is used as: i) An voltmeter reading upto 10 V. ii) An ammeter reading upto10 A. Draw the connection diagram in each case.	CO3	7 Marks

UNIT-II

3	a)	With neat figures explain the construction, working principle of a single phase wattmeter. What is the importance of deflecting torque in these analog instruments?	CO1	7 Marks
	b)	A 3 phase, 3 wire, 415 V system is a balanced load of 20 A at pf 0.8 lag. The current coil of wattmeter 1 is in phase R and of wattmeter 2 is phase B. Calculate : i) Reading on wattmeter 1 when its voltage coil is across R and Y. ii) Reading on wattmeter 2 when its voltage coil is across B and Y.	CO4	7 Marks
		(OR)		
4		Explain with a neat sketch the construction, working principle and torque equation of single phase induction type energy meter.	CO1	14 Marks

UNIT-III

5		Derive expression for actual transformation ratio, ratio error and phase angle error of a C.T.	CO2	14 Marks
		(OR)		
6	a)	Explain the three phase EDM type power factor meter with neat sketch.	CO1	7 Marks
	b)	Explain the testing of current transformer.	CO5	7 Marks

UNIT-IV

7	a)	Describe the circuit of Kelvin double bridge used for measurement of low resistance. Derive the conditions for balance.	CO1	7 Marks
	b)	The following data relates to the balanced AC bridge is; Arm AB: R_1 = 225 ohm; Arm BC: R_2=150 ohm in series with C_2=0.53 μF; Arm CD: unknown; Arm DA: R_3=100 ohm in series with L_3=7.95 mH. The oscillator frequency =1 kHz. Calculate the constants of arm CD.	CO4	7 Marks

(OR)

8	a)	Describe the working of Hay's Bridge for measurement of inductance. Derive the equations for balance. Why is this bridge suited for measurement of inductance of high Q coil?	CO1	7 Marks
	b)	Describe the measurement error of Wheatstone bridge. Why it is modified to Kelvin's Double Bridge? Derive equations at balance for Kelvin's Double Bridge.	CO2	7 Marks

UNIT-V

9		What is standardization? Explain the working of DC potentiometer and its applications.	CO1	14 Marks

(OR)

10	a)	Explain the internal structure of CRT and describe the principle of electrostatic focusing.	CO1	7 Marks
	b)	Explain, how CRO can be used to measure following parameters. i) frequency and phase by Lissajous pattern. ii) rms value of a sine wave.	CO2	7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Regular Examinations, December - 2020

GENERATION OF ELECTRIC POWER

[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)	Classify hydro electric power plants.	CO1	7 Marks
	b)	Draw a neat diagram of storage type hydro electric power plant and describe the function of each component used in the plant.	CO1	7 Marks
		(OR)		
2	a)	Draw the layout of typical thermal power plant and explain features.	CO1	7 Marks
	b)	Distinguish various turbines used in hydro electric power station in several aspects.	CO1	7 Marks

UNIT-II

3	a)	With a neat sketch explain the working principle of nuclear power plant.	CO1	7 Marks
	b)	Classify nuclear reactors. Explain pressurized water reactor with neat diagram.	CO1	7 Marks
		(OR)		
4	a)	Write various factors to be considered in choosing location of a diesel power plant.	CO5	7 Marks
	b)	Explain operation of a simple gas turbine plant with a neat diagram.	CO1	7 Marks

UNIT-III

5	a)	Explain briefly the principle of solar photovoltaic power generation.	CO6	7 Marks
	b)	Write the applications of renewable energy sources and the impacts on environment.	CO7	7 Marks
		(OR)		
6	a)	Derive an expression for power generated by a wind energy turbine generator.	CO2	7 Marks
	b)	Write short notes on Bio-gas generation and its classification.	CO6	7 Marks

UNIT-IV

7	a)	Explain the following factors and their significance load factor, diversity factor, plant use factor.	CO1	7 Marks
	b)	A 1000MW power station delivers 1000MW for 2 hours, 500MW for 6 hours and is shut down for the rest of each day. It is also shut down for maintenance for 60 days annually. Calculate its annual load factor.	CO4	7 Marks
		(OR)		
8	a)	Explain diminishing value method of calculating depreciation for power plant equipment with mathematical treatment and discuss the merits and demerits.	CO1	7 Marks
	b)	Calculate annual bill of a consumer whose maximum demand is 100kW, p.f=0.8 lagging and load factor=60%. The tariff used is Rs.75per kVA of maximum demand plus 15 paise per kWh consumed.	CO4	7 Marks

UNIT-V

9	a)	List the main categories of risk associated with a cogeneration project and discuss them briefly.	CO1	7 Marks
	b)	What are the causes of low power factor? What are the methods of improving the PF?	CO1	7 Marks

(OR)

10	a)	Derive the expression for most economical power factor for constant KW loads.	CO3	7 Marks
	b)	A 415V, 50Hz, 10HP, 3 Phase Induction motor is running at 0.7 PF at full load. Its efficiency at full load is 85%. It is desired to improve the PF to 0.95 using 3 phase capacitor bank. Find the rating of capacitor bank per phase (in Farads) if the capacitors are connected in: i) Star; ii) Delta.	CO3	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Regular Examinations, December - 2020

DESIGN OF MACHINE ELEMENTS-I

[Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What are general considerations in designing a machine component?	CO1	7 Marks
	b)	Explain the different phases of design.	CO1	7 Marks
		(OR)		
2	a)	Briefly explain various theories of elastic failure.	CO1	7 Marks
	b)	The load on a bolt consists of an axial pull of 10kN together with a transverse shear force of 5kN. Find the diameter of bolt required according to i) Maximum principal stress theory. ii) Maximum shear stress theory. iii) Maximum principal strain theory.	CO2	7 Marks

UNIT-II

3	a)	What is stress concentration? Explain the methods used to reduce stress concentration.	CO1	7 Marks
	b)	A circular bar of 500 mm length is supported freely at its two ends. It is acted upon by a central concentrated cyclic load having a minimum value of 20 KN and a maximum value of 50 KN. Determine the diameter of bar by taking a factor of safety of 1.5, size effect of 0.85, surface finish factor of 0.9. The material properties of bars are given by: ultimate strength of 650 MPa, yield strength of 500 MPa and endurance strength of 350 MPa.	CO2	7 Marks
		(OR)		
4		A solid circular shaft 15 mm in diameter is subjected to torsional shear stress that varies from 0 to 35 N/mm^2 and at the same time it is subjected to an axial stress that varies from -15 to 30 N/mm^2. The frequency of variation of these stresses is equal to shaft speed. The shaft is made of steel Fe 400 (σ_{ut} = 540 MPa and σy = 400 MPa) and the corrected endurance limit of the shaft is 200 N/mm^2. Determine the factor of safety.	CO2	14 Marks

UNIT-III

5	a)	Derive an expression for the maximum load in a bolt when a bracket with circular base is bolted to a wall by means of four bolts.	CO1	6 Marks
	b)	A bracket is bolted to a column by 4 bolts of equal size as shown in Fig.1.It carries a load of 50 kN at a distance of 150 mm from the centre of column. If the maximum allowable stress in the bolts is to be limited to 150 MPa, the distances from centre of bolts 1 and 2, 2 and 3, 3 and 4, 1 and 4 is 200 mm. Determine the diameter of bolt.	CO2	8 Marks

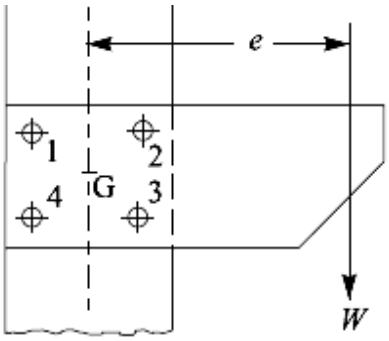
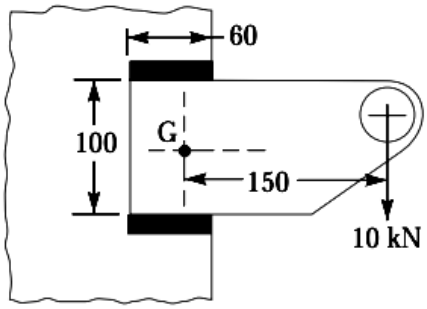


Figure. 1.

(OR)

6	a)	What is an eccentric loaded welded joint? Discuss the procedure for designing such a joint.	CO1	4 Marks
	b)	A bracket, as shown in Fig. 2, carries a load of 10 kN. Find the size of the weld if the allowable shear stress is not to exceed 80 MPa.	CO3	10 Marks



All dimensions in mm.

Figure. 2

UNIT-IV

7	Determine the diameter of a hollow shaft having inside diameter 0.5 times the outside diameter. The permissible shear stress is limited to 200 MPa. The shaft carries a 900 mm diameter cast iron pulley. This pulley is driven by another pulley mounted on the shaft placed below it. The belt ends are parallel and vertical. The ratio of tensions in belt is 3. The pulley on the hollow shaft weighs 800N and overhangs the nearest bearing by 250mm. the pulley is to transmit 35kW at 400 r.p.m.	CO3	14 Marks

(OR)

8	Design a muff coupling to connect two shafts transmitting 40 kW at 120 r.p.m. the permissible shear and crushing stresses for shaft and key material are 30 MPa and 80 MPa respectively. The material of muff is cast iron with permissible shear stress of 15 MPa. Assume that the maximum torque transmitted is 25% greater than the mean torque.	CO5	14 Marks

UNIT-V

9	Two mild steel rods of 40mm diameter are to be connected by a cotter joint. The thickness of the cotter is 12mm. calculate the dimensions of the joint, if the maximum permissible stresses are 46 MPa in tension, 35 MPa in shear and 70 MPa in crushing.	CO4	14 Marks

(OR)

10	Design a cotter joint of socket and spigot type which may be subjected to a pull or push of 30kN. All the parts of the joint are made of the same material with the permissible stress 55MPa in tension, 70 MPa in compression and 40MPa in shear.	CO3	14 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Regular Examinations, Decemeber-2020

FLUID MECHANICS

[Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Discuss the following fluid properties: i) specific weight and mass density. ii) dynamic viscosity and kinematic viscosity. iii) surface tension.	CO1	7 Marks
	b)	Two horizontal flat plates are placed 0.15 mm apart and the space between them is filled with an oil of viscosity 0.1 N.s/m². The upper plate of area 1.5 m² is required to move with a speed of 0.5 m/s relative to the lower plate. Determine the necessary force and power required to maintain this speed.	CO2	7 Marks
		(OR)		
2	a)	Define the terms: i) Absolute pressure, ii) Gauge pressure, iii) Vacuum pressure, iv) Atmospheric pressure.	CO1	7 Marks
	b)	A simple U-tube manometer containing mercury is connected to a pipe in which a fluid of specific gravity 0.8 and having vacuum pressure is flowing. The other end of the manometer is open to atmosphere. Find the vacuum pressure in pipe, if the difference of mercury level in the two limbs is 40cm and the height of the fluid in the left limb from the centre of the pipe is 15cm below. Take specific gravity of mercury as 13.6.	CO2	7 Marks

UNIT-II

3	a)	Explain the classification of fluid flows, justify with examples.	CO2	10 Marks
	b)	What is the equation of continuity for one dimensional flow?	CO1	4 Marks
		(OR)		
4		Derive Euler's equation of motion along a stream line and hence derive the Bernoulli's equation.	CO5	14 Marks

UNIT-III

5	a)	List out the minor energy losses in pipes.	CO1	6 Marks
	b)	What do you understand from the flow through pipes in series and pipes in parallel?	CO1	8 Marks
		(OR)		
6	a)	Derive an expression for the force exerted by a jet on an inclined flat plate in a direction normal to the plate.	CO3	7 Marks
	b)	A 30 mm diameter jet exerts a force of 1000 N in the direction of flow against a flat plate, which is held at an angle of 30° with the axis of the stream. Find the rate of flow.	CO3	7 Marks

UNIT-IV

7	a)	Give the comparison between impulse and reaction turbines.	CO2	6 Marks
	b)	A Pelton wheel has a mean bucket speed of 35 m/s with a jet of water flowing at the rate of 1 m^3/s under a head of 270m. The buckets deflect the jet through an angle of 170°. Calculate the power delivered to the runner and the hydraulic efficiency of the turbine. Assume coefficient of velocity as 0.98.	CO6	8 Marks

(OR)

8	a)	Define the terms unit power, unit speed and unit discharge, derive expressions for them.	CO1	7 Marks
	b)	Explain the draft tubes. Why is it used in a reaction turbine?	CO1	7 Marks

UNIT-V

9		Explain the working of centrifugal pump with neat sketch; discuss briefly its characteristic curves.	CO2	14 Marks

(OR)

10	a)	What are slip and negative slip of a reciprocating pump? Explain the reason for negative slip.	CO1	7 Marks
	b)	A single acting reciprocating pump running at 50 **r.p.m** delivers 0.01 m^3/s of water. The diameter of the piston is 200 mm and stroke length 400 mm. Determine: The theoretical discharge of the pump, coefficient of discharge, slip and percentage slip of the pump.	CO4	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Regular Examinations, December – 2020

MACHINE TOOLS AND MODERN MACHINING PROCESSES

[Mechanical 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 major properties required of cutting tool materials?	CO2	7 Marks
	b)	In an orthogonal cutting process, following data were observed; chip length of 80 mm was obtained with an uncut chip length of 200 mm and the rake angle used was 20º and depth of cut is 0.5 mm. The horizontal and vertical components of cutting force were 2000 N and 200 N respectively. Determine the shear angle, friction angle and resultant cutting force.	CO4	7 Marks
		(OR)		
2	a)	What are the different types of cutting fluids? Explain their applications.	CO3	7 Marks
	b)	Explain the factors that affect tool life.	CO4	7 Marks

UNIT-II

3	a)	Describe, with the help of a neat sketch, working of a collect chuck.	CO1	7 Marks
	b)	Draw and Explain with a neat sketch, the process of taper turning by taper turning attachment method.	CO1	7 Marks
		(OR)		
4	a)	What do you understand by parallel action and progressive action in multi-spindle lathes?	CO1	7 Marks
	b)	Draw a tool layout for production of hexagonal button using capstan lathe.	CO1	7 Marks

UNIT-III

5	a)	With the help of neat sketch explain open and cross belt drive mechanism used in planer.	CO1	7 Marks
	b)	How to do you adjust the length of the stroke in shaper? Explain with diagram.	CO1	7 Marks
		(OR)		
6	a)	Explain briefly “twist drill nomenclature” with neat sketches.	CO3	7 Marks
	b)	Describe the construction and working of jig boring machine.	CO1	7 Marks

UNIT-IV

7	a)	Explain with neat sketch about vertical milling machine.	CO1	7 Marks
	b)	Explain different types of indexing methods.	CO1	7 Marks
		(OR)		
8	a)	With a neat sketch explain the construction and working of a centre less grinder.	CO1	7 Marks
	b)	Describe grit, grade and structure of a grinding wheel.	CO1	7 Marks

UNIT-V

9	a)	Explain about various elements and their influence on Abrasive Jet Machining (AJM).	CO5	7 Marks
	b)	With the help of neat sketch explain how the following operations are carried out using Electrical Discharge Machining (EDM) process: i) Drilling of micro holes; ii) Drilling curved holes; iii) Trepanning.	CO5	7 Marks
		(OR)		
10	a)	Explain the construction and working principle of Plasma Arc Machining (PAM) with neat sketch. What are the applications of Plasma Arc Machining (PAM) process?	CO5	7 Marks
	b)	Compare and differentiate EBM and LBM process.	CO5	7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Regular Examinations, December-2020

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 working of 2 stroke petrol engine with the help of neat sketches.	CO1	7 Marks
	b)	Draw valve timing diagram for four stroke diesel engine.	CO1	7 Marks
		(OR)		
2	a)	How do the specific heats vary with temperature? What is the physical explanation for this variation?	CO1	7 Marks
	b)	Mention the various simplified assumptions used in air-standard cycles and fuel-air cycles.	CO1	7 Marks

UNIT-II

3	a)	Explain various stages of Combustion in SI engine on P-θ diagram.	CO2	8 Marks
	b)	What do you mean by Octane number and Cetane number? How are they determined?	CO2	6 Marks
		(OR)		
4	a)	What is delay period? What are factors that affect delay period?	CO4	6 Marks
	b)	What is meant by abnormal combustion? Explain the phenomena of knock in SI engines.	CO4	8 Marks

UNIT-III

5	a)	Write down the engine performance parameters with the help of formulae.	CO1	5 Marks
	b)	A single cylinder and 4-stroke cycle I.C. engine when tested, the following observations are available: Area of indicator diagram = 3 cm^2, Length of indicator diagram = 4 cm, spring constant = 10 bar/cm, speed of the engine = 400 rpm, Brake drum diameter = 120 cm, Dead weight on the brake = 380 N, Spring balance reading = 50 N, Fuel consumption= 2.8 kg/hr, C_v = 42000 kJ/kg, Cylinder diameter = 16 cm, Piston stroke = 20 cm. Find: i) FP, ii) Mechanical efficiency, iii) BSFC, iv) Brake thermal efficiency, v) BMEP.	CO3	9 Marks
		(OR)		
6	a)	Describe with suitable sketch the rope brake dynamometer.	CO1	7 Marks
	b)	Explain the procedure for preparing heat balance sheet.	CO3	7 Marks

UNIT-IV

7	a)	Define calorific value of fuel. Differentiate between H.C.V. and L.C.V. of a fuel and state which value is used in calculations and why?	CO1	4 Marks
	b)	The volumetric composition of a coal gas is given as H_2 = 27%, CO = 7%, CH_4 = 48%, C_2H_4 = 13%, CO_2 = 3% and N_2 = 2%. If 50% excess air is supplied, find the percentage composition by volume of the products assuming H_2O produced is perfect gas.	CO5	10 Marks
		(OR)		

8	a)	Describe the specific advantages of liquid fuels over solid and gaseous fuels.	CO1	5 Marks
	b)	Describe the method used for finding the calorific value of gaseous fuels.	CO1	9 Marks

UNIT-V

9	a)	Discuss the typical performance curves of reciprocating air compressors.	CO2	6 Marks
	b)	Explain the working of vane type blower with the help of neat sketch.	CO1	8 Marks
		(OR)		
10	a)	Classify the various types of air-compressors.	CO1	4 Marks
	b)	A single acting two-stage compressor with complete inter-cooling delivers 5 kg of air per minute at 15 bar pressure. Assuming an intake state of 1 bar and 15 °C and that the compression and expansion processes are polytropic with n = 1.3, calculate the power required and the isothermal efficiency, if the speed is 420 **rpm**. Assuming the clearance volumes of L.P. and H.P. cylinders to be 5% of the swept volume, calculate swept and clearance volumes for cylinders.	CO2	10 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Regular Examinations December 2020

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)	An AM modulator has an output of $X(t)$ = A. Cos 400πt + B. Cos380πt + 4.Cos420πt. The un-modulated carrier power is 100watts and the modulation efficiency is 40%. Find A and B.	CO4	7 Marks
	b)	Find the percentage power saving in AM-SSBSC signal, compared to AM-DSB-Full Carrier under tone modulation for a modulation index of 50%. Derive the expression used.	CO4	7 Marks
		(OR)		
2	a)	Why we have to choose VSB modulation technique for picture transmission? Explain the need for detection of VSB modulated signal using envelope detector and show that m(t) is recovered by envelope detector.	CO1	7 Marks
	b)	The single tone modulating wave $m(t) = A_m\cos 2\pi f_m(t)$ is used to generate the VSB wave $S(t) = aA_mA_c\cos(2\pi(f_c+f_m)t)/2+A_mA_c(1-a)\cos(2\pi(f_c-f_m)t)/2$. Where 'a' is constant, less than unity, representing the attenuation of the upper side frequency. i) find the quadrature component of the VSB wave. ii) this VSB wave, plus the carrier $A_c\cos 2\pi f_c t$ is passed through an envelope detector. Determine the distortion produced by quadrature component. iii) What is the value of constant **a** for which the distortion reaches its worst possible value?	CO4	7 Marks

UNIT-II

3	a)	An angle modulated signal with carrier frequency $\omega_c=2\pi\times10^5$ is described by the equation $s(t)$ = 10cos ($\omega_c t$ + 5 sin (3000t) + 10 sin (2000πt). Find i) the power of the modulated signal. ii) frequency deviation **Δ**f iii) deviation ratio **β** iv) phase deviation **Δφ**. v) Bandwidth using Carson's rule vi) carrier swing.	CO4	7 Marks
	b)	An NBFM signal under tone Modulation is similar to an AM signal under Tone Modulation, except a 180 degrees phase with respect to LSB-Justify.	CO1	7 Marks
		(OR)		
4	a)	Armstrong method is used to generate a WBFM signal. The NBFM signal has the carrier frequency f_{c1}=20 KHz. The WBFM signal that is required must have the parameters f_c=6MHz and **Δ**f=10 KHz. Only frequency triples are available. However they have a limitation: they cannot produce frequency components beyond 8 MHz at their output. Is frequency conversion stage required? If so, when does it become essential? Draw the schematic diagram of this problem.	CO4	7 Marks
	b)	Show that average power in FM is constant and depends only on carrier signal amplitude.	CO1	7 Marks

UNIT-III

5	a)	A tone of unit amplitude and frequency 600 Hz is sent via FM. The FM receiver has been designed for message signals up to 1 KHz. The maximum phase deviation produced by the tone is 5 radians. Show that $(SNR)_o = 31.3$ dB, given that $\frac{A_c^2}{2N_0} = 10^5$.	CO2	7 Marks
	b)	Derive the expression for Figure of Merit of FM.	CO2	7 Marks
		(OR)		
6	a)	Derive the expression for the figure of merit of DSB-SC.	CO2	7 Marks
	b)	In a laboratory experiment involving envelope detection, AM signal at the input to envelope Detector, has a modulation index of 0.5 with carrier amplitude of 2V.m(t) is a tone signal of frequency 5 KHz and $f_c >> 5$ KHz. If the two sided noise PSD at the detector input is 10^{-8} Watts/Hz, what is the expected $(SNR)_o$ of this scheme? By how many dB, this scheme is inferior to DSB-SC.	CO2	7 Marks

UNIT-IV

7	a)	Classify and explain Radio Transmitters.	CO6	7 Marks
	b)	Consider a super heterodyne FM receiver designed to receive the frequency band of 1 to 30 MHz with an IF frequency of 8 MHz. What is the range of frequencies generated by the local oscillator for this receiver? An incoming signal with a carrier frequency of 10 MHz is received at the 10 MHZ setting. At this setting of the receiver, we also get interference from a signal with some other carrier frequency if the receiver RF stage band pass filter has poor selectivity. What is the carrier frequency of the interfering signal?	CO4	7 Marks
		(OR)		
8	a)	In a super heterodyne receiver used for the reception of signals in AM broad cast band among the incoming signal frequency and local oscillator frequency which is larger? Justify with the necessary computations.	CO3	7 Marks
	b)	With the aid of a circuit diagram, explain the operation of a practical diode detector circuit, indicating what changes have been made from the basic circuit. How is AGC obtained from this detector?	CO3	7 Marks

UNIT-V

9	a)	Explain the generation of PAM.	CO1	7 Marks
	b)	Explain the generation of PPM	CO1	7 Marks
		(OR)		
10	a)	Explain TDM.	CO1	7 Marks
	b)	Compare all analog pulse modulation schemes.	CO1	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Regular Examinations, December - 2020

DIGITAL IC APPLICATIONS

[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)	Draw the CMOS Circuit for NOR gate with the help of function table.	CO1	6 Marks
	b)	Explain the terms: (i) DC noise margin (ii) Fan-out with reference to TTL gate.	CO5	8 Marks
		(OR)		
2	a)	Write a short note on bipolar logic.	CO1	6 Marks
	b)	Draw the circuit diagram of the basic TTL NAND gate and explain the three parts with the functional operation.	CO1	8 Marks

UNIT-II

3	a)	Explain the concept of structural modeling in HDL.	CO4	7 Marks
	b)	Develop a HDL code for 4 bit down counter with enable and clear inputs.	CO3	7 Marks
		(OR)		
4	a)	Design a 16:1 multiplexer using two 74x151 ICs. Also write down the functional table.	CO4	7 Marks
	b)	Explain the inertial model delay and transport delay models in VHDL with examples.	CO6	7 Marks

UNIT-III

5	a)	Realize the following expression using IC 74x151 $F(x)= \Sigma m(3,5,6)$	CO3	7 Marks
	b)	Design a 3-bit Johnson counter with preset and clear inputs. Write a verilog code for the same in structural style.	CO4	7 Marks
		(OR)		
6	a)	Cascade a 4:16 decoder using two 74x138 decoders.	CO4	7 Marks
	b)	Develop a verilog code for 4-bit comparator of 74x85 IC.	CO3	7 Marks

UNIT-IV

7	a)	Design a 3-bit up/down counter using 74x169 IC. Also write down the functional table.	CO4	6 Marks
	b)	Describe the impediments of synchronous design.	CO1	8 Marks
		(OR)		
8	a)	Design a modulo-60 counter using 74x163 IC.	CO4	6 Marks
	b)	Sketch the symbol and logic diagram of 74x194 IC.	CO2	8 Marks

UNIT-V

9	a)	Explain the architecture of FPGA. What is selection criterion of FPGA in application?	CO1	7 Marks
	b)	Write a short note on Synchronous RAM.	CO1	7 Marks
		(OR)		
10	a)	Describe DRAM with an appropriate diagram and explain about its timings.	CO1	7 Marks
	b)	Describe about the internal structure of ROM.	CO1	7 Marks

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CODE No.:16BT40404 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Regular Examinations, December-2020

LINEAR IC APPLICATIONS

[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)	List the Ideal and Practical Specifications of an Op-amp.	CO1	6 Marks
	b)	Explain the AC analysis of a Dual Input Balanced Output Configuration with a neat Sketch.	CO2	8 Marks
		(OR)		
2	a)	Define the following terms: i) CMRR ii) PSRR iii) Slew rate.	CO1	6 Marks
	b)	Calculate i) Maximum output offset voltage caused by Input offset voltage V_{ios} ii) Maximum output offset voltage caused by Input bias current I_B. Given the resistances R_1=100kΩ and R_F=10kΩ for an inverting amplifier. Let V_{ios}=6mV and I_B=500nA for 741 Op-amp.	CO4	8 Marks

UNIT-II

3	a)	What are the limitations of an ideal Op-amp differentiator? Sketch the practical differentiator circuit that will eliminate these limitations.	CO3	8 Marks
	b)	Explain the operation of Sample and Hold circuit using Op-amp 741 with a neat sketch.	CO1	6 Marks
		(OR)		
4	a)	Explain the operation of instrumentation amplifier and obtain the expression for output voltage V_0 with a neat sketch.	CO1	8 Marks
	b)	Sketch and explain the circuit of V to I converter if the load is: i) floating ii) grounded.	CO3	6 Marks

UNIT-III

5	a)	Explain 723 general purpose voltage regulator with neat functional diagram in voltage mode.	CO1	6 Marks
	b)	Define Line and Load Regulations.	CO1	8 Marks
		(OR)		
6	a)	Design a wide band reject filter having f_H = 200 Hz, f_L = 1 KHz with pass band gain of 2.	CO1	7 Marks
	b)	Design an active High Pass filter for a low cut-off frequency of 20 KHz and the desired pass band gain of 15. Also find the magnitude and phase angle of the filter for the frequency of 80KHz.	CO4	7 Marks

UNIT-IV

7	a)	Draw and explain the functional block diagram of a 555 timer in monostable mode.	CO5	8 Marks
	b)	Explain any two applications of 555 timer in monostable mode.	CO5	6 Marks
		(OR)		
8	a)	Draw the block diagram of PLL describing the function of each block briefly.	CO1	8 Marks
	b)	Explain the application of PLL as a frequency multiplication.	CO6	6 Marks

UNIT-V

9	a)	Explain the specifications of DAC/ADC.	CO1	6 Marks
	b)	Explain the working of R-2R ladder DAC with a neat sketch.	CO1	8 Marks
		(OR)		
10	a)	Explain the operation of Successive Approximation type ADC.	CO1	8 Marks
	b)	Mention the various types of ADC techniques and their advantages and disadvantages.	CO1	6 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Regular Examinations, December - 2020

COMPUTER GRAPHICS

[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)	Define Computer Graphics. What are its applications?	CO1	4 Marks
	b)	Derive the equations for midpoint circle generation and explain.	CO3	10 Marks
		(OR)		
2	a)	List the output primitives and explain about their attributes.	CO3	7 Marks
	b)	List and explain the various input devices.	CO1	7 Marks

UNIT-II

3	a)	Derive a transformation matrix for the Reflection with respect to $y = mx+c$.	CO2	7 Marks
	b)	Explain the Scan Line polygon fill algorithm.	CO3	7 Marks
		(OR)		
4	a)	Derive a composite matrix for 2D successive rotation and scaling and illustrate the commutative property.	CO2	9 Marks
	b)	Explain the 2D Transformation pipeline.	CO1	5 Marks

UNIT-III

5	a)	Discuss the Cohen-Sutherland Line clipping algorithm with example.	CO4	10 Marks
	b)	Explain the Bezier curves.	CO1	4 Marks
		(OR)		
6	a)	Explain the Window-to-Viewport transformation.	CO2	7 Marks
	b)	Explain the B-Spline curves and surfaces.	CO1	7 Marks

UNIT-IV

7	a)	Explain basic 3D Geometric Transformations.	CO2	10 Marks
	b)	Derive a composite matrix for 3D Rotation with respect to X-axis.	CO2	4 Marks
		(OR)		
8	a)	Classify and explain the 3D-projections.	CO4	10 Marks
	b)	Explain the 3D shear operation.	CO2	4 Marks

UNIT-V

9	a)	Explain the Depth Buffer method for detecting visible surfaces.	CO5	10 Marks
	b)	Define Rendering and Interpolation.	CO5	4 Marks
		(OR)		
10	a)	Classify visible-surface detection algorithms.	CO5	4 Marks
	b)	List and explain the steps involved in Phong shading.	CO5	10 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Regular Examinations, December-2020

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		Explain various Data models and Database Languages in detail.	CO1	14 Marks
		(OR)		
2	a)	Describe Relations and Relationship sets with examples.	CO1	7 Marks
	b)	Explain Additional features of ER model.	CO1	7 Marks

UNIT-II

3		Explain Key, Foreign key and general constrains with examples.	CO4	14 Marks
		(OR)		
4		Describe Relational Algebra Operators in detail.	CO3	14 Marks

UNIT-III

5		How would you use the operators IN, EXISTS, UNIQUE, ANY and ALL in writing nested queries? Explain with examples.	CO3	14 Marks
		(OR)		
6		Describe Fourth Normal Form and Fifth Normal form with relevant figures/examples.	CO1	14 Marks

UNIT-IV

7	a)	Explain Atomicity and durability in detail.	CO2	7 Marks
	b)	Describe Serializability and Recoverability concepts.	CO6	7 Marks
		(OR)		
8	a)	Explain Validation based protocols.	CO6	7 Marks
	b)	Describe Multiples Granularity in detail.	CO6	7 Marks

UNIT-V

9		Explain Hash based indexing and Tree based indexing with relevant figures.	CO5	14 Marks
		(OR)		
10		Describe B+ Trees and B-Tree Index files.	CO5	14 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Regular Examinations, December-2020

INDUSTRIAL INSTRUMENTATION - I

[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)	What are load cells? Describe a magneto-elastic load cell.	CO1	6 Marks
	b)	Explain the piezo electric load cell with block diagram and its equivalent circuits.	CO1	8 Marks
		(OR)		
2	a)	Explain the various methods for measuring torque.	CO2	6 Marks
	b)	Draw the diagram and describe the working and construction of inductive torque transducer.	CO2	8 Marks

UNIT-II

3	a)	Write short notes on stroboscope.	CO3	8 Marks
	b)	Explain the working of AC and DC tacho generator.	CO4	6 Marks
		(OR)		
4	a)	Draw and explain variable reluctance type accelerometer and mention its merits and demerits.	CO4	6 Marks
	b)	Obtain the frequency response of a piezo electric accelerometer for $k=0.4x10^{-5}$C/cm, C=500pF, τ=0.1sec, f_n=10KHz. And obtain the optimum frequency range of operation.	CO2	8 Marks

UNIT-III

5	a)	What are the different units of pressure? What do you mean by force summing device?	CO4	7 Marks
	b)	Explain how calibration of pressure guage is carried out using dead weight tester and mention what are the factors affecting the accuracy of dead weight tester.	CO4	7 Marks
		(OR)		
6	a)	Explain the capacitive type pressure guage with diagram and applications.	CO5	7 Marks
	b)	Explain the pressure measurement for the following categories: i) McLeod guage ii) thermal conductivity guage.	CO4	7 Marks

UNIT-IV

7	a)	Explain the 3 lead RTD used in industry with their characteristics.	CO4	7 Marks
	b)	Explain thermistor with merits and demerits.	CO3	7 Marks
		(OR)		
8	a)	Explain the need for cold junction compensation technique with neat sketch.	CO5	8 Marks
	b)	Draw and explain how thermistor output is linearized using analogue circuit.	CO4	6 Marks

UNIT-V

9	a)	Elaborate on optical pyrometer with neat sketch.	CO3	7 Marks
	b)	Explain the principle and working of total radiation pyrometer.	CO5	7 Marks
		(OR)		
10	a)	Write a short notes on fibre optic temperature measurement.	CO5	8 Marks
	b)	Describe the thermo electric laws and its applications.	CO4	6 Marks

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CODE No.:16BT41041 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Regular Examinations, December-2020

COMPUTER ARCHITECTURE AND ORGANIZATION

[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 are the basic operational concepts of a computer? Explain with a diagram.	CO1	6 Marks
	b)	What is a bus? Draw the figure to show how functional units are Interconnected using a bus and explain.	CO1	8 Marks
		(OR)		
2		Explain the three types of mapping procedures related to cache memory.	CO1	14 Marks

UNIT-II

3		Draw and explain the Architecture of 8085 and explain each module in detail.	CO2	14 Marks
		(OR)		
4	a)	Explain abut data transfer instruction with example.	CO1	7 Marks
	b)	What is a subroutine? Explain, how to call a subroutine? distinguish a JMP and CALL instructions.	CO2	7 Marks

UNIT-III

5		How can a rectangular wave be generated by 8085 microprocessor without using any interfacing device? Explain with the help of a program. Use delay program written with the help of HL pair.	CO3	14 Marks
		(OR)		
6		With examples, explain different addressing modes of 8085.	CO1	14 Marks

UNIT-IV

7	a)	Report the operation of arithmetic and logical unit with control lines and operation decoder.	CO3	7 Marks
	b)	Describe the construction of 4-bit ALU with multiplexer and produce the table for its operation.	CO2	7 Marks
		(OR)		
8	a)	Distinguish RISC and CISC processors in detail.	CO2	7 Marks
	b)	Briefly explain the operation of Timing and control unit of a computer with help of timing diagram.	CO1	7 Marks

UNIT-V

9		With the help of suitable algorithm/flow chart for performing addition and subtraction with Signed-Magnitude data.	CO6	14 Marks
		(OR)		
10	a)	Discuss how micro programmed control unit will produce the control signals to execute each microinstruction.	CO3	7 Marks
	b)	Demonstrate the process of instructions through four stage pipeline Processor.	CO2	7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Regular Examinations, December 2020

DESIGN AND ANALYSIS OF ALGORITHMS

[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

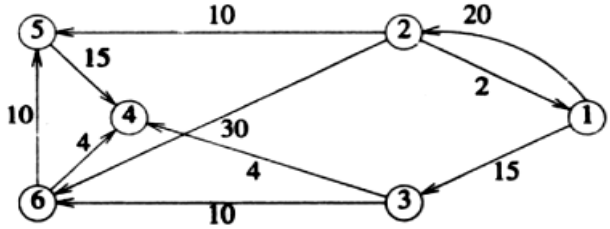
1	a)	Explain the performance analysis of algorithms in detail.	CO2	7 Marks
	b)	Analyze the time complexity of Strassen's matrix multiplication.	CO2	7 Marks
		(OR)		
2	a)	Develop recursive algorithms for towers of Hanoi and analyze its time complexity.	CO2	7 Marks
	b)	Discuss in detail about the worst case, best case and Average case efficiencies and also using the n functions, indicate how much the function value will change if its argument is increased.	CO2	7 Marks

UNIT-II

3	a)	Show that sum of the degrees of the vertices of an undirected graph is twice the no of edges.	CO3	7 Marks
	b)	Integrate Minimum spanning tree concepts and Prim's algorithm.	CO3	7 Marks
		(OR)		
4	a)	Prove or disprove: If G(V,E) is a finite directed graph such that the out-degree of each vertex is at least one, then there is a directed cycle in G.	CO3	7 Marks
	b)	With an example explain BFA Algorithm.	CO2	7 Marks

UNIT-III

5	a)	State Single Source Shortest Path problem. Solve single source shortest path from node 1 to all other remaining nodes for the following graph using Dijkstra's algorithm.	CO5	7 Marks



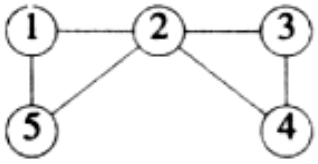
	b)	Design a Quick sort algorithm and provide Best, worst and Average case analysis for Quicksort method.	CO1	7 Marks
		(OR)		
6	a)	Analyze the algorithm for job sequencing with deadlines problem.	CO1	7 Marks
	b)	Describe in detail about divide and conquer methodology.	CO1	7 Marks

UNIT-IV

7	a)	Explain Travelling Salesperson Problem.	CO5	7 Marks
	b)	Describe the Backtracking technique to m-coloring graph. Explain with an example.	CO5	7 Marks

(OR)

8	a)	Draw state space tree for all possible colorings for the following graph when m=3.	CO5	7 Marks



	b)	Draw the state space tree and describe the progress of the method from node to node with an example.	CO4	7 Marks

UNIT-V

9	a)	Illustrate deterministic and nondeterministic algorithms. Give some examples.	CO3	7 Marks
	b)	Explain 15-puzzle problem.	CO3	7 Marks

(OR)

10	a)	Prove that And OR Graph Decision Problem (AOG) is NP-Hard.	CO5	7 Marks
	b)	Discuss the general method of branch and bound.	CO3	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Regular Examinations, December – 2020

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)	What is object-oriented programming and explain its features?	CO2	6 Marks
	b)	Write short notes on arrays and develop a Java program which accepts elements and display its transpose.	CO2	8 Marks
		(OR)		
2	a)	What are objects? How are they created from a class?	CO2	5 Marks
	b)	Distinguish between default constructor and parameterized constructor.	CO2	5 Marks
	c)	Develop a Java program to read the age of a person and display the statement as "you are eligible for voting" if age is >18 otherwise display the statement as "you are not eligible for voting".	CO6	4 Marks

UNIT-II

3	a)	What is package? How do you create a package? Explain about the access protection in packages.	CO1	7 Marks
	b)	How to create an interface? Distinguish between abstract classes and interfaces.	CO1	7 Marks
		(OR)		
4	a)	Demonstrate the multiple inheritance in Java with an example.	CO3	7 Marks
	b)	Explain how to implement interfaces in Java with an example.	CO3	7 Marks

UNIT-III

5	a)	Demonstrate the usage of `throw` and `throws` keywords.	CO1	7 Marks
	b)	Difference between Thread and Process in Java? How to implement Thread in Java?	CO1	7 Marks
		(OR)		
6	a)	Write the difference between process and thread. Explain thread life cycle methods.	CO1	7 Marks
	b)	Develop a Java program to demonstrate multi-threading.	CO1	7 Marks

UNIT-IV

7	a)	Explain `ArrayList` and `HashSet` standard collection classes with an example.	CO5	7 Marks
	b)	Define an Applet. Write the steps to execute an applet program with example.	CO4	7 Marks
		(OR)		
8	a)	Design a dashed line and dotted line using applet in Java.	CO4	8 Marks
	b)	Explain different types of AWT components with the help of a Java program.	CO4	6 Marks

UNIT-V

9	a)	What is event delegation model? Explain different steps involved in it.	CO4	6 Marks
	b)	What are the methods supported by `KeyListener` interface and `MouseListener` interface. Explain each of them with examples.	CO5	8 Marks
		(OR)		
10	a)	Explain the steps to create and execute web application in Apache Tomcat server with any simple servlet application.	CO5	7 Marks
	b)	Develop a servlet application to perform calculator operations using `HTTPServlet` (name and password)	CO6	7 Marks

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CODE No.:16BT41203 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Regular Examinations, December-2020

SOFTWARE 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)	Which process model is suitable for risk management? Discuss in detail with an example. Give the advantages and disadvantages of the model.	CO2	7 Marks
	b)	Apply waterfall model for development of a telephone directory system. Indicate in detail each of the steps.	CO1	7 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)	List out the core principles of software engineering practices.	CO2	7 Marks
	b)	Explain control specification and process specification for the system.	CO2	7 Marks

UNIT-III

5	a)	Explain briefly software architecture style and architecture pattern.	CO3, CO4	7 Marks
	b)	Explain the need for software measure and describe various metrics.	CO3	7 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	a)	Difference between black box testing and white box testing.	CO5	7 Marks
	b)	Identify the importance of validation test criteria.	CO5	7 Marks
		(OR)		
8	a)	Explain about test strategies for conventional software.	CO5	7 Marks
	b)	What is cyclomatic complexity? Explain with an example how to construct a flow graph for a program (Fibonacci series) 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)	Describe the Mc Call's quality factors and ISO 9126 quality factors.	CO6	9 Marks
	b)	What is meant by SQA? Discuss in detail SQA activities.	CO6	5 Marks

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CODE No.:16BT41204 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Regular Examinations, December-2020

THEORY OF COMPUTATION

[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)	Specify some applications of Finite Automata.	CO1	3 Marks
	b)	State and Prove the Equivalence of NFA and DFA.	CO4	6 Marks
	c)	Design an equivalent DFA from the following NFA, where the transition function of NFA is given by δ (q0, 0) = {q0, q3}, δ(q0,1)={q0,q1}, δ(q1,0)=Φ, δ(q1,1)= q2, δ(q2,0)=q2, δ(q2,1)=q2, δ(q3,0) =q4, δ(q3,1) =Φ, δ(q4,0) =q4, δ(q4,1) =q4, q0 is an initial state and q2 & q4 are the final states.	CO3	5 Marks

(OR)

2	a)	Define ε-Closure function. What is its importance?	CO1	4 Marks
	b)	Design a transition system which can accept strings over the alphabet {a, b, …. z} containing either '*cat'* or *'rat'*.	CO3	5 Marks
	c)	Design DFA over alphabet Σ= {a, b} such that every string accepted by automaton contains string whose length is less than four.	CO3	5 Marks

UNIT-II

3	a)	Design a minimum state DFA equivalent to the following DFA (q0 is an initial state and q7 is a final state)	CO3	7 Marks

State	0	1
q0	q1	q5
q1	q6	q2
q2	q0	q2
q3	q2	q6
q4	q7	q5
q5	q2	q6
q6	q6	q4
q7	q6	q2

	b)	Prove (1+00*1) + (1+00*1)(0+10*1)*(1+10*1) = 0*1(0+10*1)*.	CO2	4 Marks
	c)	State and prove Pumping Lemma of Regular Sets.	CO5	3 Marks

(OR)

4	a)	Design NFA with ε - transitions for the following Regular Expressions i) ab(a+b)* ii) 1(0+1)*0	CO3	4 Marks
	b)	State and prove the equivalence of Regular Expression and Finite Automata.	CO2, CO5	5 Marks
	c)	Is $L = \{a^m b^n / m > 1, n > 1$ and $m + n = 4\}$ Regular or Not. Justify your answer.	CO1	5 Marks

UNIT-III

5	a)	What is Parse Tree? Is a parse tree represents Left or Right most derivation? Justify.	CO1, CO5	4 Marks
	b)	Is the following grammar is Ambiguous? S →A1B, A→0A/ε, B→ 0B/1B/ ε	CO4	5 Marks
	c)	Find an unambiguous CFG for the language L = {a^n/n>=1}.	CO2	5 Marks

(OR)

6	a)	What are the applications of Context Free Grammar?	CO1	4 Marks
	b)	Show leftmost derivation and rightmost derivation for the string 'abababa' from the following CFG, S→aSa/bSb/a/b/ ε.	CO4	4 Marks
	c)	Draw parse tree for the string (id+id*id) + (id*id*id) from the following Context Free Grammar: E→E+E / E*E / E-E/ (E) / id. Show Left most derivation and rightmost derivation.	CO3	6 Marks

UNIT-IV

7	a)	Design PDA from the following CFG, S →0A/1A A →1A/0A/0/1.	CO3	5 Marks
	b)	State and prove the equivalence of CFG and PDA.	CO2, CO5	5 Marks
	c)	Differentiate between DPDA and NPDA.	CO2	4 Marks

(OR)

8	a)	Find equivalent CFG from the following PDA with, M={{q0}, {0, 1}, {z0, 0, 1}, δ, q0, z0, Φ}where δ (q0, 0, z0) = (q0, 0z0), δ(q0, 1, z0) = (q0, 1z0), δ(q0, 0, 1) = (q0, ε), δ(q0, 1, 0) = (q0, ε), δ(q0, ε, z0) = (q0, ε)	CO4	7 Marks
	b)	Justify whether the following are NPDA or not i) $\{0^n1^n / n >= 1\} \cup \{0^n1^{2n} / n >= 1\}$ ii) $\{0^n1^m / n <= m <= 2n\}$.	CO2, CO5	7 Marks

UNIT-V

9	a)	Construct a TM to accept L = {wcw^r / w Є {0, 1)*}.	CO3	7 Marks
	b)	Write the model of a TM and what are the specific features of a TM.	CO1	4 Marks
	c)	Design a TM that recognizes the language of all strings of even length over alphabet, ∑= {a,b}.	CO3	3 Marks

(OR)

10		Design a TM to implement the function 'multiplication' using the subroutine 'copy'.	CO3	14 Marks

CODE No.:16BT51202 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Regular Examinations, December – 2020

OBJECT ORIENTED ANALYSIS AND DESIGN

[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 out the best practices of Unified Process and also explain the phases of Unified Process.	CO1	7 Marks
	b)	Distinguish between Structural diagrams and Behavioral diagrams. Explain.	CO1	7 Marks

(OR)

2		Explain briefly about the conceptual model of the UML.	CO1	14 Marks

UNIT-II

3		Draw the class diagram for the following scenario: A customer, characterized by his/her name and phone number, may purchase reservations of tickets for a performance of a show. A reservation of tickets, annotated with the reservation date, can be either a reservation by subscription, in which case it is characterized by a subscription series number, or an individual reservation. A subscription series comprehends at least 3 and at most 6 tickets; an individual reservation at most one ticket. Every ticket is part of a subscription series or an individual reservation, but not both. Customers may have many reservations, but each reservation is owned by exactly one customer. Tickets may be available or not, and one may sell or exchange them. A ticket is associated with one specific seat in a specific performance, given by date and time, of a show, which is characterized by its name. A show may have several performances.	CO2	14 Marks

(OR)

4		Draw a class diagram for each group of classes: school, playground, principal, school board, classroom book, student, teacher, cafeteria, restroom, computer, desk, chair, ruler, door, swing. Add associations and generalizations and show multiplicity wherever it is applicable.	CO2	14 Marks

UNIT-III

5	a)	A midterm exam is prepared by the instructor and taken by each of the students in the class. In special cases where the student misses the test the student has to take the makeup test. Draw a use case diagram for this situation.	CO3	9 Marks
	b)	Compare and contrast the sequence diagrams and collaboration diagrams.	CO4	5 Marks

(OR)

6	a)	Consider an Online airline reservation system: i. List two actors. Explain the role of each actor. ii. List the use cases. Prepare a use case diagram for an online airline reservation system.	CO4	7 Marks
	b)	Prepare a Sequence diagram for a scenario where a borrower logs into library system, requests for a book and he logs out after the book is issued.	CO4	7 Marks

UNIT-IV

7	a)	Define activity diagram. Draw activity diagram for issue book.	CO4	7 Marks
	b)	Define action state and activity state. Illustrate with an example the object flow in an activity diagram.	CO4	7 Marks

(OR)

8	a)	Clearly explain the notation and model elements and to draw state chart diagram.	CO4	7 Marks
	b)	Define state chart diagram. Draw state chart diagram for withdraw.	CO4	7 Marks

UNIT-V

9	a)	Define component diagram. Draw component diagram for the online railway reservation system.	CO5	7 Marks
	b)	What is the difference between “components” in a component diagram and “components” in a deployment diagram?	CO5	7 Marks

(OR)

10	a)	Explain the similarities and differences between components and nodes with suitable examples.	CO5	7 Marks
	b)	What is the significance of 4+1 View Architecture?	CO6	7 Marks

CODE No.: 16BT3HS01 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

ENVIRONMENTAL STUDIES

[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)	What is an aquifer? Discuss its types.	CO5	7 Marks
	b)	What are the major causes for conflicts over water? Give solution solve this problem.	CO4	7 Marks
		(OR)		
2	a)	How can you as an individual conserve different natural resources?	CO7	7 Marks
	b)	Explain the impact of deforestation on the environment.	CO1	7 Marks
		UNIT-II		
3	a)	Explain the process of ecological succession	CO1	7 Marks
	b)	Distinguish between forest ecosystem and desert ecosystem	CO2	7 Marks
		(OR)		
4	a)	State the solutions to the environmental problems when a threat occurs to an ecosystem?	CO4	7 Marks
	b)	List out the characteristic features of food webs.	CO1	7 Marks
		UNIT-III		
5	a)	Explain the techniques used to control the water pollution.	CO5	7 Marks
	b)	List various methods to control air pollution.	CO2	7 Marks
		(OR)		
6		Discuss solid waste management in detail.	CO3	14 Marks
		UNIT-IV		
7		Why do we refer to Environment Protection Act 1986 as an umbrella act? Discuss the major Environment Protection rules 1986.	CO8	14 Marks
		(OR)		
8	a)	Discuss the natural formation and impact due to ozone depletion in the stratosphere.	CO6	6 Marks
	b)	Distinguish the anthropocentric and eco-centric world view. Which worldview appeals to you more and why?	CO2	8 Marks
		UNIT-V		
9		Visit to a local area to document environmental aspects of a grassland.	CO9	14 Marks
		(OR)		
10		Explain the term Population Explosion. Enumerate its effects and discuss the variation of population among nations.	CO1	14 Marks

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CODE No.: 16BT30401 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

ELECTRONIC CIRCUIT ANALYSIS AND DESIGN

[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)	Discuss the principle of operation of a direct coupled amplifier and mention its advantages and disadvantages	CO1	7 Marks
	b)	Three identical non-interacting amplifier stages have an overall gain of 0.3dB down at 80kHz compared to mid band gain. Calculate the uppercut-off frequencies of the individual stages.	CO4	7 Marks
		(OR)		
2	a)	Derive expressions for overall voltage gain of a two-stage RC coupled amplifier.	CO3	8 Marks
	b)	Describe the working of a cascade amplifier with neat diagram.	CO1	6 Marks

UNIT-II

3	a)	Draw the small signal high frequency CE model of a transistor also discuss about each parameter.	CO1	7 Marks
	b)	Why is hybrid - Π model called a trans- conductance model? Justify by the relevant proofs.	CO2	7 Marks
		(OR)		
4	a)	Draw and explain the CE Hybrid - Π model.	CO1	6 Marks
	b)	Derive the expressions for the voltage gain in the low frequency, medium frequency and high frequency ranges in the case of single stage amplifier.	CO2	8 Marks

UNIT-III

5	a)	Apply the concept of voltage series feedback to a Emitter follower circuit to prove an increase in input impedance and decrease in output impedance.	CO6	7 Marks
	b)	Explain principle and operation of the Wien Bridge Oscillator and derive expression for frequency of oscillation.	CO1	7 Marks
		(OR)		
6	a)	Discuss about the Piezoelectric effect. Draw an ac equivalent circuit of a Crystal.	CO1	8 Marks
	b)	Apply Voltage-Shunt feedback concept for a CE amplifier to show $R_{if} = \frac{R_i}{1 + A\beta}$, where A is gain of Trans-Resistance Amplifier.	CO6	6 Marks

UNIT-IV

7	a)	Design a class A power amplifier to obtain the maximum conversion efficiency is 25%.	CO3	8 Marks
	b)	Discuss how amplification takes place in a power amplifier.	CO1	6 Marks
		(OR)		
8	a)	Discuss the need for heat sink in Power Amplifiers.	CO1	7 Marks
	b)	Design a class B power amplifier to obtain the maximum conversion efficiency is 78.5%.	CO3	7 Marks

UNIT-V

9	a)	Illustrate the need for stagger tuning. Suggest possible applications.	CO2	7 Marks
	b)	Select a parallel resonance circuits and explain how it used as a tuned circuit.	CO5	7 Marks

(OR)

10	a)	Sketch a tuned class C amplifier with an LC tank circuit as load and derive its efficiency.	CO1	7 Marks
	b)	Select a tuned amplifier to operate in the radio frequency and explain its operation.	CO5	7 Marks

CODE No.: 16BT30403 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

SWITCHING THEORY AND LOGIC 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)	Minimize the following function f=ABC'+A'B'C+ABC+A'B'C and realize the minimized function using NOR only	CO3	7 Marks
	b)	Find duals for the following functions: i)A'B'C'+A'BC' (ii) XY'Z'+XY'Z+XYZ'	CO4	7 Marks
		(OR)		
2	a)	Realize EX-NOR operation using only NAND gates.	CO3	7 Marks
	b)	Apply De-Morgan's law for the following Boolean expressions. i) B'C'D+(B+C+D)'. ii) (ABC)'(A+B+C)'.	CO4	7 Marks

UNIT-II

3	a)	Implement the following Boolean functions using NAND or NOR gates. F=xyz'+xy'z+xyz.	CO5	7 Marks
	b)	Minimize the following Boolean expressions using Karnaugh map method F(A,B,C,D)= Σm(2,3,4,7,8,9,11,12).	CO4	7 Marks
		(OR)		
4	a)	Implement the following Boolean function with either NAND or NOR gates. F=w'x'z+wxz+x'y'z=wxyz'	CO5	7 Marks
	b)	Minimize the following Boolean expressions using Karnaugh map method F(W,X,Y)=Σm(1,3,4,5,6)	CO4	7 Marks

UNIT-III

5	a)	Describe how a multiplexer is used to implement the Boolean function with suitable example.	CO1	7 Marks
	b)	Implement the following Boolean function using 4:1 Mux: F(A,B,C,D)=∑m(0,1,2,8,9,13)	CO2	7 Marks
		(OR)		
6	a)	Mention applications of multiplexer.	CO1	4 Marks
	b)	Realize F(w,x,y,z)=∑m(1,3,7,8,10,12,15) using 8 to1 Mux	CO2	10 Marks

UNIT-IV

7	a)	Draw a 3 bit Johnson counter and explain.	CO2	7 Marks
	b)	Design a 3 bit synchronous DOWN counter.	CO3	7 Marks
		(OR)		
8	a)	Design a 3bit synchronous counter which counts in the sequence 000, 001, 011, 010,100, 110, (repeat) 000, using T flip flop.	CO3	7 Marks
	b)	Obtain the following sequence 0,2,4,6,0,2,4,6..... Synchronous counter using T-Flip flop.	CO4	7 Marks

UNIT-V

9	a)	Implement a BCD to Ex-3 code conversion using a PAL.	CO6	7 Marks
	b)	Derive the PLA programming table for the combinational circuit that squares a 3 bit number.	CO5	7 Marks
		(OR)		
10	a)	Implement BCD to Ex-3 code conversion using a PLA.	CO6	7 Marks
	b)	Explain Analysis procedure and Design procedure for Asynchronous sequential circuits	CO1	7 Marks

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CODE No.: 16BT40101 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

CONCRETE TECHNOLOGY

[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		List out various types Mineral admixtures. How these admixtures are supporting to the environment?	CO6	14 Marks
		(OR)		
2		Explain the physical and mechanical properties of aggregate.	CO1	14 Marks

UNIT-II

3	a)	Define the term workability. Explain its significance.	CO1	7 Marks
	b)	Briefly explain about the tests to be conducted for fresh concrete.	CO4	7 Marks
		(OR)		
4	a)	Explain different method of curing procedure.	CO1	8 Marks
	b)	Explain the following with reference to the properties of fresh concrete. i) Segregation. ii) Bleeding.	CO7	6 Marks

UNIT-III

5	a)	What is shrinkage of concrete?	CO1	4 Marks
	b)	Explain the various factors affecting shrinkage of concrete.	CO2	10 Marks
		(OR)		
6		Explain in detail about the rebound hammer test (NDT) that is conducted on existing structure to assess its strength with a neat diagram.	CO5	14 Marks

UNIT-IV

7		Brief explain about factors affecting choice of mix design.	CO2	14 Marks
		(OR)		
8		Design a M35 concrete mix using IS method of Mix Design for the following data: i) Maximum size of aggregate: 20mm (Angular) ii) Degree of workability: 0.90 compaction factor. iii) Quality control: good iv) Type of exposure - mild v) Specific Gravity: a) Cement - 3.12 b) Sand- 2.63 c) Coarse aggregate - 2.66 vi) Water absorption: a) Coarse aggregate - 0.5% b) Fine aggregate - 1.0% vii) Free surface moisture: a) Coarse aggregate - Nil b) Fine aggregate - 2.2% viii) Sand confirms to Zone I grading. Assume any other data required suitably.	CO3	14 Marks

UNIT-V

9	a)	Explain polymer concrete.	CO1	6 Marks
	b)	Explain types of polymer concrete.	CO1	8 Marks
		(OR)		
10		Distinguish between high performance concrete and self-compacting concrete.	CO2	14 Marks

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CODE No.: 16BT40102 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations December – 2019

ENGINEERING GEOLOGY

[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Explain the failures of civil engineering constructions due to geological drawbacks with a brief geological report.	CO7	14 Marks
		(OR)		
2		Analyze the effects of weathering of rocks at the foundation site of a concrete dam.	CO2	14 Marks

UNIT-II

3		Classify the rock forming minerals. Describe their color, crystal system, luster and hardness.	CO2	14 Marks
		(OR)		
4		Describe in detail about the structures, textures of metamorphic rocks.	CO1	14 Marks

UNIT-III

5	a)	List different types of faults and analyze their role in the failures of civil engineering projects.	CO2	9 Marks
	b)	A cavernous limestone bed in a dam site is found to be dipping at 1 in 4 along S40ºW and 1 in 6 along S25ºW. Determine the strike direction and dip direction.	CO1	5 Marks
		(OR)		
6		Distinguish between magnetic methods and geothermal methods.	CO4	14 Marks

UNIT-IV

7		Explain the hydrological cycle and outline its importance from groundwater point of view.	CO1	14 Marks
		(OR)		
8		"Landslides create havoc in the hilly areas", justify the statement. Explain how landslides inflict economic loss to the environment and society.	CO5	14 Marks

UNIT-V

9		Discuss the different aspects of geological investigation of a dam site.	CO3	14 Marks
		(OR)		
10		Explain the tunneling process in homogenous and heterogeneous conditions for a sustainable tunnels.	CO6	14 Marks

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CODE No.: 16BT40103 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

ENGINEERING HYDROLOGY

[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Mention different types of raingauges and explain non recording type raingauge with a neat sketch.	CO1	14 Marks
		(OR)		
2		Differentiate between recording and non recording raingauges and explain weighing bucket and float type rain gauge with a neat sketch.	CO2	14 Marks

UNIT-II

3		Describe evaporation pans with a neat sketch.	CO2	14 Marks
		(OR)		
4		What are the various measures required to reduce evaporation from water surfaces?	CO2	14 Marks

UNIT-III

5		An unconfined aquifer has a thickness of 30m. A fully penetrating 20cm diameter well in this aquifer is pumped at a rate of 35 lit/s. The drawdown measured in two observations wells located at distances of 10m and 100m from the well are 7.5m and 0.5m respectively. Determine the average hydraulic conductivity of the aquifer.	CO4	14 Marks
		(OR)		
6		Derive an expression to determine the rate of flow through confined aquifer using Theim's equation and its assumptions.	CO3	14 Marks

UNIT-IV

7	a)	Explain a procedure of deriving a D-h UH from the IUH of the catchment.	CO4	7 Marks
	b)	What is S-hydrograph and how can it be constructed?	CO4	7 Marks
		(OR)		
8	a)	List out various empherical formulae to estimate floods.	CO4	7 Marks
	b)	Describe various methods involved to estimate flood frequency analysis.	CO5	7 Marks

UNIT-V

9		Estimate the sediment yield from a watershed.	CO6	14 Marks
		(OR)		
10		Mention various empherical equations used for estimating sediment yield.	CO7	14 Marks

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CODE No.: 16BT40104 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

STRUCTURAL ANALYSIS-I

[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 the stresses acting in an inclined plane due to two perpendicular stresses.	CO1	8 Marks
	b)	A tie bar is 10m long and 60mm by 40mm in section. It is subjected to an axial pull of 400kN and increase in length is found to be 7mm. Determine the intensity of stress on a right cross section, normal and tangential and shear stresses on a plane inclined at 60° to the longitudinal axis and also the modulus of elasticity of the material.	CO2	6 Marks
		(OR)		
2	a)	Draw the Mohr's stress circle for the direct stresses of 100N/mm^2 (tensile) and 40N/mm^2 (compressive) and estimate the magnitude and direction of the resultant stresses on planes making angles 20° and 70° with the plane of maximum stress. Also determine the normal and tangential stresses on these planes.	CO2	10 Marks
	b)	At a point in the web of a girder the bending stress is 70N/mm^2 (tensile) and the shearing stress at the same point is 30N/mm^2. Calculate the principal stresses at that point.	CO2	4 Marks

UNIT-II

3	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.	CO1	7 Marks
	b)	A girder of uniform cross section and constant depth is freely supported over a span of 3 metres. If the point load at the mid-span is 20kN and moment of inertia is 15.614x10^{-6} m^4. Calculate the central deflection and the slopes at the ends of the beam.	CO4	7 Marks
		(OR)		
4	a)	A steel girder of uniform section, 10m long is simply supported at its ends. It carries concentrated loads 50kN and 30 kN at two points 2m and 3m from the two ends respectively. Calculate the deflection of the girder at the points under the two loads.	CO4	8 Marks
	b)	A cantilever beam of span 'l' is loaded with a concentrated load 'W' at the free end. Determine the slope and deflection at the free end using moment area method.	CO2	6 Marks

UNIT-III

5		What are limitations due to which Euler's formula is of little practical use? Derive the Euler's formula when one end is fixed and other is free.	CO1	14 Marks
		(OR)		
6		A 1.5m long C.I column has a circular cross-section of 5cm 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 560MN/m^2, and a = 1/1600 for pinned ends. ii) Euler's formula. Young's modulus for C.I. = 120GN/m^2.	CO5	14 Marks

UNIT-IV

7	Analyze a fixed beam AB of span 'l' carrying uniformly distributed load w per unit length throughout its span. Draw the shear force and bending moment diagrams.	CO6	14 Marks

(OR)

8	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.	CO6	14 Marks

UNIT-V

9	A shaft is subjected to a maximum torque of 10kNm and a maximum bending moment of 7.5kNm at a particular section. If the allowable equivalent stress in simple tension is 160MN/m^2, find the diameter of the shaft according to maximum shear stress theory.	CO3	14 Marks

(OR)

10	Derive the expression for shear center of I-section.	CO1	14 Marks

CODE No.: 16BT40105 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

WATER SUPPLY ENGINEERING

[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Enumerate and explain the characteristics of surface and ground water and state their environmental significance.	CO5	7 Marks
	b)	Discuss the objectives of protected water supply systems.	CO1	7 Marks

(OR)

2	a)	Describe the different sources of water and their characteristics with respect to Turbidity, Hardness and Chlorides.	CO2	7 Marks
	b)	The chemical analysis of water sample indicates the presence of cations as follows. Estimate the total hardness, carbonate hardness and non-carbonate hardness equivalent to $CaCO_3$	CO2	7 Marks

Species	Concentration in mg/L
Na^{+}	20
Ca^{+2}	45
Mg^{+2}	60
HCO_3^{-}	248
SO_4^{-2}	220
Cl^{-}	79.2

UNIT-II

3	a)	Define the design period. Give the design period for various components in the water supply scheme.	CO1	7 Marks
	b)	Explain gravity and pumping methods of water supply to the town or city.	CO1	7 Marks

(OR)

4		Present and past populations 20 years and 40 years back for a town are 292000, 172000 and 30000 respectively. Assess the population expected after 40 years using logistic curve method.	CO2	14 Marks

UNIT-III

5	a)	Write short notes on break point chlorination and jar test.	CO1	7 Marks
	b)	A rectangular Sedimentation tank is designed to treat 2 MLD of water per day having 6m wide, 15m long and having a water depth of 3m. Determine: i) the detention time. ii) the average flow velocity through the tank. iii) if 6 mg/L is the suspended solids present in raw water, how much dry solids will be deposited per day in the tank, assuming 70% removal in the basin and average specific gravity of the deposit as 2, and also iv) compute the overflow rate.	CO2	7 Marks

(OR)

6	a)	Sketch the various units in a water treatment plant and list the functions of each unit.	CO1	7 Marks
	b)	Design a PST for a city with a population of 1,20,000, when they are supplied with 100Lpcd. State all the assumptions made during the design process.	CO3	7 Marks

UNIT-IV

7	a)	Explain: i) Chemical oxidation. ii) Membrane processes.	CO6	7 Marks
	b)	Explain briefly about the removal of color, odour and tastes from waters by using activated carbon filter.	CO5	7 Marks

(OR)

8	a)	What are the requirements of good water distribution system to maintain the water quality standards?	CO7	7 Marks
	b)	Classify the water distribution reservoirs. Draw the neat sketch of RCC underground reservoir and explain about its salient features.	CO2	7 Marks

UNIT-V

9	a)	Compare the merits and demerits of continuous and intermittent systems of supply of water.	CO4	7 Marks
	b)	Elucidate the different types of water connection systems for residences.	CO1	7 Marks

(OR)

10	a)	What are the guidelines followed in design and construction of water systems in high rise residential buildings?	CO4	7 Marks
	b)	Explain with neat sketch, the house water connection from main to building.	CO1	7 Marks

CODE No.: 16BT40201 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

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)	Three resistors have the following ratings: $R_1=200\Omega \pm 5\%$, $R_2=100\Omega \pm 5\%$, $R_3=50\Omega \pm 5\%$. Determine the magnitude of resultant resistance and limiting errors in percentage and ohms, if the above three resistors are connected in (i) Series and (ii) Parallel.	CO4	7 Marks
	b)	A moving coil voltmeter with an internal resistance of 20Ω gives a full scale deflection of 120^0 when a potential difference of 100mV is applied across it. The moving coil has dimensions of 30mm x 25mm and is wound with 100 turns. The control spring constant is 0.375×10^{-6}N-m/degree. Calculate flux density in air gap and also diameter of copper coil winding if 30% of instrument resistance is due to coil winding. The specific resistance of copper is $1.7 \times 10^{-8}\Omega$-m.	CO4	7 Marks

(OR)

2	a)	Describe the constructional details of an attraction type Moving Iron instrument with the help of a neat diagram. Derive the equation for deflection if spring control is used and comment upon the shape of the scale.	CO1	10 Marks
	b)	A basic D'arsonaval movement with a full scale reading of 50 micro amps and internal resistance of 1800Ω. It is to be converted into 0-1V, 0-5V, 0-25V, 0-125V multi rage voltmeter using individual multipliers for each range. Design suitable multipliers to extend the range.	CO3	4 Marks

UNIT-II

3		Discuss in detail about the various errors occurs in the Electrodynamometer type wattmeter and also suggest the suitable compensations to reduce errors.	CO1	14 Marks

(OR)

4		Describe in detail about the constructional details and working principle of single phase induction type energy meter and also derive the expression for deflecting and braking torques produced in it.	CO1	14 Marks

UNIT-III

5		Discuss the theory of a Current Transformer (CT) with phasor diagram. Derive the expressions for ratio error and phase angle error of a CT.	CO1	14 Marks

(OR)

6	a)	Explain how the power factor of a three phase load can be determined by two wattmeter method with relevant equations.	CO1	7 Marks
	b)	Explain the construction and working principle of three phase electro dynamometer type power factor meter with neat sketch.	CO1	7 Marks

UNIT-IV

7	a)	Derive the equation of balance for an Owen's bridge with phasor diagram and also list the advantages and disadvantages of the bridge.	CO2	7 Marks
	b)	The four arms of a Wheatstone bridge are as follows: AB = 100Ω; BC = 1000Ω ; CD = 4000Ω ; DA = 400Ω. The galvanometer has a resistance of 100Ω, a sensitivity of 100mm/μA and is connected across AC. A source of 4V DC is connected across BD. Calculate the current through the galvanometer and its deflection, if the resistance of arm DA is changed from 400Ω to 401Ω.	CO4	7 Marks

(OR)

8	a)	Describe the working of a De-sauty's bridge and derive the equations for capacitance and dissipation factor under balance condition with a neat phasor diagram.	CO2	7 Marks
	b)	A Capacitor bushing forms arm AB of a Schering bridge and a standard capacitor of 500pF capacitance and negligible loss, forms arm AD. Arm BC consists of a non-inductive resistance of 300Ω .When the bridge is balanced arm CD has a resistance of 72.6Ω in parallel with a capacitance of 0.148μF. The supply frequency is 50Hz. Calculate the capacitance of bushing and dielectric loss angle of capacitor.	CO5	7 Marks

UNIT-V

9		Describe the construction and working of a polar type potentiometer and it's standardization procedure. Also explain how it is used to measure the unknown voltages can be measured by using this potentiometer.	CO1	14 Marks

(OR)

10	a)	Describe in detail about the working of Integrating type digital voltmeter with neat block diagrams.	CO1	7 Marks
	b)	Describe how the following measurements can be made with CRO in industries and laboratories. i) Frequency. ii) Phase angle.	CO6	7 Marks

CODE No.: 16BT40202 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

GENERATION OF ELECTRIC POWER

[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)	Distinguish various turbines used in hydro electric power station in several aspects.	CO1	6 Marks
	b)	Explain the principle of operation of pumped storage plant. How does it help to meet sudden peak loads in power stations?	CO1	6 Marks
	c)	List few environmental regulations for eco-friendly operation of hydro power plants.	CO8	2 Marks

(OR)

2	a)	Explain mass curve. Construct mass curve and find reserve capacity of the plant from the following data.	CO4	10 Marks

Week	1-6	7-12	13-18	19-24	25-30	31-36	37-42	43-48	49-52
Discharge (m3/sec)	600	700	300	400	1700	1300	900	600	300

	b)	With a neat sketch, explain fluidized bed combustion.	CO1	4 Marks

UNIT-II

3		Differentiate nuclear power reactors with reference to their application in nuclear power station with relevant neat sketches	CO2	14 Marks

(OR)

4	a)	Enumerate and explain briefly the components of a gas turbine power plant.	CO1	9 Marks
	b)	Write various factors to be considered in choosing location of a diesel power plant.	CO5	5 Marks

UNIT-III

5	a)	Explain the conversion of wind energy to electrical energy using a wind turbine with a neat diagram.	CO6	10 Marks
	b)	Write about non conventional energy sources and explain how they will be used for energy supply options.	CO6	4 Marks

(OR)

6	a)	Derive wind power equation and discuss various factors on which wind power depends.	CO2	8 Marks
	b)	Write the applications of renewable energy sources and the impacts on environment.	CO7	6 Marks

UNIT-IV

7	a)	Explain: i) load factor. ii) plant use factor. iii) diversity factor iv) demand factor. v) contribution factor and write their significance.	CO1	10 Marks
	b)	A generating station has a connected load of 43MW and a maximum demand of 20MW; the units generated being 61.5×10^6 per annum. Calculate: i) demand factor. ii) load factor.	CO4	4 Marks

(OR)

8	a)	Discuss the various methods of determining the depreciation of the equipment.	CO1	10 Marks
	b)	A generating station has maximum demand of 100MW. Calculate cost per unit, if capital cost is Rs. 200×10^6, annual load factor is 40%, annual cost of fuel and oil are Rs 15×10^6, taxes, wages and salaries is Rs 10×10^6. Interest and depreciation is 15%.	CO4	4 Marks

UNIT-V

9	a)	List the main categories of risk associated with a cogeneration project and discuss them briefly.	CO1	6 Marks
	b)	An industrial load takes 80,000 units in a year, the average power factor being 0.707 lagging. The recorded maximum demand is 500kVA. The tariff is Rs 120 per kVA of maximum demand plus 2.5 paise per kWh. Design suitable size of phase advance plant and find the annual cost of supply and also find out the annual saving, if the installed phase advancing plant cost Rs 50 per kVAR which raises the p.f. from 0.707 to 0.9 lagging. Allow 10% per year on the cost of phase advancing plant to cover all additional costs.	CO3	8 Marks

(OR)

10	a)	Name some factors that need to be considered to determine the viability of a Cogeneration plant.	CO7	7 Marks
	b)	Discus with detail about shunt and series capacitors for power factor improvement.	CO1	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

TRANSFORMERS AND INDUCTION 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)	Define and derive an expression for voltage regulation of a transformer. Explain its significance.	CO1	7 Marks
	b)	A single phase transformer has a regulation of 10**%** when delivering full load at unity **p.f.** and 15**%** when delivering the same load at 0.8 **p.f.** lagging. What would be the regulation if the transformer is delivering half-load at 0.8 **p.f.** leading?	CO4	7 Marks
		(OR)		
2	a)	How the core losses in a transformer are separated?	CO1	6 Marks
	b)	A single phase transformer has 63W as core losses at 40 Hz while 110W at 60Hz. Both the tests are performed at same values of maximum flux density in the core. Find hysteresis and eddy current losses at 50Hz frequency.	CO4	8 Marks

UNIT-II

3	a)	Deduce expressions for the load shared by two transformers in parallel when no-load voltages of these transformers are not equal.	CO2	6 Marks
	b)	Two single-phase transformers having the same voltage ratio on no-load operate in parallel to supply a load of 1000kVA at 0.8 **p.f.** lagging. One transformer is rated at 400kVA and has a per unit equivalent impedance of 0.01+j0.06; the other is rated at 600kVA and has a per unit equivalent impedance of 0.01+j0.05. Determine the load on each transformer in kVA and the operating **p.f**.	CO4	8 Marks
		(OR)		
4	a)	Explain Sumpner's test for testing two single phase transformers. also explain why this is beneficial for finding efficiency of transformers	CO1	6 Marks
	b)	A 2300/230V, 500kVA, 50Hz distribution transformer has core loss of 1600W at rated voltage and copper loss of 7.5kW at full load. During the day it is loaded as follows:	CO4	8 Marks

% Load	0	20	50	80	100	125
P. f.	-	0.7 lag	0.8 lag	0.9 lag	1	0.85 lag
Hours	2	4	4	5	7	2

Determine the all-day efficiency.

UNIT-III

5	a)	As an electrical engineer, give your views on supplying 3-phase power to a 3-phase power user with three 1-phase transformers with that of one 3-phase transformer.	CO6	6 Marks
	b)	Discuss how the voltage on the secondary side of a transformer is regulated on-load.	CO1	8 Marks
		(OR)		
6	a)	It is desired to have a balanced 3-phase system from a 2-phase supply whose voltages are displaced by 90º. Suggest and explain for this.	CO5	8 Marks
	b)	Discuss the merits and demerits of the following: (i) Y-Y (ii) Δ-Y system of operation.	CO1	6 Marks

UNIT-IV

7	a)	Write the significance of deep-bar cage rotors. Explain its construction and working.	CO1	8 Marks
	b)	List out the features of slip ring and squirrel cage inductor motors. Thereby suggest their suitability in domestic, agriculture and industrial sectors.	CO6	6 Marks

(OR)

8	a)	Develop the equivalent circuit for a 3-phase induction motor. Give its significance in providing solutions to problems in industry.	CO3	8 Marks
	b)	A 10 kW 3-phase 50 Hz 4 pole induction motor has a full-load slip of 0.03 mechanical and stray load losses at full load are 3.5% of output power. Compute: i) power delivered by stator to rotor. ii) rotor ohmic losses at full load.	CO4	6 Marks

UNIT-V

9	a)	Rotor **emf** injection method is popular and widely used in industries for the control of speed of a 3-phase induction motor. Why? Explain the method with relevant expressions and illustrations.	CO5	6 Marks
	b)	A 3-phase squirrel cage induction motor has a short circuit current equal to 4 times the full-load current. Find the starting torque as a percentage of full-load torque if the motor is started by: i) Direct switching to supply. ii) Star-Delta starter. iii) Auto-transformer starter. iv) A resistance in stator circuit. The stator current in (iii) and (iv) is limited to 2 times the full-load current and full-load slip is 3%.	CO1	8 Marks

(OR)

10	a)	Explain the slip energy recovery speed control method and discuss its merits over rotor resistance speed control method.	CO1	6 Marks
	b)	Two 50 Hz 3-phase induction motors having six and four poles respectively are cascaded, the 6-pole motor being connected to the main supply. Determine the frequency of the rotor currents and slips referred to each stator field, if the set has a slip of 2%.	CO4	8 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

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.	CO1	6 Marks
	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.	CO2	8 Marks
		(OR)		
2	a)	Discuss various types of brakes and what is the self locking of brake.	CO1	4 Marks
	b)	A band brake acts on the 3/4th of circumference of a drum of 450mm diameter which is keyed to the shaft. The band brake provides a braking torque of 225 N-m. One end of the band is attached to a fulcrum pin of the lever and the other end to a pin 100mm from the fulcrum. If the operating force is applied at 500mm from the fulcrum and the coefficient of friction is 0.25, find the operating force when the drum rotates in the (i) anticlockwise direction, and (ii) clockwise direction.	CO2	10 Marks

UNIT-II

3	a)	Define Gyroscopic couple and explain the effect on aeroplane, when the aeroplane is taking left and right turns, engine is rotating in anticlockwise direction and view point of the observer is from front.	CO1	7 Marks
	b)	The heavy turbine rotor of a sea vessel rotates at 1500 r.p.m. clockwise looking from the stern, its mass being 750kg. The vessel pitches with an angular velocity of 1rad/s. Determine the gyroscopic couple transmitted to the hull when bow is rising, if the radius of gyration for the rotor is 250mm. Also show in what direction the couple acts on the hull?	CO3	7 Marks
		(OR)		
4	a)	Differentiate between fly wheel and governor.	CO1	4 Marks
	b)	The turning moment diagram for a multi-cylinder engine has been drawn to a scale 1mm = 600N-m vertically and 1mm = 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 + 107mm^2 , when the engine is running at a speed of 600r.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 0.5m.	CO3	10 Marks

UNIT-III

5	a)	Define the terms: i) Sensitiveness of a governor. ii) Stability of a governor. iii) Isochronous of a governor. iv) Hunting. v) Effort and power of a governor.	CO1	8 Marks
	b)	A Porter governor has all four arms 250mm long. The upper arms are attached to the axis of rotation and the lower arms are attached to the sleeve at a distance of 30mm from the axis. The mass of each ball is 5kg and the sleeve has a mass of 50kg. The extreme radii of rotation are 150mm and 200mm. Determine the range of speed of the governor.	CO2	6 Marks

(OR)

6		The upper arms of a Porter governor has lengths 350mm and are pivoted on the axis of rotation. The lower arms has lengths 300mm and are attached to the sleeve at a distance of 40mm from the axis. Each ball has a mass of 4kg and mass on the sleeve is 45kg. Determine the equilibrium speed for a radius of rotation of 200mm and find also the effort and power of the governor for 1% speed change.	CO2	14 Marks

UNIT-IV

7	a)	Why balancing of rotating and reciprocating masses of the engine is required?	CO1	6 Marks
	b)	A, B, C and D are four masses carried by a rotating shaft at radii 100, 125, 200 and 150mm respectively. The planes in which the masses revolve are spaced 600mm apart and the mass of B, C and D are 10kg, 5kg, and 4kg respectively. Find the required mass A and the relative angular settings of the four masses so that the shaft shall be in complete balance.	CO4	8 Marks

(OR)

8		An inside cylinder locomotive has its cylinder centre lines 0.7m apart and has a stroke of 0.6m. The rotating masses per cylinder are equivalent to 150kg at the crank pin, and the reciprocating masses per cylinder to 180kg. The wheel centre lines are 1.5m apart. The cranks are at right angles. The whole of the rotating and 2/3 of the reciprocating masses are to be balanced by masses placed at a radius of 0.6m. Find the magnitude and direction of the balancing masses. Find the fluctuation in rail pressure under one wheel, variation of tractive effort and the magnitude of swaying couple at a crank speed of 300 **r.p.m**. Interpret the importance of system reliability by considering the series and parallel reliability.	CO4	14 Marks

UNIT-V

9	a)	Derive an expression for Natural Frequency of Free Longitudinal Vibrations Rayleigh's method.	CO1	6 Marks
	b)	A shaft 1.5m long, supported in flexible bearings at the ends carries two wheels each of 50kg mass. One wheel is situated at the centre of the shaft and the other at a distance of 375mm from the centre towards left. The shaft is hollow of external diameter 75mm and internal diameter 40mm. The density of the shaft material is 7700kg/m^3 and its modulus of elasticity is 200GN/m^2 . Find the lowest whirling speed of the shaft, taking into account the mass of the shaft.	CO5	8 Marks

(OR)

10	A machine has a mass of 100kg and unbalanced reciprocating parts of mass 2kg which move through a vertical stroke of 80mm with simple harmonic motion. The machine is mounted on four springs, symmetrically arranged with respect to centre 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: i) the force transmitted to foundation at 1000 r.p.m. ii) the force transmitted to the foundation at resonance. iii) the amplitude of the forced vibration of the machine at resonance.	CO5	14 Marks

CODE No.: 16BT40303 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

FLUID MECHANICS

[Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Differentiate between: i) Absolute and gauge pressure. ii) Simple and differential manometers. iii) Piezometer and pressure gauges.	CO1	14 Marks
		(OR)		
2		Define the surface tension. Prove that the relation between surface tension and pressure inside the droplet of liquid in excess of outside pressure.	CO1	14 Marks

UNIT-II

3		A pitot-static tube placed in the centre of a 300mm pipe line has one orifice pointing upstream and other perpendicular it. The mean velocity in the pipe is 0.8 of the central velocity. Find the discharge through the pipe if the pressure difference between two orifices is 60mm of water. Take the co-efficient of pitot tube as 0.98.	CO2	14 Marks
		(OR)		
4		Distinguish between the following. i) Steady and un-steady flow. ii) Uniform and non-uniform flow. iii) Compressible and incompressible flow. iv) Rotational and irrotational flow. v) Laminar and turbulent flow.	CO1	14 Marks

UNIT-III

5	a)	Draw a neat sketch of the Reynolds experiment and explain how the laminar flow can be demonstrated.	CO1	7 Marks
	b)	The rate of flow of water through a horizontal pipe is 0.25m^3/sec. The diameter of the pipe which is 20 cm is suddenly enlarged to 40cm. The pressure intensity in the smaller pipe is 11.772N/cm^2. Determine: i) Loss of head due to sudden enlargement. ii) Pressure intensity in larger pipe. iii) Power loss due to enlargement.	CO4	7 Marks
		(OR)		
6		Derive an expression for the force exerted by a jet of water on a moving flat plate in the direction of flow.	CO5	14 Marks

UNIT-IV

7		A pelton wheel develops 8000 kW under a net head of 130m at a speed of 200 r.p.m. Assuming the co-efficient of velocity for the nozzle 0.98, hydraulic efficiency 87%, speed ratio 0.46 and jet diameter to wheel diameter ratio 1/9, determine: i) the discharge required. ii) the diameter of the wheel. iii) the diameter and number of jets required. iv) the specific speed. Mechanical efficiency is 75%.	CO6	14 Marks
		(OR)		

8		Describe the governing mechanism of pelton turbie with a neat sketch.	CO1	14 Marks

UNIT-V

9	a)	Define cavitation. What are the effects of cavitation? Give the necessary precautions against cavitation.	CO1	8 Marks
	b)	Distinguish pumps in series and parallel.	CO1	6 Marks

(OR)

10		Explain construction and working principle of a double acting reciprocating pump with a neat diagram.	CO1	14 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

MACHINE TOOLS AND MODERN MACHINING PROCESSES

[Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define tool signature. With a neat diagram, explain the various angles in single point cutting tool geometry.	CO6	7 Marks
	b)	Differentiate between Orthogonal and Oblique cutting.	CO2	7 Marks
		(OR)		
2	a)	A cutting tool made of HSS gave a tool life of 50 min. when operated at a speed of 200 m/min. At what steel should the tool have to be operated in order to have a tool life of 2 hrs 15 min. Assume n=0.185.	CO4	7 Marks
	b)	Analyze the various factors affecting tool life.	CO2	7 Marks

UNIT-II

3	a)	Narrate the various operations performed in lathe.	CO1	7 Marks
	b)	Explain the various work holding devices in lathe. Explain in detail.	CO1	7 Marks
		(OR)		
4	a)	Elucidate the capstan lathe.	CO1	7 Marks
	b)	Classify the automatic lathes in detail.	CO1	7 Marks

UNIT-III

5	a)	Describe the principal parts of a shaper.	CO1	7 Marks
	b)	Classify the planning machines.	CO2	7 Marks
		(OR)		
6	a)	Design a twist drill and discuss its nomenclature.	CO3	7 Marks
	b)	Explain the principle of Jig boring machine.	CO1	7 Marks

UNIT-IV

7	a)	List the different types of abrasives used in grinding wheel. Explain	CO1	7 Marks
	b)	Briefly describe about the tool and cutter grinding machine.	CO1	7 Marks
		(OR)		
8	a)	List the different types of milling cutters. Explain in brief.	CO1	7 Marks
	b)	Write a short note on simple indexing.	CO2	7 Marks

UNIT-V

9	a)	Differentiate between conventional and unconventional machining process.	CO5	7 Marks
	b)	Classify modern machining processes with the distinctive features of each.	CO5	7 Marks
		(OR)		
10	a)	Explain the working principle of EBM.	CO5	7 Marks
	b)	State the advantages and limitations of Electron Beam Machining.	CO5	7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

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)	What are the differences between External Combustion Engines and Internal Combustion Engines?	CO1	7 Marks
	b)	Explain the working principle of four stroke CI Engine with neat sketch	CO1	7 Marks
		(OR)		
2	a)	What are the differences between CI engines and SI Engines?	CO1	7 Marks
	b)	Describe with working principle theoretical and actual valve timing diagrams of four stroke SI Engine.	CO1	7 Marks

UNIT-II

3	a)	What is the need of air movement in CI Engine combustion chamber? Explain.	CO2	7 Marks
	b)	Discuss the effects of the following variables on the diesel knock. i) Injection timing and rate of fuel the injection. ii) Turbulence caused in the combustion chamber. iii) Compression ratio.	CO2	7 Marks
		(OR)		
4	a)	Explain the causes of knock in CI Engines.	CO2	7 Marks
	b)	What are the types of combustion chambers used on CI Engines and explain their role in generating turbulence?	CO1	7 Marks

UNIT-III

5	a)	A gasoline engine working on four- stroke develops a brake power of 20.9kW. A Morse test was conducted on this engine and the brake power (kW) obtained when each cylinder was made inoperative by short circuiting the spark plug are 14.9, 14.3, 14.8 and 14.5 respectively. The test was conducted at constant speed. Find the indicated power, mechanical efficiency and brake mean effective pressure when all the cylinders are firing. The bore of the engine is 75mm and the stroke is 90mm. The engine is running at 3000 r.p.m.	CO4	7 Marks
	b)	Explain the measurement of brake power of IC Engine by using rope brake dynamometer.	CO1	7 Marks
		(OR)		
6	a)	Define indicated mean effective pressure related to IC Engine and how it can be measured.	CO1	7 Marks
	b)	A two cylinder four stroke engine runs at 240 r.p.m developing a torque of 5 KN-m. The bore and stroke of cylinder are 30cm and 60cm respectively. Engine runs with gaseous fuel having calorific value of 16.8 MJ/m^3. The gas and air mixture is supplied in proportion of 1:7 by volume. The volumetric efficiency is 0.85. Determine: i) The brake power. ii) The mean piston speed in m/s. iii) The brake mean effective pressure. iv) The brake thermal efficiency.	CO3	7 Marks

UNIT-IV

7	a)	Define heating value of fuel and adiabatic flame temperature.	CO1	4 Marks
	b)	One kg ethane (C_2H_6) is burned with 90% of theoretical air. Assuming complete combustion of hydrogen in the fuel determine the volumetric analysis of the dry products of combustion.	CO5	10 Marks

(OR)

8	a)	Describe the bomb calorimeter used for determination of heating values with the help of neat sketch.	CO1	7 Marks
	b)	Methane (CH_4) is burned with atmospheric air. The analysis of the products on a dry basis is as follows. Co_2=10% O_2=2.37% CO=0.53% N_2=87.10% i) Determine the combustion equation. ii) Calculate the air-fuel ratio. iii) Percent theoretical air.	CO5	7 Marks

UNIT-V

9	a)	What is the function of a compressor and what are the different types of compressors?	CO1	7 Marks
	b)	A single stage single acting air compressor delivers $14m^3$ of free air from 1 bar to 7 bar. The speed of the compressor is 300 r.p.m. Assuming the compression and expansion is $pV^{1.35}$ = constant and clearance is 5% of the swept volume, find the diameter and stroke of the compressor. Take stroke length is 1.5 times the bore diameter.	CO2	7 Marks

(OR)

10	a)	Derive an expression for minimum work required for two stage reciprocating air compressor with perfect inter-cooling and neglect clearance volume.	CO2	7 Marks
	b)	A compressor compresses air 100kpa to 700kpa. The clearance volume is 2.13 liters and compression and expansion are polytrophic with n=1.3 for each. If the volumetric efficiency of compressor be 85 %, determine the swept volume and the diameter of the cylinder. Assume a stroke length of 30mm.	CO2	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

DIGITAL IC APPLICATIONS

[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)	Draw the logic diagram equivalent to the internal structure of an 8-input CMOS NAND gate.	CO1	7 Marks
	b)	What are the typical parts of a TTL data sheet and discuss their importance in circuit design?	CO5	7 Marks
		(OR)		
2	a)	List out different categories of characteristics in a TTL data sheet. Discuss electrical and switching characteristics of 74LS00.	CO5	8 Marks
	b)	Draw the circuit diagram of ECL and explain its operation.	CO1	6 Marks

UNIT-II

3	a)	Identify the role of Data Flow design elements of Verilog HDL.	CO4	7 Marks
	b)	Identify and summarize the types of delays that can be specified in a Procedural assignment statement using an example.	CO6	7 Marks
		(OR)		
4	a)	Develop Verilog HDL code for a full adder design containing two half adders and one OR gate.	CO4	7 Marks
	b)	Assess the performance of case and if statements in Verilog HDL program.	CO6	7 Marks

UNIT-III

5	a)	Draw a logic symbol for 8 sources sharing a 3 state priority line using a 74X138 decoder. And write a VHDL programme using a case statement.	CO2	7 Marks
	b)	Design a priority encoder with 8 inputs. Write a VHDL program for the same in structural style.	CO3	7 Marks
		(OR)		
6	a)	Sketch the symbol, logic diagram and write Verilog HDL source code of 74X138 IC.	CO2	7 Marks
	b)	Design a 4x4 combinational multiplier and develop the corresponding Verilog HDL program.	CO3	7 Marks

UNIT-IV

7	a)	Design an 8-bit universal parallel-in serial out shift register with a control input. Shift-left operation with control input 1 and shift-right operation with control input 0 is to be performed.	CO4	7 Marks
	b)	Explain the operation of a 4 bit synchronous binary counter with the required diagram and waveforms.	CO1	7 Marks
		(OR)		
8	a)	Design a conversion circuit to convert a D flip-flop to J-K flip-flop. Write its behavioural model Verilog HDL program.	CO3	7 Marks
	b)	Explain how to convert JK flip flop to T flip flop and D flip flop with excitation table, logic diagram and K map simplification.	CO4	7 Marks

UNIT-V

9	a)	Illustrate the architecture of FPGA.	CO1	7 Marks
	b)	Reproduce the internal structure of a 128X1 ROM using two-dimensional decoding and explain.	CO4	7 Marks
		(OR)		
10	a)	Explain the internal structure of 64KX1 DRAM. With the help of timing waveforms discuss DRAM access.	CO1	7 Marks
	b)	Realize the logic function performed by 74X381 with ROM.	CO4	7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

LINEAR IC APPLICATIONS

[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)	Discuss in detail about level translator and its significance in the circuits.	CO1	7 Marks
	b)	Determine the output voltage of an op-amp for the input voltages of V_{in1}=150μV, V_{in2}=140μV. This amplifier has a differential gain of 4000 and the value of CMRR is 100 and for 10^5.	CO2	7 Marks
		(OR)		
2	a)	Explain the open loop and closed loop configurations of an op-amp.	CO1	7 Marks
	b)	Define CMRR. Obtain expression for CMRR.	CO2	7 Marks

UNIT-II

3	a)	Explain the operation of sample and hold circuit using an op-amp.	CO1	7 Marks
	b)	Prove that an op-amp can be used to find the log of a given analog signal.	CO3	7 Marks
		(OR)		
4	a)	Briefly explain why negative feedback is desirable in amplifier applications.	CO1	7 Marks
	b)	Explain the working of a comparator using op-amp. What are its limitations?	CO1	7 Marks

UNIT-III

5	a)	Write notes on all pass filter. Draw the suitable circuit diagram and discuss about phase shift between input and output voltages.	CO1	7 Marks
	b)	Discuss the characteristics of fixed voltage series regulator.	CO1	7 Marks
		(OR)		
6	a)	Explain about Line and Load regulation.	CO1	7 Marks
	b)	Write a short note on dual voltage supply.	CO1	7 Marks

UNIT-IV

7	a)	Derive an expression for the voltage to frequency conversion factor of 566 VCO	CO3	7 Marks
	b)	How a 555 timer can be used to realize square waveform generator of frequency 1 kHz and duty cycle 75%?	CO5	7 Marks
		(OR)		
8	a)	Derive an expression for capture range of PLL	CO3	7 Marks
	b)	Use 555 IC astable multivibrator as voltage controlled oscillator.	CO5	7 Marks

UNIT-V

9	a)	A dual slope ADC uses a 16-bit counter and operates at 4MHz clock rate. The maximum input voltage is +10V. Find the value of integrator resistor 'R' if the maximum output voltage of the integrator is -8V after 2^n counts for an integrator capacitor of 0.1μF.	CO4	7 Marks
	b)	Explain the operation of an inverted R-2R ladder DAC and mention its applications	CO1	7 Marks
		(OR)		
10	a)	An 8-bit ADC has a supply voltage of +12 V. Calculate: i) the voltage step size of LSB. ii) the value of analog input voltage for a digital output of 01001011.	CO4	7 Marks
	b)	Compare dual-slope ADC with successive approximation ADC.	CO1	7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

COMPUTER GRAPHICS

[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)	Explain the working principle of CRT with neat diagram.	CO1	7 Marks
	b)	Differentiate Raster-scan display and Random-scan display methods.	CO2	7 Marks
		(OR)		
2	a)	Explain Graphics monitors and Workstations.	CO1	7 Marks
	b)	Discuss the operation of an Electron-gun with accelerating anode.	CO2	7 Marks

UNIT-II

3	a)	Generate Shear transformation matrix relative to y-axis.	CO5	2 Marks
	b)	Determine a sequence of basic Transformations that are equivalent to the y-direction shearing matrix.	CO2	12 Marks
		(OR)		
4	a)	Explain how an ellipse displayed with midpoint method could be properly filled with a Boundary-fill algorithm.	CO1	7 Marks
	b)	Develop Boundary-fill algorithm to fill the specified area.	CO4	7 Marks

UNIT-III

5	a)	Explain Cohen-Sutherland line clipping method in detail.	CO1	7 Marks
	b)	Derive the 2-Dimensional Window-to-viewport coordinate transformation equations.	CO3	7 Marks
		(OR)		
6	a)	Determine the equation of the Bezier curve for five control points.	CO2	8 Marks
	b)	Evaluate by substituting the point at u = 0.5 in the equation of Bezier curve, where u is the normalized parameter.	CO6	6 Marks

UNIT-IV

7	a)	Describe 3-Dimensional transformations. i) Translation. ii) Scaling with suitable examples.	CO1	6 Marks
	b)	Write short notes on 3-Dimensional Viewing co-ordinates.	CO3	8 Marks
		(OR)		
8	a)	Define Clipping and describe how will you clip a point. List the different types of Text clipping methods available.	CO1	7 Marks
	b)	Describe 3-Dimensional Rotation about X, Y and Z axes and write the corresponding transformation matrices.	CO1	7 Marks

UNIT-V

9	a)	Design an algorithm for Depth buffer method.	CO3	7 Marks
	b)	Discuss about Back-face detection method.	CO2	7 Marks
		(OR)		
10	a)	Differentiate between Flat and Smooth shading.	CO2	6 Marks
	b)	Explain procedure for Area subdivision method.	CO1	8 Marks

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CODE No.: 16BT40502 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

DATABASE MANAGEMENT SYSTEMS

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

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Distinguish strong entity set with weak entity set. Draw an ER diagram to illustrate weak entity set.	CO2	7 Marks
	b)	Explain in detail the Database Architecture.	CO3	7 Marks
		(OR)		
2	a)	Define Database. Write the applications of Database Systems in detail.	CO1	7 Marks
	b)	What is meant by ER-model? Explain with an example.	CO4	7 Marks

UNIT-II

3	a)	Discuss about Domain Relational Calculus in detail.	CO1	7 Marks
	b)	Write in detail about altering tables and views with examples.	CO5	7 Marks
		(OR)		
4	a)	Explain the cross product and rename.	CO1	7 Marks
	b)	Consider the following relations containing airline flight information: Flights(flno:integer, from:string,to:string,distance:integer, departs:time, arrives:time); Aircraft(aid:integer, aname:string, cruisingrange:integer) Certified(eid:integer,aid:integer) Employees(eid:integer,ename:string,salary:integer) Write the relational algebraic expression for the following i) Find the total number of employees whose salary is less than 100000 ii) Find the names of pilots certified for some Airbus aircraft iii) Find the ***flno*** of flights from Delhi to Newyork iv) Find the ***eid*** of employee who has certified for more than three flights	CO6	7 Marks

UNIT-III

5	a)	Discuss different types of aggregate operators with examples in SQL.	CO5	7 Marks
	b)	Illustrate group by and Having clauses with examples.	CO5	7 Marks
		(OR)		
6	a)	Illustrate Multivalued dependencies and Fourth normal form with examples.	CO6	7 Marks
	b)	Write SQL query to find second highest salary of Employee from Employee table.	CO5	7 Marks

UNIT-IV

7	a)	Differentiate two phase locking protocol and strict two-phase locking protocol.	CO2	7 Marks
	b)	Describe Timestamp based locking protocol.	CO1	7 Marks
		(OR)		

8	a)	What is serializable schedule, recoverable schedule and strict schedule? Give example for each.	CO5	7 Marks
	b)	How is the log used in transaction roll back and crash recovery?	CO2	7 Marks

UNIT-V

9	a)	Demonstrate searching a given element in B+ trees. Explain with an example.	CO4	7 Marks
	b)	Illustrate insertion of an element in B+ trees with an example.	CO4	7 Marks
		(OR)		
10	a)	Describe various methods of defining indexes on multiple keys.	CO1	7 Marks
	b)	Show how to reduce access time with primary index by considering example?	CO3	7 Marks

CODE No.: 16BT41001 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

INDUSTRIAL INSTRUMENTATION – I

[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)	Select an appropriate non contact type sensing mechanism for measurement of torque. Justify your sensor selection and explain its principle using a neat sketch.	CO5	7 Marks
	b)	Explain the construction and working principle of Piezo resistive type load cell.	CO1	7 Marks
		(OR)		
2	a)	Design a sensing mechanism for measurement of torque using magnets.	CO3	7 Marks
	b)	Analyze the different force and torque sensing methods and summarize which of them could be used in conducting environment and which in nonconducting insulating environment.	CO2	7 Marks

UNIT-II

3	a)	Analyze different acceleration sensing mechanisms, summarize them and give 3 different units of acceleration.	CO2	7 Marks
	b)	What is Relative Velocity? With a neat sketch explain the construction of Drag-Cup Type Tachometer and how it can be used for measurement of velocity.	CO1	7 Marks
		(OR)		
4	a)	A sensing mechanism has a mass M of 5Kg. It is connected to a fixed base using a spring with spring constant k N/m. An acceleration of 5m/s^2 results in 1mm displacement of mass. Assume the relation between acceleration and displacement of the mass is linear. An LVDT used for measuring displacement gives an output voltage of 1mv for every 2mm for up to maximum of 10mm. i) What would be range of acceleration measured? ii) What would be the maximum voltage? iii) If the minimum detectable acceleration is 1m/s^2 what would the resolution of the output voltage?	CO4	7 Marks
	b)	Select an appropriate sensor for measurement of velocity which is a non contact type. Justify your selection and explain its principle using a neat sketch.	CO5	7 Marks

UNIT-III

5	a)	Analyze different types of mechanical pressure sensing mechanisms, summarize them and give 3 different units of the pressure.	CO2	7 Marks
	b)	With a neat sketch of a suitable sensing setup explain measurement of pressure using resistive, inductive and capacitive methods.	CO1	7 Marks
		(OR)		
6	a)	Identify an appropriate sensing mechanism for measurement of low pressure. Justify your sensor selection and explain how this works with a neat sketch.	CO5	7 Marks
	b)	What is Static Pressure? With a neat sketch explain ionization gauge.	CO1	7 Marks

UNIT-IV

7	a)	What is Freezing Point, Melting Point, Boiling point, Vapor Pressure point and Triple point? Discuss the role of these in standards of temperature measurement. What are the instruments used as standard in the measurement of temperature.	CO1	7 Marks
	b)	Design a measuring circuit to convert resistance of a thermistor to a corresponding voltage. Assume PTC. i.e 200Ω to 250 Ω. Temperature Range of 20 to 50ºC. Output voltage range of 0-5V. Calculate the approximate temperature if the output voltage is 3V according to the designed circuit.	CO3	7 Marks

(OR)

8	a)	Select an appropriate sensor for measurement of temperature that has high sensitivity, portable and cheap. Justify your sensor selection and explain how this sensor works with a neat sketch.	CO5	7 Marks
	b)	Analyze and list different types of thermocouples, and their applications.	CO2	7 Marks

UNIT-V

9	a)	Explain the different terms of radiation thermometry and explain about the general form of radiation measurement system.	CO1	7 Marks
	b)	Select an appropriate sensor for non contact type measurement of temperature. Justify your sensor selection and explain how this sensor works with a neat sketch.	CO5	7 Marks

(OR)

10	a)	Describe pyrometric cones, Pneumatic and suction pyrometers.	CO1	7 Marks
	b)	Explain spectroscopic temperature measurement and thermography.	CO1	7 Marks

CODE No.: 16BT41002 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

LINEAR AND DIGITAL ICS

[Electrical and Electronics 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)	Draw the basic block diagram of a general op-amp and explain the operation of each block.	CO1	7 Marks
	b)	Define and explain the significance of the following op-amp parameters. i) CMRR. ii) PSRR. iii) Thermal Drift.	CO1	7 Marks
		(OR)		
2	a)	Design a practical inverting amplifier and derive an expression for output impedance.	CO6	7 Marks
	b)	Design an analog IC which has a slew rate of 2V/μs. What is the maximum frequency of an output sinusoid of peak value 5V at which the distortion sets in due to the slew rate limitation?	CO3	7 Marks

UNIT-II

3	a)	Explain the working of an instrumentation amplifier using op-amp with neat diagram along with various applications.	CO2	7 Marks
	b)	Draw the first order low-pass Butterworth filter and analyze the same by deriving the gain and phase angle equation.	CO2	7 Marks
		(OR)		
4	a)	Design a second order Butter worth LPF and plot its frequency response.	CO3	7 Marks
	b)	Design a differentiator that will differentiate an input signal with f_{max}=100Hz.	CO3	7 Marks

UNIT-III

5	a)	An 8-bit Analog to digital converter has a supply voltage of +12 volts. Calculate: i) the voltage step size for LSB. ii) the value of Analog input voltage for a digital output of 01001011.	CO4	7 Marks
	b)	Explain the operation of Monostable multivibrator using 555 timer. Derive the expression of time delay of a Monostable multivibrator using 555 timer.	CO1	7 Marks
		(OR)		
6	a)	Justify how an Astable multivibrator using 555 timer connected into a pulse position modulator? Explain with a circuit diagram.	CO2	7 Marks
	b)	Design a square waveform generator of frequency 1kHz and a duty cycle of 75% using 555 timer.	CO3	7 Marks

UNIT-IV

7	a)	Write a detail notes on CMOS logic families.	CO1	7 Marks
	b)	Explain HDL based design flow.	CO1	7 Marks
		(OR)		
8	a)	Outline the desirable features of CMOS gates.	CO1	7 Marks
	b)	Design a 4-input CMOS OR-AND-INVERT gate. Explain the circuit with the help of logic diagram and function table.	CO3	7 Marks

UNIT-V

9	a)	Sketch the logic diagram and appraise the operation of 74 x 283 IC.	CO2	7 Marks
	b)	Develop a Verilog program for a 4-bit ripple carry adder.	CO6	7 Marks
		(OR)		
10	a)	Use appropriate structure to develop 1:8 Demultiplexer using two 1:4 Demultiplexer.	CO5	7 Marks
	b)	Realize the following expression using 74 x 151 ICs and 74 x 139 IC. F(Z) = ABCD + ABCD + ABCD + ABDE + ACDE + ABCE + ABCD.	CO4	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

COMPUTER ARCHITECTURE AND ORGANIZATION

[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 block diagram, explain the functional units of a computer.	CO1	7 Marks
	b)	Explain the role of the operating system for effective usage of the resources of the computer.	CO1	7 Marks
		(OR)		
2	a)	Design a 1K x 4 Bit DRAM and illustrate with a neat sketch.	CO3	7 Marks
	b)	Demonstrate the organization of data on a magnetic tape.	CO1	7 Marks

UNIT-II

3		Draw the pin diagram of 8085 and explain the function of each pin in detail.	CO1	14 Marks
		(OR)		
4	a)	Discuss about the different registers of an 8085 microprocessor. What is the necessity of register pairs in 8085 microprocessor?	CO1	7 Marks
	b)	Differentiate between a JMP and CALL instructions.	CO2	7 Marks

UNIT-III

5	a)	What is meant by addressing mode? Explain the following addressing modes of 8085 microprocessor with suitable examples. i) Immediate addressing mode. ii) Register addressing mode. iii) Direct addressing mode. iv) Implicit addressing. v) Register indirect addressing mode.	CO1	7 Marks
	b)	Write an 8085 program to perform addition of 5 bytes which are stored in consecutive memory locations starting at the address 5000H.	CO3	7 Marks
		(OR)		
6	a)	With the help of interrupt hardware of 8085 microprocessor, show that the interrupt i) RST 7.5 is Edge Triggred. ii) RST 6.5, RST 5.5 and INTR are Level Triggered. iii) TRAP is non-maskable while all other interrupts are maskable	CO1	7 Marks
	b)	A memory system of size 32KB is to be designed for an 8085 microprocessor based computer with memory chips each of size 4KB. Suggest the number of chips required. Also, give the memory map of each chip assuming the starting address 4000H.	CO3	7 Marks

UNIT-IV

7		Design a bus system for four registers using multiplexers.	CO3	14 Marks
		(OR)		
8	a)	Design a 4-bit combinational circuit for shifting bits to the left or to the right.	CO3	7 Marks
	b)	Compare RISC and CISC processors.	CO2	7 Marks

UNIT-V

9		With a suitable example, demonstrate the binary addition and subtraction operations carried out by a processor. Deduce an efficient algorithm / flow chart for the same.	CO6	14 Marks
		(OR)		
10		Develop an algorithm to perform division operation. Explain with an example.	CO5	14 Marks

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CODE No.: 16BT41201 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

DESIGN AND ANALYSIS OF ALGORITHMS

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

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

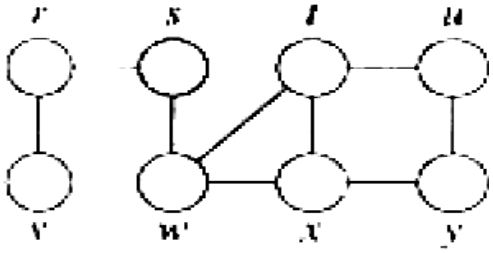
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define an algorithm. Outline its characteristics.	CO1	7 Marks
	b)	Design an algorithm that inputs three integers and outputs them in non-decreasing order.	CO3	7 Marks
		(OR)		
2	a)	What is the use of asymptotic notations? Explain different asymptotic notations with suitable examples.	CO1	7 Marks
	b)	Identify the complexity of below recurrence: $T(n) = 3T(n-1)$, if $n > 0$ $= 1$, otherwise	CO3	7 Marks

UNIT-II

3	a)	Explain Collapsing Rule for FIND with an example.	CO1	7 Marks
	b)	Outline an algorithm of collapsing find and calculate its time complexity.	CO1	7 Marks
		(OR)		
4	a)	Outline an algorithm of BFS and calculate its time complexity.	CO2	7 Marks
	b)	Apply BFS algorithm for the following graph.	CO3	7 Marks

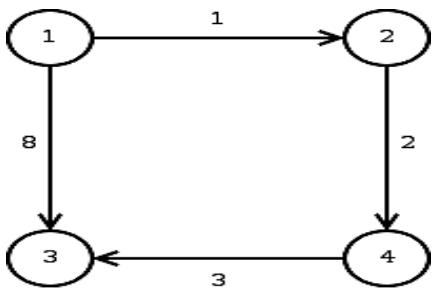


UNIT-III

5	a)	i) Define Divide and Conquer. ii) List the applications of Divide and conquer. iii) Write the control abstraction of divide and conquer	CO1	9 Marks
	b)	Distinguish Merge sort and Quick sort.	CO2	5 Marks
		(OR)		
6	a)	Outline a Krushkal's algorithm to generate Shortest Path.	CO1	7 Marks
	b)	Outline an algorithm to the Job sequencing with deadlines.	CO1	7 Marks

UNIT-IV

7	a)	Outline the algorithm of all pair shortest path	CO1	7 Marks
	b)	Determine shortest path of the following graph using all pair shortest path algorithm.	CO5	7 Marks



(OR)

8	a)	Construct dynamic state space tree for 0/1 Knapsack problem.	CO3	7 Marks
	b)	Explain the recursive Backtracking algorithm.	CO1	7 Marks

UNIT-V

9		Estimate optimal tour of traveling sales person for the following cost matrix using LCBB. The cost matrix is $\begin{bmatrix} \infty & 20 & 30 & 10 & 11 \\ 15 & \infty & 16 & 4 & 2 \\ 3 & 5 & \infty & 2 & 4 \\ 19 & 6 & 18 & \infty & 3 \\ 16 & 4 & 7 & 16 & \infty \end{bmatrix}$.	CO5	14 Marks

(OR)

10	a)	Draw a state space tree for 4-queens problems using FIFO branch and bound algorithm	CO2	7 Marks
	b)	Summarize about LC Branch and Bound solution.	CO1	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

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 ServletContext 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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

SOFTWARE 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)	Compare different types of myths in Software Engineering.	CO1	7 Marks
	b)	What are the key features for testing Extreme Programming?	CO5	7 Marks
		(OR)		
2	a)	Explain about Agile Unified Process (AUP).	CO1	6 Marks
	b)	List out the sequence of Cleanroom tasks for each increment within the pipeline in the Cleanroom Strategy.	CO4	8 Marks
		UNIT-II		
3		Explain the activities of requirement elicitation and analysis process in detail.	CO1	14 Marks
		(OR)		
4	a)	Assess on software requirement specification for Banking system.	CO4	7 Marks
	b)	Develop non-functional requirement for on-line Banking System	CO2, CO3	7 Marks
		UNIT-III		
5	a)	List out the important software design concepts that span both traditional and object-oriented software development in Design Engineering.	CO1	9 Marks
	b)	Illustrate in detail about four Architectural styles with a neat sketch.	CO1	5 Marks
		(OR)		
6	a)	List and explain the software quality guidelines and attributes in Design Process.	CO2	7 Marks
	b)	Compare and contrast between framework & pattern and idiom & pattern.	CO1	7 Marks
		UNIT-IV		
7	a)	Explain the difference between verification and validation.	CO6	6 Marks
	b)	Define Debugging. Explain the process of debugging.	CO1	5 Marks
	c)	Discuss the Psychological considerations in debugging	CO5	3 Marks
		(OR)		
8	a)	Explain different test strategies for object oriented design.	CO1	7 Marks
	b)	Compare between Black box and White box testing	CO2	7 Marks
		UNIT-V		
9	a)	Explain in detail about risk identification.	CO1	6 Marks
	b)	Analyze on the concept of risk projection.	CO2	8 Marks
		(OR)		
10		Explain the following. i) Reverse Engineering to Understand Data. ii) Reverse Engineering to Understand Processing. iii) Reverse Engineering User Interfaces. iv) Forward Engineering for Client-Server Architectures. v) Forward Engineering for Object-Oriented Architectures.	CO1	14 Marks

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CODE No.: 16BT41204 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

THEORY OF COMPUTATION

[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) If L is accepted by an NFA with ε-transition then show that L is accepted by an NFA without ε-transition. CO1 7 Marks

b) Construct a DFA equivalent to the NFA. M= ({p, q, r}, {0,1}, δ, p,{q, s}) Where δ is defined in the following table. CO5 7 Marks

	0	1
p	{q,s}	{q}
q	{r}	{q,r}
r	{s}	{p}
s	-	{p}

(OR)

2 a) Prove that a language L is accepted by some ε–NFA if and only if L is accepted by some DFA. CO1, CO4 7 Marks

b) Construct a NDFA accepting all string in {a, b} with either two consecutive a's or two consecutive b's. CO3 7 Marks

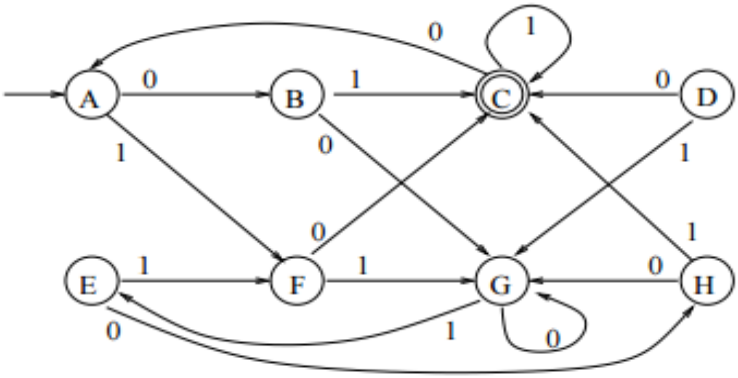
UNIT-II

3 a) "The set L= $\{a^n b^n | n \geq 1\}$ is not a regular". Justify. CO5 7 Marks

b) List and explain the applications of regular expressions. CO1 7 Marks

(OR)

4 a) Minimize the following automata. CO5 8 Marks



b) Write the Regular expression for the following languages: CO3 6 Marks

i) All strings over {0,1} with the substring '0101'.
ii) All strings beginning with '11' and ending with 'ab'.
iii) Set of all strings over {a, b} with 3 consecutive b's.
iv) Set of all strings that end with '1' and has no substring '00'.

UNIT-III

5 Construct a grammar in GNF which is equivalent to the grammar CO3 14 Marks

S→ AA | a
A→ SS | b

(OR)

6		Let G be the grammar S→aB|Ba A→a|aS|bAA B→b|bS|aBB Construct the parse tree and left most and right most derivations for the string aaabbabbba.	CO3	14 Marks

UNIT-IV

7	a)	Construct a PDA that recognizes the language $\{a^ib^jc^k \mid i,j,k>0$ and i=j or i=k$\}$.	CO3	7 Marks
	b)	Analyze the following PDA acceptance methods. i) From empty stack to final state. ii) From final state to empty stack.	CO2	7 Marks
		(OR)		
8	a)	Construct the grammar for the following PDA: M=({q0, q1},{0,1},{X,z0},δ,q0,Z0,Φ) where δ is given by δ(q0,0,z0)={(q0,XZ0)}, δ(q0,0,X)={(q0,XX)}, δ(q0,1,X)={(q1, ε)}, δ(q1,1,X)={(q1, ε)}, δ(q1, ε, X)={(q1, ε)}, δ(q1, ε, Z0)={(q1, ε)}	CO3	12 Marks
	b)	Define instantaneous description of a PDA.	CO1	2 Marks

UNIT-V

9		Design a Turing Machine M to implement the function 'multiplication' using the subroutine 'copy'.	CO4	14 Marks
		(OR)		
10		Design a TM to accept the language $L=\{a^nb^nc^n \mid n > 1\}$.	CO4	14 Marks

CODE No.: 16BT51202 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations December - 2019

OBJECT ORIENTED ANALYSIS AND DESIGN

[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		Differentiate three major elements in UML (Unified Modeling Language).	CO2	14 Marks
		(OR)		
2		Differentiate forward engineering and reverse engineering.	CO2	14 Marks

UNIT-II

3	a)	Define package.	CO1	2 Marks
	b)	Explain modeling techniques of package.	CO1	6 Marks
	c)	List and explain different stereotypes that apply in package.	CO2	6 Marks
		(OR)		
4	a)	Explain sample, anonymous, orphan and multi object instances.	CO1	7 Marks
	b)	How can we model the prototypical instances? Explain in detail	CO1	7 Marks

UNIT-III

5		Build use case diagram for the following statement in hospital reception case study “For the patient that will stay in the hospital ("inpatient") she or he should have a bed allotted in a ward. Receptionists might also receive patient's payments, record them in a database and provide receipts, file insurance claims and medical reports.”	CO4	14 Marks
		(OR)		
6		Design sequence diagram for Facebook user authentication in a web application. **Purpose:** It shows how Facebook user could be authenticated in a web application to allow access to his/her Facebook resources. **Summary:** Facebook uses OAuth 2.0 protocol framework which enables web application (called "client"), which is usually not the Facebook resource owner but is acting on the Facebook user's behalf, to request access to resources controlled by the FB user and hosted by the Facebook server. Instead of using the Facebook user credentials to access protected resources, the web application obtains an access token.	CO4	14 Marks

UNIT-IV

7		Design state chart diagram for ATM with sub states.	CO5	14 Marks
		(OR)		
8		Design state chart diagram for online shopping by using all kinds of events.	CO5	14 Marks

UNIT-V

9	a)	Apply modeling techniques for component diagram with example.	CO3	7 Marks
	b)	Build different types of nodes for any application.	CO3	7 Marks
		(OR)		
10		Identify various modeling techniques of implementation diagrams with example.	CO3	14 Marks

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CODE No.: 16BT3HS01 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

ENVIRONMENTAL STUDIES

[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)	State the significance and scope of the environmental education.	CO1	7 Marks
	b)	Analyze the contribution of different disciplines contribute to environmental studies.	CO2	7 Marks
		(OR)		
2	a)	Analyze the environmental impacts of groundwater usage.	CO2	7 Marks
	b)	Explain soil erosion. List the strategies to control soil erosion.	CO3	7 Marks

UNIT-II

3	a)	Analyze biogeochemical cycle.	CO2	7 Marks
	b)	Define biodiversity. Write down the different levels of biodiversity.	CO1	7 Marks
		(OR)		
4	a)	Summarize the models of energy flow in an ecosystem.	CO2	7 Marks
	b)	Analyze the major features of a stream that differ from that of a lake.	CO2	7 Marks

UNIT-III

5	a)	Explain and give examples for primary and secondary air pollutants.	CO1	7 Marks
	b)	State the appropriate techniques to control soil pollution.	CO5	7 Marks
		(OR)		
6		What are point and non-point sources of water pollution? Explain how you will manage to reduce the water pollution.	CO3	14 Marks

UNIT-IV

7		What do you mean by sustainable development? What are the major solutions to attain sustainability?	CO7	14 Marks
		(OR)		
8	a)	How the urban problems can be solved related to energy.	CO4	8 Marks
	b)	Summarize the protection laws for forest resources.	CO8	6 Marks

UNIT-V

9	a)	State the impact behind the increased population growth in the less developed nations compared with developed nations.	CO2	7 Marks
	b)	Explain doubling time with reference to population growth.	CO1	7 Marks
		(OR)		
10		Write a report based on the visit in an industrial area.	CO9	14 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

ELECTRONIC CIRCUIT ANALYSIS AND DESIGN

[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)	Compare Capacitive and Transformer coupling in Multi stage amplifiers.	CO2	7 Marks
	b)	What is an Amplifier? Discuss about CE amplifier with neat diagram.	CO1	7 Marks
		(OR)		
2	a)	Discuss about different methods used for coupling multistage amplifiers with their Frequency response	CO1	7 Marks
	b)	List out various types of distortions that occur in transistor amplifiers. Discuss the causes for each type listed.	CO2	7 Marks

UNIT-II

3	a)	Discuss the frequency response of BJT amplifier at low, mid and high frequencies. and give its significance in each region.	CO3	7 Marks
	b)	Derive an expression for the overall higher cut-off frequency of a two stage amplifier with identical stages of individual higher cut-off frequency, fH.	CO1	7 Marks
		(OR)		
4	a)	Derive the relation between f_β and f_T	CO1	7 Marks
	b)	Explain the effect of Coupling capacitor in frequency response of Amplifier	CO3	7 Marks

UNIT-III

5	a)	Compare in between LC and RC oscillators.	CO2	7 Marks
	b)	Calculate the input impedance and output impedance of voltage series feedback amplifier having gain A = -200, R**in** = 2.5k-ohms and R**out** = 100 k-ohms, β= 0.01.	CO4	7 Marks
		(OR)		
6	a)	Explain the concept of frequency stability in Oscillators.	CO1	6 Marks
	b)	A Hartley oscillator is designed with L**1** = 20μH; L**2** = 2mH. Determine range of capacitances if frequency is varied between 950kHz and 2050kHz.	CO4	8 Marks

UNIT-IV

7	a)	Explain how cross over distortion can be eliminated in case of a transformer coupled class-B push pull power amplifier.	CO1	7 Marks
	b)	Which methodology can applied to eliminate cross over distortion in class-B push pull power amplifier.	CO6	7 Marks
		(OR)		
8	a)	What is a tuned amplifier and List out its Applications?	CO1	7 Marks
	b)	What is heat sink? How can you apply heat sink concept to the power amplifiers?	CO6	7 Marks

UNIT-V

9	a)	What are the advantages and disadvantages of a transformer coupled Class-A power amplifier?	CO1	6 Marks
	b)	Select a tuned amplifier to operate in the radio frequency and explain its operation.	CO5	8 Marks
		(OR)		

10	a)	Why stability is required in case of tuned amplifiers? What are various stabilization techniques? Explain any one in detail with neat circuit diagram.	CO1	7 Marks
	b)	Select a single tuned amplifier and explain its operation.	CO5	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations October - 2020

SWITCHING THEORY AND LOGIC 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)	Identify the error bit location for the received information $(0100011)_2$ using Even parity	CO6	6 Marks
	b)	Convert the following binary numbers to Gray code equivalents. i) $(110010101)_2$ ii) $(101111001)_2$ iii) $(111010111)_2$ iv) $(111111011)_2$	CO4	8 Marks
		(OR)		
2	a)	Determine the error bit location for the received information $(0100011)_2$ using odd parity	CO6	6 Marks
	b)	Deduce the Boolean function to minimum number of literals and convert the results from Standard SOP to Standard POS and Standard POS to Standard SOP respectively i) F(A, B, C)= Σ (0,2,4,6,7,9,10,14). ii) F(A,B,C) = π (1,3,4,5,7,11,15).	CO4	8 Marks

UNIT-II

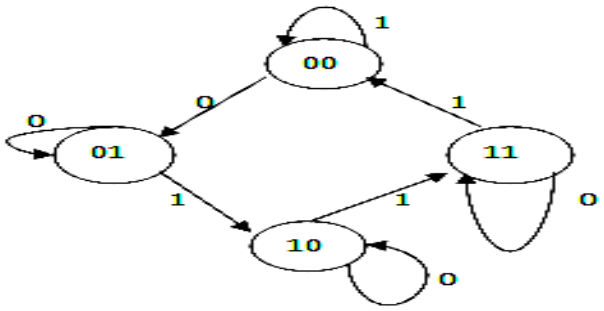
3	a)	Simplify the Boolean function using K-map in SOP forms F=∑m(0,1,2,4,7,8,12,14,15,16,17,18,20,24,28,30,31)	CO2	7 Marks
	b)	Minimize the criterion the following using K-map. FA,B,C,D).= Σm (0,1,2,3,5,6,7,8,9,10,11,13)	CO3	7 Marks
		(OR)		
4	a)	Simplify the following Boolean function using tabular method. Y(w,x,y,z)=∑m(1,2,3,5,9,12,14,15)	CO3	7 Marks
	b)	Simplify the following Boolean function using K-Map. F(A,B,C,D)=Σm(0,3,4,5,7,8,9,12,13,14)	CO2	7 Marks

UNIT-III

5	a)	Prepare 5-to-32 decoder using one 2-to-4 and four 3-to-8 decoders.	CO3	8 Marks
	b)	Mention its application along with the serial Transfer in 4-bit shift registers.	CO1	6 Marks
		(OR)		
6	a)	Construct a full adder using a suitable multiplexer.	CO3	7 Marks
	b)	Explain 4-line to 16-line decoder using 3-line to 8-line decoders.	CO1	7 Marks

UNIT-IV

7	a)	Convert SR Flip-Flop to T Flip-Flop.	CO2	7 Marks
	b)	Design a synchronous counter for 4—5—6—3—1—4 using T flip-flop.	CO3	7 Marks
		(OR)		
8	a)	Describe race-around problem in JK Flip-flop with necessary diagrams.	CO4	7 Marks
	b)	Design a Sequential circuit using T Flip flop from the following state diagram.	CO6	7 Marks



UNIT-V

9	a)	Implement the following functions using a 8 x 3 PROM $F_1=\Sigma m(0,2,4,7)$, $F_2=\Sigma m(0,1,3,6)$, $F_3=\Sigma m(1,2,4,5,6)$.	CO5	7 Marks
	b)	Design a combinational using a PROM. The circuit accepts 3-bit binary number and generates its equivalent gray code.	CO3	7 Marks
		(OR)		
10	a)	Implement PAL programming table for the combinational circuit that squares a 2 bit number.	CO5	7 Marks
	b)	Explain in detail about: i) EEPROM. ii) PROM. iii) EPROM.	CO1	7 Marks

CODE No.: 16BT40101 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

CONCRETE TECHNOLOGY
[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Briefly explain test procedure of consistency of cement.	CO4	7 Marks
	b)	Briefly explain the consistent materials used in the concrete.	CO6	7 Marks
		(OR)		
2	a)	Explain the phenomenon of gain of strength of concrete with age.	CO2	7 Marks
	b)	In what way the source affects the quality of aggregate.	CO7	7 Marks

UNIT-II

3	a)	Explain the phenomenon of gain of strength of concrete with age.	CO2	7 Marks
	b)	Write Mechanical properties of concrete.	CO1	7 Marks
		(OR)		
4	a)	What are the various steps involved in concrete manufacturing.	CO2	7 Marks
	b)	Describe Quality of water used in concrete.	CO7	7 Marks

UNIT-III

5		What is the purpose of conducting non-destructive tests?	CO5	14 Marks
		(OR)		
6		Write short notes on: i) Creep. ii) Shrinkage.	CO1	14 Marks

UNIT-IV

7		Brief explain about factors affecting choice of mix design.	CO2	14 Marks
		(OR)		
8		Explain the mix design procedure of concrete as per IS code Method.	CO3	14 Marks

UNIT-V

9		Write short notes on: i) Bacterial concrete. ii) Fibre Reinforced concrete. iii) SIFCON.	CO1	14 Marks
		(OR)		
10		Distinguish between light weight concrete and high density concrete.	CO1	14 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

ENGINEERING GEOLOGY
[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1		The knowledge of geology is very essential at planning stage, design stage and construction stage of any Civil Engineering project. Justify this statement with a reference to a Dam site selection.	CO1	14 Marks
		(OR)		
2		Classify the types of weathering and its effects on construction sites.	CO2	14 Marks
		UNIT-II		
3		Distinguish the physical properties of Calcite, Ampbibole group of minerals.	CO2	14 Marks
		(OR)		
4		Classify the igneous, sedimentary and metamorphic rocks.	CO2	14 Marks
		UNIT-III		
5	a)	Discuss the procedure to take up the construction of tunnels, reservoirs and roads in folded regions.	CO1	9 Marks
	b)	A sandstone bed is dipping 1 in 4 along N35^{0}E and 1 in 2.5 along S75^{0}E. Determine the strike direction and dip direction.	CO1	5 Marks
		(OR)		
6		Evaluate the importance of geophysical investigations to determine the depth of bed rock.	CO3	14 Marks
		UNIT-IV		
7		Distinguish the intensity and magnitude scale. Discuss the causes and effects of earthquakes.	CO5	14 Marks
		(OR)		
8		Discuss the geological and natural causes of landslides. List the suitable techniques to mitigate landslides.	CO4	14 Marks
		UNIT-V		
9		Describe the effect of siltation on reservoir life. List suitable methods to mitigate the siltation for a sustainable reservoir.	CO6	14 Marks
		(OR)		
10		Summarize a geological report with all geological considerations for suitable bridge site.	CO7	14 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

ENGINEERING HYDROLOGY
[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		What are the various precautions must strictly observed while selecting site for a rain gauge? Describe how the rainfall data can be analyzed and interpreted.	CO1	14 Marks

(OR)

2	a)	List out the possible errors in measurement of rainfall. Explain the various methods used in estimating the missing data of precipitation.	CO2	7 Marks
	b)	Describe various methods used for calculation of mean precipitation over an area and mention its advantages and disadvantages.	CO2	7 Marks

UNIT-II

3		Define infiltration and explain various factors affecting infiltration. Sketch the distribution of soil moisture in the infiltration process.	CO2	14 Marks

(OR)

4		Sketch infiltration capacity curve and explain its importance. Describe the measurement of infiltration.	CO2	14 Marks

UNIT-III

5	a)	Derive an expression to determine the rate of flow through unconfined aquifer using Dupti's equation.	CO4	7 Marks
	b)	A well of 0.5m diameter penetrates fully into a confined aquifer of thickness 20m and hydraulic conductivity 8.2×10^{-4}m/s. What is the maximum yield expected from this well if the drawdown in the well is no to exceed 3m. The radius of influence may be taken as 260m.	CO3	7 Marks

(OR)

6		Describe the estimation of yield of an open well using recuperation test.	CO3	14 Marks

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.	CO2	14 Marks

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

(OR)

8		Explain the step-by-step procedure to be adopted in using Log-Pearson Type III distribution to arrive at the flood discharge of any given return period	CO5	14 Marks

UNIT-V

9		Define trap efficiency and mention various factors affecting trap efficiency.	CO6	14 Marks

(OR)

10		Classify reservoirs and mention the methods for predicting sediment distribution.	CO7	14 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

STRUCTURAL ANALYSIS-I

[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 principal planes and principal stresses? Derive the expression for principal stresses.	CO1	8 Marks
	b)	A point in a girder is subjected to 250N/mm^2 tensile and 150N/mm^2 compressive acting mutually perpendicular to each other. Using Mohr's circle, determine the stresses in a plane inclined by 60° with respect to the major stress plane.	CO2	6 Marks

(OR)

2		An element has a tensile stress of 800N/mm^2 and 400N/mm^2 acting mutually perpendicular to each other. Determine the stresses in a plane inclined at 70° with the major stress plane. Also verify the results using graphical method.	CO2	14 Marks

UNIT-II

3	a)	A beam AB of length 'l' is supported at the ends carries a point load 'W' at a distance 'a' from the left end and 'b' from the right end. Determine the deflection under the load.	CO4	10 Marks
	b)	A cantilever beam of span 4 m carries a point load 'w' at its free end. The moment of inertia of the section is 8500cm^4. If the deflection at the free end is not to exceed 0.75cm, what must be the value of W? Take G= 210GN/m^2.	CO5	4 Marks

(OR)

4		A steel girder of uniform section, 14m long is simply supported at its ends. It carries concentrated loads of 90kN and 60kN at two points 3 meters and 4.5 meters from the two ends respectively. Calculate: i) The deflection of the girder at the two points under the loads. ii) The maximum deflection.	CO4	14 Marks

UNIT-III

5		A built-up I beam with flanges having a width of 30cm and a depth of 5cm and web having a width of 2cm and a depth of 100cm is simply supported at its ends. Compute its length given when it is subjected to a load of 40kN per meter length, it deflects by 1cm. Find out the safe load, if this beam is used as a column with both ends fixed. Assume a factor of safety of 4. Use Euler's formula E = 210GN/m^2.	CO5	14 Marks

(OR)

6		From the following data of a column of circular section calculate the extreme stresses on the column section. Also find the maximum eccentricity in order that there may be no tension anywhere on the section. External diameter = 20 cm Internal diameter = 16 cm Length of the column = 4 m Load carried by the column = 200 kN Eccentricity of the load = 2.5 cm (from the axis of the column) Young's modulus = 94 GN/m^2.	CO3	14 Marks

UNIT-IV

7	A fixed beam of 6m span is loaded with point loads of 150kN at distance 2m from each support. Draw the B.M. and S.F. diagrams. Find also the maximum deflection. Take $E = 2 \times 10^8$ kN/m^2 and I = 10000 cm^4.	CO6	14 Marks

(OR)

8	A continuous beam ABCD of uniform cross – section is loaded as shown in the figure. If the support B sinks by 10mm, find the following: i) Moments at the supports. ii) Reactions at the supports. iii) Points of contraflexure. Take $E = 2 \times 10^8$ kN/m^2 and $I = 8.5 \times 10^{-5}$ m^4.	CO2	14 Marks

UNIT-V

9	In a material the principal stresses are 60MN/m^2, 48MN/m^2 and -36MN/m^2, calculate: i) Total Strain Energy. ii) Volumetric Strain Energy. iii) Shear Strain Energy. iv) Factor of safety on the total strain energy criterion if the material yields at 120 MN/m^2. Take E= 200 GN/m^2 and Poisson's ratio= 0.3.	CO2	14 Marks

(OR)

10	A 40mm x 40mm x 5mm angle is used as simply supported beam over a span of 2.4 m. It carries a load of 200N along the vertical axis, passing through the centroid of the section. Determine the resulting bending stresses on the outer corners of the section, along the middle section of the beam.	CO2	14 Marks

CODE No.: 16BT40105 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

WATER SUPPLY ENGINEERING

[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Describe the various types of wells.	CO1	7 Marks
	b)	Write short note on E-coli index.	CO1	7 Marks
		(OR)		
2		Analyze the characteristics of water and their testing procedures.	CO2	14 Marks

UNIT-II

3	a)	Enumerate the factors affecting the per capita demand of water.	CO2	7 Marks
	b)	Design the size of supply conduits, serving i) A relatively small town of 30,000 population. ii) A relatively large city with industrial establishments having a population of 6 lakhs. Also find the hydraulic gradient at which the pipelines are proposed to be laid. Assume average daily water consumption for town is 120Lpcd and for city is 270Lpcd also assume velocity is 1.2m/s and C_H is 110.	CO3	7 Marks
		(OR)		
4		What is intake structure? Explain with neat sketches, the various types of intake structures based on sources.	CO4	14 Marks

UNIT-III

5	a)	Distinguish between rapid and slow sand filters.	CO2	7 Marks
	b)	Calculate how many kg of bleaching powder with 25% available chlorine is required daily to treat 5MLD of water with 3mg/L of chlorine and suggest how much residual chlorine should be present in the water supply system.	CO7	7 Marks
		(OR)		
6	a)	Describe Chlorination and its types.	CO1	7 Marks
	b)	Estimate the alum and quick lime requirements with reactions involved to treat 100 MLD of water with raw water alkalinity of 9 MLD as $CaCO_3$ if the alum dosage adopted was 40mg/L.	CO2	7 Marks

UNIT-IV

7		Excess of iron and manganese cause ill health to the people. Describe the various methods of removing iron and manganese from groundwater to provide solutions for treatment of water.	CO6	14 Marks
		(OR)		
8	a)	Write short notes on Membrane process.	CO1	7 Marks
	b)	Enumerate the Desalination process to remove the salts present in water.	CO5	7 Marks

UNIT-V

9	a)	Briefly discuss the principles and precautions involved in laying pipe lines in the premises of buildings.	CO1	7 Marks
	b)	Draw the layout of water supply in single and multi storyed buildings.	CO1	7 Marks
		(OR)		
10		Draw a sketch and label the parts of a water supply service connection from the street main to a residential building and state the functions of each fitting.	CO7	14 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

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 how a potential divider arrangement can be used as multiplier for multi range voltmeters. Derive an expression for resistance of different sections of a 4 range voltmeter.	CO3	7 Marks
	b)	A basic D'arsonval movement with a full scale deflection of 50μA and an internal resistance of 1800Ω is available. It is to be convert into a 0-1V, 0-5V, 0-25V, and 0-125V multi range voltmeter using individual multipliers for each range. Design a suitable multiplier for each case.	CO3	7 Marks
		(OR)		
2		Discuss the following types of errors in Moving Iron instruments and also suggest a suitable compensating method to reduce the errors i) Hysteresis errors. ii) Temperature errors. iii) Error on account of stray magnetic fields. iv) Error on account of change of frequency.	CO1	14 Marks

UNIT-II

3	a)	Explain in detail about the measurement of three phase active power in a balanced load.	CO1	6 Marks
	b)	Explain the various errors raised due to connections in Electrodynamometer (EDM) type wattmeter.	CO1	8 Marks
		(OR)		
4	a)	Explain the working of a three phase energy meter with a neat sketch.	CO1	6 Marks
	b)	An energy meter is designed to make 100 revolutions for one unit of energy. Calculate the no. of revolutions made by it when connected to load carrying 40A at 230V and 0.4p.f for an hour. If it actually makes 360 revolutions, find the percentage error.	CO4	8 Marks

UNIT-III

5		Explain in detail about the testing of CT by using Silsbee's method.	CO1	14 Marks
		(OR)		
6	a)	A CT has a single turn primary and has 200 turn secondary winding. The secondary supplies a current of 5A to a non-inductive burden of 1Ω. The requisite flux is set up in the core by 80 ampere-turns in the primary winding. If the frequency of 50Hz, the cross sectional area of the core of 11cm^2 and the stacking factor is 0.91, then calculate: i) The current ratio and phase angle error of the transformer. ii) The flux density in the core. Neglect the effects of magnetic leakage, iron and copper losses.	CO4	7 Marks
	b)	Define the following terms concerned potential transformer. i) Transformation ratio. ii) Nominal ratio. iii) Turns ratio. iv) Ration correction factor.	CO1	7 Marks

UNIT-IV

7	a)	Derive the equation of balance for Hay's bridge and draw the phasor diagram for balanced conditions. Also list the advantages and disadvantages of the bridge.	CO2	7 Marks
	b)	The four arms of a Hay's bridge are arranged as follows: AB is a choke coil of unknown impedance; BC is a non-reactive resistor of 1000Ω; CD is a non-reactive resistor of 833Ω in series with a standard capacitor of 0.38μF; DA is non- reactive resistor of 16800Ω. If the supply is 50Hz determine the inductance and the resistance at the balanced conditions.	CO6	7 Marks

(OR)

8	a)	Derive the equation of balance for a Wien's bridge and draw the phasor diagram for balanced conditions. And also list the advantages and disadvantages of the bridge.	CO2	7 Marks
	b)	A four terminal resistance was measured by Kelvin's double bridge. The bridge has the following component resistances. Standard resistance = 100.3 μΩ Inner ratio- arm resistances = 200.62 Ω and 400 Ω Outer ratio-arm resistances = 200.48 Ω and 400 Ω The resistance of the link connecting the standard and unknown resistance=700 μΩ. Draw the bridge circuit and calculate the unknown resistance.	CO4	7 Marks

UNIT-V

9	a)	Draw the circuit diagram of a basic slide wire potentiometer and explain its method of standardization to measure unknown resistance.	CO1	7 Marks
	b)	Standard A basic slide wire potentiometer has a working battery voltage of 3.0V with the negligible internal resistance. The slide wire is 400Ω and its length is 200cm scale is placed along the slide wire. The slide wire has 1mm scale divisions and it is possible to read up to 1/5 of a division. The instrument is standardized with 1.018V standard cell with sliding contact at the 101.8 cm mark on scale. Calculate: i) working current. ii) the resistance of series rheostat. iii) the measurement range. iv) the resolution of instrument.	CO4	7 Marks

(OR)

10	a)	Describe in detail about successive approximation type digital voltmeters with neat block diagram.	CO1	10 Marks
	b)	Write the differences between the analog type and digital type of instruments.	CO1	4 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations October - 2020

GENERATION OF ELECTRIC POWER

[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)	Classify different types of hydro electric power stations.	CO2	8 Marks
	b)	Explain the hierarchy of a simple power system and discuss some environmental regulations to be followed for erecting power generating plants.	CO8	6 Marks
		(OR)		
2	a)	Draw flue gas diagram indicating flow path through various equipments in thermal power plant.	CO1	8 Marks
	b)	Explain the method of pulverization and explain why we need this technique?	CO2	6 Marks

UNIT-II

3	a)	Differentiate base load and peak load plants and list some power plants.	CO2	7 Marks
	b)	Explain the process of heat exchanger in nuclear power station with a neat diagram.	CO1	7 Marks
		(OR)		
4	a)	Discuss a simple gas turbine plant with a neat sketch. List the factors to be considered for erecting the gas turbine power plant.	CO1 CO5	8 Marks
	b)	Write the advantages and disadvantages of gas turbine power plant over diesel and thermal power plants	CO2	6 Marks

UNIT-III

5	a)	With a neat diagram, explain the operation of biomass plant and write its applications.	CO6	8 Marks
	b)	Discuss the impacts of renewable energy generation on environment and its sustainability.	CO7	6 Marks
		(OR)		
6		Explain the energy conversion principle by using a fuel cell. Explain the types of fuel cells and briefly discuss the operation of any one fuel cell for production of electric power.	CO6	14 Marks

UNIT-IV

7	a)	Write about different types of power factor tariff.	CO1	6 Marks
	b)	A generating station has a maximum demand of 500MW. If the annual load factor is 50% and capacity factor of 40%, then find the reserve capacity of plant.	CO4	8 Marks
		(OR)		
8	a)	Explain i) two part tariff. ii) three part tariff. iii) power factor tariff.	CO1	9 Marks
	b)	Calculate the annual bill of a consumer whose maximum demand is 100kW, p.f=0.8 lag and load factor is 60%. The tariff used was Rs 75 per kVA of maximum demand plus 15 paise per kWh consumed.	CO4	5 Marks

UNIT-V

9	a)	Design a capacitor bank for power factor improvement and obtain the value of power factor which may be attained by a consumer.	CO3	7 Marks
	b)	Discuss the various methods for power factor improvement.	CO1	7 Marks
		(OR)		
10	a)	Explain the economical and environmental benefits of cogeneration plants.	CO7	7 Marks
	b)	Why a consumer having low power factor is charged at higher rate tariff?	CO2	7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

TRANSFORMERS AND INDUCTION 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)	Develop the exact equivalent circuit of a single phase transformer. From this derive the approximate and simplified equivalent circuits of the transformer. State the various assumptions made.	CO2	8 Marks
	b)	A 30kVA, 2400/120V, 50Hz transformer has a high voltage winding resistance of 0.2Ω and leakage reactance of 0.22Ω. The low voltage winding resistance is 0.035Ω and leakage reactance is 0.012Ω. Find the equivalent winding resistance, reactance and impedance referred to HV side.	CO4	6 Marks
		(OR)		
2	a)	Discuss the effects of variation of frequency and supply voltage on iron losses of transformer. Suggest the means for minimization of iron losses.	CO1	6 Marks
	b)	A 5kVA, 500/250V, 50Hz single phase transformer gave the following readings **OC test:** 500V, 1A, 50W (LV open) **SC test:** 25V, 10A, 60W (LV shorted) Determine: i) the efficiency on full load at 0.8 lagging p.f. ii) the voltage regulation on full load at 0.8 leading p.f. iii) the efficiency on 60% of full load at 0.8 leading p.f. iv) draw the equivalent circuit referred to primary showing all the parameter values.	CO4	8 Marks

UNIT-II

3	a)	An industry prefers an autotransformer over two winding transformer for saving the conductor material and better operating efficiency. Find the saving in conductor material and the efficiency over two winding transformer.	CO5	8 Marks
	b)	Two single-phase transformers A and B with equal turns have impedances of (0.0+j4) and (0.8+j10) ohms respectively with respect to the secondary. If they operate in parallel, determine how they will share load of 120kW at 0.8 power factor lagging.	CO4	6 Marks
		(OR)		
4	a)	Give the constructional features of an autotransformer and state its merits and demerits over the two-winding transformer.	CO1	6 Marks
	b)	An auto transformer supplies a load of 5kW at 100V at unity power factor. If the applied primary voltage is 220V, Calculate the power transferred to the load (i) Inductively and (ii) Conductively.	CO4	8 Marks

UNIT-III

5	a)	With the help of circuit diagram and phasor diagrams, explain how Scott connections are used to obtain 2-phase supply from 3-phase supply mains.	CO1	8 Marks
	b)	Two T-connected transformers are used to supply a 440V, 33kVA balanced load from a 3-phase supply of 3.3kV. Calculate: (i) voltage and current rating of each coil (ii) kVA rating of the main and teaser transformer	CO4	6 Marks

(OR)

6	a)	With illustration, explain the construction and working of on-load tap changing transformer.	CO1	6 Marks
	b)	Two electric furnaces are supplied with 1-phase current at 80V from a 3-phase 11000V system by means of two 1-phase Scott-connected transformers with similar secondary windings. When the load on the main transformer is 800kW and on the teaser transformer is 500kW, determine the currents in the 3-phase lines i) at unity power factor. ii) at 0.5 p.f lagging.	CO4	8 Marks

UNIT-IV

7	a)	Sketch the torque-slip characteristics of a 3-phase induction motor indicating the starting torque, maximum torque and the operating region.	CO1	6 Marks
	b)	A 18.65 kW, 4-pole 50 Hz, 3-phase Induction motor has friction and windage losses of 2.5% of output. The full load slip is 4%. Compute the following at full load. i) rotor Cu loss. ii) rotor input. iii) shaft torque. iv) gross electromagnetic torque.	CO4	8 Marks

(OR)

8	a)	Derive the expression for the following quantities of a 3-phase Induction Motor i) full load torque. ii) maximum torque. iii) relation between rotor reactance and rotor resistance for maximum torque.	CO2	6 Marks
	b)	The power input to the rotor of a 440V, 50 cycles/second, 6-pole, 3-phase induction motor is 60kW. The rotor **emf** frequency is 90 cycles/minute. Calculate the slip, rotor speed, rotor copper loss, mechanical power developed and rotor resistance per phase if the rotor current is 60A.	CO4	8 Marks

UNIT-V

9	a)	Discuss the phenomenon of cogging in an induction motor. Describe the measures to overcome cogging in an induction motor.	CO1	7 Marks
	b)	The rotor of a 4-pole 50Hz slip-ring induction motor has a resistance of 0.25Ω per phase and runs at 1440 r.p.m at full-load. Calculate the external resistance per phase which must be added to lower the speed to 1200 r.p.m, the torque being the same as before.	CO4	7 Marks

(OR)

10	a)	An industry requires: i) more torque at reduced speed. ii) high speeds at reduced torques. Suggest and prove approximate cascading scheme (cumulatively or differential) of operation of induction motors for the above desired operations.	CO6	8 Marks
	b)	A cascade set consists of two motors A and B with 4-poles and 6-poles respectively. The motor is connected to a 50Hz supply. Find: (i) speed of the set (ii) electric power transferred to motor B when the input to the motor A is 25kW. Neglect losses.	CO4	6 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations October - 2020

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)	Describe a cone clutch and deduce an equation for the total torque transmitted with a neat sketch.	CO1	6 Marks
	b)	A conical friction clutch is used to transmit 90kW 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 375mm and the intensity of normal pressure is not to exceed 0.25N/mm^2, find the dimensions of the conical bearing surface and the axial load required.	CO2	8 Marks

(OR)

2		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 1m effective diameter. The drum and flywheel mounted on the same shaft has a mass of 2000 kg and a combined radius of gyration of 500mm. The two ends of the band are attached to pins on opposite sides of the brake lever at distances of 30mm and 120mm from the fulcrum. If a force of 200N is applied at a distance of 750mm from the fulcrum, find: i) maximum braking torque. ii) angular retardation of the drum. 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.	CO2	14 Marks

UNIT-II

3	a)	Write a short note on gyroscope.	CO1	4 Marks
	b)	The turbine rotor of a ship has a mass of 3500kg. It has a radius of gyration of 0.45m 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 100m 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.	CO3	10 Marks

(OR)

4	a)	What is the function of a flywheel? How does it differ from that of a governor?	CO1	6 Marks
	b)	A punching press is required to punch 40mm diameter holes in a plate of 15mm thickness at the rate of 30 holes per minute. It requires 6N-m of energy per mm^2 of sheared area. If the punching takes 1/10th 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.	CO3	8 Marks

UNIT-III

5		Explain the term height of the governor. Derive an expression for the height in the case of a Watt governor. What are the limitations of a Watt governor?	CO1	14 Marks

(OR)

6		In a spring loaded governor of the Hartnell type, the mass of each ball is 1kg, length of vertical arm of the bell crank lever is 100mm and that of the horizontal arm is 50mm. The distance of fulcrum of each bell crank lever is 80mm from the axis of rotation of the governor. The extreme radii of rotation of the balls are 75mm and 112.5mm. The maximum equilibrium speed is 5 per cent greater than the minimum equilibrium speed which is 360 r.p.m. Find, neglecting obliquity of arms, initial compression of the spring and equilibrium speed corresponding to the radius of rotation of 100mm.	CO3	14 Marks

UNIT-IV

7	a)	Discuss how a single revolving mass is balanced by two masses revolving in different planes.	CO1	6 Marks
	b)	A shaft carries four masses A, B, C and D of magnitude 200kg, 300kg, 400kg and 200kg respectively and revolving at radii 80mm, 70mm, 60mm and 80mm in planes measured from A at 300mm, 400mm and 700mm. The angles between the cranks measured anticlockwise are A to B 45°, B to C 70° and C to D 120°. The balancing masses are to be placed in planes X and Y. The distance between the planes A and X is 100mm, between X and Y is 400mm and between Y and D is 200mm. If the balancing masses revolve at a radius of 100mm, find their magnitudes and angular positions.	CO4	8 Marks

(OR)

8		A twin cylinder V-engine has the cylinders set at an angle of 45°, with both pistons connected to the single crank. The crank radius is 62.5mm and the connecting rods are 275mm long. The reciprocating mass per line is 1.5kg and the total rotating mass is equivalent to 2kg at the crank radius. A balance mass fitted opposite to the crank, is equivalent to 2.25kg at a radius of 87.5mm. Determine for an engine speed of 1800 r.p.m.; the maximum and minimum values of the primary and secondary forces due to the inertia of reciprocating and rotating masses	CO4	14 Marks

UNIT-V

9	a)	Explain the terms 'under damping, critical damping' and 'over damping'	CO1	6 Marks
	b)	The measurements on a mechanical vibrating system show that it has a mass of 8kg and that the springs can be combined to give an equivalent spring of stiffness 5.4N/mm. If the vibrating system have a dashpot attached which exerts a force of 40N when the mass has a velocity of 1m/s, Find : i) Critical damping coefficient. ii) Damping factor. iii) Logarithmic decrement. iv) Ratio of two consecutive amplitudes.	CO5	8 Marks

(OR)

10	a)	Define Magnification Factor or Dynamic Magnifier.	CO1	4 Marks
	b)	A mass of 10 kg is suspended from one end of a helical spring, the other end being fixed. The stiffness of the spring is 10N/mm. The viscous damping causes the amplitude to decrease to one-tenth of the initial value in four complete oscillations. If a periodic force of 150 cos 50tN is applied at the mass in the vertical direction, find the amplitude of the forced vibrations. What is its value of resonance?	CO5	10 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

FLUID MECHANICS
[Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Calculate the dynamic viscosity of oil, which is used for lubrication between the square plate of size 0.8 x 0.8 m and an inclined plane with an angle of inclination of 30^0. The weight of the square plate is 300N and its slide down the inclined plane with a uniform velocity of 3m/s. Thickness of the oil film is 1.5mm.	CO4	14 Marks
		(OR)		
2	a)	Explain the different types of fluids.	CO1	7 Marks
	b)	Distinguish between dynamic viscosity and kinematic viscosity and state their units of measurements.	CO1	7 Marks

UNIT-II

3		State the applications of orificemeter. Derive an expression for the discharge through orificemeter.	CO3	14 Marks
		(OR)		
4		Derive Bernoulli's equation for the flow of an incompressible frictionless fluid from consideration of momentum.	CO3	14 Marks

UNIT-III

5	a)	Derive an expression for head loss through pipes due to friction.	CO2	7 Marks
	b)	An old water supply distribution pipe of 250mm diameter of a city is to be replaced by two parallel pipes of smaller equal diameter having equal lengths and identical friction factor values. Find out the new diameter required.	CO6	7 Marks
		(OR)		
6		A jet of water of 20mm diameter and moving at 15 m/s strikes upon the centre of symmetrical vane. After impingement the jet gets deflected through 160^0 by the vane presuming vane to be smooth determine. The force exerted by jet on the vane.	CO2	14 Marks

UNIT-IV

7	a)	State the uses of draft tube. Describe with neat sketches different types of draft tubes.	CO1	6 Marks
	b)	A reaction turbine works at 500 r.p.m under a head of 100m. The diameter of turbine at inlet is 100cm and flow area is $0.35m^2$. The angles made by absolute and relative velocities at inlet are 15^0 and 60^0 respectively with the tangential velocity. Determine: i) The volume flow rate. ii) The power developed. iii) Efficiency. Assume whirl at outlet to be zero.	CO5	8 Marks
		(OR)		
8		Explain the following. i) Water hammer. ii) Cavitation. iii) Surge tank.	CO1	14 Marks

UNIT-V

9	Draw and discuss the operating characteristics of a centrifugal pump.	CO1	14 Marks

(OR)

10	A single acting reciprocating pump running at 30 r.p.m., delivers $0.012m^3$/sec of water. The diameter of the piston is 25cm and stroke length is 50cm. Determine: i) The theoretical discharge of the pump. ii) Co-efficient of discharge. iii) Slip and percentage slip of the pump.	CO6	14 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

MACHINE TOOLS AND MODERN MACHINING PROCESSES
[Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Outline the assumptions made in Merchant's theory.	CO6	6 Marks
	b)	The following data were obtained under orthogonal cutting conditions for machining aluminium. F_H=1500N, F_V=1000N, $\alpha=10^0$, $r=t_1/t_2=0.37$. Determine as per merchant theory, the friction and shear forces. Also determine the coefficient of friction at the tool chip interface.	CO4	8 Marks
		(OR)		
2	a)	Write a short note on different types of wear.	CO1	7 Marks
	b)	If the relationship for H.S.S tools is $VT^{1/8}=C_1$ and that for tungsten carbide tools $VT^{1/5}=C_2$ and assuming at a speed of 25m/min the tool life was 3 hours in each case, compare their cutting lives at 32m/min.	CO4	7 Marks
		UNIT-II		
3	a)	Explain the different types of lathes.	CO1	7 Marks
	b)	Explain the half nut mechanism in lathe.	CO1	7 Marks
		(OR)		
4	a)	Differentiate between Capstan and Turret lathes.	CO1	7 Marks
	b)	Discuss multi spindle automatic lathes.	CO1	7 Marks
		UNIT-III		
5	a)	Explain the principle of operation involved in shaper.	CO1	4 Marks
	b)	Design and Narrate the crank and slotted lever quick return mechanism in shaper.	CO3	10 Marks
		(OR)		
6	a)	Describe the principle involved in drilling machine.	CO1	4 Marks
	b)	Explain in detail the various operations performed on drilling machine.	CO1	10 Marks
		UNIT-IV		
7	a)	Analyze the need of a grinding wheel.	CO2	7 Marks
	b)	Explain about horizontal external cylindrical grinding.	CO1	7 Marks
		(OR)		
8	a)	Give a brief classification of milling machines.	CO2	8 Marks
	b)	Distinguish between up milling and down milling process.	CO1	6 Marks
		UNIT-V		
9	a)	Explain the important factors considered during the selection of modern machining process for a given job.	CO5	7 Marks
	b)	Classify the modern machining processes.	CO5	7 Marks
		(OR)		
10	a)	Explain the Electro chemical machining process in detail	CO5	8 Marks
	b)	List the advantages and limitations of ECM.	CO5	6 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

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.	CO1	7 Marks
	b)	Discuss the working of two stroke cycle petrol engine with help of neat sketches.	CO1	7 Marks
		(OR)		
2	a)	Distinguish between SI Engines and CI Engines.	CO1	7 Marks
	b)	Explain the working principle of four stroke SI engine with neat sketch	CO1	7 Marks

UNIT-II

3	a)	What is diesel knock? How to minimize knocking in CI engine?	CO2	7 Marks
	b)	Define Cetane number and briefly explain the method of evaluating Cetane number for given fuel.	CO2	7 Marks
		(OR)		
4	a)	What is the reference fuels used for rating of CI engine fuels? Discuss.	CO1	7 Marks
	b)	Explain with figure various types of combustion chambers used in CI engines.	CO1	7 Marks

UNIT-III

5	a)	How do you measure air consumption rate of IC engine?	CO5	7 Marks
	b)	A four stroke four cylinder diesel engine running at 300 r.p.m produces 250kW of brake power. The cylinder dimensions are 30cm bore and 25cm 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.	CO4	7 Marks
		(OR)		
6	a)	Define the terms: brake power, piston speed, brake mean effective pressure and brake thermal efficiency.	CO1	7 Marks
	b)	A two stroke two cylinder engine runs with speed of 3000 r.p.m and fuel consumption of 5 litres/hr. The fuel has specific gravity of 0.7 and air-fuel ratio is 19. The piston speed is 500m/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	CO3	7 Marks

UNIT-IV

7	a)	How do you classify the combustion fuels and explain gaseous fuels	CO1	7 Marks
	b)	The gravimetric analysis of a sample of coal is given as 82%C, 10% H_2 and 8% ash. Calculate: i) The stoichiometric A/F ratio. ii) The analysis of the products by volume.	CO2	7 Marks
		(OR)		

8	a)	Describe with the help of neat sketch the Junkers gas calorimeter used for determination of heating values	CO1	7 Marks
	b)	Calculate the stoichiometric air-fuel ratio for the combustion of a sample of dry anthratic of the following composition by mass: Carbon (C) = 88% Hydrogen(H_2) = 4% Oxygen(O_2) = 3.5% Nitrogen(N_2) = 1% Sulphur (S) = 0.5% Ash = 3% If 30% excess air is supplied determine: i) Air-Fuel ratio. ii) Wet dry analysis of the products of combustion by volume.	CO5	7 Marks

UNIT-V

9	a)	With the help of neat sketch, explain the working of vane type compressor. Also show the compression process in P-V diagram	CO1	7 Marks
	b)	A Vaned compressor handles free air of 0.6 m^3/s at 1 bar and compresses to 2.3 bar. There occurs 30% reduction in volume before the back flow occurs. Determine the indicated power required and isentropic efficiency.	CO2	7 Marks

(OR)

10	a)	List out different type of Air Compressors.	CO1	7 Marks
	b)	Explain working of centrifugal compressor with neat sketch.	CO1	7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

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)	Draw the circuit of a balanced modulator. Give the mathematical analysis to explain how and why only the carrier is suppressed in a balanced modulator.	CO5	7 Marks
	b)	With neat block diagram, explain the generation of SSB wave by phase discrimination method.	CO1	7 Marks
		(OR)		
2	a)	With the canonical representation of band pass signal and derive the expression for time function of SSBSC waveform.	CO5	7 Marks
	b)	Explain the principle of ring modulator to produce DSBSC signal and why this ring modulator is known as double balanced modulator.	CO1	7 Marks

UNIT-II

3	a)	Explain the operation of limiter circuit in FM demodulation.	CO1	8 Marks
	b)	A sinusoidal wave of amplitude 10volts and frequency of 1 kHz is applied to an FM generator that has a frequency sensitivity constant of 40 Hz/volt. Determine the frequency deviation and modulating index.	CO4	6 Marks
		(OR)		
4	a)	Explain the principle of Armstrong method to generate FM modulated wave.	CO1	8 Marks
	b)	Design Armstrong FM generator for the generation of WBFM signal with Δf = 75kHz and f_c = 100MHz, using the narrow band carrier as 100kHz and second carrier as 9.5MHz. Find the suitable multiplying factors. Assume the message signal is defined in the range, 100Hz-15KHz.	CO4	6 Marks

UNIT-III

5	a)	How is FM superior to AM with reference to noise?	CO2	8 Marks
	b)	An amplifier with 10dB nose figure and 4dB power gain is cascaded. With a second amplifier has a 1OdB power gain and 1OdB noise figure. What is the overall noise figure and power gain?	CO3	6 Marks
		(OR)		
6	a)	Prove that narrow band FM offers no improvement in SNR over AM.	CO2	8 Marks
	b)	An AM receiver operates with a tone modulation, and the modulation index ma=0.6. The message signal is 60Sin(5000Πt). Calculate the output SNR relative to the baseband performance.	CO3	6 Marks

UNIT-IV

7	a)	Draw and explain to block diagram of variable reactance type FM transmitter.	CO1	7 Marks
	b)	Discuss the factors influencing the choice of the intermediate frequency of radio receivers.	CO2	7 Marks
		(OR)		
8	a)	Explain the limitations of TRF receivers.	CO1	7 Marks
	b)	What can be done to improve the overall limiting performance of an FM receiver? Explain the operation of the double limiter and also AGC in addition to a limiter.	CO2	7 Marks

UNIT-V

9	a)	For a pulse amplitude modulated transmission of voice signal having maximum frequency equal to f_m=5kHz, calculate the transmission bandwidth. It is given that the sampling frequency f_s=10 kHz and the pulse duration t=0.2T_s	CO6	7 Marks
	b)	Describe the synchronization procedure for PAM, PWM and PPM signals.	CO1	7 Marks
		(OR)		
10	a)	Discuss about the spectra of PWM and PDM signals.	CO1	7 Marks
	b)	For a pulse amplitude modulated transmission of voice signal having maximum frequency equal to f_m=3kHz, calculate the transmission bandwidth. It is given that the sampling frequency f_s=8 kHz and the pulse duration t=0.1T_s.	CO6	7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-16) Supplementary Examinations October - 2020

DIGITAL IC APPLICATIONS

[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)	Sketch the circuit diagram for basic CMOS gate. Explain its operation.	CO1	7 Marks
	b)	Develop an equivalent circuit for a CMOS NAND gate using single Pole, double throw relays.	CO3	7 Marks
		(OR)		
2	a)	Assess the different factors considered in TTL/CMOS interfacing.	CO4	7 Marks
	b)	Draw the circuit diagram of 2-input LS-TTL NAND gate and explain its operation.	CO1	7 Marks

UNIT-II

3	a)	Differentiate initial and always statements.	CO2	7 Marks
	b)	Explain Behavioral design elements of Verilog HDL.	CO1	7 Marks
		(OR)		
4	a)	Differentiate program structure of Verilog HDL and any other procedural language with a suitable example.	CO2	7 Marks
	b)	Discuss the types and constants of Verilog HDL.	CO1	7 Marks

UNIT-III

5	a)	Design a 32x1 multiplexer by sing 74 x 151 IC and explain its operation.	CO3	7 Marks
	b)	Explain the function of 74 x 86 Exclusive-OR gates, 74 x 280 9-Bit Parity Generator Circuits.	CO4	7 Marks
		(OR)		
6	a)	Appraise the features of combinational multiplier and its Verilog HDL code.	CO6	7 Marks
	b)	Using two 74*138 decoders design a 4 to 16 DECODER? And write the Verilog HDL code.	CO4	7 Marks

UNIT-IV

7	a)	Draw the logic diagram of 74 x 74 IC and explain its operation.	CO1	7 Marks
	b)	Design an 8 bit synchronous binary counter with serial enable control.	CO6	7 Marks
		(OR)		
8	a)	Design a self correcting 4-bit, 4-state ring counter with a single circulating 1.	CO6	7 Marks
	b)	Discuss in detail about the operation of 4-bit synchronous binary counter with the required diagram and waveforms.	CO1	7 Marks

UNIT-V

9	a)	List and appraise the two dimensional decoding techniques.	CO5	7 Marks
	b)	Develop the internal structure of synchronous SRAM and explain the operating modes of SSRAM.	CO3	7 Marks
		(OR)		
10	a)	Suggest the design process of developing 256 x 8 ROM using a 4 x 4 binary multiplier.	CO5	7 Marks
	b)	Develop MOS transistor memory in ROM and explain the operation.	CO3	7 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

ELECTROMAGNETIC THEORY AND TRANSMISION LINES

[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)	Formulate the expression for capacitance using Coulombs Law or Gauss Law for the following capacitors. i) Parallel Plate Capacitor. ii) Coaxial Capacitor. iii) Spherical Capacitor.	CO3	9 Marks
	b)	Suggest a method to obtain Resistance and Capacitance of a uniform conductor.	CO6	5 Marks
		(OR)		
2	a)	Formulate expressions for force (i) due to a moving charged particle in a B field (ii) on a current element in an external B field and (iii) between two current elements.	CO3	8 Marks
	b)	Planes 2 = 0 and z = 4 carry current K = $-10a_x$ A/m and K = $10a_x$ A/m, respectively. Determine H at (1, 1, 1) and (0, –3, 10) and suggest the plane at which the field is maximum.	CO6	6 Marks

UNIT-II

3	a)	Derive Maxwell's curl equation from Ampere's law and express the equations in phasor form for time harmonic fields.	CO2	8 Marks
	b)	Find the total current in a circular conductor of radius 4mm, if the current density varies according to $J=10^4/r$ A/m^2.	CO4	6 Marks
		(OR)		
4	a)	Two coils A and B with 800 and 1200 turns respectively are having common magnetic circuit. A current of 0.5Amp. in coil A produces a flux of 3mWb and 80% of flux links with coil B. Calculate L_1,L_2 and M.	CO4	7 Marks
	b)	Derive the Maxwell's equation based on Ampere's circuit law for a Time Varying Fields.	CO2	7 Marks

UNIT-III

5	a)	Define Polarization of a Uniform Plane Wave. Illustrate different types of polarizations with the necessary expressions. Explain the terms "Linear polarization", "Elliptical polarization" and "Circular Polarization".	CO1	7 Marks
	b)	A uniform plane wave propagating in a medium has $E = 2e^{-\alpha z} \sin(10^8 t - \beta z)\, a_y$ V/m. If the medium is characterized by ε_r=1, μ_r=20 and σ=3mhos/m, find α, β and H.	CO4	7 Marks
		(OR)		
6	a)	Define and formulate the expressions for the following. i) Total Internal Reflection. ii) Surface Impedance.	CO1	8 Marks
	b)	In a nonmagnetic medium $E=4 \sin(2\pi \times 10^7 t - 0.8x)\, a_z$ V/m, find: i) $\varepsilon r, \eta$. ii) The time-average power carried by the wave. iii) The total power crossing 100cm^2 of plane $2x + y = 5$.	CO4	6 Marks

UNIT-IV

7	a)	Develop the condition for distortionlessness and Minimum Attenuation.	CO5	8 Marks
	b)	A transmission line has a characteristic impedance of (683-j138).The propagation constant is ((0.0074+j0.0356)per Km. Determine the values of R and L of this line if the frequency is 1000Hz.	CO4	6 Marks

(OR)

8	a)	Assess the relation between the primary constants in terms of secondary constants.	CO5	8 Marks
	b)	A transmission line operating at 500MHz has Zo=80 Ω, α=0.04Np/m, β=1.5 rad/m. Find the line parameters R, L, G and C.	CO4	6 Marks

UNIT-V

9	a)	Derive the expression for the input impedance of a transmission line of length L.	CO2	7 Marks
	b)	Illustrate and formulate the expressions used for the development of Smith Chart.	CO1	7 Marks

(OR)

10	a)	Derive the expressions for reflection coefficient and VSWR.	CO2	8 Marks
	b)	Calculate the characteristic impedance of a transmission line if the following measurements have been made on the line Zoc=550 ∠-60° Ω and Zsc=500 ∠30°Ω.	CO4	6 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

PULSE AND DIGITAL CIRCUITS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

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

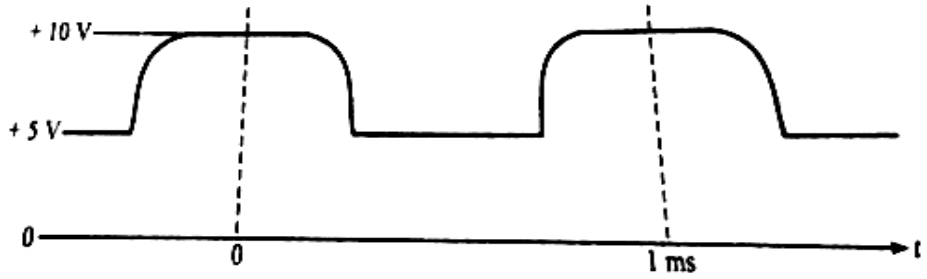
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

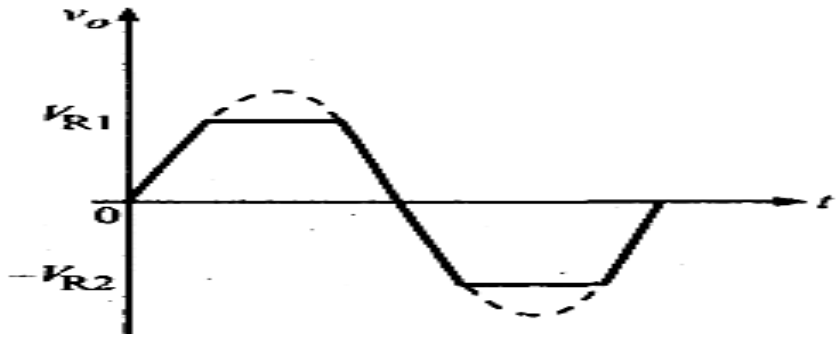
1	a)	Obtain the response of RC High Pass circuit for a square wave input for different Time Constants and evaluate %Tilt.	CO1	8 Marks
	b)	Justify how a Low-pass RC circuit acts as an Integrator.	CO2	6 Marks
		(OR)		
2	a)	Explain in detail about attenuators.	CO1	7 Marks
	b)	Describe how a Compensated Attenuator improves the unsatisfactory response of a simple Attenuator.	CO2	7 Marks

UNIT-II

3	a)	Design a clipping circuit with ideal components, which can give the following waveform shown in figure below for a sinusoidal input. Assume necessary data.	CO3	6 Marks



	b)	Explain the operation of emitter coupled clipper with a neat sketch.	CO1	8 Marks
		(OR)		
4	a)	Design a clipper circuit which produces the following output and Assume the input applied voltage is 50v (P-P), V_{R1}=10V, V_{R2}=-10V and assume Diode is Ideal.	CO3	6 Marks



	b)	Discuss in detail about negative Peak Clamper with neat sketches.	CO1	8 Marks

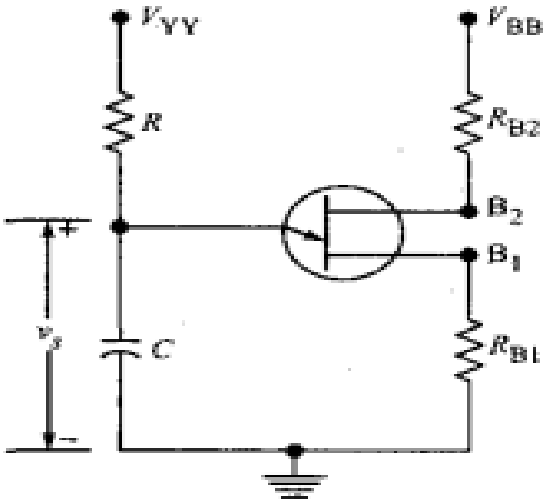
UNIT-III

5	a)	Identify and Apply appropriate multivibrating technique to convert any signal to square signal, using two transistors.	CO5	7 Marks
	b)	Determine the frequency of oscillations and duty cycle for an Astablemultivibrator with R_1 = 15 kΩ, R_2=10kΩ, C_1= 0.01μF and C_2= 0.015μF.	CO4	7 Marks
		(OR)		

6	a)	Sketch the output waveform of a Schmitt trigger circuit for sine wave input of 12V peak to peak if UTP = 5V and LTP = 3V.	CO4	8 Marks
	b)	Apply an appropriate multivibrating technique that fits to trigger a vending machine and make a comment on it.	CO5	6 Marks

UNIT-IV

7	a)	In the UJT Sweep circuit, V_{BB}=20V, V_{YY}=50V, R=5KΩ, R_{B1}, R_{B2}=0Ω and C = 0.001μF. Find (i) the amplitude of the sweep signal (ii) the slope and displacement errors (iii) the duration of the sweep.	CO4	6 Marks



	b)	Describe the generation of sweep signal from an exponential sweep circuit.	CO1	8 Marks

(OR)

8	a)	Explain the generation of Sweep waveform using UJT.	CO1	7 Marks
	b)	Compare Miller and Bootstrap Sweep generators.	CO2	7 Marks

UNIT-V

9	a)	In a four diode sampling gate, obtain larger value of $(V_c)_{min}$ that improves linearity in addition to safety.	CO6	7 Marks
	b)	Sketch and explain the working of CMOS inverter.	CO1	7 Marks

(OR)

10	a)	In a bidirectional two diode sampling gate, obtain larger value of $(V_c)_{min}$ that improves linearity in addition to safety.	CO6	6 Marks
	b)	Explain the operation of Emitter Coupled Logic.	CO1	8 Marks

CODE No.: 16BT40501 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

COMPUTER GRAPHICS

[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)	Demonstrate the Midpoint circle algorithm by determining positions along with the circle octant in the first quadrant from X = 10 to Y=Y where Radius = 10.	CO5	10 Marks
	b)	Differentiate Raster-scan display and Random-scan display methods.	CO2	4 Marks
		(OR)		
2	a)	Give short note on Direct view storage tubes.	CO2	4 Marks
	b)	Demonstrate Midpoint ellipse algorithm.	CO5	10 Marks

UNIT-II

3	a)	Explain Transformation matrix representations on: i) Translation. ii) Scaling. iii) Rotation transformation techniques.	CO1	7 Marks
	b)	Explain about the Shear and Composite transformations.	CO1	7 Marks
		(OR)		
4	a)	Show that the two successive Rotations about the origin are commutative.	CO6	7 Marks
	b)	Develop Scan-line polygon fill algorithm for a specified area.	CO4	7 Marks

UNIT-III

5	a)	Define Polygon. Explain different types of polygons and various approaches used to represent polygon.	CO1	7 Marks
	b)	Differentiate Beizer curves and surfaces with relevant examples.	CO2	7 Marks
		(OR)		
6	a)	Explain Hermite interpolation method of curve generations.	CO1	7 Marks
	b)	Explain the procedure for generation of various surfaces and curves using B-spline method.	CO1	7 Marks

UNIT-IV

7	a)	Write short notes on: i) Parallel projections. ii) Perspective projections.	CO3	8 Marks
	b)	Differentiate Oblique and Orthographic parallel projections.	CO2	6 Marks
		(OR)		
8	a)	Describe about 3-Dimensional Scaling transformation.	CO1	6 Marks
	b)	Derive the 3-Dimensional transformation matrix for scaling an object by scaling factor s in a direction defined by the directional angles α, β, γ.	CO3	8 Marks

UNIT-V

9	a)	Define the following Surface detection methods. i) Back-face detection. ii) Scan-line detection. iii) BSP tree method.	CO1	8 Marks
	b)	Define Rendering. State the stages of rendering in creating shadows.	CO1	6 Marks
		(OR)		
10	a)	Explain in detail about Depth-sorting visible surface detection method.	CO1	8 Marks
	b)	Write a program to display an Octree representation of an object so that hidden-surfaces are removed.	CO3	6 Marks

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CODE No.: 16BT40502 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

DATABASE MANAGEMENT SYSTEMS

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

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

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Discuss about different types of Data Models.	CO1	7 Marks
	b)	Write in detail about the concept design with the ER model.	CO2	7 Marks
		(OR)		
2	a)	Explain in detail how to translate an ER diagram into a collection of tables with associated constraints.	CO4	7 Marks
	b)	What are the disadvantages of traditional file systems? Explain clearly.	CO1	7 Marks
		UNIT-II		
3	a)	Explain about different types of integrity constraints.	CO1	7 Marks
	b)	Discuss about the logical database design.	CO2	7 Marks
		(OR)		
4	a)	Discuss about Expressive Power of Algebra in detail.	CO1	7 Marks
	b)	Explain about Integrity Constraints over Relations.	CO1	7 Marks
		UNIT-III		
5	a)	Describe logical connectives of SQL.	CO1	7 Marks
	b)	Illustrate outer joins with examples.	CO5	7 Marks
		(OR)		
6	a)	Discriminate 4NF and 5NF with suitable example.	CO2	7 Marks
	b)	Describe Active Databases in detail.	CO1	7 Marks
		UNIT-IV		
7	a)	Discuss how to implement Atomicity and Durability.	CO2	7 Marks
	b)	Explain ACID properties and Illustrate them through examples.	CO4	7 Marks
		(OR)		
8	a)	Discuss the various anomalies associated with interleaved execution.	CO3	7 Marks
	b)	How to do testing for serializability? Explain.	CO1	7 Marks
		UNIT-V		
9	a)	Write in detail about Hash based Indexing and Tree based Indexing.	CO1	7 Marks
	b)	Compare I/O costs for all file organizations.	CO2	7 Marks
		(OR)		
10	a)	Discuss about B tree index files.	CO1	7 Marks
	b)	Compare and contrast B trees with B+ trees.	CO2	7 Marks

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CODE No.: 16BT41001 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

INDUSTRIAL INSTRUMENTATION – I
[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)	Analyze different Force sensing mechanisms, summarize them and give three different units of Force.	CO2	7 Marks
	b)	Define Dynamic Torque. With a neat sketch, explain the construction and working principle of torque measurement based on Magnetostrictive principle.	CO1	7 Marks
		(OR)		
2	a)	Select an appropriate load cell based sensing mechanism for measurement of force that is a non contact type. Justify your sensor selection and explain its principle using a neat sketch.	CO5	7 Marks
	b)	A shaft of diameter 2cm is connected to cradle of length 3cm. A force of 5Kg is applied at the end of the cradle. i) Calculate the toque generated on shaft. ii) What is the amount of torque in Newton's required to rotate the shaft of 2Kg weight. iii) If the shaft is applied a torque of 5Nm what is the force in kg created at the end of the cradle.	CO4	7 Marks

UNIT-II

3	a)	Analyze Moving coil type and Moving Iron type velocity sensors. Summarize and give three different units for velocity.	CO2	7 Marks
	b)	What is Relative Acceleration? With a neat sketch, explain the construction of Null-balance type accelerometer and how it can be used for measurement of acceleration.	CO1	7 Marks
		(OR)		
4	a)	Design a sensing mechanism to measure acceleration by using optical technique and explain its working.	CO3	7 Marks
	b)	Select an appropriate sensor for measurement of velocity which consumes little or no power and explain its principle.	CO5	7 Marks

UNIT-III

5	a)	Identify an appropriate sensing mechanism for measurement of medium pressure. Justify your sensor selection and explain how this works with a neat sketch.	CO5	7 Marks
	b)	What is Absolute pressure? With a neat sketch, explain Thermal conductivity Gage	CO1	7 Marks
		(OR)		
6	a)	With a neat sketch, explain Knudsen gage and Momentum transfer gage.	CO1	7 Marks
	b)	Analyze different types of manometers, summarize them and give three different units of the quantity they measure.	CO2	7 Marks

UNIT-IV

7	a)	Analyze thermopile and a thermocouple. Sketch both and list the merits and demerits of each.	CO2	7 Marks
	b)	Select an appropriate sensor for measurement of high range of temperatures while providing high linearity and accuracy. Justify your sensor selection and explain how this sensor works.	CO5	7 Marks

(OR)

8	a)	Name the junctions of a thermocouple. What is the need for cold junction compensation in a thermocouple? Explain the ways of achieving cold junction compensation.	CO1	7 Marks
	b)	Analyze 2-Wire, 3-Wire and 4-Wire lead resistance methods.	CO2	7 Marks

UNIT-V

9	a)	Analyze different temperature sensors	CO2	7 Marks
	b)	List the different types of radiation thermometers and explain Optical pyrometers.	CO1	7 Marks

(OR)

10	a)	Select an appropriate sensor for measurement of very high temperature. Justify your sensor selection and explain how this sensor works with a neat sketch.	CO5	7 Marks
	b)	Explain about calibrators and simulators for temperature sensors.	CO1	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

COMPUTER ARCHITECTURE AND ORGANIZATION

[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 performance equation of a computer. Discuss how processor time 'T' can be reduced.	CO2	7 Marks
	b)	Construct a SRAM cell with CMOS transistors.	CO1	7 Marks
		(OR)		
2	a)	Show the organization of bit cells in a memory chip with 16 locations of 8 bits each.	CO3	7 Marks
	b)	Cache memory enhances the performance of the processor. Justify.	CO2	7 Marks
		UNIT-II		
3	a)	Discuss the similarities and differences between CALL & RET and PUSH & POP.	CO1	6 Marks
	b)	With the help of Timing diagram, illustrate the sequence of operations carried out by 8085 microprocessor while executing the instruction SUB M.	CO2	8 Marks
		(OR)		
4		Illustrate the internal architecture of 8085 microprocessor.	CO1	14 Marks
		UNIT-III		
5	a)	Write an 8085 program to perform subtraction of two bytes by accessing data from memory and store the result in memory.	CO3	7 Marks
	b)	Compare Peripheral mapped I/O with Memory mapped I/O.	CO2	7 Marks
		(OR)		
6	a)	Design a memory system for 8085 such that it contains 2KB of EPROM and 2 KB of RAM with starting address 0000H and 6000H respectively.	CO3	10 Marks
	b)	A water level control system is to be designed for an overhead tank. Whenever the water level goes beyond the Upper Limit (UL), the motor should be turned OFF. Ensure that the water never overflows. Similarly, the motor should be turned ON whenever the water level goes below the Lower Limit (LL). Identify appropriate interrupts of 8085 processor for handling this situation. Justify your answer.	CO4	4 Marks
		UNIT-IV		
7		Design a 4-bit arithmetic circuit and explain it's operation with suitable examples.	CO3	14 Marks
		(OR)		
8	a)	Show how computer registers are connected to a common bus using Multiplexers.	CO5	8 Marks
	b)	Compare CISC and RISC processors.	CO2	6 Marks
		UNIT-V		
9		Develop an algorithm to perform binary multiplication. Also suggest the hardware required.	CO5	14 Marks
		(OR)		
10	a)	Demonstrate the advantages of signed 2's complement addition and subtraction over signed magnitude addition and subtraction.	CO2	7 Marks
	b)	Define instruction Hazard. Discuss an efficient method to overcome instruction hazard.	CO6	7 Marks

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CODE No.: 16BT41202 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

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)	How Java supports platform independency?	CO1	4 Marks
	b)	Develop a java program using any Three String library functions.	CO3	5 Marks
	c)	Compare and contrast overloading and overriding methods in Java.	CO2	5 Marks
		(OR)		
2	a)	Explain the this keyword and garbage collection	CO1	5 Marks
	b)	Design an application that finds the smallest of several integers. Assume that the first value read specifies the number of values to input the user.	CO3	9 Marks

UNIT-II

3	a)	Why subclass reference variables cannot refer to a super class object? Justify.	CO4	4 Marks
	b)	Design an interface queue with the following methods. i) enqueue and dequeue. ii) qfull and qempty.	CO3	10 Marks
		(OR)		
4	a)	What is a package? Create a simple package and describe its usage.	CO5	7 Marks
	b)	List types of inheritances in Java. Write each of them in detail.	CO1	7 Marks

UNIT-III

5		What are built in exceptions? Create a java program to generate and catch an Index out of Bounds Exception, and with an example, prove that always finally block will execute.	CO3	14 Marks
		(OR)		
6	a)	Explain about Thread Creation in Java. What is Multi Threading?	CO1	3 Marks
	b)	What is multitasking? Is multithreading a form of multitasking?	CO1	11 Marks

UNIT-IV

7		Create an anonymous inner class for handling mouse entered event into an Applet.	CO5	14 Marks
		(OR)		
8	a)	With an example, explain how will pass parameters to an Applet.	CO4	7 Marks
	b)	Design a class to model a ball. Add a color property to the balls. Have functions to move the balls randomly.	CO6	7 Marks

UNIT-V

9		Write about Events, Event Sources and Event Classes.	CO1	14 Marks
		(OR)		
10		What is a servlet? Write a servlet which retrieves the data from database.	CO1, CO3	14 Marks

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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 October – 2020

SOFTWARE 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)	List and explain about seven general principles in software engineering.	CO1	7 Marks
	b)	Distinguish between Scrum and Lean Software Development in Agile Modeling.	CO2	7 Marks
		(OR)		
2	a)	Inspect between management myth and customer myth.	CO2	7 Marks
	b)	Explain Extreme Programming (XP) in Software Process.	CO1	7 Marks

UNIT-II

3	a)	Discuss how an engineer responsible for drawing up a system requirements specification might keep track of the relationships between functional and non-functional requirements.	CO5	7 Marks
	b)	Develop a sequence diagram showing the interactions involved when a student registers for a course in a university. Courses may have limited enrollment, so the registration process must include checks that places are available. Assume that the student accesses an electronic course catalog to find out about available courses.	CO4	7 Marks
		(OR)		
4	a)	Discuss the steps in creating a Data flow Model in Flow Oriented Modeling	CO3	5 Marks
	b)	How is SRS for a development project arrived at? What minimum features are required to be present in a good SRS?	CO1	9 Marks

UNIT-III

5	a)	Explain about the various design concepts considered during design.	CO1	8 Marks
	b)	Discuss the metrics for improving Software quality.	CO6	6 Marks
		(OR)		
6		List and explain two metrics which are used to measure the software in detail. Discuss clearly the advantages and disadvantages of these metrics.	CO4	14 Marks

UNIT-IV

7		Explain all the Test strategies that can be used to test for conventional software.	CO1	14 Marks
		(OR)		
8	a)	Discuss eight testing strategies issues.	CO6	8 Marks
	b)	Explain in detail about any one control structure testing.	CO1	6 Marks

UNIT-V

9		Explain the risk strategies of Reactive and Proactive. Also explain different types of risks involved in the software.	CO4	14 Marks
		(OR)		
10	a)	Explain the Software Reengineering process model with its activities	CO1	10 Marks
	b)	Compare and contrast between code reconstructing and data reconstructing	CO2	4 Marks

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CODE No.: 16BT51202 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations October – 2020

OBJECT ORIENTED ANALYSIS AND DESIGN

[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)	Define modeling.	CO1	2 Marks
	b)	List and explain principles of modeling.	CO1	12 Marks
		(OR)		
2	a)	Define UML. List various basic building blocks of UML.	CO1	7 Marks
	b)	Outline structural and behavioral diagrams of UML in detail.	CO1	7 Marks
		UNIT-II		
3	a)	Compare and contrast class diagram and object diagram.	CO2	7 Marks
	b)	Analyze and explain how to control the visibility of elements present in package.	CO2	7 Marks
		(OR)		
4	a)	List various owned elements in package diagram.	CO1	7 Marks
	b)	Compare and contrast various adornments in dependency relationship.	CO2	7 Marks
		UNIT-III		
5	a)	Apply modeling techniques of use case diagram for ATM application.	CO3	7 Marks
	b)	Model use case diagram for home automation system.	CO3	7 Marks
		(OR)		
6	a)	Apply modeling techniques of sequence diagram for School monitoring system.	CO3	7 Marks
	b)	Model sequence diagram for communication setup in mobile.	CO3	7 Marks
		UNIT-IV		
7		Discuss in detail about State machines along with simple state, nested states, concurrent states, different events and action within each state for POS (Point of Sale) system.	CO4	14 Marks
		(OR)		
8		Explain communication problems between thread states and thread lifecycle in state chart diagram.	CO4	14 Marks
		UNIT-V		
9	a)	Design component diagram for online shopping.	CO5	7 Marks
	b)	Design deployment diagram for client server processing.	CO5	7 Marks
		(OR)		
10	a)	Design component diagram for home automation system.	CO5	7 Marks
	b)	Design deployment diagram for home automation system.	CO5	7 Marks

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CODE No.:10BT50103 SVEC-10

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC10) Supplementary Examinations November - 2019

ENGINEERING HYDROLOGY

[Civil Engineering]

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

Answer any FIVE questions
All questions carry equal marks

1. a) Describe the hydrologic cycle with the help of neat sketch.
b) What do you understand by precipitation?

2. a) List out different types of self recording rain ranges. Explain the working of any one of them with the help of neat sketch.
b) What is a rainfall hyetograph? How is it derived from a given rainfall mass curve?

3. a) Define Ø-index and W-index and bring out the difference between them. How is Ø -index determined from the rainfall hyetograph?
b) What are the factors to be considered in locating a stream gauging site?

4. a) Explain the various physiographic factors which affect runoff.
b) What is a flow duration curve? How is it constructed?

5. a) What is a unit hydrograph? Explain the various assumptions involved in the unit hydrograph theory.
b) Given the ordinates of a 4-h unit hydrograph as below derive the ordinates of a 12-h unit hydrograph for the same catchment.

Time (h)	0	4	8	12	16	20	24	28	32	36	40	44
Ordinate of 4-h UH	0	20	80	130	150	130	90	52	27	15	5	0

6. a) What are the methods of estimating design flood? What are their limitations?
b) The annual flood peak of a stream is estimated to have 50 year and 100 year floods of 2400m^3/s and 2730m^3/s respectively. What is 200 year flood for the same stream?

7. a) Explain briefly the following terms as used in ground water flow studies.
i) Specific yield. ii) Porosity. iii) Specific retention.
b) Distinguish between:
i) Aquifer and Aquifuge. ii) Confined aquifer and water table aquifer.
iii) Aquiclude and Aquitard.

8. a) Explain the recuperation test with a neat sketch.
b) Write a note on:
i) DAD curves.
ii) Mass curve and its use.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC10) Supplementary Examinations November - 2019

SOIL MECHANICS

[Civil Engineering]

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

Answer any FIVE questions
All questions carry equal marks

1. a) What are the clay minerals? How does clay adsorb water? Explain.
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 - 17.6 kso/m^3.

2. a) Explain the salient features of Indian Standard Classification system.
b) The Atterberg limits of a clay sample are, liquid limit = 60**%**, plastic limit = 45**%** and natural moisture content = 50%.
Determine i) liquidity index ii) consistency index iii) plasticity index.

3. a) What are the various factors that affect the permeability of a soil?
b) A constant head permeability test was performed on a medium dense sand of diameter 6 cm and height 15 cm. The water was allowed to flow under a head of 60 cm. The permeability of sand was 4×10^{-2} cm/sec. Determine:
i) discharge (cc/min)
ii) the seepage velocity assuming the void ratio as 0.64.

4. a) Explain the construction of phreatic line in an earth dam with horizontal filter.
b) The horizontal and vertical permeabilities of an embankment are 4×10^{-6} cm/sec and 2×10^{-6} cm/sec respectively. The full reservoir level is 20 m above the downstream filter. The flow net constructed for the transformed section of the dam consists of 4 flow channels and 15 equipotential drops. Estimate the seepage loss per metre length of the dam.

5. a) Using Boussinesq's expression , derive the expression for vertical stress at depth 'z' under the centre of a particular area of radius 'a' loaded uniformly with a load 'q' per unit area at the surface of the soil mass.
b) A line load of 90 kN/m run extends to a long distance. Determine the intensity of vertical stress at a point 1.5m below the surface.
i) Directly under the line load and
ii) At a distance 1m perpendicular to the line. Use Boussinesq's theory.

6. a) What is the effect of compaction on engineering properties of soils?
b) How to measure the water content of the filed soil with the help of Proctor needle method? Discuss in detail.

7. Explain briefly Terzaghi's theory of one dimensional consolidation and derive its equation.

8. a) Discuss the relative advantages and disadvantages of the direct shear test and the triaxial compression test. How are triaxial tests classified based on drainage conditions?
b) A series of undrained shear box tests (area of box = 3600mm^2) were carried out on a soil with the following results.

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.

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CODE No.:10BT50403 SVEC-10

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC10) Supplementary Examinations November - 2019

LINEAR IC APPLICATIONS

[Electronics and Communication Engineering]

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

Answer any FIVE questions
All questions carry equal marks

1. a) Discuss about dc analysis of Dual input balanced output amplifier
b) Derive the output voltage of an op - amp based differential amplifier.

2. a) Write short notes on frequency compensation technique.
b) Explain any 4 dc characteristics of op amplifier.

3. a) Draw a neat circuit diagram of a.c non - inverting amplifier with single supply. Explain its working with its input output waveforms.
b) For a non - inverting single supply AC amplifier $R_{in} = 50\Omega$, $C_i = 0.1\mu f$, $C_1 = 0.1\mu f$, $R_1 = R_2 = R_3 = 100K\Omega$, $R_F = 1M\Omega$ and $V_{cc} = +15V$. Determine the bandwidth of the amplifier and maximum output voltage swing.

4. a) What do you mean by a precision rectifier?
b) Explain the working of a full wave rectifier using op-amp.

5. a) Design a first-order low-pass and a high-pass Butterworth active filters to satisfy the given requirements.
b) Write notes on all-pass filter. Draw the suitable circuit diagram and discuss about phase shift between input and output voltages.

6. a) Explain how the Op-Amp as a Schimitt trigger with neat diagram.
b) Design a Schimitt trigger having upper and lower threshold of 120mv. Input to this circuit is 1V peak to peak triangular wave of 100Hz. Draw the hysterisis loop.

7. a) Define the following terms for Digital-to-Analog Converter:
i) Resolution ii) Settling Time iii) Conversion Time
b) Explain the operation of R-2Rladder D/A Converter with neat diagram.

8. a) Explain a basic multiplier and its characteristics
b) Explain the performance parameters of the multiplier

CODE No.:10BT50421

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC10) Supplementary Examinations November - 2019

ELECTROMAGNETIC THEORY

[Electronics and Instrumentation Engineering, Electronics and Control Engineering]

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

Answer any FIVE questions
All questions carry equal marks

1. a) State and prove Gauss's law. Give three applications of Gauss's law with suitable examples.
b) Given that electric flux density $D = z\rho \cos^2\phi \ a_z \ C/m^2$, use Gauss's law to calculate the charge density at $(1, \pi/4, 3)$ and the total charge enclosed by the cylinder of radius of 1m with $-2 \le z \le 2$.

2. a) Derive equation of continuity.
b) Derive an expression for capacitance between two concentric spheres.

3. a) Find the incremental field strength at point (0,3,0) due to the differential current element of 2naz μAm at point P1(4,0,0) .
b) Derive Amperes force law.

4. a) Given $E = Em \sin(\omega t - \beta z)ay$ in free space, find D, B and H.
b) Deduce the Boundary condition for dielectric-dielectric and Dielectric- conductor interface.

5. a) Show that intrinsic impedance of free space is 377Ω.
b) Derive the propagation characteristics of EM waves in good dielectrics.

6. a) Derive power poynting theorem.
b) Using Snell's law, explain oblique incidence of a plane wave on dielectric.

7. a) Explain the natural and man-made EMI sources.
b) Discuss about pulse power Electro-magnetics.

8. Write short notes on:
i) Bonding.
ii) Grounding.

CODE No.:10BT50422 SVEC-10

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC10) Supplementary Examinations November - 2019

LINEAR AND DIGITAL IC APPLICATIONS

[Electronics and Instrumentation Engineering, Electronics and Control Engineering]

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

Answer any FIVE questions
All questions carry equal marks

1. a) List out the AC characteristics of an op-amp and discuss about them.
b) Explain frequency compensation techniques used in op-amps.

2. a) Explain the operation of Integrator and Differentiator.
b) Explain briefly about triangular wave generator and log amplifier.

3. a) Explain the operation of astable multivibrator using 555 timer.
b) Explain the FSK using IC PLL.

4. a) Explain how to estimate sinking current for low output and sourcing current for high output of CMOS gate.
b) Write a detailed note on CMOS logic families.

5. a) Draw the circuit diagram of basic CMOS gate and explain the operation.
b) List out different categories of characteristics in a TTL data sheet. Discuss electrical and switching characteristics of 74LS00.

6. a) Explain about VHDL program structure
b) Give the description on libraries and packages.

7. a) Explain briefly about multiplexer.
b) Write short notes on code converter.

8. a) Design a 4-bit ripple down counter using T-flip-flops.
b) Briefly discuss about the impediments to synchronous design.

CODE No.:10BT50502 **SVEC-10**

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC10) Supplementary Examinations November - 2019

MICRO-PROCESSOR AND INTERFACING

[Computer Science and Engineering, Information Technology]

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

Answer any FIVE questions
All questions carry equal marks

1. a) Explain the addressing modes of 8086 microprocessor with an example for each.
b) Describe the functions of the following two registers
i) Instruction pointer. ii) Stack pointer.

2. a) What are the assembler directives and explain?
b) What is the difference between jump and loop instructions?

3. a) Draw and discuss a typical minimum mode 8086 system.
b) Interface eight 8K chips of RAM and four 8K chips of EPROM with 8086. Interface the RAM Bank at segment address 0B00H and the EPROM Bank at a physical address F8000H don't allow any fold back space.

4. a) Explain different modes of operations of 8255.
b) How the stepper motor can be interfaced with 8255?

5. a) Write briefly about DOS and BIOS interrupts and give the necessary examples.
b) With the help of a block diagram, explain the function of 8259.

6. a) Explain the mode instruction control word format of 8251.
b) Draw and discuss the Asynchronous mode transmitter and receiver data formats of 8251.

7. a) Discuss the salient features of Pentium processor.
b) Discuss about the Branch prediction of Pentium processor.

8. a) Discuss the various addressing modes of 8051 micro controller
b) Explain the alternate functions of Port-0, Port-1, Port-2 of 8051 micro controller.

CODE No.:10BT50503

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC10) Supplementary Examinations November - 2019

DATABASE MANAGEMENT SYSTEMS

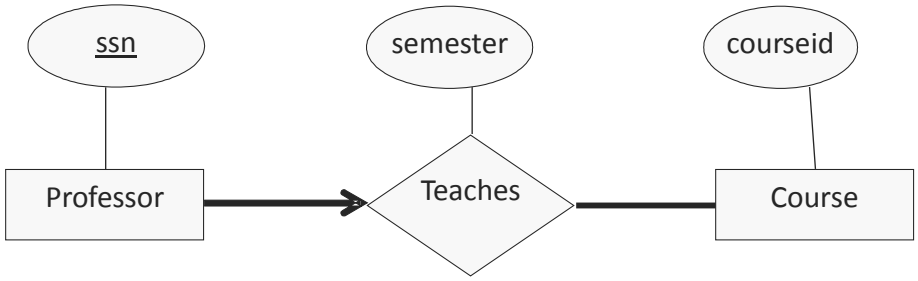
[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

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

Answer any FIVE questions
All questions carry equal marks

1. a) Compare file system versus a DBMS.
b) Discuss about levels of data abstraction in DBMS.

2. a) List the entity sets and their primary keys of the following diagram.



b) Discuss about ternary relationship

3. a) What is the difference between tuple relational calculus and domain relational calculus?
b) Explain with suitable example different join operations exist in Relational algebra.

4. a) Explain the various types of triggers with examples.
b) What are the various aggregate operators supported by SQL?

5. a) Explain 1NF, 2NF and 3NF with an example.
b) Write short notes on schema refinement in database design.

6. a) Define the terms: atomicity, isolation, blind write, dirty read, recoverable schedule.
b) Discuss the RW,WR and WW conflict.

7. a) Describe about the following:
i) 2PL. ii) Conservative 2PL.
b) Write short notes on buffer management.

8. a) What is RAID system and how it improves the performance and reliability.
b) Describe the B+ tree insertion algorithm with an example. How it eliminates overflow pages?

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC10) Supplementary Examinations November - 2019

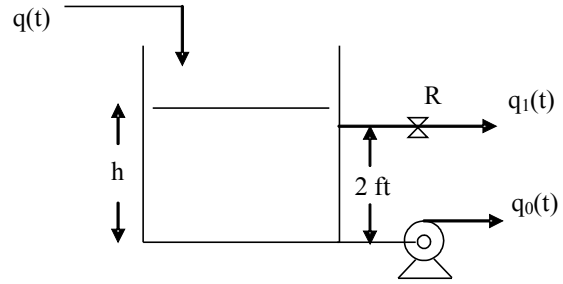
PROCESS CONTROL INSTRUMENTATION

[Electronics and Instrumentation Engineering]

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

Answer any FIVE questions
All questions carry equal marks

1. a) Find a transfer function H(*s*)/Q(*s*) for the liquid level system shown in figure. The tank operates about the steady state value of (a) h_s = 1ft (b) h_s = 3ft. The pump removes water at a constant rate of 10cfm. The area of A = 2ft^2 and resistance of R = 0.5 ft/cfm.



b) Develop the closed-loop responses for set point and load changes in generalized feedback control system.

2. a) Compare P, I, and D modes with equations. What are their relative advantages and disadvantages.
b) Discuss in detail about characteristics of ON-OFF control.

3. a) What are the advantages of the force type pneumatic controllers? Describe with neat diagrams, the working of a force type pneumatic proportional controller.
b) Explain the working principle of a hydraulic proportional controller. How proportional gain can be adjusted in this controller?

4. a) Explain in detail about IAE, ISE, ITAE evaluation criteria.
b) Discuss continuous oscillation method for control loop tuning.

5. a) Draw a neat figure of pneumatic actuator with a positioner and explain. List its advantages.
b) With neat sketch explain about the I/P converter.

6. a) What is control valve sizing? Describe the procedure for selection of suitable valve size for given application.
b) Write shot notes on cavitations in control valves.

7. a) With a specific example, explain how feed forward controller improves the performance of a conventional feedback control.
b) What is Ratio control system? Discuss such a control system with a specific process.

8. a) Write short notes on heat exchanger process.
b) What is drying process? Explain the conventional control system for rotating drum dryer.

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC10) Supplementary Examinations November - 2019

THEORY OF COMPUTATION

[Computer Science and Systems Engineering]

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

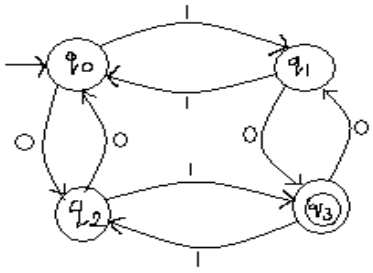
Answer any FIVE questions
All questions carry equal marks

1. a) Explain the construction steps involved in converting an NFA to DFA.
b) Design a DFA which accepts set of all strings contains 1100 as substring, where $\sum = \{0, 1\}$.

2. Describe in the English language the sets represented by the following regular expressions:
i) a(a+b)*ab.
ii) a*b + b*a.

3. a) Construct NFA for the given Regular Expression $(11 + 0)^* (00 + 1)^*$.
b) Check whether the following languages are regular or not.
i) $L = \{a^{2n} | n > 0\}$ ii) $L = \{0^{n^2} | n \geq 1\}$

4. a) Find the left linear grammar for the given DFA.



b) Write the Chomsky classification of languages.

5. a) What are ambiguous grammars?
b) Convert the following grammar into Chomsky Normal Form
S → ASA | aB, S → B | S, B → b |ε

6. a) Define the pushdown automata. Discuss its applications.
b) Give the rules for constructing a grammar G from the given PDA **M={Q,Σ,τ, δ,q0,F)** such that L(G)=L(M).

7. a) What is counter machine and discuss counter machine are turning equivalent?
b) Design turning machine to accept strings of the language defined as **{a^n b ^{n} / n >=1}.**

8. a) Explain about P and NP problems.
b) Explain about Un-decidability of PCP problem.

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CODE No.:10BT50104 SVEC-10

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC10) Supplementary Examinations September – 2020

SOIL MECHANICS

[Civil Engineering]

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

Answer any FIVE questions
All questions carry equal marks

1. For constructing an embankment, the soil is transported from a borrow area using a truck which can carry 6m^3 of soil at a time. With the following details, determine the number of truck loads of soil required to obtain 100m^3 of compacted earth fill and the volume of borrow pit.

2. a) Explain with the help of particle size distribution curves for the following types of soils.
i) Well graded. ii) Uniformly graded. iii) Gap graded.
b) Draw a typical plasticity chart used in I.S. Classification system. Show the different soil groups on the chart.

3. a) What are the factors affecting permeability? Explain the effect of each factor on permeability.
b) A constant head test was conducted on a sand sample of 250mm length and 2000mm^2 in area. The head loss was 500mm and the discharge was found to be 260cc in 130 seconds. Determine the coefficient of permeability of the sand sample. Find the discharge and seepage velocities if the dry unit weight and specific gravity of the sample were 17.98kN/m^3 and 2.68 respectively.

4. a) Enumerate effective stress principle. Is effective stress a physically existing one or not? Explain with the help of a neat sketch the concept of effective stress, total stress and pore water pressure.
b) Explain the step by step procedure for constructing top flow line in an eastern embankment with horizontal drainage filter? What are the corrections to be applied?

5. a) Using Boussinesq's expression , derive the expression for vertical stress at depth 'z' under the centre of a particular area of radius 'a' loaded uniformly with a load 'q' per unit area at the surface of the soil mass.
b) A line load of 90kN/m run extends to a long distance. Determine the intensity of vertical stress at a point 1.5m below the surface.
i) Directly under the line load.
ii) At a distance 1m perpendicular to the line. Use Boussinesq's theory.

6. a) What is the effect of compaction on the engineering properties of the soil?
b) The following data is obtained in compaction test.

Water content (%)	12	14.2	15.6	16.8	17.5	20.0
Wet density (kN/m^3)	17.1	18.3	21.6	22.05	22.35	22.01

Calculate the optimum moisture content and maximum dry density.

7. a) Distinguish between normally consolidated and over consolidated soil. Also describe the method of determining the preconsolidation pressure.
b) A saturated clay layer is 10m thick underlain by an impervious stratum. The natural water content of clay is 40% and its liquid limit is 48%. What will be the consolidation settlement of clay if the foundation load increases the vertical pressure by 50% of its initial overburden pressure? The clay is normally consolidated and the specific gravity of clay is 2.70.

8. a) Explain the following terms:
i) Critical void ratio. ii) Sensitivity. iii) Liquifaction. iv) Pore pressure coefficients.

b) A cylindrical specimen of saturated soil fails under an axial stress 150kN/m^2 in an unconfined compression test. The failure plane makes an angle of 52^0 with the horizontal. Calculate the cohesion and angle of internal friction of the soil.

CODE No.:10BT51001 **SVEC-10**

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC10) Supplementary Examinations September – 2020

PROCESS CONTROL INSTRUMENTATION

[Electronics and Instrumentation Engineering]

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

Answer any FIVE questions
All questions carry equal marks

1. a) Define input and output variables with respect to a stirred tank heater.
b) Derive the transfer function of a mercury thermo-meter.

2. a) Compare P, I and D modes with equations. What are their relative advantages and disadvantages.
b) Discuss in detail about characteristics of ON-OFF control.

3. a) Explain the force type pneumatic P controller with neat sketch.
b) Explain the electronic type P controller with a neat sketch.

4. a) Explain 1/4th decay ratio.
b) Discuss continuous oscillation method for control loop tuning.

5. a) Explain deferent types of electrical actuators and give their applications.
b) Explain with neat sketch about P/I Converter.

6. a) Explain in detail about cavitations.
b) List different types of valves and elaborate on butterfly valves.

7. a) How would you determine the type of process that would require a cascade control and the type that require feed forward control?
b) What are basic differences between the cascade and feed forward control.

8. a) Draw the schematic diagram of distillation column with its condenser and reboiler. And show the various control loops required to control the process.
b) Write short notes on shell and tube heat exchanger.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC10) Supplementary Examinations September – 2020

THEORY OF COMPUTATION

[Computer Science and Systems Engineering]

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

Answer any FIVE questions
All questions carry equal marks

1. a) Write the properties of transition functions and prove that if $\delta(q,x) = \delta(q,y)$ then $\delta(q,xz) = \delta(q,yz)$ for all strings Z in $\sum^+$.
b) Give the definitions of finite automaton and non deterministic finite automaton.

2. a) Construct a mealy machine can output EVEN, ODD according as the total number of 1's encountered is even or odd. The input symbols are 0 and 1.
b) Write the applications of the finite automata with output.

3. a) Prove that Regular Sets are close under Union, Concatenation, Kleene Closure.
b) Explain Context free grammar and construct a CFG to generate set of palindromes over alphabet {a, b}.

4. a) Obtain a CFG to generate unequal number of a's and b's.
b) Obtain a CFG to obtain balanced set of parentheses.(i.e every left parentheses should match with the corresponding right parentheses).

5. a) Write the procedure for converting from a CFG to CNF.
b) Write the pumping lemma for CFL.

6. a) Construct PDA which accepts $L = \{a^3 b^n c^n - n \geq 0\}$.
b) Convert CFG to PDA S→Aaa, A→aS/Bs/a.

7. a) Discuss various types of Turing machines.
b) Define LBA and write the equivalence of LBA's and CFG's.

8. a) Explain about P and NP Problems.
b) Explain about Undecidability of PCP problem.

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations November - 2019

REINFORCED CEMENT CONCRETE STRUCTURES-I

[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Explain the behaviour of under reinforced and over reinforced beam section with neat sketch. 14 Marks

(OR)

2 Briefly explain working stress method and limit state design. 14 Marks

UNIT-II

3 Design the reinforcement for a RCC beam of size 300mm x 400mm of M20 grade of concrete to resist an ultimate moment of 150kN-m, using mild steel bars of grade Fe250. 14 Marks

(OR)

4 Design the reinforced concrete beam 300mm wide and 400mm deep of grade M20, to resist an ultimate moment of 150kN-m, using mild steel bars of grade Fe250. 14 Marks

UNIT-III

5 a) Describe about interaction curve with a neat sketch. 7 Marks

b) Design a circular short column to carry an axial working load of 1200 kN. Assume the column is helically reinforced column. 7 Marks

(OR)

6 a) What is (are) the difference(s) between uniaxial bending columns and biaxial bending columns. 7 Marks

b) Design a main steel for the data: 7 Marks
b = 300mm, D = 500mm, Pu = 1000kN, Mux = 70kN.m,
use M20 and Fe415

UNIT-IV

7 A Square column 400 mm x 400 mm carries an axial load of 1200kN. Design a square footing for the column. The safe bearing capacity of the soil is 150kN/m^2. Use M20 concrete and Fe 415 steel. 14 Marks

(OR)

8 Design a reinforced concrete rectangular combined footing located 3.6m apart. The size of the two columns is 500mm x 500mm. Each column carries an axial load of 1500kN. The safe bearing capacity of the soil is 200kN/m^2. Use M20 concrete and Fe 415 steel. 14 Marks

UNIT-V

9 Design a R.C.C floor slab for a room having inside dimensions 4m x 10m and supported on all sides by a 40 cm thick brick wall the superimposed load may be taken as 3 kN/m^2. Use M20 grade mix and Fe 415 steel. 14 Marks

(OR)

10 Design a two way slab 4m x 6m continuous on all edges and supported on 300mm wide beams to serve as an officer floor. Adopt M20 grade of concrete and Fe415 steel. 14 Marks

CODE No.:14BT50104 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations November - 2019

SOIL MECHANICS

[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Define the terms: Void ratio, Porosity, Degree of Saturation, Percentage air voids, Air content and Water content. 6 Marks

b) Show that $\gamma_d = \frac{G\gamma_w}{1+e}$. 8 Marks

(OR)

2 a) Define plasticity and give examples for plastic soils. Explain Atterberg's limits in detail. 7 Marks

b) What will be the IS classification for the soil given below: 7 Marks

Passing 4.75 mm sieve = 70 %
Passing 75 μ sieve = 8 %
Plasticity index = 3 %
Coefficient of uniformity = 7
Coefficient of curvature = 3

UNIT-II

3 a) Explain the determination of coefficient of permeability of layered soil. 7 Marks

b) In a falling head permeability test, the initial head is 400mm when time is zero. The head drops by 50mm in 10 minutes. Calculate the time required to run the test for the final head to be at 200mm. If the sample is 60mm in height and 50 x 100mm^2 in cross section area, calculate the coefficient of permeability value by taking the cross sectional area of stand pipe as 0.5 x 100mm^2. 7 Marks

(OR)

4 a) Explain the construction of phreatic line in an earth dam with horizontal filter. 7 Marks

b) A sand stratum is 10m thick. The water table is 2m below ground level. The unit weights of sand layer above and below water table are 17kN/m^3 and 21kN/m^3. The capillary rise above water table is 1m. Draw the effective stress, pore pressure and total stress diagrams. 7 Marks

UNIT-III

5 a) What are the basic assumptions in Boussinesq's theory of stress distribution in soils? Also describe the concept of pressure bulb and its use. 6 Marks

b) Two footings 6m apart (c/c distance) at the same level carry concentrated loads of 1500kN and 1800kN respectively. Compute the vertical pressure at the following points: 8 Marks

i) Midway between the footings at a depth of 4m below the footing level.
ii) Vertically below the centre of each footing at the same depth as in (1).

(OR)

6 The following results were obtained in a compaction test: 14 Marks

Bulk unit weight (kN/m^3)	18.8	20.0	20.5	21.0	21.0	20.0
Water content (%)	17.5	19.0	20.0	20.8	21.8	22.4

Determine the optimum moisture content and maximum dry density. Also draw 5% air voids line and 90% saturation line if G=2.67.

UNIT-IV

7 a) Differentiate between compaction and consolidation. 6 Marks

b) What is pre-consolidation pressure and Describe the determination of pre-consolidation pressure. 8 Marks

(OR)

8 Explain briefly Terzaghi's theory of one dimensional consolidation and derive its equation. 14 Marks

UNIT-V

9 a) Enumerate the factors affecting shear strength of cohesionless soils. 6 Marks

b) What are the advantages of triaxial shear test over direct shear test? 8 Marks

(OR)

10 A direct shear test was performed on a dry sand sample. Normal stress and shear stress at failure are given in the following table. Determine shear parameters of sand. 14 Marks

Normal stress (kN/m^2)	Shear stress (kN/m^2)
50	36
100	80
200	154

CODE No.:14BT50105 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations November - 2019

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)	Define hydrology. Give description of the hydrologic cycle.	8 Marks
	b)	Describe the principle of working of a weighing bucket type recording rain gauge with a neat sketch.	6 Marks
		(OR)	
2	a)	"Hydrology is a highly inter-disciplinary science". Justify the statement.	7 Marks
	b)	Describe the three methods of determining the average depth of rainfall over an area.	7 Marks

UNIT-II

3	a)	Explain what you understand by evapotranspiration.	6 Marks
	b)	List the factors affecting evapotranspiration and describe their influence.	8 Marks
		(OR)	
4	a)	What is infiltration? How infiltration does is affected by various factors?	7 Marks
	b)	How do you reduce the evaporation?	7 Marks

UNIT-III

5	a)	What are the different components of runoff and describe them.	7 Marks
	b)	Explain area velocity method to estimate stream flow.	7 Marks
		(OR)	
6	a)	Describe double mass curve technique with a neat sketch.	7 Marks
	b)	Explain the measurement of velocity using current meter.	7 Marks

UNIT-IV

7	a)	Why is base flow separated from total runoff? Describe any one method of separating base flow from the total runoff.	7 Marks
	b)	What is Unit Hydrograph? Explain how a 2D hour Unit Hydrograph is derived from a D hour Unit Hydrograph.	7 Marks
		(OR)	
8	a)	Define design flood. Explain the method of design flood estimation using the rational method.	7 Marks
	b)	The peak of a flood hydrograph due to a 6-h storm is 470m^3/s. The mean depth of rain fall is 8.0cm. Assume an average infiltration loss of 0.25cm/h and a constant base flow of 15m^3/s and estimate the peak discharge of the 6-h unit hydrograph for this catchment.	7 Marks

UNIT-V

9		Define trap efficiency and explain density of sediment deposits.	14 Marks
		(OR)	
10		Describe distribution of sediment in the reservoir and reservoir sedimentation problems in India.	14 Marks