

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech (SVEC10) Regular Examinations June - 2011

ENGINEERING PHYSICS

[Civil Engineering, Electrical and Electronics 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 any FIVE questions
All questions carry equal marks

1. a) What is meant by Unit cell? Explain its significance.
b) Briefly explain Bravais Lattices.
c) Explain the Point defects in crystals with suitable examples.
2. a) Write a short note on electrical conductivity in semi conductors.
b) With suitable examples, explain the direct and indirect band gap semiconductors.
c) Write the diode equation and explain the terms in it.
3. a) Describe with suitable diagrams relating to the construction and action of P-N junction diode.
b) An N-type semiconductor is to have a resistivity 10 ohm/cm Calculate the number of donor atoms which must be added to achieve this. Give $\mu_n=500 \text{ cm}^2/\text{volt-sec}$.
4. a) Explain Hysteresis loop, soft and hard magnetic materials.
b) A circular loop of copper having a diameter of 10 cm carries a current of 500 mA. Calculate the magnetic moment associated with the loop.
c) What is local field ?
5. a) Explain the significance of Sabine's formula for reverberation time.
b) Describe the method of measuring the absorption coefficient of a material.
c) What are mufflers? Explain.
6. a) What is Meissner effect ? Explain.
b) A long superconducting wire produces a magnetic field of $200 \times 10^3 \text{ amp/m}$ on its surface due to current through it at temperature T. Its critical Magnetic field at 0 K is $250 \times 10^3 \text{ amp/m}$. The critical temperature of the material is 12 K. Find the value of T.
c) Write the general properties of superconductors.
7. a) Explain the principle of an optical fiber as a wave guide.
b) What is a numerical aperture (NA) of an optical fiber? What does the numerical aperture signify ?
c) What are the uses of holography?
8. a) Explain the basic properties of nano materials.
b) Discuss in detail any one technique of fabrication of nano materials.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

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I B.Tech (SVEC10) Regular Examinations June - 2011

ENGINEERING CHEMISTRY

[Civil Engineering, Electrical and Electronics 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 any FIVE questions
All questions carry equal marks

1. What are the characteristics of insulating material? Describe the engineering applications of insulators?
2. a) Explain in detail the vulcanization of rubber.
b) Write the preparation, properties and applications of the following:
(i) PVC (ii) Buna-S
3. a) Describe calomel electrode with the electrochemical equation.
b) Explain the working principle of hydrogen-oxygen fuel cell.
4. a) Define corrosion? Explain different methods of controlling corrosion.
b) Write a note on electroplating.
5. a) Derive Langmuir adsorption isotherm equation and mention how the surface area of an adsorbent is calculated from slope and intercept of Langmuir's plot.
b) Write the important applications of colloidal dispersions.
6. a) Explain chemical shift in NMR spectroscopy.
b) Give the applications of Flame photometry.
7. a) Explain the properties of nanomaterials.
b) Describe the preparation of nanomaterials using Sol-gel process.
8. a) How total hardness of water is determined using EDTA ?
b) What is reverse osmosis? How is sea water purified by R.O.?



SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech (SVEC10) Regular Examinations June - 2011

ENGINEERING MATHEMATICS

[Civil Engineering, Electrical and Electronics 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°C and the substance cools from 100°C to 70°C in 5 minutes, find when the temperature will be 40°C .
2.
 - a) Find the complete solution of $y'' - 2y' + 2y = x + e^x = \cos x$.
 - b) Solve the neutralize each other is non-homogeneous ordinary differential equation $y'' + y = \sec x$ by the method of variation of parameters.
3.
 - a) If $u = \frac{yz}{x}, v = \frac{zx}{y}, w = \frac{xy}{z}$, show that $\frac{\partial(u, v, w)}{\partial(x, y, z)} = 4$.
 - b) Examine for minimum and maximum values of $\sin x + \sin y + \sin(x + y)$.
4.
 - a) Show that the radius of curvature at any point of the asteroid $x + a \cos^3 \theta, y + a \sin^3 \theta$ is equal to three times the length of the perpendicular from the origin to the tangent at the point.
 - b) Trace the curve $r = a(1 + \cos \theta)$.
5.
 - a) Find the Laplace transform of $(1 - \cos at)/t$.
 - b) Apply convolution theorem to evaluate $L^{-1} \left[\frac{s}{(s^2 + 1)^2} \right]$.
6.
 - a) Solve by the method of Laplace transforms, the equation $y'''' + 2y'' - y' - 2y = 0$ given $y(0) = y'(0) = 0$ and $y''(0) = 6$.
 - b) Find the inverse Laplace transform of $\frac{2s^2 - 6s + 5}{s^3 - 6s^2 + 11s - 6}$ by using Heaviside's expansion formula.
7.
 - a) Find the volume of a spherical segment of height 'h' cut off from a sphere of radius 'a'.
 - b) Evaluate $\int_0^\infty \int_x^\infty \frac{e^{-y}}{y} dy dx$ by changing the order of integration.
8.
 - a) Find the value of 'a' if the vector $(ax^2y + yz)i + (xy^2 - xz^2)j + (2xyz - 2x^2y^2)k$ has zero divergence. Find the curl of the above vector which has zero divergence.
 - b) Use Green's theorem to evaluate $\int_C (x^2 y dx + x^2 dy)$, 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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MATHEMATICAL METHODS

[Electrical and Electronics 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) By reducing the matrix $\begin{pmatrix} 1 & 2 & 3 & 4 \\ 2 & 1 & 4 & 3 \\ 3 & 0 & 5 & -10 \end{pmatrix}$ into normal form and find its rank.
- b) Find the values of a and b for which the equations $x + y + z = 3$, $x + 2y + 2z = 6$, $x + 2y + az = b$ have i) no solution ii) a unique solution iii) infinite number of solutions.

2. a) Find the Eigen values and Eigen vectors of the matrix $\begin{bmatrix} 5 & -2 & 0 \\ -2 & 6 & 2 \\ 0 & 2 & 7 \end{bmatrix}$.
- b) Using Cayley-Hamilton theorem find the inverse and A^{-4} of the matrix

$$A = \begin{bmatrix} 7 & 2 & -2 \\ -6 & -1 & 2 \\ 6 & 2 & -1 \end{bmatrix}$$

3. a) Develop a recurrence relation for \sqrt{N} using Newton Raphson method and then compute $\sqrt{8}$ upto three decimal places.
- b) The following table gives the results of the measurements of train resistances, V is the velocity in miles per hour, R is the resistance in pounds per ton
- | | | | | | | |
|-----|-----|-----|------|------|------|-----|
| V : | 20 | 40 | 60 | 80 | 100 | 120 |
| R : | 5.5 | 9.1 | 14.9 | 22.8 | 33.3 | 46 |
- If R is related to V by the relation $R = a + bV + cV^2$, then find a, b, c by least squares.

4. a) Find $f(22)$ for the following data by Gauss forward Interpolation formula.

x	20	25	30	35	40	45
y	354	332	291	260	231	204

- b) Find the Lagrange's Interpolation polynomial for the following data.

x	0	1	2	5
y	2	3	12	147

5. a) From the following table of values of x and y, find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ for $x = 1.2$.

x	1.0	1.2	1.4	1.6	1.8	2.0	2.2
y	2.7183	3.3201	4.0552	4.9530	6.0496	7.3891	9.0250

- b) Evaluate $\int_0^1 e^x dx$ using Simpsons 1/3rd rule.

6. Given that $y' = 1 + xy^2$, $y(0) = 1$, 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) Show that $Z(\sinh n\theta) = \frac{z \sinh \theta}{z^2 - 2z \cosh \theta + 1}$

b) Find the Z- transform of $\left(\frac{1}{2}\right)^n + \left(\frac{1}{3}\right)^n$.

8. a) If $f(x) = \begin{cases} x & 0 < x < \frac{\pi}{2} \\ \pi - x & \frac{\pi}{2} < x < \pi \end{cases}$ then show that

$$f(x) = \frac{4}{\pi} \left\{ \sin x - \frac{1}{3^2} \sin 3x + \frac{1}{5^2} \sin 5x - \dots \right\}.$$

b) Find the Fourier cosine transform of $f(x) = \frac{1}{1+x^2}$.



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I B.Tech (SVEC10) Regular Examinations June - 2011

MATHEMATICS FOR BIOTECHNOLOGISTS

[Bio-Technology]

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

1. a) If $(1,2,3), (2,5,-1)$ and $(-1,12)$ are the vertices of a triangle, then find its area.
b) Find the sum of the coefficients in the expansion of $(1 - x + 2x^2)^n$.
2. a) Show that $f(x) = |x|$ is continuous on \mathbb{R} .
b) Determine the value of x , if $ax^2 + 2hxy + by^2 = 0$.
3. a) Evaluate $\int x^2 \sin x \cos x dx$.
b) Find the area bounded by the parabola $y^2 = 4ax$ and its latus rectum.
4. a) Solve $x \frac{dy}{dx} + y = x^3 y^6$.
b) Determine the orthogonal trajectories of the family of coaxial circles $x^2 + y^2 + 2\lambda y + c = 2$, λ being the parameter.
5. a) Solve $\frac{d^2y}{dx^2} - y = x \sin 3x + \cos x$.
b) Solve $\frac{d^2y}{dx^2} + y = x \sin x$ by the method of variation of parameters.
6. a) (i) Find the Laplace transform of $t \cosh t \sin 2t$.
(ii) State convolution theorem and hence evaluate $L^{-1} \left[\frac{s}{(s^2 + 4)(s^2 + 1)} \right]$.
b) Find the inverse Laplace transform of $\log \frac{s+4}{s-3}$.
7. 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) Solve the equations $\frac{dx}{dt} - y = e^t, \frac{dy}{dt} + x = \sin t$ by using Laplace transforms. Given that $x(0)=1, y(0)=0$.
8. a) Find the angle between the surfaces $x \log z = y^2 - 1, x^2 y = 2 - z$ at the point $(1,1,1)$.
b) Apply Green's theorem to evaluate $\oint_C [(y - \sin x) dx + \cos x dy]$, where C is the plane triangle enclosed by the lines $y = 0, x = \frac{\pi}{2}$, and $y = \frac{2}{\pi} x$.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

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I B.Tech (SVEC10) Regular Examinations June - 2011

PROBLEM SOLVING AND COMPUTER PROGRAMMING

[Civil Engineering, Electrical and Electronics 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 any FIVE questions
All questions carry equal marks**

1. a) Draw the flow chart to check whether a given number is prime or not.
b) Briefly explain the top down design technique of problem solving.
2. a) Write and explain the structure of a typical C program.
b) What are preprocessor commands? Explain with an example.
3. a) Distinguish between While and Do-while control loops with examples.
b) Write a C program to demonstrate Switch case statement.
4. a) Design an algorithm to find the Fibonacci numbers up to n.
b) Write an algorithm to reverse the digits of a multi digit number.
5. a) Write a C program for binary search.
b) Write a C Program to sort the given array of integers using Bubble Sort Technique.
6. a) Differentiate between call by value and call by reference with suitable examples.
b) What is recursion? Write a recursive program to solve the problem of Towers-of-Hanoi.
7. a) What is a pointer data type? Write a C program using pointers to exchange the contents of two variables.
b) Explain in detail about the concept of Dynamic memory allocation.
8. a) Write a C program to copy the contents of one file to another file.
b) Write a C program to implement push and pop operations of a stack using arrays.



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TECHNICAL ENGLISH

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

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

1. What are the qualities that a director should look for while finalizing the plot for a film ?
2. Sir C.V.Raman's life is a lesson in discipline and commitment. Elaborate .
3. C.V. Raman's determination, spirit and contributions will indeed remain special within the context of the practice of science in India. Illustrate.
4. Describe the steps taken by the Cuddalore district administration to ensure that potable water was available after the tsunami.
5. What is the mystery of the Bubbling Well Road? Was Kipling able to solve it?
6. Explain how Chaplin's own poverty helped him succeed in creating the famous tramp character.
7. a) Attempt an essay on the importance of technology in India.
b) Write a letter to your friend declining his invitation.
8. **a. Fill in the blanks with suitable propositions.**
 - i. We have been waiting here _____ more than two hours.
 - ii. Vijay wants to discuss the proposal _____ his father.**b. Correct the errors in the following sentences:**
 - i. Vinay has never been advantageous person.
 - ii. Saroj asked where is his spectacles.**c. Choose the correct verb out of the two given in brackets.**
 - i. Titanic with it's crew _____ lost (was, were).
 - ii. Neither Kishore nor Prasad _____ (have, has) attended the meeting.**d. Fill in the blanks with appropriate article.**
 - i. He is _____ most popular actor.
 - ii. Mangoes sell eighty rupees _____ dozen.**e. Change the voice of the verbs in the following sentences.**
 - i. They chose him their leader.
 - ii. The manager will give you a memo.**f. Put the verbs in brackets into the present continuous.**
 - i. He has collected these pictures. (collect).
 - ii. Kavya has given me a gift. (give).**g. Write the following sentences in indirect speech.**
 - i. Arjun asked "what are you doing today"?
 - ii. Vivek said "Ramya has a car".



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ENGINEERING MECHANICS

[Civil Engineering]

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1. a) Define the following: (i) Law of parallelogram of forces (ii) Principle of force transmissibility, (iii) Particle and (iv) Rigid body
- b) The resultant of three forces is 60 N as shown in Fig.1. Two of the three forces are also shown as 20 N and 40 N. Determine the third force.

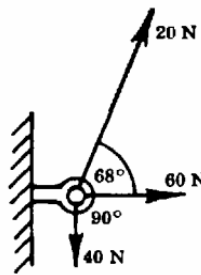


Fig. 1

- 2. a) Define the following with examples: (i) Coplanar and Non-Coplanar forces (ii) Collinear and Non-Collinear Forces
- b) In the Fig.2, three spheres each with 20 N weight and each 350 mm in diameter rest in a box 760 mm wide. Find (a) the reaction of B on A, (b) the reaction of the wall on C, and (c) the reaction of the floor on B.

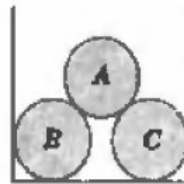


Fig.2

- 3. a) Define cone of friction and wedge friction. Write the laws of friction.
- b) The coefficient of friction between a copper block A and an aluminum block B is 0.3, and between the block B and the floor is 0.2. The weight of block A is 30 N and of block B is 20 N as shown in Fig.3. What force P will cause the motion of block A to impend?

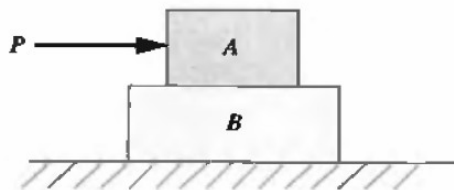


Fig.3

4. a) What is perfect frame and imperfect frame? Write the advantage of method of sections as compared to method of joints.
 b) Determine the forces in FH, HG, IG, and IK in the truss shown diagrammatically in Fig. 4. Each load is 2 kN. All triangles are equilateral with sides of 4 m.

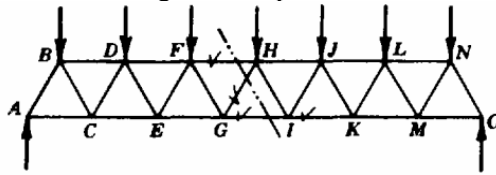


Fig.4

5. Determine centroid of shaded area as shown in fig. 5

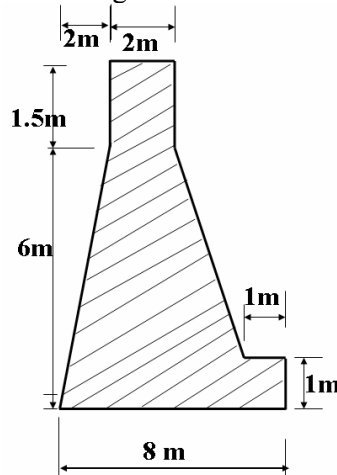


Fig. 5

6. Find the area moment of inertia about x and y axes of the plane area shown in Fig.6.

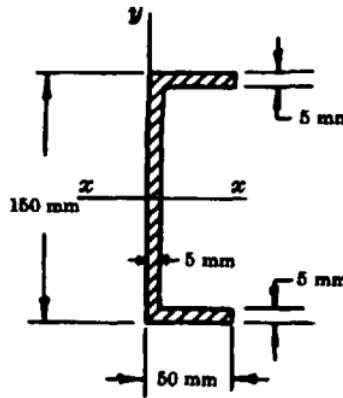


Fig. 6

7. 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 7.2 m/s . It then proceeds with the same speed until the brakes are applied. It comes to rest, at point B, 18 m beyond the point where the brakes are applied. Assuming uniform acceleration, determine the time required for the bus to travel from A to B. Distance between A and B is 90 m .
8. a) Explain D'Alembert's principle.
 b) A lift carries a weight of 1000 N and is moving with a uniform acceleration of 1.962 m/sec^2 . Calculate the tension in the cables supporting the lift, when (i) lift is moving upward, and (ii) lift is moving downward.



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I B.Tech (SVEC10) Regular Examinations June - 2011

BASICS OF BIOLOGY

[Bio-Technology]

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

1. Explain the methods of enzyme immobilization, in detail.
2. Describe the process of early phase development of plant organs.
3. What is photosynthesis? Explain the process of CO₂ fixation.
4. Describe the phylogeny of invertebrates.
5. Describe the structure and specific functions of circulatory system in humans.
6. Write about different harmful species of fungi.
7. Write short notes on:
 - a) Secondary metabolites of animals.
 - b) Antibodies.
8. Write short notes on
 - a) Single cell protein.
 - b) Recombinant proteins.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.C.A. I Semester (SVEC10) Regular Examinations February - 2011

ACCOUNTING AND FINANCIAL MANAGEMENT

[MASTER OF COMPUTER APPLICATIONS]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

- What are accounting concepts and conventions? Name them and explain any two accounting concepts in detail.
- From the following balances and information you are required to prepare final accounts of Mohan Bros. for the year ended 31st March, 2008:

Particulars	Rs.	Particulars	Rs.
Plant and Machinery	49,500	Rent and Taxes	1,951
Depreciation on Plant and Machinery	5,500	Rent outstanding	150
Fixtures and fittings	1,720	Office Expenses	2,778
Fuel and power (factory)	542	Carriage - Purchases	897
Office salaries	4,095	Discount allowed	422
Salary outstanding	350	Drawings	6820
Lighting (factory)	392	Stock (1-4-2007)	21,725
Travelling Expenses	925	Direct sundry expenses	2,680
Carriage as sales	960	Sale returns	7,422
Cash at Bank	2,313	Insurance	570
Trade debtors	47,800	Capital	93230
Purchases (adjusted)	66,710	Sales	1,26,177
Stock (31.03.2008)	16,580	Creditors	22,680
Wages	9,915	Returns outwards	3,172
		Bills payable	6,422

Additional Information:

- Depreciate furniture and fittings at 10%
 - Provision for bad debts at 2 ½ % on debtors
 - Insurance unexpired Rs. 70 and
 - Outstanding wages Rs. 800.
- Explain the terms (1) Margin of Safety (2) P/V Ratio (3) Contribution Margin. The Profit/Volume Ratio of a company is 60 % and the margin of safety is 20 %. If the fixed cost is found to be Rs.24,000 for a year, you are required to calculate (a) Break-Even Sales (b) Actual Total Sales for the year (c) Profit for the year end (d) Variable cost for the year.
 - Briefly discuss the objectives and scope of Financial Management.
 - What is funds flow statement? Discuss the significance of funds flow statement as a tool of financial analysis.
 - What do you mean by Break-Even Point, Margin of Safety, Profit Zone and Angle of Incidence. Give your answer with suitable example.
 - What are the different methods and sources of raising long-term capital?
 - The life of a machine which costs Rs.1,20,000 is estimated 5 years. It's salvage value is estimated Rs. 20,000 at the end of 5th year. The earnings after taxes were estimated as given below:

Year	Rs.
1	10,000
2	90,000
3	80,000
4	70,000
5	60,000

Calculate Average Return on investment



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M.C.A. I Semester (SVEC10) Regular Examinations February - 2011

ENGLISH LANGUAGE AND COMMUNICATION SKILLS

[MASTER OF COMPUTER APPLICATIONS]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. (a) Correct the following sentences
 - (i) Tendulkar is a good player, isn't it?
 - (ii) The book consists five chapters.
 - (iii) We congratulated Rahul for his success.
 - (iv) The list of books are displayed on the notice board.
 - (v) Everyday I am going to college by car.
 - (vi) He is one of the best actor in the country.
 - (vii) Kiran is good in English.
 - (viii) It is more better to read text books than guides.
- (b) Fill in the blanks with the correct verb forms.
 - (i) The clerk _____(type) the letters still. He usually _____ (finish) his work quickly, but today he _____ (seem) to be a bit slow.
 - (ii) I _____ (learn) to ride a scooter.
 - (iii) Ravi _____ (play) chess with his friend now. He _____ (play) chess well and _____(win) most of the time.
 - (iv) "You can't see the principal now. He _____(be) in a meeting."
2. Discuss the different elements of communication.
3. What are the features of effective listening?
4. What are the features of written communication?
5. Examine the different strategies of reading.
6. As Personnel Manager of ABC Company you have to interview fresh graduates for recruitment to the junior management cadre. Prepare a list of questions which you are likely to use for interviewing the candidates.
7. (a) What are the characteristics of Report Writing?
(b) Write short notes on:
 - i) Progress Reports
 - ii) E-mail
8. (a) What is a business letter? Briefly mention the chief characteristics of a good business letter.
(b) What are the advantages of block format in letter writing?



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(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.C.A. I Semester (SVEC10) Regular Examinations February - 2011

DISCRETE MATHEMATICAL STRUCTURES

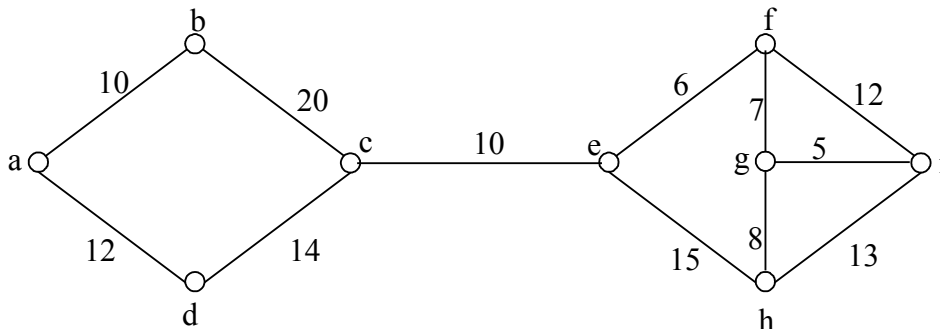
[MASTER OF COMPUTER APPLICATIONS]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. (a) Show that $\neg (P \wedge Q) \rightarrow (\neg P \vee (\neg P \vee Q)) \Leftrightarrow (\neg P \vee Q)$
 (b) Obtain the Principal disjunctive normal form of
 (i) $\neg P \vee Q$ (ii) $(P \wedge Q) \vee (\neg P \wedge R) \vee (Q \wedge R)$
2. (a) Show that the following premises are inconsistent
 i If jack misses many classes through illness, then he fails high school.
 ii If jack fails high school, then he is uneducated.
 iii If jack reads a lot of books, then he is not uneducated.
 iv Jack misses many classes through illness and reads a lot of books.
 (b) Show that $(x) (P(x) \vee Q(x)) \Rightarrow (x) P(x) \vee (\neg x) Q(x)$.
3. a) If $A = \{1,2,3,4\}$ and $B = \{a,b,c,d\}$, determine if the following functions are one-to-one or onto
 i) $f = \{(1,a),(2,a),(3,b),(4,d)\}$
 ii) $g = \{(1,d),(2,b),(3,a),(4,c)\}$
 b) Prove that every chain is a distributive lattice.
4. a) If $f: G \rightarrow H$ and $g: H \rightarrow K$ are homomorphism, prove that $g \circ f: G \rightarrow K$ defined by $(g \circ f)(x) = g\{f(x)\}$ is a homomorphism.
 b) Show that every monoid $\langle M, *, e \rangle$ is isomorphic to a submonoid of $\langle M^M, \circ, \Delta \rangle$ where Δ is the identity mapping of M .
5. a) State and prove the pigeon hole principle.
 b) How many words of four letters can be formed from the letters of the word "EXAMINATION".
6. (a) Find the solution of recurrence relation $A_n = 3a_{n-1} - 3a_{n-2} - a_{n-3}$ with initial conditions $a_0=1, a_1=2, a_2=-1$
 (b) Find all solutions of the recurrence relation $A_n = 5a_{n-1} - 6a_{n-2} + 7^n$
7. (a) Prove that an undirected graph has an even number of vertices of odd degree,
 (b) Define chromatic number of a graph. Find the chromatic number of K_n and $K_{m,n}$.
8. Explain kruskal algorithm and using the same obtain the minimal spanning tree for the following weighted graph.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.C.A. I Semester (SVEC10) Regular Examinations February - 2011

PROGRAMMING THROUGH C

[MASTER OF COMPUTER APPLICATIONS]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) What is a flowchart? Draw a flowchart for finding the dot product of two vectors.
b) Describe with suitable examples arithmetic and arithmetic-assignment operators of C language.
2. a) Explain about the syntax of for-loop of C language. What are compulsory parts of a for-loop?
b) Write a C language program to find the value of $\sin(x)$ series for a given value of x up to 4- digit accuracy.
3. a) Write a program for sorting a given list of names.
b) Write a program for multiplication of a matrix by a vector.
4. a) What is the difference between near and far pointers? Give declarations for single, double and multiple pointers.
b) What is a dangling pointer? What are the problems with pointers?
5. a) Differentiate between System defined and User defined functions? Explain the advantages and limitations of each.
b) Explain various Storage classes with examples.
6. a) Differentiate between Structure and Union? Give brief description of each with syntax and examples.
b) Describe the Static and Dynamic linked list representation.
7. a) Define a file. Explain various types of files and their usage.
b) Write a C program to implement Sequential access.
8. a) Write a program to display a line of yellow text with red background color.
b) Write a program to draw a filled rectangle using *line()* function only, in graphics mode.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.C.A. I Semester (SVEC10) Regular Examinations February - 2011

DATA STRUCTURES

[MASTER OF COMPUTER APPLICATIONS]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Describe Asymptotic notations briefly.
b) Discuss the efficiency of an algorithm for the multiplication of two square matrices.
2. a) Explain how to implement two stacks in one array $A[1..n]$ in such a way that neither stack overflows unless the total number of elements in both stacks together is 'n'. The push and pop operation should run in $O(1)$ time.
b) Consider a recursive program which returns the n^{th} Fibonacci number. Draw the recursion tree(for $n=4$) and show the content of the stack at every step of the evaluation of the recursion . What is the worst case time complexity of the program?
3. a) What is a queue? Explain the implementation of a queue using linked list.
b) Illustrate Queue for CPU scheduling..
4. a) Write an algorithm to insert and delete elements in a doubly linked list.
b) Describe sparse matrix representation.
5. a) Write an algorithm to sort the elements whose worst and average cases are $o(n \log n)$
b) Consider the list of elements: -15, -6, 0, 7, 9, 23, 54, 82, 101, 112, 125, 131,142, 151. Trace the elements 151, -14, 9 using binary search algorithm.
6. a) Define in brief about the following terms.
 - tree
 - indegree and outdegree of a node
 - level of a node
 - height of a tree
 - leaf node
 - siblingsb) What is binary tree traversal? Explain traversal methods.
7. a) Insert a sequence of numbers {101,113,83,89,73,109,97,79,107,103} to an empty AVL tree. Show the intermediate AVL trees. After the final tree constructed delete the node 83 and 97 from it and show the final tree.
b) Create a max heap from the following list of numbers and show all intermediate steps {44,30,50,22,60,55,77,55}. Finally delete the root node and reheap.
8. Let G be a graph whose vertices are the integers from 1 to 8, and let the adjacent vertices of each vertex given below.

<u>vertex</u>	<u>adjacent vertices</u>
1	(2,3,4)
2	(1,3,4)
3	(1,2,4)
4	(1,2,3,6)
5	(6,7,8)
6	(4,5,7)
7	(5,6,8)
8	(5,7)

 - a) Draw the graph G and find the adjacency matrix of G .
 - b) Order the vertices as they are visited in a Depth First Search traversal starting at vertex 1.
 - c) Order the vertices as they are visited in a Breadth First Search traversal starting at vertex 1.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.C.A. I Semester (SVEC10) Supplementary Examinations August - 2011

ACCOUNTING AND FINANCIAL MANAGEMENT

[MASTER OF COMPUTER APPLICATIONS]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

- What you meant by Accounting concepts? Explain the following concepts.
 - Business entity concept
 - Money measurement concept
 - Dual concept.
- From the following Trail Balance of Visaka Traders Ltd. Prepare Trading and Profit & Loss account for the year ended 31st. March 2009.

TRAIL BALANCE

Dr	Rs.	Cr	Rs
Opening Stock	10,000	Sales	2,40,000
Purchases	1,60,000	Returns	10,000
Returns	5,000	Commission	16,000
Furniture	18,000	Creditors	12,000
Carriage in	3,000	Bank Overdraft	6,000
Carriage out	5,000	Discount	3,000
Wages	15,000	Out standing Salaries	10,000
Salaries	25,000	Interest	3,000
Debtors	40,000		
Depreciation on Plant	12,000		
Prepaid insurance	1,000		
Rent and rates	6,000		
	<u>3,00,000</u>		<u>3,00,000</u>

Adjustments:

- Closing stock on 31-3-2009 was Rs. 20,000
- Sales include Rs. 5,000 on account of sale of old furniture.

- Explain the importance of Ratio Analysis. Discuss any five ratios other than liquidity ratios, in detail with suitable examples.
- What do you mean by wealth maximization and profit maximization? Which one do you suggest? Why?
- From the following Balance Sheets of X Ltd., Prepare Funds Flow statement?

Liabilities	2007 Rs.	2008 Rs.	Assets	2007 Rs.	2008 Rs.
Equity share capital	3,00,000	4,00,000	Goodwill	1,15,000	90,000
6% Redeemable Preference share capital	1,50,000	1,00,000	Land and Buildings	2,00,000	1,70,000
General Reserve	40,000	70,000	Plant	80,000	2,00,000
Profit & Loss A/C	30,000	48,000	Debtors	1,60,000	2,00,000
Proposed Dividend	42,000	50,000	Stock	77,000	1,09,000
Creditors	55,000	83,000	Bills Receivable	20,000	30,000
Bills Payable	20,000	16,000	Cash in Hand	15,000	10,000
Provision for Taxation	40,000	50,000	Cash at bank	10,000	8,000
	6,77,000	8,17,000		6,77,000	8,17,000

Additional Information:

- Charge depreciation of Rs. 10,000 and 20,000 on plant, and land and buildings respectively.
- Interim dividend Rs. 20,000, 3. Tax Paid Rs. 35,000.

- What do you mean by Break-Even Point, Margin of Safety, Profit Zone and Angle of Incidence. Give your answer with suitable example.

7. What are the sources of raising capital ? Explain the different sources of long-term financing with suitable examples.
8. A company is considering two mutually exclusive projects. Both projects require an initial cash outlay of Rs.10,000 each and have a life of 5 years. The company's required rate of return is 10 % and pays tax at 50 %. The project will be depreciated on a straight line basis. The before tax cash flows expected to be generated by the project are as follows:

Before Tax Cash Flows					
Year	1	2	3	4	5
Project A	10,000	10,000	10,000	10,000	10,000
Project B	5,000	5,000	3,000	5,000	5,000

Calculate for each project (1) Pay Back Period (2) Accounting Rate of Return (ARR)



SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.C.A. I Semester (SVEC10) Supplementary Examinations August - 2011

PROGRAMMING THROUGH C

[MASTER OF COMPUTER APPLICATIONS]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) What is a flowchart? Draw a flowchart for finding the dot product of two vectors.
b) Describe with suitable examples arithmetic and arithmetic-assignment operators of C language.
2. a) Differentiate between two way selection and multi way selection. And write a brief note on various selection statements under each category.
b) Write a C program to generate Fibonacci series using for loop.
3. a) Write a C program to add two matrices of your choice.
b) Explain String representation and initialization with example.
4. a) Using a double indirect pointer create a two-dimensional array and read and display the values of that array.
b) Explain about the differences between *malloc*, *calloc* and *realloc* functions.
5. a) What are the different storage classes?
b) Write a program for displaying the Fibonacci series for a given *n* value.
6. a) What is Derived Data Type? Briefly explain various Derived Data Types in C language.
b) Describe how structures are passed to functions.
7. a) What are command line arguments? Give an outline code to access the command line arguments.
b) Write a program to display the contents of a given text file as a command line argument.
8. a) Describe about text attribute control functions.
b) Explain basic graphics functions.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.C.A. I Semester (SVEC10) Supplementary Examinations August - 2011

DATA STRUCTURES

[MASTER OF COMPUTER APPLICATIONS]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Give formal definition of big-O , theta and Omega notation with examples.
b) Consider the following induction “proof” that all sheep in a flock are the same in color:
Base case: one sheep. It is clearly the same color as itself.
Induction step: A flock of 'n' sheep. Take a sheep, *X*, out of the flock. The remaining 'n-1' are all the same color by induction. Now put sheep *X* back in the flock, take out a different sheep, *Y*. By induction, the 'n-1' sheep(now with *X* in their group)are all same color. Therefore, *X* is the same color as all the other sheep; hence all the sheep in the flock are the same color. What is wrong with this “proof”?
2. (a) Write an algorithm to convert an infix expression into postfix expression using stack.
(b) Write an algorithm to to implement stack ADT using arrays.
3. a) What is a queue? Explain the implementation of a queue using linked lists.
b) Write about CPU scheduling in a multiprogramming environment.
4. (a) Write an algorithm to insert and delete elements in a circular linked list.
(b) What is a Sparse Matrix? Explain about the linear list representation of a sparse matrix?
5. a) Consider the merge-sort algorithm for sorting a set of 'n' points.
 - i) Draw the recursion tree for this algorithm for 'n'=13.
 - ii) How many levels are there in the recursion tree, by assuming first level start at zero?
 - iii) How many comparisons are done at each of the levels in the worst case and what is the total number of comparison needed?b) Is it possible to combine insertion sort and merge-sort by first performing the merge-sort and then switch to the insertion sort algorithm when the input array reaches a certain size(e.g. 5)? Write down a C code for such combination.
6. a) Write a recursive procedure to search a particular node exists in a Binary Search Tree or not.
b) A binary tree *T* has 9 nodes. The inorder and preorder traversals of *T* yield the following sequences of node.
Inorder: E A C K F H D B G
Preorder: F A E K C D H G B
Draw the tree *T*, where each letter is a node.
7. What is a heap? Explain the implementation of a heap using an array. How are insertion and deletion operations performed on a heap?
8. a) Explain the following terms.
 - Graph
 - Digraph
 - Path
 - Strongly connected graph
 - Disjoint graph
 - Indegree and outdegree of a vertexb) Explain the depth-first traversal of a graph with the help of an example.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.C.A. II Semester (SVEC10) Regular Examinations August - 2011

PROBABILITY AND STATISTICS

[MASTER OF COMPUTER APPLICATIONS]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) State and prove the multiplication theorem of probability
b) A candidate is selected for Interviews for three posts. For the first post there were 4 candidates ; for the second post 5 candidates and for the third post 2 candidates. What is the probability that the candidate is selected for at least one post ?
2. a) What are the probability mass function and probability density function of a random variable?
b) A random variable X has the following probability function:

X:	0	1	2	3	4	5	6	7
P(X):	0	K	2K	2K	3K	K ²	2K ²	7K ² +K

Find the value of K and P(X≥5).
3. a) Derive the Mean and Variance of Poisson distribution.
b) State the properties of Normal distribution. Also give its importance.
4. a) A random sample of size 81 was taken whose variance is 20.25 and mean is 32, construct 98% confidence interval.
b) If the population is 3,6, 9, 15, 27
 - (i) List all possible samples of size 3 that can be taken without replacement from the finite population.
 - (ii) Calculate the mean of each of the sampling distribution of means.
 - (iii) Find the standard deviation of sampling distribution of means.
5. a) Write about Type-I error and Type-II error.
b) A manufacturer of electronic equipment subjects samples of two completing brands of transistors to an accelerated performance test. If 45 of 180 transistors of the first kind and 34 of 120 transistors of the second kind fail the test, what can he conclude at the level of significance $\alpha = 0.05$ about the difference between the corresponding sample proportions?
6. a) 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 hypothesis that the true variances are equal.
b) A die is thrown 264 times with the following results. Show that the die is biased.

No. of appeared on the die	1	2	3	4	5	6
Frequency	40	32	28	58	54	60

7. a) The following are data on the drying time of a certain paint and the amount of an additive that is intended to reduce the drying time

Amount of paint additive (grams) x	0	1	2	3	4	5	6	7	8
Drying time (hrs) y	12	10.5	10	8	7	8	7.5	8.5	9

Fit a second degree polynomial (parabola) by the method of least squares. Use the result to predict the drying time of the paint when 6.5 grams of the additive is being used.

- b) For a set of values of x and y, the two regression lines are $31x - 37y + 5 = 0$ and $50x - 36y - 612 = 0$. Identify the regression line of y on x and that of x on y. Also obtain the values of \bar{x} , \bar{y} and r.
8. a) 10 samples each of size 50 were inspected and the number of defectives in the inspection was: 2, 1, 1, 2, 3, 5, 5, 1, 2, 3. Draw the appropriate control chart for defectives.
b) What are statistical quality control techniques? Discuss the objectives and advantages of statistical quality control.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.C.A. II Semester (SVEC10) Regular Examinations August - 2011

PROGRAMMING THROUGH C

[MASTER OF COMPUTER APPLICATIONS]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) What is a flowchart? What is its importance? Describe various symbols used in chart?
b) Briefly explain about various Data types in C language.
2. a) Explain about the syntax of for-loop of C language. What are compulsory parts of a for-loop?
b) Write a C language program to find the value of $\sin(x)$ series for a given value of x up to 4-digit accuracy.
3. a) Write a program to compare two given strings without considering their case.
b) Write a program to find dot product of two vectors.
4. a) With syntax explain dynamic memory management functions.
b) Describe Null pointer, Wild pointer and Constant pointer.
5. a) What are the different storage classes?
b) Write a program for displaying the Fibonacci series for a given n value.
6. a) What is the purpose of a union? Explain about the memory requirements and the usage of unions.
b) Give the usage of enumerated data type and typedef statements.
7. a) What are command line arguments? Give an outline code to access the command line arguments.
b) Write a program to display the contents of a given text file as a command line argument.
8. a) Write a program to clear a given rectangular region on screen in text mode.
b) Write a graphics program to draw vertical and horizontal lines using *putpixel()* function only.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.C.A. II Semester (SVEC10) Regular Examinations August - 2011

COMPUTER ARCHITECTURE AND ORGANIZATION

[MASTER OF COMPUTER APPLICATIONS]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Convert the following numbers with the indicated bases to decimal.
i) $(1212)_3$ ii) $(430)_5$ iii) $(50)_7$ iv) $(1110101)_2$
b) Derive the circuit for a 3-bit parity generator and 4-bit parity checker using an odd parity bit.
2. a) Write short notes on NAND gates decoders
b) Explain 4-bit binary counter in detail using block diagram.
3. Discuss in detail about different addressing modes.
4. Describe various registers and memory.
5. Define cache memory? Explain different mapping procedures in the organization of cache memory with suitable example.
6. a) Define microprogramming. Write a short notes on microinstruction format.
b) Explain conditional branching in detail.
7. Discuss briefly about DMA transfer.
8. a) Discuss the characteristics of multiprocessors.
b) Explain briefly about message passing multicomputers.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.C.A. II Semester (SVEC10) Regular Examinations August - 2011

OPERATING SYSTEMS

[MASTER OF COMPUTER APPLICATIONS]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. Explain about following types of operating systems
i) Batch ii) Multi programmed iii) Real time iv) Distributed.
2. a) Distinguish between the following directory structures:
i) Acyclic - Graph Directories ii) Tree structured directory structure.
b) Discuss about NFS.
3. What is the difference between preemptive and non preemptive CPU scheduling? Explain an algorithm for each scheduling type.
4. Explain the solution for the critical section problem for multiple processes.
5. Explain Banker's algorithm in detail.
6. a) In a fixed partitioning scheme, what are the advantages of using unequal size partitions?
b) What is the difference between internal and external fragmentation?
c) Compare logical, relative and physical addresses?
7. a) What are the goals of protection? What is a domain of protection? Discuss briefly a system with three protection domains.
b) Describe the model of protection, an Access Matrix.
8. Explain in detail about various Fault Tolerance Techniques.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.C.A. II Semester (SVEC10) Regular Examinations August - 2011

OBJECT ORIENTED PROGRAMMING

[MASTER OF COMPUTER APPLICATIONS]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. Explain the following terms:
 - a) polymorphism .
 - b) Scope and life time of variables.
 - c) type conversion and casting.

2.
 - a) Distinguish between static and non static method, illustrate with suitable examples.
 - b) Define Recursion and write a recursive routine for GCD .

3.
 - a) Explain about the feature of dynamic method dispatch. Give an example program to demonstrate this feature.
 - b) Give some frequently used string operations (at least four). Explain about the use of data conversion method *valueOf()* with suitable example statements.

4.
 - a) What is an interface in Java language? How this can be used to get the functionality of multiple inheritance?
 - b) What is CLASSPATH environment variable? Explain its use with example commands for Java program execution.

5.
 - a) Discuss the Java error handling mechanism? What is the difference between 'unchecked exceptions' and 'checked exceptions'? What is the implication of catching all the exceptions with the type "Exception"?
 - b) Explain Multithreading. How java implements its thread Model?

6.
 - a) Write a program to illustrate the concept of stream class ?
 - b) Explain the concept of concatenating and buffering files ?

7.
 - a) Explain about the following Events and corresponding listeners.
(i) TextEvent (ii) AdjustmentEvent (iii) MouseEvent
 - b) Write a Java program using AWT classes for creating a simple user input form (name, address) along with the buttons (OK, cancel) and display the entered input when OK button is pressed.

8.
 - a) Explain the hierarchy of Swing components ?
 - b) Write a program to pass parameters to applets.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.C.A. II Semester (SVEC10) Regular Examinations August - 2011

DATABASE MANAGEMENT SYSTEMS

[MASTER OF COMPUTER APPLICATIONS]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Describe the system structure of database system.
b) List out the functions of DBA.
2. a) Construct an ER-diagram for a car insurance company whose customers own one/more cars each. Assume that each car has associated with it zero to any number of recorded accidents?
b) Differentiate between weak & strong entity set, with an example for each?
3. The given database Schema is
Employee(FName, Initial, Lname, ENO ,DOB, Address, Sex, Salary, Supereno, Dno)
Department(Dname, Dnumber , mgreno,mgrstartdate)
Dept_locations(Dnumber,Dlocation)
Project(Pname, Pnumber , plocation, dnum)
Works_on(EENO, PNo, hours)
Dependent(EENo, Dependent_Name, Sex, BDate, Relationship)
Write the queries in relational algebra with the above schema
 - a) Retrieve the name and address of all employees who work for the 'Research department'
 - b) List the project numbers for projects that involve an employee whose last name is 'Kumar', either as a worker or as a manager of the department that controls the project.
 - c) For each department, retrieve the department name and the average salary of all employees working in that department.
 - d) List the names of all employees who have a dependent with the same first name as themselves.
 - e) Retrieve the average salary of all female employees
 - f) Retrieve the names of employees who work on all the projects that 'Mahesh Kumar' works on.
4. Write a PL/SQL program using cursors for calculating the CGPA of a M.C.A student.
5. a) What are the problems caused by redundancy & decompositions in the databases?
b) Give a set of FD's for the relational schema R (A, B, C, D) with primary key AB under which R is in 1NF but not in 2NF?
6. a) Explain how serializability is achieved in concurrent execution of transactions?
b) Describe undo algorithm by illustrating the working nature of the algorithm for handling repeated system crashes?
7. a) Describe the lock table & transaction table data structures and their role in lock management?
b) Differentiate between primary & secondary indexes?
8. a) Explain how the RAID system improves performance and reliability.
b) Describe the structure of B+ tree and list the characteristics of a B+ tree.



CODE No.:10MT10301

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.Tech I Semester (SVEC10) Regular Examinations April - 2011

GENERAL MICROBIOLOGY AND BIOCHEMISTRY

[Bio-Technology]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. Explain various enrichment culture techniques used in isolation of bacteria.
2. Write short notes on -
 - a) Water soluble lipids
 - b) Nitrogen fixation .
3. Write an account on basic principles and techniques used in bacterial classification.
4. Sketch the structural differences between prokaryotic and eukaryotic cells with diagrams.
5. Write a brief account on Watson and Crick model of DNA structure and various types with suitable examples.
6. Explain the various types and importance of non covalent interaction in biological systems.
7. Define high energy compounds and explain their role in microbial fermentations.
8. How the nitrogen is freed by microorganisms? and write the mechanism in detail.



CODE No.:10MT10302

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.Tech I Semester (SVEC10) Regular Examinations April - 2011

MOLECULAR BIOLOGY

[Bio-Technology]

Time: 3 hours

Max Marks: 60

**Answer any FIVE questions
All questions carry equal marks**

1. What are the different DNA repair mechanisms that are operational in biological systems?
2. What are the methods available for isolation of genomic, plasmid and mitochondrial DNA? How will you check for the purity of DNA?
3. Give an account of post transcriptional modifications in Eukaryotes.
4. Describe in detail protein biosynthesis.
5. What are different extra chromosomal elements in bacteria and yeast cells?
6. Comment on
 - a) Mechanism of mutagenesis by physical and biological agents.
 - b) Different types of mutations.
7. What are ribozymes? How they were first discovered? Add a note on their importance.
8. What are the currently available cloning technologies? Add a brief note on risks and critical issues of cloning.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.Tech I Semester (SVEC10) Regular Examinations April - 2011

MICROBIAL ENGINEERING

[Bio-Technology]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) What are the various steps outlines in integrated bioprocessing?
b) Explain about various isolation methods used for industrial microorganisms.
2. a) Discuss about complex media used in fermentation technology.
b) Write about the role of water in the fermentation media.
3. *Acetobacter aceti* bacteria convert ethanol to acetic acid under aerobic conditions. A continuous fermentation process for vinegar production is proposed using nonviable *Acetobacter aceti* cells immobilized on the surface of gelatine beads. The production target is 2 Kg⁻¹ acetic acid; however the maximum acetic acid concentration tolerated by the cells is 12%. Air is pumped into the fermenter at a rate of 200 gmol h⁻¹.
 - a) What minimum amount of ethanol is required?
 - b) What minimum amount of water must be used to dilute the ethanol to avoid acid inhibition?
 - c) What is the composition of the fermentor of gas?
4. What is Response surface methodology? Considering that one need to optimize glucose, ammonia and pH for the maximum production of ethanol, design the experimental plan using any statistical technique and list out what statistical analysis will be required for optimization.
5. Citric acid is manufactured using submerged fermentation of *Aspergillus* sp. in a batch reactor at 30° C. In two days, 2500 Kg glucose and 860 kg oxygen are consumed to produce 1500 kg citric acid, 500 kg biomass and other byproducts. Ammonia is used as nitrogen source. Power input to the system by mechanic agitation of the broth is about 15 kW and approximately 100 kg water is evaporated over the culture period. Calculate the cooling requirements.
Additional data:
Heat of vaporization= 2430.7 kJ/kg
Heat of reaction = -460 KJ/g mole of oxygen.
6. Compare and contrast the batch and continuous sterilization.
7. a) Explain about unstructured model for microbial growth.
b) The substrate concentration versus specific growth rate data were collected for growth of *Saccharomyces cervivisiae* on glucose in a fermentor and presented as follows.

S (g/l)	15	12	9	6	2.5	1.7
μ (h ⁻¹)	0.34	0.33	0.32	0.3	0.22	0.18

Calculate Monod constants.

8. a) What are the points to be considered in designing the vector for recombinant products.
b) List out important regulatory constraints in production of recombinant products.



CODE No.:10MT10304

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech I Semester (SVEC10) Regular Examinations April - 2011

IMMUNOLOGY

[Bio-Technology]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. Explain humoral and cell mediated immune response.
2. Give the structural and functional details of secondary lymphoid organs in mammals.
3. What are antigens and immunogens? Explain various factors influencing immunogenicity?
4. Define antibody. Mention the types and functions of different antibodies.
5. Describe the following
 - a) Immunofluorescence.
 - b) Apoptosis
 - c) Western blotting.
6. Explain the MHC .
7. List out the complement proteins. Describe the process of complement activation and its role in neutralizing antigen.
8. Define autoimmunity. Describe the factors involved in autoimmune diseases citing atleast *TWO* examples.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech I Semester (SVEC10) Regular Examinations April - 2011

PROCESS ENGINEERING PRINCIPLES

[Bio-Technology]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) State the Ideal Gas law, Dalton's law and Amagat's law. Write the equations and explain.
b) Air contains 21%O₂ and 79%N₂ by volume. Calculate the composition in terms of percent by weight and its density at a pressure of 735.56 mmHg and a temperature of 25°C. Assume air to behave as an ideal gas.
2. a) Compute the work done in following cases: i) 10kg mass of water is evaporated at atmospheric pressure until a volume of 1.25 m³ is occupied. ii) Steam admitted to cylinder of an engine of stroke = 35 cm and bore = 18 cm at a constant pressure of 100 kgf/cm².
b) What is enthalpy? Is enthalpy a path function ?
3. a) What is the continuity equation? Describe and discuss the steady and unsteady flow.
b) Discuss in detail the agitation and power requirement in bioreactors .
4. a) Describe the construction, working and uses of centrifugal pump.
b) Derive Kozeny- Carman equation for flow through bed of solids and mention the assumptions involved in it.
5. a) Write the analogies between heat and momentum transfer.
b) Explain heat conduction through a composite plane wall with a neat figure. Also, derive the equation for the rate of heat transfer.
6. a) Write a note on Grashoff number and explain its significance in convection.
b) Hot water (0.01 m³ /min) enters the tube side of a cocurrent shell and tube heat exchanger at 80°C and leaves at 50°C. Cold oil (0.05 m³/min) of density 800 kg/m³ and specific heat of 2 kJ/(kg K) enters at 20°C. Calculate the log mean temperature difference in °C .
7. a) Write short notes on film theory.
b) Ammonia is diffusing through a stagnant air film 0.25mm thick. The total pressure is 2 atm. and temperature of 50°C. Calculate the rate of diffusion of ammonia in kilograms per hour through 1 sq .m surface if the concentration difference across the film is 10% to 2% ammonia by volume. The diffusivity of NH₃ in air at 0°C and 1 atm is 0.198 cm²/s.
8. a) Write various types of separation processes that can be used for the separation of gas- liquid systems and explain them briefly.
b) Identify the resistances that are important for the transfer of oxygen from gas phase to a microorganism.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.Tech I Semester (SVEC10) Regular Examinations April - 2011

ANALYTICAL TECHNIQUES IN BIOTECHNOLOGY

[Bio-Technology]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. What is electrophoresis? Explain the principles and experimental procedure for separation of proteins by SDS-PAGE.
2. Define Rotor. Explain the role of rotor in ultracentrifugation. Add a note on maintenance of rotors.
3. Give an account of the principle and detailed procedure of affinity chromatography with a suitable example.
4. Give an account of the principles, instrumentation and applications of FTIR.
5. Write an essay on principles and applications of NMR spectroscopy.
6. Add a note on:
 - A. Radioactive Decay
 - B. GM counter
 - C. Non-Radioisotopes.
7. What is Automatic analyzer for protein and amino acids ? Explain the principle and methodology of Automatic analyzer.
8. What is microscopy ? Explain principle and applications of electron microscopy.



SREE VIDYANIKETHAN ENGINEERING COLLEGE
 (An Autonomous Institution, Affiliated to JNTUA, Anantapur)
 M.Tech I Semester (SVEC10) Regular Examinations April - 2011
COMPUTER ARCHITECTURE
 [Computer Science]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
 All questions carry equal marks

1. a) How many flip flops will be complemented in a 10 bit binary counter to reach the next count after (i) 1001100111, (ii) 0011111111.
 b) Simplify using 4-variable k -map and draw the logic diagram for the Boolean function

$$F(A,B,C,D) = \sum (0,1,8,10,11,14,15)$$

 c) For the following function find (i) the dual function (ii) the complement function (iii) the dual of the complement and (iv) the complement of the dual.

$$f(x,y,z) = xyz + xy'z' + x'y'z + x'yz$$
2. a) Show that the XOR function $x = A \oplus B \oplus C \oplus D$ is an odd function.
 b) Show the connections between four 4-bit binary counters with parallel load to produce a 16-bit binary counter with parallel load. Show how the above counter can be made to operate as a divide-by-N counters.
3. a) What do you mean by 'register transfer'? What is the importance of a 'control function' in register transfer explain with example.
 b) What is the use of a Bus in any microcontroller/processor. Draw and explain Bus system for 4 registers.
 c) Show the block diagram of the hardware that implements the following register transfer statement.

$$yT_2 : R_2 \leftarrow R_1, R_1 \leftarrow R_2$$
4. It is necessary to design a pipeline for a fixed-point multiplier that multiplies two 8-bit binary integers. Each segment consists of a number of AND gates and a binary adder similar to an array multiplier
 (i) How many AND gates are there in each segment and what size of adder is needed? (ii) How many segments are there in the pipeline? (iii) If the propagation delay in each segment is 30ns, what is the average time that it takes to multiply two fixed-point numbers in the pipeline?
5. a) Explain about Wilke's Micro programmed control unit.
 b) Distinguish between hardwired control unit and micro programmed control unit.
6. A computer employs RAM chips of 256×8 and ROM chips of 1024×8 . The computer system needs 2K bytes of RAM, 4K bytes of ROM, and four interface units, each with four registers. A memory-mapped I/O configuration is used. The two highest-order bits of the address bus are assigned 00 for RAM, 01 for ROM and 10 for interface registers. (i) How many RAM and ROM chips are needed? (ii) Draw a memory-address map for the system. (iii) Give the address range in hexadecimal for RAM, ROM and interface.
7. a) In most computers an interrupt is recognized only after the execution of the instruction. Consider the possibility of acknowledging the interrupt at any time during the execution of the instruction. Discuss the difficulty that may arise.
 b) What is the difference between isolated I/O and memory-mapped I/O? What are the advantages and disadvantages of each ?
8. a) Describe in words and by means of a block diagram how multiple matched words can be read out from an associative memory.
 b) What additional logic is required to give a no-match result for a word in an associative memory when all key bits are zeros ?

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.Tech I Semester (SVEC10) Regular Examinations April - 2011

DISCRETE STRUCTURES AND AUTOMATA THEORY

[Computer Science]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Construct the truth table for the following formula
 $(P \wedge Q) \vee (\neg P \wedge Q) \vee (P \wedge \neg Q) \wedge (\neg P \wedge \neg Q)$.
 b) Show the following equivalence.
 $(P \rightarrow Q) \wedge (R \rightarrow Q) \Leftrightarrow (P \vee R) \rightarrow Q$.
2. a) Define the term Abelian Group. Let $(A, *)$ be an algebraic system where $*$ is a binary operation such that for any $a, b \in A$, $a * b = a$. Show that $*$ is an associative operation.
 b) Among 100 students, 32 study maths, 20 study physics, 45 study biology, 15 study maths and biology, 7 study maths and physics, 10 study physics and biology, and 30 do not study any of the three subjects. How many students are studying all three subjects?
3. a) Find the number of distinct triples (x_1, x_2, x_3) of non negative integers satisfying $x_1 + x_2 + x_3 < 15$.
 b) Solve the recurrence relation
 $\mu_n - 7\mu_{n-1} + 16\mu_{n-2} - 12\mu_{n-3} = 0$.
 $\mu_0 = 1, \mu_1 = 4, \mu_2 = 8$.
4. a) How do you differentiate a tree from a graph? For a binary search tree T, the Postorder and Preorder traversal sequences are given as - A C F D B and B A D C F respectively.
 What is the structure of the tree T?
 b) Give a method to visit all the nodes of an undirected and unconnected graph using BFS.
5. a) Define the following terms with examples - Alphabet, String, Language and Sentence.
 b) Design a finite state automaton with output (i.e. a Moore machine) which takes as input a binary number starting from least significant bit to most significant bit and produces its 2's complement as output.
6. a) Explain different closure properties of regular sets .
 b) Construct left linear and right linear grammar for the regular expression $0^*(1(0+1))^*$.
7. a) Convert the following grammar into Chomsky normal form
 $S \rightarrow aA/a/B/F$
 $A \rightarrow aB/E$
 $B \rightarrow aA$
 $F \rightarrow gFD$
 $D \rightarrow abd$
 b) Design a PDA to accept the following CFG.
 $S \rightarrow AA/a$
 $A \rightarrow SA/b$.
8. a) Compare and contrast finite automata push down automata and Turing machine.
 b) Design Turing machine which multiplies two integers and Draw its state transition diagram.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.Tech I Semester (SVEC10) Regular Examinations April - 2011

DATA STRUCTURES AND ALGORITHMS

[Computer Science]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Explain about linked stacks in detail.
b) Convert the following infix expression into prefix expression.
 $(- (A * B) / D) \uparrow C + E - F * H * I$
2. a) Describe what is meant by the big O notation in algorithm analysis.
b) How do you estimate the efficiency of an algorithm.
3. a) What are threaded Binary Trees? Explain.
b) What are different Graph Traversal Techniques? Explain.
4. What are the four cases that violate the AVL tree condition? Give example showing the height imbalance for each case?
5. a) How to construct an 'Expression Tree'?
b) Briefly explain about 'Splay Trees'?
6. a) Explain the Strassen's Matrix Multiplication method with an example.
b) Explain the Single Source Shortest Path Technique with an example.
7. Construct an optimal travelling sales person tour using dynamic programming for the following TSP instance:

$$\begin{bmatrix} 0 & 10 & 9 & 3 \\ 5 & 0 & 6 & 2 \\ 9 & 6 & 0 & 7 \\ 7 & 3 & 5 & 0 \end{bmatrix}$$

8. a) What is graph coloring problem?
b) Explain Backtracking approach for 8-Queens problem.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech I Semester (SVEC10) Regular Examinations April - 2011

SOFTWARE ENGINEERING

[Computer Science]

Time: 3 hours

Max Marks: 60

**Answer any FIVE questions
All questions carry equal marks**

1. a) Explain the SEI CMM levels.
b) What steps you would suggest to convert a CMM level 4 Company to a CMM level 5 Company ?
2. a) State agility principles and Agile Software Development Process ?
b) Describe briefly Extreme programming ?
3. a) How are collaborative requirements and quality function deployed in eliciting requirements ?
b) How is Software Requirement specification document generated ?
4. a) What are the software quality guidelines and attributes? Explain.
b) What is an architecture? Why is an architecture important ?
c) How architectural design useful for software to develop ?
5. a) What are the steps involved in designing an interface ?
b) How an effective design pattern can be characterized? Discuss about various kinds of patterns.
6. a) What are the golden rules of User Interface Design ?
b) What are Design Patterns ?. Give examples.
7. a) Explain about object oriented testing methods ?
b) Discuss about white box testing.
8. a) Explain briefly about i) Size oriented metrics ii) Function oriented metrics.
b) What are the metrics needed for software quality ?



SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.Tech I Semester (SVEC10) Regular Examinations April - 2011

DATABASE MANAGEMENT SYSTEMS

[Computer Science]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

- What are the drawbacks of a DBMS? Briefly describe situations when a DBMS should not be used.
 - What is data independence? Describe about physical data independence and logical data independence.
- For a binary decomposition to be loss-less and dependency preserving, what are the necessary conditions?
 - Consider a relation schema $R = \{A, B, C, D, E\}$. Let the set of functional dependencies be $F = \{ \{A, B\} \rightarrow \{C\}, \{C\} \rightarrow \{D\}, \{D\} \rightarrow \{B\}, \{D\} \rightarrow \{E\} \}$. Find all candidate keys for R. If R is not in 3NF, find a 3NF decomposition of R. Similarly find a BCNF decomposition of R.
- Convert the following relational algebra expressions into both tuple and domain relational calculus (Note, * denotes *natural join*).

 - $\sigma_{A=D} (R(A, B, C) \times S(D, E)) \sigma_{A=D} (R(A, B, C) \times S(D, E))$
 - $\pi_{\langle A, D \rangle} (R(A, B, C) * S(C, D)) \pi_{\langle A, D \rangle} (R(A, B, C) * S(C, D))$
 - $(R(A, B, C) - S(A, B, C)) \cap T(A, B, C) (R(A, B, C) - S(A, B, C)) \cap T(A, B, C)$
 - $R(A, B) \div S(A) R(A, B) \div S(A)$
- Describe the concepts of cursors in embedded SQL and stored procedures?
 - What are the differences between stored procedures and functions? Explain with example.
- Explain with example, the functionality of dynamic hashing? Also discuss how it is useful in DBMS?
 - Construct B+ tree for the following set of key values
5 15 25 35 45 55 65 75 85 95 99

Assume that the tree is initially empty and values are added in ascending order where number of pointers that will fit in one node is four.
- (i) With specific and simple examples explain about conflict serializability and view serializability? (ii) Give an example schedule which is view serializable, but not conflict serializable.
 - (i) Compare and contrast between basic, conservative, strict and rigorous two phase locking protocols. (ii) Briefly describe about Thomas's write rule and where it is applicable.
- In distributed databases, what is distribution transparency? Briefly describe about distribution transparency for update applications.
 - Discuss how costs and benefits of fragment allocation can be measured for both horizontal and vertical fragmentation.
- (i) What are various threats to databases? (ii) What are various types of security? (iii) What are various responsibilities of the DBA?
 - (i) What is the difference between persistent and transient objects? How is persistence handled in a typical object oriented database system? (ii) Discuss the concept of polymorphism in object oriented databases.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.Tech I Semester (SVEC10) Regular Examinations April - 2011

SOFTWARE TESTING METHODOLOGIES

[Computer Science]

Time: 3 hours

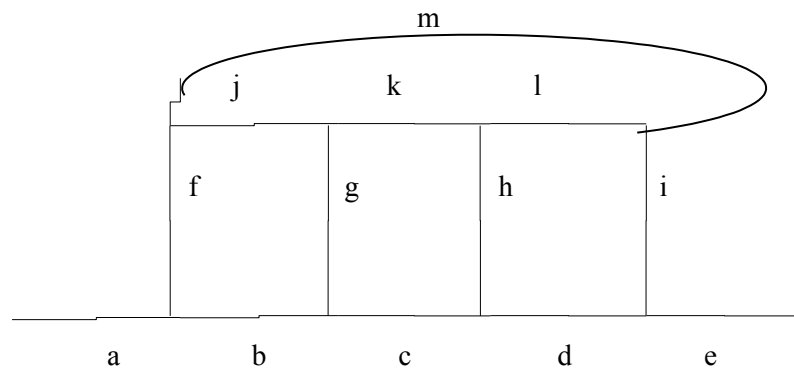
Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. Write about the goals for testing. Explain the model of testing with a neat diagram.
2. a) Briefly explain about the kinds of loops.
b) Explain about Multi Entry and Multi Exit routines.
3. Briefly Explain the Transaction Flow Testing techniques.
4. Compare and contrast nice and ugly domains .
5. a) Draw a KV-chart for the following expression:

$$\overline{A} \overline{B} \overline{D} + BD + \overline{B} C$$

- b) Apply the reduction procedure and reduce the following graph:



6. write a short note on the following :
 - a) Equivalent states.
 - b) Unspecified and contradictory transitions.
 - c) Dead states.
7. a) Explain the Partitioning algorithm.
b) What are the different matrixes Operations? Explain briefly.
8. Explain about java testing tools.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.Tech I Semester (SVEC10) Regular Examinations April - 2011

ADVANCED DIGITAL SIGNAL PROCESSING

[Digital Electronics and Communication Systems]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Show that an absolutely summable sequence has finite energy, but a finite energy sequence may not be absolutely summable.
b) Determine the impulse response of an LTI system described by the difference equation:
 $y[n] + 0.1 y[n-1] - 0.06 y[n-2] = x[n] - 2 x[n-1]$.
2. a) What do you mean by minimum and maximum phase transfer functions? Explain.
b) Discuss about 'deconvolution' with suitable example.
3. a) With suitable derivation, give the design procedure of FIR digital filter with least mean square error.
b) Design a linear phase FIR low pass filter of length 37 with a pass band edge at 0.3π using the frequency sampling approach. Assume ideal brick-wall characteristics for the desired magnitude response.
4. a) Give the procedure to perform split radix FFT with suitable example.
b) How chirp - z transform is used to compute DFT signals? Explain.
5. a) Describe Lagrange's interpolation algorithm used in connection with sampling rate converter.
b) Develop an expression for the output $y[n]$ as a function of the input $x[n]$ for a multi-rate structure described below: an Interpolation by 5 block, a decimation by 20 block, and an interpolation block by 4 are all connected in cascade form.
6. a) Explain the estimation of the autocorrelation and power spectrum of random signals of finite length.
b) Give the estimation of power spectrum using Welch non-parametric method.
7. a) Derive the Yule Walker equation for the estimation of Auto-correlation from the random data.
b) Determine the autocorrelation $R_{xx}(n)$ of a random sequence $x[n] = A \cos(\omega_1 n + \Phi)$, where Φ is uniformly distribute phase over $0 - 2\pi$ interval.
8. Write the following:
 - a) Over-sampling D/A converter.
 - b) Discrete time Analytic signal generation.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.Tech I Semester (SVEC10) Regular Examinations April - 2011

DIGITAL COMMUNICATION TECHNIQUES

[Digital Electronics and Communication Systems]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Derive the output frequency response in terms of input and system response for discrete-time signals.
b) Discuss about Rayleigh distribution and its importance.
2. a) Derive the response of Band-pass system to a Band pass signal.
b) Determine the energy of Band pass signal $S(t)$ in terms of its envelope.
3. a) Discuss M-ary phase shift keying and derive power spectral density of it. Represent M-ary PSK signal geometrically.
b) Draw the M-ary PSK transmitter and explain working mechanism.
4. a) What is matched filter? Derive the expression for SNR expression at the output of matched filter. Give its applications.
b) Derive the expression for probability of error for binary modulation.
5. a) Discuss maximum - likelihood carrier phase estimation
b) Using phase-locked loop how phase of an unmodulated carrier is estimated.
6. a) What is an equalizer? Explain it with a suitable example.
b) Describe the peak distortion and the mean square error criteria.
7. a) Discuss the model of spread spectrum digital communication system.
b) Explain the DS-QPSK receiver with the help of block diagram.
8. Explain the sliding correlator for DS signal acquisition with block diagram.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.Tech I Semester (SVEC10) Regular Examinations April - 2011

DIGITAL SYSTEM DESIGN

[Digital Electronics and Communication Systems]

Time: 3 hours

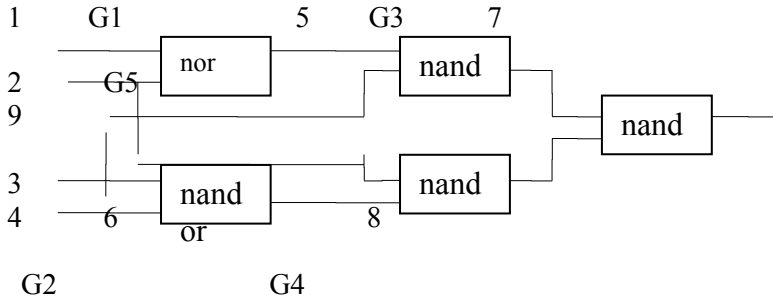
Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Consider the state table of the machine M, find equivalence partition and a corresponding reduced machine in standard form.

P.S.	N.S., Z	
	X=0	X=1
A	B,0	E,0
B	E,0	D,0
C	D,1	A,0
D	C,1	E,0
E	B,0	D,0

- b) Explain the need for state reduction and proper state assignments.
2. a) Design a 4-bit magnitude comparator using 1-bit magnitude comparator.
b) Design a mod-8 gray code counter and realize using a PLA.
3. a) Define stuck-at faults and bridging faults in detail.
b) Realize the function $F=X_1'X_2X_3'+X_1'X_2'X_3$ using NOR gates and determine the tests for checking all single node faults.
4. a) Explain Random testing method in detail.
b) Generate a test vector to detect G2 output S_{a_0} in the circuit given using D-algorithm



5. Apply fault detection experiment for the given machine and derive test sequence

PS	NS, Z	
	X = 0	X = 1
A	C, 0	A, 1
B	D, 0	C, 1
C	B, 1	D, 1
D	C, 1	A, 0

6. Apply IISC algorithm and minimize the given PLA output function.
 $f = 2001 + 2020 + 1200 + 2211.$
7. a) Explain different kinds of cross point faults.
b) Explain semi random test generation method used for PLAs.
8. a) Define Races, Hazards and cycles.
b) Show a primitive and reduced flow table for the circuit specified by “Z=1 if both $x_1 = x_2 = 1$, but only if x_1 becomes 1 before x_2 ”.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.Tech I Semester (SVEC10) Regular Examinations April - 2011

EMBEDDED SYSTEMS

[Digital Electronics and Communication Systems]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Discuss in detail Embedded Systems development process.
b) What do you mean by software design, hardware design and co-design.
2. a) Discuss system bus configuration of a CPU in an Embedded Systems.
b) Explain glue logic interface scheme.
3. Explain round-robin architecture with a suitable example.
4. a) Explain the tool chain for building embedded software.
b) Explain instruction set simulator.
5. a) Describe the various interrupt service routines in an RTOS environment.
b) How message queues are used for communication among processes in RTOS environment.
Explain.
6. Differentiate the advanced processor architectures (ARM and SHARC processors) with respect to their preliminaries and instruction sets.
7. a) Bring out the list of requirements for development of Embedded Systems.
b) Explain AND state in statechart.
8. Explain in detail the following design example.
Telephone PBX.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.Tech I Semester (SVEC10) Regular Examinations April - 2011

MICROCOMPUTER SYSTEM DESIGN

[Digital Electronics and Communication Systems]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. Draw a neat sketch of the internal architecture of 8086. and explain its register organization.
2.
 - a) Explain how interrupts are handled by 80286?
 - b) Explain how one task can call another task in multi-tasking 80286 system?
 - c) Explain the steps to move from real mode to protected mode of 80286.
3.
 - a) Explain the concept of memory paging mechanism. How does it affect the memory management in 80486 processor.
 - b) Explain the descriptors available in 80386 and how do they help in handling multiple tasks ?
4.
 - a) Bring out the architectural difference between 80486 and Pentium.
 - b) Explain Branch prediction. How does it enhance the speed of execution ?
5. Write a detailed note on dual core microprocessor architecture.
6. Explain the steps in initializing DMA to handling block transfers using DMA.
7. List out various process management techniques in multi programming / processing. Explain any two techniques listed.
8. Write a brief note on
 - (i) Co-processor and its requirement.
 - (ii) MMX technology.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.Tech I Semester (SVEC10) Regular Examinations April - 2011

LOW POWER VLSI DESIGN

[Digital Electronics and Communication Systems]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Explain about the Design Limitations imposed on Low-Power, Low-Voltage Circuits Pertaining to the following Parameters.
 - i) Power Supply Voltage.
 - ii) Threshold Voltage.
 - iii) Scaling.
 - iv) Interconnect Wires.b) What are the advantages and limitations of Silicon-on-Insulator.
2. a) What is threshold voltage? What are various factors that influences threshold voltage.
b) Explain the principle of BiCMOS inverter.
3. a) Illustrate low-voltage low-power deep submicron CMOS processes.
b) Describe the future trends and directions of low-voltage low-power CMOS/ BiCMOS processes.
4. a) Give the analytical and experimental characterization of sub-half micron MOS devices and its significance.
b) Differentiate the performance parameters of MOSFET models with Bipolar models.
5. With suitable diagrams, explain the performance evaluation of conventional CMOS and BiCMOS logic gates.
6. a) Derive the Rigorous expression for turn-off or Rise time; considering body effect for a CMOS Inverter Logic Gate.
b) Draw the circuits and explain about the Two-types of Feed back type BiCMOS Digital circuits.
7. a) Explain the design approach for low-power latches and flip-flops with an example from each logic circuit.
b) Describe the quality measures for low-power latches and flip-flops.
8. Explain the following relevant to low-power VLSI special techniques.
 - (a) Low Power Bus.
 - (b) Low Power Techniques for SRAM.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech I Semester (SVEC10) Regular Examinations April - 2011

ADVANCED CONTROL SYSTEMS

[Electrical Power Systems]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Explain how lead-lag compensative effects the time response plot of a typical second order system.
b) Explain the procedure to derive a lead compensator by using Root locus technique.
2. a) What is a PID controller? Derive expressions for K_p , K_i and K_d in frequency domain approach.
b) Find a compensator for the unity feedback system having open loop transfer function $G(s) = \frac{4K}{s(s+2)}$, so that $K_V = 20/\text{sec}$, phase margin $\geq 50^\circ$, gain margin $\geq 10\text{dB}$. Use Bode plots.

3. a) Explain the physical concept of observability.

b) Given the system, $\dot{x} = \begin{bmatrix} -1 & 0 & 0 \\ 0 & -2 & 0 \\ 0 & 0 & -3 \end{bmatrix} x + \begin{bmatrix} 0 & 1 \\ 2 & 0 \\ 0 & 1 \end{bmatrix} u; y = \begin{bmatrix} 0 & 1 & 2 \\ 0 & 1 & 0 \end{bmatrix} x;$

State the condition of controllability and observability of the system.

4. a) Discuss the characteristics of non-linear systems.
b) Derive the describing function of a non-linear system with dead zone and saturation at the same time.
5. a) Define and classify singular points.
b) Determine the equilibrium points of the following system and classify them

$$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} x_2 \\ -x_1^2 - x_2 \end{bmatrix}$$

6. a) Explain about the Liapunov stability criterion.
b) Check the stability of the system described by the equations using variable gradient method

$$\begin{aligned} \dot{x}_1 &= x_2 \\ \dot{x}_2 &= x_1 - b_1 x_2 - b_2 x_2^3, b_1, b_2 > 0. \end{aligned}$$

7. a) Write about state observers.
b) Consider the system defined by

$$\dot{x} = Ax + Bu$$

where $A = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -1 & 5 & -6 \end{bmatrix}$ and $B = \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix}$

By using the state feedback control $u = -Kx$, it is desired to have the closed-loop poles at $s = -2 \pm j4$ and $s = -10$. Determine the state feedback gain matrix K using Ackermann's method.

8. a) Explain about the new concepts concerning 'functionals'.

b) Find the extremal for the functional $J(x) = \int_1^{t_1} (2x - \frac{1}{2} \dot{x}^2) dt$, $x(1) = 2, x(t_1) = 2, t_1 > 1$ is free.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech I Semester (SVEC10) Regular Examinations April - 2011

EHVAC TRANSMISSION

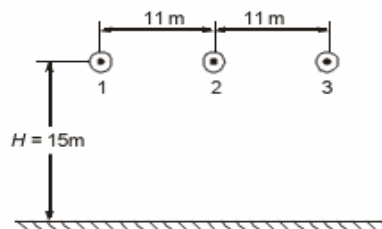
[Electrical Power Systems]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

- Explain the advantages of EHVAC transmission over other transmission.
 - Derive the expression for Capacitance of a 2 conductor line.
- The dimensions of a 3-phase 400-kV horizontal line, as shown in the Fig. below:
 $H = 15\text{ m}$, $S = 11\text{ m}$ phase separation, conductor $2 \times 3.18\text{ cm}$ dia, and $B = 45.72\text{ cm}$. Calculate.
 - the matrix of inductances per km, for untransposed configuration, and
 - the same when there is complete transposition.



- Explain about voltage gradients on sub conductors.
 - Derive the expressions for computing electrostatic field components near an EHVAC line.
- Explain Electrostatic Field of Double-Circuit 3-Phase Line.
- Explain about Static VAR compensation.
 - Explain about (i) Series compensation (ii) Shunt compensation.
- What is mean by Attenuation of voltage on traveling waves? Explain.
 - Explain the generation and characteristics of Audible noise.
- Explain how will you measure Radio interference field Intensity with neat block diagram.
- What are the two most important factors that are to be considered to design EHV lines? Explain briefly.



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M.Tech I Semester (SVEC10) Regular Examinations April - 2011

MICROPROCESSORS AND MICROCONTROLLERS

[Electrical Power Systems]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Draw the architecture of Intel 8086 microprocessor. Indicate the use of different registers of this processor.
b) Distinguish the use of 8086 microprocessor in 'minimum' and 'maximum' modes.
2. a) Explain the flag register of 8086/8088.
b) what is the reset add of 8086.
3. Explain the importance & functioning of
(a) ALE pin (b) Mov ax, 004CH INT 21 H (c) Mov ax, @ Data Mov DS, AX
(d) Min/Maxi pin. (e) DT/R (f) INTR (g) RESET (h) TEST.
4. a) Draw the functional block diagram of Intel 8259, programmable interrupt controller. Explain the features of each block.
b) Write down format of different control words required for programming programmable interrupt controller 8259.
5. a) With the help of block diagram explain the operation of USART (8251A)
b) Discuss the salient features of 8259 - programmable interrupt controller.
6. a) Explain various addressing modes of microcontroller Intel 8051, Give an example to each addressing mode.
b) Write short note on architectural features of Intel 8051 microcontroller.
7. a) Describe different modes of operating timers in 8051.
b) Write an assembly language program to generate square wave from P1.0 using timer 0 of 8051 microcontroller.
8. a) Draw the interfacing diagram of analog to digital converter with 8051 micro controller. What are factors related to hardware on which the accuracy of conversion depend?
b) Write an assembly language program to get the digital equivalent of triangular wave input connected to input pin of ADC.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech I Semester (SVEC10) Regular Examinations April - 2011

POWER SYSTEM CONTROL & STABILITY

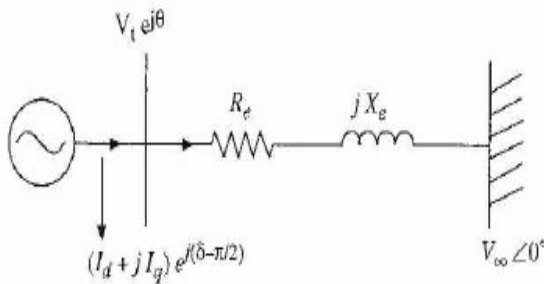
[Electrical Power Systems]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Derive the swing equation of a single generator connected to a double circuit line through the transformer and there from analyze the steady state stability.
b) A synchronous machine having inertia constant $H=4.0$ MJ/MVA is initially operated in steady state against an infinite bus with angular displacement of 30 elec deg and delivering 1.0 pu power. Find the natural frequency of oscillation for this machine, assuming small perturbations from the operation point.
2. With the help of neat block diagram, analyze the effect of voltage and speed control of a synchronous machine with voltage regulation with one time lag.
3. Consider a single machine connected to an infinite bus as shown in figure. Assume $V_\infty=1.0$; the parameters are



line:

$R_c=0.0$; $X_c=0.4$ pu

Generator:

$X_d X'_d = 1.6$ pu; $X_q X'_q = 1.55$ pu; $X'_d X'_d = 0.32$ pu;

$T'_{d0} T'_{d0} = 6.0$ sec; $H = 3$ sec

Injected power into bus: $P = 0.8$ pu; $Q = 0.4$ pu

Exciter: $K_A = 50$; $T_A = 0.05$ sec

Compute $K_1 - K_6$ constants and comment on the stability of the machine.

4. Derive and explain the block diagram of approximate model of complete exciter.
5. Explain, with help of block diagram, non-continuously regulated excitation systems.
6. Describe state space modeling of type2, type3 and type 4 excitation systems.
7. Derive the expression for energy function of generator connected to infinite busbar.
8. Explain and compare rotar angle and voltage stability with diagrams.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.Tech I Semester (SVEC10) Regular Examinations April - 2011

REACTIVE POWER COMPENSATION AND MANAGEMENT

[Electrical Power Systems]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. (a) What are the objective and specifications of load compensation?
(b) Illustrate the p.f correction of unsymmetrical loads with an example.
2. (a) Explain the advantages and disadvantages of various types of compensation equipment used in transmission lines.
(b) Describe how an open circuited transmission line is going to perform without compensation.
3. (a) Discuss the characteristic time periods of reactive power compensation in transmission systems.
(b) Explain the synchronous condensers compensation in transmission system.
4. (a) Explain the basic concept of quality of power supply.
(b) Discuss the importance of reactive power coordination.
5. (a) Classify the customer categories in distribution networks.
(b) Explain about the additional tariff features that are incorporated to aid demand side management.
6. (a) What are the loss reduction method? Explain briefly.
(b) Discuss the retrofitting of capacitor banks on distribution side reactive power management.
7. (a) Explain the characteristics of different types of capacitors used in domestic sector.
(b) Draw the sketch of an UPS and explain its operation.
8. (a) Draw the typical layout of traction systems? Explain.
(b) Explain the p.f of an arc furnace with the help of neat characteristics.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech I Semester (SVEC10) Regular Examinations April - 2011

NEURAL NETWORKS & FUZZY SYSTEMS

[Electrical Power Systems]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. (a) Define the activation functions, bias, threshold, and learning in the context to artificial neural networks.
(b) Explain supervised and unsupervised learning in detail with the help of block diagram.
 2. (a) State and prove Perceptron convergence theorem.
(b) With suitable derive the backpropagation training algorithm
 3. (a) What are the modes of operation of a Hopfield network?. Explain the algorithm for storage of information in a Hopfield network. Similarly explain the recall algorithm.
(b) State and prove BAM stability theorem.
 4. (a) Discuss the ART network with block diagram.
(b) Explain LVQ architecture with algorithm.
 5. (a) Given that $A=0.2/4 + 0.8/5 + 0.3/6$ and $B=0.3/4 + 0.2/6$, determine
 - (i) the algebraic sum of the two sets.
 - (ii) the bound sum of the two sets.
(b) (i) Given that $A=0.8/4+0.7/5+0.3/6$ and $B=0.5/4+0.1/5+0.8/6$, determine the bounded sum of the two sets.
(ii) Give that $A=0.6/4 + 0.5/6 + 0.7/8$ and $B=0.3/4 + 0.5/8$, determine the bounded difference $A \ominus B$.
6. (a) Compare and contrast fuzzy logic control and classical control system.
(b) Summarize in a point form the design steps of fuzzy logic control.
 7. (a) Explain in detail about Fuzzy and Neural function estimators.
(b) Explain in detail about adaptive Neuro-Fuzzy interface systems.
 8. (a) Explain how ANN is used for process identification.
(b) Explain in detail about Fuzzy classification.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech I Semester (SVEC10) Regular Examinations April - 2011

ADVANCED DATA STRUCTURES AND ALGORITHMS

[Software Engineering]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Write algorithms that insert and delete at either end of a deque with deque being represented in a one-dimensional array.
b) What is circular queue? How it is advantageous over a linked queue?
2. a) Given an array of n elements, (possibly with some of the elements are duplicates), write an algorithm to remove all duplicates from the array in time $O(n \log n)$.
b) Suppose you are choosing between the following three algorithms:
 - Algorithm A solves problems by dividing them into five subproblems of half the size, recursively solving each subproblem, and then combining the solutions in linear time.
 - Algorithm B solves problems of size n by recursively solving two subproblems of size $(n - 1)$ and then combining the solutions in constant time.
 - Algorithm C solves problems of size n by dividing them into nine subproblems of size $n/3$, recursively solving each subproblem, and then combining the solutions in $O(n^2)$ time. What are the running times of each of these algorithms (in big-O notation), and which would you choose?
3. a) Write the deletion algorithm for a general tree.
b) Write an algorithm that creates a mirror image of a binary tree. All left children become right children and vice versa.
4. a) Write an algorithm that processes a threaded binary tree. The program should first build the tree, then use an iterative traversal to process it using the threads.
b) Write an iterative algorithm for insertion into AVL tree.
5. a) Explain various operations on Splay tree.
b) What is B-tree? What are the time complexities of insertion, deletion operation on B-tree?
Construct a B-tree of order 3 for following elements: 25,10,20,30,35,80,40,50,60,82,70,90,85,93.
6. a) Write the control abstraction of Divide and Conquer technique and discuss the time complexity.
b) Explain Strassen's matrix multiplication and discuss its time complexity.
7. a) Write the control abstraction of Dynamic Programming.
b) State and explain 0/1 knapsack problem using Dynamic Programming with an example.
8. a) State 8-queens problem and solve using Backtracking.
b) Write the control abstraction of Branch and Bound and explain LC Search.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech I Semester (SVEC10) Regular Examinations April - 2011

ADVANCED SOFTWARE ENGINEERING

[Software Engineering]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) What do you mean by a software process? List the differences between a methodology and a process?
b) Briefly explain the characteristics of software.
2. “Unified process is use case driven , Architecture centric, Iterative and incremental”
-Justify the above statement?
3. a) Define a risk. How will you assess a risk?
b) Explain various stages in security specifications.
4. a) What is software reuse? Write short notes on generator based reuse.
b) What is a reusable component? Under what environmental conditions (software/hardware) these components can be reused?
5. a) Discuss the differences between black box and structural testing and suggest how they can be used together in defect testing process.
b) Define maintenance and list the key factors that distinguish development from maintenance.
6. a) List the differences between service oriented and aspect oriented software engineering.
b) Write short notes on following:
 - services as reusable components.
 - modeling and documentation.
7. Distinguish between Quality Control and Quality Assurance?
8. Enumerate the golden rules of User Interface Design?



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M.Tech I Semester (SVEC10) Regular Examinations April - 2011

MIDDLEWARE TECHNOLOGIES

[Software Engineering]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. (a) Explain the advantages and disadvantages of Centralized computing and Distributed Computing.
(b) What are the components of Client/Server Environment? Explain how these components interact with one another.
2. (a) Explain connection oriented Programming
(b) Write about connectable objects.
3. (a) Discuss the problems of asynchrony in component development.
(b) Compare component framework with aspect oriented programming.
4. Explain how web services can be described using WSDL.
5. (a) Define Namespace and state available namespaces in .NET
(b) Write an overview on library.
6. Explain how ADO.NET is used to access data defined in XML. Discuss suitable examples.
7. Discuss contextual and data-driven compositions with the help of Enterprise Java Beans.
8. What are CORBA Component Containers?



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M.Tech I Semester (SVEC10) Regular Examinations April - 2011

SOFTWARE METRICS

[Software Engineering]

Time: 3 hours

Max Marks: 60

**Answer any FIVE questions
All questions carry equal marks**

1. a) What is measurement? Explain the objectives for software measurement.
b) Give brief description about capability maturity assessment.
2. a) What is a prediction system? How does it differ from measurement system?
b) Write briefly about the various classes of measurement scales?
3. a) What is meant by validation? Explain its role in software measurement.
b) Define process. Explain its role in classifying software.
4. a) Explain how data can be stored and extracted?
b) With an example explain various fields of fault report in detail?
5. a) Discuss in detail about the Albercht's approach for functionality.
b) Write a short notes on Reuse.
6. a) Define morphology. Mention its characteristics.
b) Draw and explain the different flowgraphs for program structure models.
7. a) Explain the defect density measures in detail.
b) Present a detailed note on ISO 9126 standard quality model.
8. a) What is a metric plan? Why we have to develop goals for better plan. Explain.
b) Explain in detail the different classes in ISO 9001.



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(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.Tech I Semester (SVEC10) Regular Examinations April - 2011

SOFTWARE REQUIREMENTS AND ESTIMATION

[Software Engineering]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. Assume that you are a software engineer working on a complex system to be developed for a large hospital chain. The system requirements include integrating hospital records of all patients, providing a means of digitizing and storing physicians' reports, acquiring and displaying digital images from equipment provided by another manufacturer, and providing a local area network interconnecting physician's offices with each other and a central file server. The hardware/software/operator system is required to allow a physical to call up an enhanced radiographic image from the central file server, Evaluate the image, and dictate the report to a microphone attached to his display. The system will be required to store the report, distribute the report to the referring physician, and add the fee to the patient's bill. Assume that you have been assigned to perform system risk analysis and prioritize the areas of greatest technical risk, and provide a rationale for the results you mentioned.
2.
 - a) State why a prototype is necessary? How does this approach save cost, effort and resources?
 - b) Identify the functional requirements and non-functional requirements in the following systems
 - i) An unattended petrol pump system which includes a credit card reader. The customer swipes the card through the reader then specifies the amount of fuel required. The fuel is delivered and the customer's account debited.
 - ii) The cash dispensing function in a bank auto-teller machine.
 - iii) The spell checking and correcting function in a word processor.
3. What is the difference between RDD (Requirements Definition and Description) and SRS (Software Requirements and Specifications)? What role do these documents play in the project development life cycle and the product development life cycle? Explain with an appropriate example.
4. Suggest which estimation models you would use in the following types of software.
 1. Financial Accounting package.
 2. Customized ERP.
 3. Modifications to existing sales and distribution system.
 4. system integration through interface developments.
 5. web enabling of the order processing system.
5. Is it possible to have a system that can automatically verify completeness of an SRS do Consider a project to develop a full-screen editor . The major components identified are (1). Screen edits, (2) Command language interpreter, (3) file input and output, (4) cursor movement and (5) screen movement. The sizes of these are estimated to be 4K, 2K, 1K, 2K and 3K delivered source code lines. For this project, determine the staff requirement for different phases and What are the average, maximum and minimum staff requirements. Explain your answer.
6. You are a programming manager who has given the task of rescuing a project that is critical to the success of the company. Senior management has given you an open-ended budget and you may choose a project team of up to five people from any other projects going on in the company. However, a rival company, working in the same area is actively recruiting staff and several staff working for your company has left to join them. Describe two models of programming team organization which might be used in this situation and make a choice of one of these models by using an appropriate effort and schedule estimation methods. Give reasons for your choice and explain why you have rejected the alternative model.
7. What is the advantage in automating the requirements management and briefly describe how this can be useful for the systems like e-banking
8. Describe the features in Software Life Cycle Management Tools containing the estimation tools for system development. Dou you think that estimation tools should be the part of SLIM, if yes justify your answer with appropriate example.

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M.Tech I Semester (SVEC10) Regular Examinations April - 2011

VIRTUALIZATION AND CLOUD COMPUTING

[Software Engineering]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. What is virtualisation? How virtualisation helps the cloud computing platform? Present Dynamic benefits of co-ordinated resource sharing in a virtual organization for a stock market information system.
2. How do you use for virtualization for implementing server virtualization?
3. Explain in detail about Oracle Virtualization?
4. a) How to achieve interoperability in cloud computing? Explain.
b) How does virtualisation help cloud computing? Explain with suitable examples.
5. Describe the components of Cloud Computing?
6. Describe the goals of on demand business computing and explain how cloud computing will meet the challenges of on demand business ?
7. Explain the Security issues in Cloud Computing?
8. Write a short note on:
 - a) Para-virtualisation.
 - b) OS virtualisation.
 - c) Storage virtulisation.



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M.Tech I Semester (SVEC10) Regular Examinations April - 2011

ANALOG IC DESIGN

[VLSI]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. Draw the high frequency equivalent circuit of nMOS and npn BJT transistor and derive the formulas for necessary parameters.
2. a) Explain the small signal for simple CMOS current mirror.
b) Explain in detail the design and operation of cascade current mirror. Identify the limitations and suggest remedies.
3. a) State the limitations of single stage amplifiers.
b) Explain in detail the design and operation of Wilson current mirror.
4. Draw the three -input switched capacitor summing / Integrator and derive its output voltage using signal flow graph method.
5. a) Compare and contrast CMOS and BICMOS sample and hold circuits and their performance.
b) What is a switched capacitor filter? List important features of it. How does it differ from an analog filter?
6. Explain how charge injection effect is reduced in switched capacitor circuits.
7. a) Define the terms as referred to data converters:
 - i) offset and gain error
 - ii) INL error
 - iii) DNL error
b) Compare the performance of different types of D/A converters?
8. a) Explain in detail about Band pass over sampling converter.
b) Derive the component values of 1st order continuous time filter.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech I Semester (SVEC10) Regular Examinations April - 2011

DIGITAL DESIGN MODELING AND SYNTHESIS WITH HDLS

[VLSI]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Explain the Verilog module and descriptive style in detail.
b) Discuss structured Top-Down design methodology.
2. a) What are the different types of user defined primitives are there explain in detail.
b) Give the different types of delays are there in HDL, explain with an example.
3. a) Explain about procedural timing controls and synchronization in Verilog?
b) Explain various constructs in Verilog for activity flow control?
4. a) What is the difference between Simulation and Synthesis?
b) Develop a Verilog code for 4×1 MUX using Transmission Logic.
5. a) Model and synthesize a synchronous UP-DOWN counter that is to assert at the count of 17.
Compare the area and performance of two implementations.
b) Develop a Verilog code for 8-bit words magnitude comparator.
6. a) Write the switch level description for a 3-input static CMOS NAND gate? Explain.
b) Explain about CMOS Transmission gates. Develop a Verilog model for a Transmission gate based Exclusive-OR gate?
7. a) Develop a VHDL code for Full-adder using two Half-adders in structural model.
b) Explain about synthesis and simulation and optimization.
8. a) Differentiate VHDL and Verilog in terms of Process and assert statements.
b) Explain MSI based design.



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M.Tech I Semester (SVEC10) Regular Examinations April - 2011

DIGITAL IC DESIGN

[VLSI]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Consider the circuit configuration of Fig. 1. Write the equations which are needed to determine the voltage at node X. Neglect short channel effects and assume that $\lambda_p = 0$. Determine the required width of the transistor (for $L = 0.25 \mu\text{m}$) such that X equals 1.5 V.

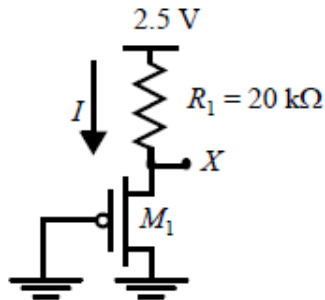


Fig.1.

- b) Explain the Dynamic Characteristics of CMOS inverter with suitable diagrams.
2. a) Consider a conventional 4-stage Domino logic circuit as shown in Fig.1 in which all precharge and evaluate devices are clocked using a common clock ϕ . Assume that the pulldown network is simply a single NMOS device, so that each Domino stage consists of a dynamic inverter followed by a static inverter. Assume that the precharge time, evaluate time, and propagation delay of the static inverter are all $T/2$. Assume that the transitions are ideal (zero rise/fall times). Complete the timing diagram for signals *Out1*, *Out2*, *Out3* and *Out4*, when the *IN* signal goes high before the rising edge of the clock ϕ . Assume that the clock period is 10 T time units.

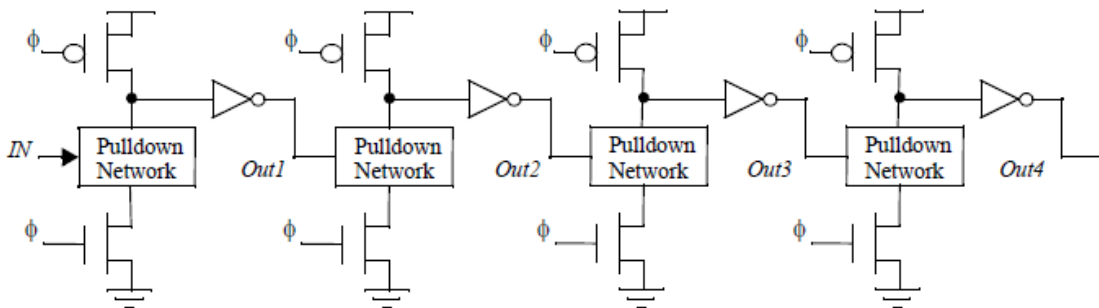


Fig.1

- b) What is the function implemented by the circuit shown in fig. 2?

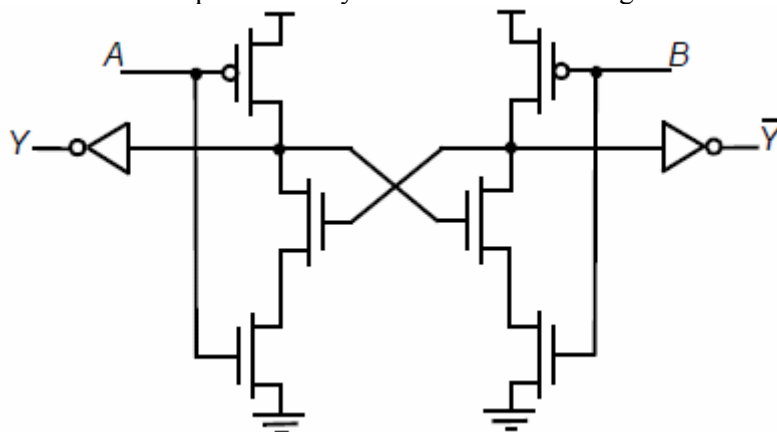


Fig. 2

3. a) Realize a serial adder in NORA logic.
b) Discuss the limitations of static Domino logic and their remedies.
4. a) Implement a 3-bit Multiplier using Complementary static CMOS
b) Explain possible ways of reducing static and dynamic dissipation in CMOS design.
5. a) Design a 2-input NOR gate using BiCMOS structures.
b) List out the advantages of BiCMOS technology,
6. a) Explain well rules, contact rules and transistor rules in detail.
b) Explain in detail latch-up and its triggering and the preventive methods.
7. a) Define area capacitance of layers and explain the procedure for calculation with suitable example.
b) Explain various types of design rules in detail.
8. a) Explain pipe-lined multiplier in detail.
b) Explain various functions that can be implemented using an adder with the help of a neat outline of a 4-bit adder.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech I Semester (SVEC10) Regular Examinations April - 2011

HARADWARE AND SOFTWARE CO-DESIGN

[VLSI]

Time: 3 hours

Max Marks: 60

**Answer any FIVE questions
All questions carry equal marks**

1. a) Illustrate the typical Co-design flow.
b) Distinguish Languages used for Hardware description and system design.
2. Distinguish VULCAN and COSYMA approaches for HW/SW partitioning.
3. a) Distinguish ICD and ICE.
b) Explain memory architecture suitable for tightly coupled HW/SW systems.
4. Explain the system communication infrastructure.
5. Explain the compiler techniques for specialized architectures.
6. a) Explain how a typical simulation environment used for verification.
b) Explain the computational model, which uses extensively concurrency coordinating concurrent computations.
7. a) Compare language oriented and architecture oriented system level design representations.
b) Explain the process of the C - VHDL mixed co-simulation.
8. Explain how the heterogeneous embedded system is modeled and co-simulation in the Lycos system.



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M.Tech I Semester (SVEC10) Regular Examinations April - 2011

VLSI TECHNOLOGY

[VLSI]

Time: 3 hours

Max Marks: 60

**Answer any FIVE questions
All questions carry equal marks**

1. a) Draw the cross-sectional view of n-well CMOS inverter?
b) What is Bi-CMOS technology? What are the additional process steps apart from CMOS?
2. a) Draw the NMOS inverter circuit diagram and draw its voltage transfer characteristics curve?
b) Explain latch-up in CMOS inverter?
3. a) Explain the various design rules for wires that used to design a CMOS layout?
b) Draw the stick diagram of 2-input NAND gate?
4. Explain the cascading problem of dynamic logic and how the domino logic is used to overcome the problem.
5. Explain the left edge algorithm for channel routing with a pseudo code?
6. a) Draw the circuit diagram of D-Flip flop?
b) Explain in brief the sequential system design?
7. a) Explain in brief Built in self Test?
b) Explain the different architectural methods for reducing power consumption.
8. a) Explain and draw the generic design flow for VLSI Systems?
b) Explain the different types of routing in layout?



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M.Tech I Semester (SVEC10) Regular Examinations April - 2011

ASIC DESIGN

[VLSI]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) What are the key parameters that motivate the chip designers to opt for ASICs? Explain?
b) What is full custom ASIC design flow? Explain advantages and disadvantages of full custom ASIC design flow?
2. a) Draw the architectural block diagram of PAL2V110?
b) Compare the performance of PAL with PLA? Is it possible to achieve equal performance capability for a given circuit?
3. a) Describe ASIC design flow?
b) Estimate the economics involved in the cell based ASIC design methodology?
4. a) Explain turnkey route ASIC design sequence?
b) State the ASIC design styles? And explain in brief?
5. a) Explain the bottom-up chip design approach?
b) Explain the system design sequence of the ASIC design flow?
6. a) Explain logic synthesis?
b) Explain logic synthesis of blocking and non-blocking statements of the Verilog HDL?
7. a) What are the goals and objectives of the system partitioning?
b) Explain any one type of partitioning algorithm.
8. a) What is system partitioning? State the objectives of system partitioning?
b) What is circuit parasitic extraction? And explain how logic effort will be maintained during the chip design?



SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.Tech I Semester (SVEC10) Supplementary Examinations October - 2011

PROCESS ENGINEERING PRINCIPLES

[Bio-Technology]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Define a unit operation and a unit process and write a short note on at least three unit operations and unit processes.
b) The force F exerted on a body immersed in a flowing fluid is dependent on the relative velocity between the solid and the fluid u , the fluid density ρ , the fluid viscosity μ and a characteristic length of the body Using Rayleigh's method, determine the dimensionless groups in which the dimensional variables may be arranged.
2. a) State the first, second and third laws of thermodynamics. Represent the cornot cycle schematically and discuss.
b) A thermodynamic system undergoes a cycle composed of a series of three processes for which $Q_1 = +10$ kJ, $Q_2 = +30$ kJ, $Q_3 = -5$ kJ. For the first process, $\Delta U = +20$ kJ, and for the third process, $\Delta U = -20$ kJ. What is the work in the second process, and the net work output of the cycle?
3. a) What is the physical significance of the Reynold's number? Explain the importance of the Reynold's number in laminar flow and turbulent flow.
b) Differentiate between laminar flow and turbulent flow. Show the velocity profiles for laminar and turbulent flow.
4. a) Differentiate between a packed bed column and fluidized bed column with applications.
b) Write a short note on Reciprocating, Rotary and Centrifugal Pumps.
5. a) A circular tube of outer diameter 5 cm and inner diameter 4 cm is used to convey hot fluid. The inner surface of the wall of the tube is at a temperature of 80°C , while the outer surface of the wall of the tube is at 25°C . What is the rate of heat transport across the tube wall per meter length of the tube of steady state, if the thermal conductivity of the tube wall is $10 \text{ W}/(\text{mK})$?
b) Derive the equation of LMTD and explain the significance of LMTD in heat transfer.
6. a) Write about overall heat transfer coefficient and fouling factors in terms.
b) State and explain black body, specular body, white body and diathermonous body.
7. a) What is a mass transfer? Discuss the molecular diffusion with suitable equations.
b) Describe and discuss the two-film theory, penetration theory and surface renewal theory.
8. a) Classify the industrial dryers and explain the operation of tray dryers.
b) What is crystallization? Write a short notes on the crystallization equipment.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech I Semester (SVEC10) Supplementary Examinations October - 2011

COMPUTER ARCHITECTURE

[Computer Science]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Construct a 4-bit Binary adder-subtractor. The circuit should operate as adder/subtractor based on a control which is an one bit input. (i.e.) when the control signal is a binary '1' it should act as an adder and as a subtractor when it is '0'.
- b) Design a combinational circuit using only gates and MUXes that follows the following truth table. Use minimal gates

Inputs: A, B, C, S₀, S₁

Output: Y

S ₀	S ₁	Y
0	0	A'B + AB'
0	1	A + B + C
1	0	(A + B) + C(A + B)
1	1	(A + B) + C'(A + B)

2. a) For the following statement, tell whether it is true or false. If a statement is “false,” briefly explain how so by describing how the statement may most simply be made true with an example? Simply stating the negation of the false statement is not sufficient justification. **“Given a fixed number of bits, 2's complement allows for the representation of the same number of useful values as 1's complement.”**
- b) Write a program for the following expression using IAS computer Instruction set and interpret same to the flow of IAS computer.
A=B+C+ (D*E)
Assume that all are integer variables, and Data variables are available at memory location address is 200 onwards and program starting in memory location address is 100.
3. a) Write about an importance of Register transfer languages and interpret for any architecture.
- b) Assuming the following address and register contents, determine all possible ways to put the value 8 into register R0, assuming instructions of the form MOV R0,_____ for each way, describe type of addressing mode you are using

	Address					Register				
Location	1	2	3	4	5	1	2	3	4	5
Content	6	5	4	2	8	2	3	4	5	0

4. a) Write a Booth's algorithm for binary multiplication and interpret same to an example -7 × 3.
- b) State reasons for control hazards. And specify the techniques to handle control hazards in pipelining.
5. A computer has 16 registers, an ALU with 32 operations, and a shifter with 8 operations, all connected to a common bus systems. (i) Formulate a control word for a micro operation (ii) Specify the number of bit in each field of the control word and give a general encoding scheme (iii) Show the bits of the control word that specify the micro operation R₄ → R₅ + R₆.
6. a) A computer employs RAM chips of 1024 x 4 and ROM chips of 2048 x 8. The computer

system needs 2K x 16 of RAM, and 4K x 16 of ROM and two interface units with 256 registers each. A memory-mapped I/O configuration is used. The two higher -order bits of the address bus are assigned 00 for RAM, 01 for ROM, and 10 for interface.

- i. How many RAM and ROM chips are needed?
 - ii. Tell, how many lines of the address bus must be used to access total memory? How many of these lines will be common to all chips?
 - iii. Propose, the number of lines must be decoded for chip select? Specify the size of the decoder
 - iv. Devise a memory-address map for the system and Give the address range in hexadecimal for RAM, ROM
 - v. Design memory chip layout for that address map.
- b) Discuss briefly about the types of internal memories and make a comparison table for various physical characteristics.

7. a) Explain DMA in detail.
b) List various asynchronous data transfer modes? And explain any one of them.
8. List various interconnection structures and explain any two in detail.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech I Semester (SVEC10) Supplementary Examinations October - 2011

DIGITAL COMMUNICATION TECHNIQUES

[Digital Electronics and Communication Systems]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) What is chebyshev inequality? Explain how it is useful in communication systems.
b) Suppose that an R-L low pass filter is excited by a stochastic process $x(t)$ having power spectral density of $N_0/2$ for all 'f'. Find power density spectrum at the output of the low pass filter.
2. (a) Derive the response of band-pass system to a band pass signal.
(b) Determine the energy of band pass signal $S(t)$ in terms of its envelope.
3. (a) Draw the block diagram of DPSK modulator and explain the working mechanism.
(b) Discuss the probability of error in BPSK system.
4. Discuss the working mechanism of optimum detector and realize optimum AWGN receiver. What are the merits and demerits comparing with matched receiver.
5. Discuss about decision directed and non-decision directed methods related to symbol time estimation.
6. (a) Discuss optimum maximum - likelihood receiver for channels with ISI and AWGN.
(b) How the channel with ISI is modelled using discrete - time model.
7. (a) Generate gold sequences of length $n=31=2^5-1$.
(b) Draw the block diagram of an frequencies hopping spread spectrum system and explain the operation.
8. Write the following:
 - a) Delay locked loop.
 - b) Tau-dither loop.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech I Semester (SVEC10) Supplementary Examinations October - 2011

ADVANCED CONTROL SYSTEMS

[Electrical Power Systems]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) What is the need for a lag compensation that it is obtained using Root locus design procedure.
b) Given the procedure to design a lead-lag compensator by using Root locus technique.
2. a) For an electrical lead compensator derive transfer function and expressions for maximum phase angle and frequency of maximum phase lead.
b) The open loop transfer function of certain unity feedback control system is given by $G(s) = K/s(0.1s+1)(0.2s+1)$. It is desired to have the phase margin to be atleast 30° and $K_v = 70s^{-1}$. Design a suitable phase lead series compensator.

3. a) Derive the conditions for complete state controllability of continuous-time systems if state matrix has non-distinct eigenvalues.
b) Consider the system defined by

$$\dot{x} = Ax + Bu$$

$$y = Cx$$

where $A = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -6 & -11 & -6 \end{bmatrix}$, $B = \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix}$ and $C = [20 \ 9 \ 1]$

Check for complete state controllability and complete observability of the system.

4. a) Explain the various types of non-linearities.
b) Determine the describing function of saturation non-linearity.
5. a) Determine the kind of singularity: $\ddot{y} - 8\dot{y} + 17y = 34$.
b) Explain how the stability of a limit cycle can be assessed through phase plane analysis.
6. a) Explain about the limit cycle behavior of nonlinear systems.
b) Consider a nonlinear system described by the equations

$$\dot{x}_1 = -3x_1 + x_2$$

$$\dot{x}_2 = x_1 - x_2 - x_2^3$$

Investigate the stability of equilibrium state using Kravovskii's method.

7. Consider an n^{th} order, single input system, $\dot{x} = Ax + bu$; and assume that the feedback is of the form $u = -kx + r$; r = reference input signal. Show that the zeros of the system are invariant under state feedback.

8. a) Explain about the fundamental theorem of calculus of variations.
b) Find the extremal for the functional

$$J(x) = \int_0^{t_1} \frac{\sqrt{1+x^2}}{x} dt, \quad x(0) = 0, \quad x(t_1) = t_1 - 5.$$



SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech I Semester (SVEC10) Supplementary Examinations October - 2011

POWER SYSTEM CONTROL & STABILITY

[Electrical Power Systems]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Explain the effect of excitation system on transient stability.
b) A Synchronous machine having inertia constant $H=4$ MJ/MVA is initially operated in steady state against an infinite bus with angular displacement of 30° and delivering 1.0 p.u power. Find the natural frequency of the oscillations for this machine, assume small perturbation from the operating point.
2. Find the modes of oscillation of a three machine system. The machines are Un-regulated and classical model representation is used.
3. Draw the block diagram representation of a single machine connected an infinite bus and from the characteristic equation determine the necessary conditions for stability using Routh criteria.
4. Derive and explain the block diagram of linear system.
5. a) Discuss the various fundamental characteristics of Excitation system.
b) Using the DC exciter with $K_E=1.0$; $S_E=0$; $T_E=0.5$ sec; compute the response of V_f for a constant input of $V_R=1.0$. Use an initial value of $V_f=0$.
6. a) Derive the state space modal of a Type 2 rotating rectifier excitation system.
b) Discuss the effect of Excitation on generator performance.
7. Explain the Lyapunov's stability theory for non linear systems using energy function.
8. a) Write the methods to control the voltage instability.
b) List out various ways to analyze the voltage instability and collapse.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech I Semester (SVEC10) Supplementary Examinations October - 2011

NEURAL NETWORKS & FUZZY SYSTEMS

[Electrical Power Systems]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. (a) Explain the historical developments of artificial neural networks.
(b) With suitable diagrams explain the basic neural circuits that are found in the central nervous system. Also give the assumptions made in McCulloch-Pitts theory.
2. (a) Derive training algorithm of discrete multi-category perceptron model
(b) Explain the credit assignment problem.
(c) Explain the generalized delta rule.
3. Explain the architecture of Hopfield network. Explain the storage and recall phases of Hopfield network. Also show that the energy function decreases every time the neuron output changed.
4. (a) What are the self organizing maps? Explain the architecture and learning algorithm used for Kohonen's SOP.
(b) Explain the function ART network and explain the operation with relevant equations.
5. (a) Define the terms with example (i) Fuzzy set (ii) Convex Fuzzy set (iii) Non Convex Fuzzy set (iv) Normal Fuzzy set (v) Sub Normal Fuzzy set.
(b) Given the Fuzzy sets
 $A = \{0.5/2+0.3/3+1/4+0.7/5\}$ $B = \{0.2/2+0.4/3+0.7/4+0.5/5\}$
Find (i) Complement (ii) Union (iii) Intersection (iv) Difference (v) Sum of above fuzzy sets.
6. (a) Explain in detail about the following Rule Based Models.
(i) Mamdani model (ii) TSK model.
(b) With a suitable example explain in detail about different defuzzification techniques based on Maxima Method.
7. (a) Explain clearly the architecture of FAM system.
(b) Compare Fuzzy and Neuro systems.
8. (a) Explain the method of optimization of rule base of fuzzy logic controller using neural networks.
(b) Explain the Fuzzy neural networks.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.Tech I Semester (SVEC10) Supplementary Examinations October - 2011

ADVANCED DATA STRUCTURES AND ALGORITHMS

[Software Engineering]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Write a function to reverse the links in a circular singly linked list
b) Discuss the advantages and disadvantages of implementing a circular queue using linked list.
2. a) Discuss the factors which effect the efficiency of an algorithm.
b) Explain Average, Best and worst case time complexities of an algorithm with an example.
3. a) Explain different tree representations and graph representations.
b) Write the routines to traverse a graph using iterative approach (DFS, BFS).
4. a) Write the iteration and recursion routines to find an element in a binary search tree and discuss their time complexities.
b) Explain Red-Black trees and what the applications of Red-Black trees are.
5. a) Explain various operations on Splay tree.
b) What is the maximum number of disk accesses needed to delete an element that is in a non-leaf node of a B-tree of order m .
6. a) Give the partition algorithm for Quick sort.
b) Write the Prim's algorithm to find the minimum spanning tree.
7. a) State and solve single source shortest path problem using dynamic programming and compare the same with greedy method.
b) State traveling sales person's problem and solve using dynamic programming.
8. a) State 8-queens problem and solve using branch and bound.
b) State 0/1 knapsack problem and solve using branch and bound.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech I Semester (SVEC10) Supplementary Examinations October - 2011

ADVANCED SOFTWARE ENGINEERING

[Software Engineering]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) What do you mean by the *99% complete* syndrome in software development? Why does it occur?
b) What characteristics differentiate WebApps from other software?
2. a) What is the goal of Team software process? List its objectives.
b) What characterizes an “agile” process? Explain in detail.
3. a) Define the following terms:
i) Software availability and ii) Software Reliability
b) Explain the meaning of system specification?
4. What is an Application Framework? Explain its desirable features?
5. What should be objectives of Software Testing? Explain the process of Software Testing?
6. Explain how AOSD is used to streamline complex system development?
7. Distinguish between Quality Control and Quality Assurance?
8. a) Give the characteristics of graphical user interfaces.
b) Explain the Golden rules of User Interface Design.
c) How will you evaluate User interface design?



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M.Tech I Semester (SVEC10) Supplementary Examinations October - 2011

SOFTWARE METRICS

[Software Engineering]

Time: 3 hours

Max Marks: 60

**Answer any FIVE questions
All questions carry equal marks**

1. a) Explain the role of metrics in software Engineering?
b) Explain the objectives of software measurement?
- 2a) a) Write a short notes on measurement scales and types.
b) Explain the role of prediction in measurement.
3. a) Give the classification of software entities? Mention the internal and external attributes with in each class of entity?
b) Write short notes on cost and effort estimation?
4. a) Explain when a data is called a Good Data?
b) With an example explain various fields of fault report in detail?
5. a) What are the aspects that effect the size of software.
b) Write in detail about the traditional code measures.
6. a) Explain Mc Call software quality model?
b) How defect density measures are used as a measure of software quality?
7. a) Explain the defect density measures in detail.
b) Present a detailed note on ISO 9126 standard quality model.
8. a) Mention the problems with empirical research?
b) Explain how to analyze satisfaction data?



SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.Tech I Semester (SVEC10) Supplementary Examinations October - 2011

DIGITAL DESIGN MODELING AND SYNTHESIS WITH HDLS

[VLSI]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Explain Arrays of Instances with an example?
b) Explain Hierarchical Design Methodology with an example?
2. a) What are the different types of user defined primitives are there explain in detail.
b) Give the different types of delays are there in HDL, explain with an example.
3. a) Develop a Very log code for four bit UP-DOWN counter.
b) What is mean by FSM? Explain block diagram of mealy model FSM.
4. a) Explain about synthesis of Moore type FSM with an example?
b) Explain various ways of synthesizing a combinational logic circuit?
5. a) with suitable example explain the synthesis of the following language constructs.
i) Case statement
ii) Fork join block
b) Explain about the synthesis of compiler directives?
6. a) Implement 4X1 MUX using Transmission Logic gate and write and verify a switch level model.
b) Write a test bench and verify the master and slave D-Flip-Flop.
7. a) Explain design procedure used for system design using CAD tools.
b) Draw and explain Place and Rout concept.
8. a) Explain the significance of Wait statement with an example?
b) Write the behavioral description of formatted ASCII I/O operators using VHDL?



CODE No.:10MT20301

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

BIOREACTOR ENGINEERING

[Bio-Technology]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) What are the different components of bioreactor and explain their functions.
b) Discuss the different methods of aeration in bioreactor.
2. Discuss in detail the design of bubble column bioreactor.
3. a) Explain the theories of mass transfer with appropriate schematic diagrams.
b) Discuss the factors affecting the saturation concentration of oxygen.
4. Discuss the different types of agitators used for Newtonian and Non-Newtonian fluids.
5. Describe the static and dynamic method for determination of $K_L a$.
6. a) Discuss the various methods of minimizing the cell damage in bioreactors.
b) Discuss the effect of laminar and turbulent flow on animal and plant cells in bioreactors.
7. Discuss the different components involved in computerized control of bioprocess.
8. Discuss the different biosensors used in bioreactors.



CODE No.:10MT20302

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

GENETIC ENGINEERING

[Bio-Technology]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. What are the Restriction enzymes? Describe about different classes of Restriction enzymes.
2. Write the differences between Southern and Northern blotting techniques and describe in detail about the Northern blotting.
3. Describe the structure of Ti plasmid and write about its application in agriculture.
4. Write about the use of viruses in Gene therapy.
5. Differentiate body and end labeling of a DNA molecule. Describe a method for radioactive end labeling of DNA.
6. What is RFLP? Describe its role in identifying a correct father of a child.
7. Describe the importance of genetic engineering in the current fields of medicine and agriculture.
8. Describe about different affinity tags that are useful in purification of a chimeric protein developed by recombinant DNA technology.



CODE No.:10MT20303

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

BIOSEPARATION PROCESSES

[Bio-Technology]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. Explain the down stream processing of a bioprocess along with various unit operations involved in it.
2. Describe solid shear and liquid shear methods used for cell disruption.
3. Write short notes on:
 - a) Constant pressure filter.
 - b) RCF.
 - c) Plate and frame filter.
4. Define Evaporation? Explain any two evaporators in detail.
5. Describe the criterion for selection of membranes for separation purpose and explain a few advantages.
6. Describe liquid - liquid extraction. Explain LLE used in a bioprocess.
7. Explain in detail about affinity chromatography also describe its application in q bioprocess.
8. Describe in detail about various types of industrial dryers.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

CELL TECHNOLOGY

[Bio-Technology]

Time: 3 hours

Max Marks: 60

**Answer any FIVE questions
All questions carry equal marks**

1. Explain the various types of culturing animal cells.
2. Describe about the cell culture wave and equipments that are commonly used and explain different sterilization techniques.
3. Define and explain the characteristic features of the following:
 - a) Complete media.
 - b) Serum.
 - c) Balanced salt solution.
4. What is transformation? Explain in detail the transformation of cells using oncogenes.
5. Explain the process of primary cell culture.
6. What are the different phases in cell growth? Explain growth curve? How do you characterize the different phases of growth cycle?
7. Explain the applications of RNA silencing of cells.
8. Explain in detail the following with experimental notes
 - a) Suspension cloning.
 - b) Monolayer cloning.



CODE No.:10MT20305

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

BIOINFORMATICS

[Bio-Technology]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. Define Bioinformatics? What are the research areas in Bioinformatics and role of Bioinformatics and its applications in the field of Biotechnology?
2. Explain various methods of nucleotide sequence analysis with examples?
3. Write in detail about Si-RNA design and applications?
4. Why Ramachandran plot is important in predictions of 2^o protein structure- explain?
5. Explain secondary structure prediction methods.
6. Describe the energy minimization process and molecular dynamics useful in the prediction of protein structure.
7. Explain processing & assembly of whole genome sequence data.
8. Define proteomics and genomics? Discuss in detail various tools used for functional genomics and proteomics.



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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

ADVANCED IMMUNOTECHNOLOGY

[Bio-Technology]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. Describe the following.
 - a) Idiotypic Vaccines.
 - b) RDNA based vaccines.
2. Explain the role T cell subsets in cell mediated immunity.
3. Explain the relationship between Memory and Vaccines.
4. Explain how adjuvants aid in the antibody generation?
5. Explain how cytokines and interleukins are used in therapeutic purposes?
6. Explain immunodiagnosis of cancer.
7. Write short notes on.
 - a) Bacterial peptides.
 - b) Genetically engineered lymphokines.
8. Write an account on.
 - a) Immuno-electrophoresis.
 - b) Immunomodulators.
 - c) Immunofluorescence.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

COMPUTER NETWORKS

[Computer Science]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Explain in brief the roles and responsibilities of forums and organizations of Internet administration.
b) What are the functions of ISO-OSI reference model? Explain with neat sketch.
2. a) Describe the services offered by a link-layer protocol.
b) Explain the working of CSMA/CD protocol within a specific adapter.
3. a) An ICMP message has arrived with the following information in the header (in hexadecimal): **05 00 11 12 11 0B 03 02**
 - i. What is the type of the message?
 - ii. What is the code?
 - iii. What is the purpose of the message?
 - iv. What is the value of last 4 bytes?
 - v. What do the last bytes signify?b) Calculate the checksum for the following simple ICMP packet:

8	0	0
1	9	
TEST		

4. a) Discuss the services offered by transport layer to the upper layers.
b) Explain how TCP uses congestion control to alleviate congestion in the network.
5. a) Explain web caching in detail.
b) Discuss the service provided by DNS.
6. Write notes on the following
 - i. IEEE 802.11 wireless standards.
 - ii. Wireless mesh networks.
7. Identify the six classes of commands used by the FTP client to establish communication with the server.
8. Explain the architecture of email and discuss the mail transfer mechanism used in SMTP.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

DATA WAREHOUSING AND DATA MINING

[Computer Science]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) How data mining systems are classified?
b) State and explain the primitives to define a data mining task.
2. a) Give the 3 method for data normalization with examples.
b) What are the methods of lossy data compression?
3. What is a Data Warehouse? Explain about Multidimensional Data Model.
4. a) Explain various approaches for mining multilevel association rules.
b) Explain various approaches for mining multi-dimensional association rules from relational databases and data warehouses.
5. a) Define prediction. Explain linear regression and non-linear regression.
b) How to estimate classifier accuracy and to increase classifier accuracy?
6. a) Categorize various clustering methods.
b) Give k-means algorithm and explain with example.
7. a) How frequent pattern mining is done in data streams?
b) Explain lossy counting algorithm.
8. a) Write short notes on spatial data mining.
b) Explain various text retrieval methods.



CODE No.:10MT20503

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

JAVA AND WEB TECHNOLOGIES

[Computer Science]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) What is overloading? Describe about overloading methods and constructors.
b) Write short notes on multithreading. Give an example.
2. a) Write the differences between AWT controls and Swing Controls.
b) Develop a web page using applet and swing.
3. a) Differentiate between HTML and dynamic HTML.
b) Write HTML code to create a web page containing list of branches in your college.
4. a) What is Document type definition? Give an example.
b) Write short notes on DOM and SAX.
5. a) Explain constrained properties of java bean.
b) Write the advantages of java beans.
6. Define servlet? Explain the lifecycle of servlet?
7. a) Write about JSP processing.
b) Explain the components of JSP.
8. Explain the steps involved to access a database from a JSP page.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

OBJECT ORIENTED ANALYSIS AND DESIGN

[Computer Science]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Enumerate the principles of modeling?
b) Explain the various views considered in modeling a system's architecture?
2. a) Explain about interfaces, roles and operations.
b) Explain about visibility, links and association.
3. a) Explain about collaboration diagram.
b) Explain modeling the flow of control by organization.
4. a) Explain the two types of sub states?
b) Enumerate the steps to model Inter Process Communication (IPC)?
c) Enumerate the steps to model the context of a system?
5. a) What are the standard stereotypes UML defines that apply to components?
b) What are the differences between components and classes?
c) Enumerate the steps to reverse engineer a deployment diagram?
6. a) Explain in detail about an architecture-centric process?
b) What is the need of iterative incremental development and explain?
7. a) Explain briefly about the inception phase?
b) Explain briefly about the elaboration phase?
8. a) Explain about iteration work flow execution.
b) Explain early phase in transition.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

OPERATING SYSTEMS

[Computer Science]

Time: 3 hours

Max Marks: 60

**Answer any FIVE questions
All questions carry equal marks**

1. a) What are the functions of an operating system?
b) Why operating system is called a control program.
2. a) Explain the reasons for process terminations.
b) Describe the single blocked queue and multiple blocked queues with an example.
3. Explain the state of the process Queue for the Readers / Writers problem and get the solution to the same by using message -passing.
4. a) Three processes share 4 resource units that can be reserved and reused only one at a time. Each process needs a maximum of 2 units. Show that a deadlock cannot occur.
b) N processes share M resource units that can be reserved and released only one at a time. The maximum need of each process does not exceed M and the sum of all maximum needs is less than $M + N$. Show that a dead lock cannot occur.
5. How Monitors can be used for synchronization of the processes.
6. a) Discuss about various criteria used for short-term scheduling.
b) Discuss about fair share scheduling method.
7. a) Explain how remote procedures can be called.
b) What is the need for group communication? How group communication is achieved.
8. Write different strategies of deadlock detection and prevention in distributed systems?



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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

SYSTEM THINKING

[Computer Science]

Time: 3 hours

Max Marks: 60

**Answer any FIVE questions
All questions carry equal marks**

1. Explain the delusion of learning from previous experience.
2. Explain the principle “today's problems come from yesterday's solutions”.
3. Prove that “Cause and effect are not closely related in time and space.”
4. How do you choose between self limiting and self sustaining growth?
5. Why do visions die prematurely?
6. How do managers create time for learning?
7. Explain prescriptive action and seven action steps of limits to growth.
8. Explain the archetype - Eroding goals.



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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

ADAPTIVE SIGNAL PROCESSING

[Digital Electronics and Communication Systems]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) What is eigen filter? Explain with suitable block diagram.
b) Describe any three properties of a correlation matrix of a discrete stochastic process in detail.
2. a) What is transversal filter? Explain it with suitable sketch.
b) Obtain mean square error (MSE) expression for the transversal filter in terms of input correlation matrix, and weight vector of the filter.
3. a) With reference to the Wiener filters, state and explain the principle of orthogonality.
b) Give the solution of the Wiener -Hopf equations for linear transversal filters using matrix formulation.
4. Discuss about gradient search by the method of steepest descent algorithm in detail.
5. a) Discuss about the convergence of Least Mean Square (LMS) algorithm specified to one application say noise cancellation in digital communication systems.
b) With suitable experiment, explain the effect of the step size parameter in LMS algorithm.
6. a) What is Matrix inverse lemma? How is it useful in Recursive Least Square (RLS) algorithm?
b) Give the summary of Recursive Least Square (RLS) algorithm with suitable block diagram and signal flow graph.
7. Write the following:
 - (a) Recursive mean square estimation.
 - (b) Kalman filtering.
8. a) Discuss about zero memory non-linear estimator of the data sequence of Blind equalization.
b) Explain the Bussgang process.
c) Decision directed Algorithm.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

CODING THEORY AND TECHNIQUES

[Digital Electronics and Communication Systems]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) What is the significance of mutual information? And Prove that the mutual information of a channel is related to the joint entropy of the channel input and channel output by $I\{X; Y\} = H(X) + H(Y) - H(X, Y)$.
b) Consider there are four messages generated by a source having their respective probabilities of occurrence as, $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{8}$. Assuming noise less channel, compute the coding efficiency if a binary code is applied for coding the messages.

2. a) Consider five messages S_0, S_1, S_2, S_3, S_4 given by the probabilities 0.5, 0.25, 0.125, 0.0625, 0.0625. Use the Shanaon-Fano algorithm to develop an efficient Code. Find the Code Efficiency.
b) Discuss the importance of Lempel-Ziv Codes.

3. a) Discuss the generator matrix for linear block codes.
b) Generator matrix of a (7,4) block code is

$$G = \begin{bmatrix} 1 & 0 & 0 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 & 0 & 1 & 1 \end{bmatrix}$$

- (i) Determine the Parity - Check matrix.
- (ii) Determine the maximum weight of the code.

4. a) What is Hamming distance? Discuss the error detection and correction capabilities of Hamming codes.
b) Give the mathematical description of linear block codes.
5. The generator polynomial of a (7, 4) cyclic code is $g(x) = 1+x+x^3$. Obtain all the code vectors for the code in non-systematic and systematic form.

6. Consider the convolutional encoder as shown in the figure given below

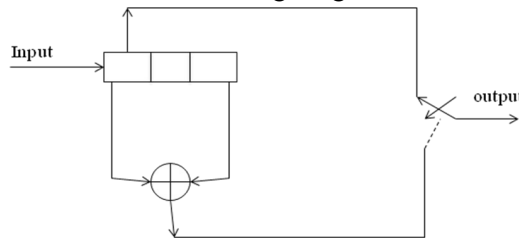


Fig: convolutional encoder

- a) Find the impulse response of the encoder.
- b) Determine the output code word for data input $d = [1 0 1]$.
- c) Draw the state diagram and the trellis diagram.
- d) What is the free distance of the code?
7. Explain the Viterbi's decoding algorithm with examples.
8. a) List the Properties of binary BCH codes.
b) Explain the decoding procedure of BCH codes.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

DETECTION AND ESTIMATION OF SIGNALS

[Digital Electronics and Communication Systems]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) We are given k independent observations:

$$\begin{aligned} H_1: Z_k &= V_k & k &= 1, 2, \dots, K \\ H_0: Z_k &= 1 + V_k & k &= 1, 2, \dots, K \end{aligned}$$

Where V_k is zero-mean Gaussian random variable with variance σ^2 . Compute the likelihood ratio and the threshold for the optimum receiver. Assume that $C_{00}=C_{11}=0$, $C_{01}=2$, $C_{10}=1$ and that $P(H_0)=0.7$, $P(H_1)=0.3$.

- b) What are the possibilities to be consider in making a decision in any binary hypothesis testing?
2. a) Find the expression for the probability of error for the problem of detection of equal energy, orthogonal signals observed in additive, white Gaussian noise?
Design a matched filter to detect the signal

$$y(t) = \begin{cases} e^{\frac{t}{2}} - e^{-t} & t \geq 0 \\ 0 & t \leq 0 \end{cases}$$

The noise spectral density is $\phi_s(S) = \frac{1}{1-s^2}$.

3. a) Explain the performance of optimum receiver, designed based on binary decision rule.
b) Draw the estimation model and explain it with suitable example.
4. a) Explain how to find the Bayes estimate for the absolute value cost function?
b) What are the types of estimates for nonrandom parameters? Explain them briefly.
5. Define the following terms with respect to estimators:
(a) Bias (b) Efficiency (c) Sensitivity (d) Uniform cost function
6. a) What are the required conditions for LMS estimator is to be an optimum estimate?
b) Define the asymptotic relative efficiency of an estimator and derive its expression.
7. a) Explain the forward linear prediction for estimation and find minimum cost associated with this estimate?
b) Consider the following message and observation models in which α is an unknown constant parameter.

$$\begin{aligned} \dot{x}_1(t) &= x_2(t) \\ \dot{x}_2(t) &= -x_1(t) - \alpha x_2(t) + w(t) \\ z(t) &= x_1(t) + v(t) \end{aligned}$$

Where $w(t)$ and $v(t)$ are zero-mean, white, with unity variance, and uncorrelated with each other. Consider $a(t) = x_3(t)$

as a state and $\hat{x}_3 = 0$. Set up Kalman filter algorithm for this problem.

8. a) Prove that a statistic is a sufficient statistic if the conditional density is independent of θ .
b) What is likelihood function? How it is used to estimate a function?



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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

HIGH PERFORMANCE NETWORKS

[Digital Electronics and Communication Systems]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Specify the characteristics of high performance networks in detail. Name some of such networks.
b) Mention different types of traffic and explain its characteristics?
2. a) Discuss ISDN channels, BRI and PRI interfaces. Obtain the transmission rates of these Interfaces.
b) Describe BISDN reference model in detail
3. a) Explain the following terms:
 - i. Digital section
 - ii. Transmission path
 - iii. Virtual channel/path link
 - iv. Virtual channel/path connectionb) Briefly explain applications of Virtual channel/ path connections?
4. What is the need for AAL in ATM networks? Draw the AAL frame format which supports:
 - i. Connection oriented data service.
 - ii. CBR services.
 - iii. VBR services.
5. a) What are the functions of software architecture in an ATM switch?
b) Explain ATM switching networks with block diagrams?
6. a) Explain in brief about rearrangeable multistage shuffle/exchange networks?
b) Describe the significance of looping algorithm in Benes network?
7. a) Discuss the various issues related to ABR traffic management?
b) Explain in detail PNNI signaling with example?
8. a) Compare passive and active queue management schemes. What are the drawbacks of passive queue management schemes.
b) Compare services applications of TCP IP and UDP protocols.



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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

WIRELESS COMMUNICATIONS

[Digital Electronics and Communication Systems]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Explain the evolution of mobile radio communications globally.
b) List out the wireless communication systems of yesteryears and explain about them briefly.
2. a) Describe the free space propagation model and deduce the expression for received power.
b) A receiver is located 10 km away from a 50 W transmitter. The carrier frequency is 900 MHz, the free space propagation is assumed. The gain of the transmitting antenna is unity, and the receiver antenna gain is 2.
Find (i) the power at the receiver,
(ii) the magnitude of the electric field at the receiving antenna,
(iii) the R.M.S voltage applied to the receiver input assuming that the receiver antenna has a purely real impedance of 50 ohms and is matched to the receiver.
3. a) List out different types of small scale fading and describe the effect of each type in communication systems.
b) For each of three cases mentioned below, decide if the received signal is best described as undergoing fast fading, frequency selective fading, or flat fading.
 - (i) A binary modulation has a data rate of 500 kbps, $f_c = 1$ GHz, and a typical urban radio channel is used.
 - (ii) A binary modulation has a data rate of 5 kbps, $f_c = 1$ GHz, and a typical urban radio channel is used to provide communication to cars moving on a highway.
 - (iii) A binary modulation has a data rate of 10 kbps, $f_c = 1$ GHz, and a typical urban radio channel is used to provide communication to cars moving on a highway.
4. What are the different types of diversity techniques that improve the systems performance? Explain them with suitable sketches.
5. a) Prove that for a hexagonal geometry, the co-channel reuse ratio is given by $= \sqrt{3N}$, where $N = i^2 + j^2 + ij$, and 'i', 'j' are non-negative integers.
b) A cellular phone owns 100 call sites and 20 is the traffic intensity per cell with a bandwidth of 30 kHz. Assuming each user makes three calls per hour and average holding time per call is 4 minutes; determine the total number of subscribers that the service provider can support with GOS of 0.02.
6. a) Give the comparison between FDD and TDD technologies.
b) Explain about the frame structures used in TDMA.
c) The GSM TDMA system uses a 270.833 kbps data rate to support eight users per frame. What is the raw data rate provided for each user? If guard time, ramp-up time, and synchronization bits occupy 10.1 kbps, determine the traffic efficiency for each user.
7. a) Explain the concept of space diversity in MIMO wireless communication systems.
b) Derive the mathematical model for MIMO channels.
8. Write the following:
(a) CDMA-2000. (b) Signal Processing in GSM.

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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

OPTICAL COMMUNICATIONS

[Digital Electronics and Communication Systems]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) What are the advantages of Optical Fiber systems over the conventional copper systems?
b) Calculate the numerical aperture of a plastic step-index fiber having a core refractive index of $n_1=1.6$ and a cladding index $n_2=1.49$.
c) Draw the structure of Step-index fiber and explain how optical ray can be propagate in it?
2. a) Draw the Schematic of a fiber-drawing apparatus and explain how fibers are made?
b) Define the following terms with respect to optical fiber cable:
(i) Allowable axial load (ii) fiber brittleness (iii) jacket.
3. a) Draw the schematic of an elastic-tube splicing of fibers and explain it.
b) What are the principal requirements of a good connector design for optical fibers?
4. a) Sketch the variations and describe the functional characteristics of Injection Lasers.
b) Describe the basic principle of working of a photo-diode, and define the terms - Quantum Efficiency and Responsivity.
5. a) Derive the expression for the power transfer function of the Fabry -Perot filter.
b) Explain how a four-wave mixing in a semiconductor optical amplifier is used for wavelength conversion?
6. a) Distinguish between direct detection and coherent detection processes. Describe the features of a typical coherent receiver.
b) List out and differentiate between the different types of modulation schemes used for optical fiber transmission, and comment on the scrambling format.
7. a) Classify the Access networks and compare them based on their distribution network and bandwidth.
b) Design an optical multiplexer to create the bit-interleaved TDM stream and explain its working.
8. a) Describe the principle of working and performance features of soliton communications.
b) Write short notes on Photonics Simulation Tools.



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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

ECONOMIC OPERATION AND CONTROL OF POWER SYSTEM

[Electrical Power Systems]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) What is the need of economic operation of power system?
b) Explain the economic dispatch by gradient search and write its algorithm.
2. a) Describe the thermal unit constraints in unit commitment.
b) What are the merits and demerits of priority list method and write down its shut-down algorithm.
3. Describe the hydro-scheduling using linear programming and what are the constraints to be considered for simple hydro scheduling.
4. Explain how the control scheme result in zero tie-line power deviation and zero-frequency deviation under steady state condition, following a step load change in one of the areas of a two area system with neat block diagram.
5. a) Discuss the economy interchange between interconnected utilities.
b) What is meant by power pools in interchange of power and energy?
6. a) Derive the power balance equation in a power system and explain the Decoupled method of load flow analysis.
b) Write comparisons and differences between AC Power flow and DC Power flow.
7. a) Draw the flow chart for contingency analysis using sensitivity factors.
b) Describe the bounding procedure for power system security.
8. a) Discuss the Newton's method of optimal power flow.
b) Explain the security constrained optimal power flow and draw necessary flow chart.



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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

FACTS CONTROLLERS

[Electrical Power Systems]

Time: 3 hours

Max Marks: 60

**Answer any FIVE questions
All questions carry equal marks**

1. a) What is the importance of controllable parameters of basic types of FACTS controllers?
b) Explain the benefits from FACTS controllers.
2. a) Explain about the transformers connections used for 24 pulse operation?
b) What are the advantages of slope in the dynamic characteristics of SVC?
3. What are the objectives of Shunt Compensation? Explain in detail.
4. a) Explain various conditions for transient free switching operations of TSC.
b) Explain the VAR demand versus VAR output characteristics of TSC-TCR type static VAR generator.
5. Explain in detail, the comparison between STATCOM and SVC.
6. Write the objectives of voltage and Phase Angle Regulators? Explain the power flow control by Phase Angle Regulators?
7. Explain the operation of thyristor tap changer supplying
 - i) Resistive Load
 - ii) Inductive Load
8. Explain the conventional transmission control capabilities of the UPFC.



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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

HVDC TRANSMISSION

[Electrical Power Systems]

Time: 3 hours

Max Marks: 60

**Answer any FIVE questions
All questions carry equal marks**

1. a) Briefly explain the role of HVAC and HVDC Transmission.
b) What are the basic conversion principles of HVDC Transmission?
2. a) With a neat circuit diagram and wave forms, explain the operation of 12-pulse converter.
b) Explain the special features of converter transformers.
3. a) Explain the working of band -pass filter used in HVDC systems. Explain the term detuning and state its importance in the design of filters for HVDC systems.
b) What are the adverse effects caused due to the presence of harmonics.
4. a) Explain the principle of DC Link control.
b) Explain the individual phase control and equidistant firing angle control.
5. a) Explain about DC power modulation in HVDC system.
b) Explain in detail about sequential method?
6. a) How is power control is achieved in an MTDC system?
b) With V-I characteristics, explain the operation of two-rectifier, two-inverter MTDC systems.
7. a) Describe the major types of HVDC-AC systems interactions?
b) Explain the voltage stability problems in HVDC-AC systems.
8. a) Describe the different faults on AC side of converter stations.
b) Describe the valve group over current protection.



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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

POWER SYSTEM RELIABILITY

[Electrical Power Systems]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Explain the rules of combining probabilities of events with suitable examples.
b) Derive the expressions for expected value and standard deviation of binomial distribution.
2. a) Distinguish between unit redundancy and component redundancy. Explain with suitable example.
b) A four engine aircraft can operate only if at least two engines are working. It has two generators driven by the engine, each one of which can supply the minimum load demand. Write down the various system configurations possible and compare reliability.
3. a) What is the difference between Standby redundancy and Parallel redundancy? Derive expressions for reliability and MTTF of a standby system. Mention the assumptions made.
b) Determine the reliability of the following linked system shown in Fig. 1 using Decomposition method.

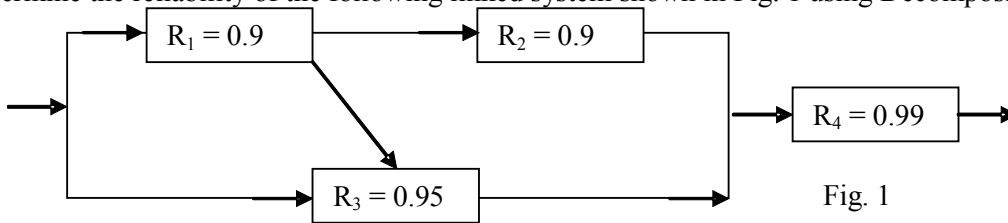


Fig. 1

4. a) Develop the expressions for limiting state probabilities of two identical components repairable model using STPM approach.
b) Derive the equation for the state probabilities of a two state Markov process representing a single component with repair from the fundamental.
5. A generating station consists of two units of 40 and 60 MW with forced outage rates of 0.08 and 0.05 respectively. The MTTR of either unit is 20 days. Calculate LOLP, frequency of failure of the system, if it has to deliver a steady load of 50 MW. Assume exposure factor $e = 0.5/\text{yrs}$
6. Explain the evaluation of cumulative probability and cumulative frequency of encountering of merged states with suitable example.
7. A generating plant has two 20 MW units and one 40 MW unit. For each unit, the failure rate $\lambda = 0.4/\text{yr}$ and the repair rate $\mu = 9.6/\text{yr}$. Using state merging technique, obtain equivalent space state diagram and thus evaluate frequency and cumulative frequency of each state.
8. a) Explain the effects of active and passive failures on substations and switching stations.
b) Write a short note on preventive maintenance.
c) Explain the effects of open circuit and short circuit failures on substations and switching stations.



CODE No.:10MT20705

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

STATIC AND DIGITAL PROTECTION OF POWER SYSTEM

[Electrical Power Systems]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Explain the basic construction of static relays.
b) Explain duality between amplitude and phase comparators.
2. a) Explain instantaneous amplitude comparators.
b) Explain vector product type phase comparators.
3. a) Discuss about hybrid comparator.
b) Discuss switched distance schemes.
4. Explain various static differential relay schemes.
5. a) Explain the effect of line length and source impedance on distance relays.
b) Discuss about angle impedance relay sampling comparator.
6. Explain the operation of microprocessor based over current relays with suitable block diagrams and flow chart.
7. Discuss the realization of MHO characteristics.
8. Discuss about numerical relays.



SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

ENERGY AUDIT, CONSERVATION AND MANAGEMENT

[Electrical Power Systems]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Explain the advantages of energy audit.
b) Explain the energy audit in a process industry.
2. a) Discuss the principles of energy management program. What are the various stages present in energy management program?
b) What is a Sankey diagram? Explain in detail.
3. a) What are the qualities and functions of Energy manager?
b) Discuss the check list for top management regarding energy management program.
4. a) Discuss the effect of voltage change on the operation of Induction motors.
b) Explain the energy audit procedure for electric motors. A 3-phase induction motor of 25 hp is replaced with an energy efficient motor of same rating. Their efficiencies are 88% and 92% respectively. The motor operates for 5000 hours in a year. Find the payback period, if the costs of the two machines are Rs.25,000/- and Rs.31,500/- respectively. The unit cost of energy is Rs 4.50/ kW-hr.
5. a) Explain the luminous efficacy.
b) Explain the advantages of high frequency electronic ballasts in place of conventional ballasts.
6. a) Explain the effect of power factor on the efficiency of an electric motor.
b) How tong testers are different from conventional meters and why energy loss is minimum in them.
7. a) Explain the need for performing financial analysis of an energy saving proposal.
b) Briefly explain the simple pay back period and its significance.
8. Write short notes on the following:
 - a) life cycle costing application to lighting
 - b) Declining balance method.
 - c) Effect of voltage unbalance on induction motors



CODE No.:10MT22501

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

SERVICE ORIENTED ARCHITECTURE

[Software Engineering]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) How are services designed? Illustrate with example.
b) What is transition plan? Explain.
c) Give a note on OASIS.
2. Discuss Activity management and composition in SOA.
3. a) How correlation is implemented in Web services?
b) Discuss the WS-notification framework.
4. a) Discuss common principles of service orientation in SOA.
b) Explain the interrelation between principles of Service Orientation and Object orientation.
5. Explain various service layers in SOA.
6. Discuss about service oriented analysis and benefits of business centric SOA.
7. What is WSDL? Explain in detail about WSDL in Service oriented design.
8. Give the structure of a common WS-BPEL process definition and discuss the basics of WS-BPEL language.



CODE No.:10MT22502

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech Semester (SVEC10) Regular Examinations October - 2011

SOFTWARE ARCHITECTURE AND DESIGN PATTERNS

[Software Engineering]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Why software architecture is important?
b) “Architecture is the vehicle for stakeholder communication” justify?
2. a) Explain about documenting a view.
b) Explain about UML module views.
3. a) Explain responsibilities and characteristics of participants of ATAM.
b) What are the outputs of ATAM?
4. Discuss about architectural mismatches?
5. a) What are the design problems?
b) How design patterns solve design problems?
6. Explain about Bridge.
7. Explain the issues related to implementation of Observer pattern?
8. Explain a case study in interoperability with World Wide Web?



CODE No.:10MT22503

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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

SOFTWARE REENGINEERING AND REUSE

[Software Engineering]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) What is Software Maintenance ? What is the need for software maintenance and maintenance report.
b) Explain how to estimate the maintenance cost.
2. a) What is the difference between reverse engineering and reengineering ?
b) Explain the tools of reverse engineering.
3. a) Explain about Data Reengineering Process with an example.
b) Write the characteristics of Structured code.
4. Define Refactoring? What is the need of refactoring in Object oriented context.
5. Explain with an example how forward engineering can be applied for object oriented architectures.
6. a) Explain about Forward engineering user interfaces.
b) Explain about Application and Component system.
7. What is Component Systems Engineering? Discuss its advantages and disadvantages.
8. Discuss the benefits and drawbacks of Application System Engineering.



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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

SOFTWARE SECURITY ENGINEERING

[Software Engineering]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) What is software assurance? Explain.
b) Explain the sources of software insecurity.
2. Write about the Influential Properties of Secure Software with help of a diagram?
3. a) Describe the importance of the Requirements Engineering.
b) What is a Misuse case? Explain with example.
4. a) Explain Architectural vulnerability assessment in connection with Architectural Risk Analysis.
b) What is Risk Mitigation planning? Explain.
5. List the two common methods for testing whether software has met its security requirements? Explain about them?
6. List the Categories of Errors that can aid in the analysis of security failures? Explain each?
7. Explain the characteristics of effective security governance and management.
8. Discuss in detail about what makes a good and a bad metric.



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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

SOFTWARE QUALITY ASSURANCE AND TESTING

[Software Engineering]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Enumerate the components of software quality assurance.
b) Explain steps to develop and implement a software quality assurance.
2. Define software quality metrics and explain product and In-process quality metrics.
3. How will you implement the software quality metrics and analyze the software metrics results?
4. a) Discriminate between functional and structural testing.
b) Enumerate and explain the eight considerations in developing testing methodologies.
5. a) Distinguish between Bottom-up approach and top-down approach.
b) Write brief note on the following:
 - i) Random testing
 - ii) Thread testing
 - iii) Performance testing.
6. a) Briefly explain the taxonomy of testing tools.
b) Give an example of testing tool and explain rational testing tools.
7. Explain the WinRunner, LoadRunner, SQA Robot, SilkTest, JMeter and its advantages?
8. Briefly explain about some of the testing specialized systems and their applications.



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INFORMATION RETRIEVAL SYSTEMS

[Software Engineering]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Give the definition and objectives of Information Retrieval Systems.
b) Discuss similarities and dissimilarities between data warehousing and information retrieval.
2. Explain the following with respect to Information Retrieval system.
a) Search Capabilities.
b) Browse Capabilities.
3. Explain:
a) Automatic Indexing.
b) Information Extraction.
4. a) Discuss n-Gram Data structure for information Retrieval system.
b) How PAT Binary tree is used in Information Retrieval system.
5. a) Discuss on probabilistic weighting and vector weighting in statistical indexing.
b) Write the concept vector for the concept “washing machine” under concept indexing.
6. a) Explain the methodology for clustering using existing clusters.
b) Explain Item clustering with respect to clustering.
7. a) Write a note on similarity measures. Discuss equations related to it.
b) Discuss on Relevance feedback.
8. a) How Information Retrieval Systems are evaluated. Explain.
b) What is URR metric. How do you measure URR? Explain with an example.



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M.Tech II Semester (SVEC10) Regular Examinations October - 2011
ALGORITHMS FOR VLSI PHYSICAL DESIGN AUTOMATION
[VLSI]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Explain various design methods?
b) What is spanning tree? Explain how minimum spanning tree algorithm will improve the performance of the circuit?
2. a) Write a pseudo code description of backtracking algorithm for exhaustive search?
b) Discuss about Integer linear programming? Give an example for linear programming?
3. a) Compare the maze routing algorithms.
b) Write a pseudo code for Lee's Algorithm for single layer routing.
4. a) What is simulation? What are the components of a simulation?
b) Explain about compiler-driven and event-driven simulation?
5. Let $f(x_1; x_2; x_3; x_4) = x_1x_2' + x_3x_4' + x_2x_4$, and $g(x_1; x_2; x_3) = x_1 + x_2'x_3$.
Draw the BDDs for f and g for the variable ordering $x_1 < x_3 < x_4 < x_2$.
6. a) Discuss briefly the hardware models for high-level synthesis?
b) Write any two scheduling algorithms?
7. Explain the FPGA routing algorithms for the segmented model with a pseudo code.
8. Explain the Antifuse and SRAM FPGA technology's with neat sketch.



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CPLD AND FPGA ARCHITECTURES AND APPLICATIONS

[VLSI]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Explain the basic characteristics and distinguish PLDs from each other with the aid of suitable block diagrams.
b) Realize the following functions using a PLA. Give the PLA table and internal connection diagram for the PLA.
 $F_1(a, b, c, d) = \sum m(1, 2, 4, 5, 6, 8, 10, 12, 14)$
 $F_2(a, b, c, d) = \sum m(2, 4, 6, 8, 10, 11, 12, 14, 15)$
2. a) Draw and explain the architecture of MACH 1 & 2 family CPLD devices. Give their salient features.
b) Draw and explain the architecture of Cypress FLASH370 CPLDs.
3. a) Draw and explain the block diagram of FLEX 8000 device and give the significance of its Logic Array Block.
b) With the aid of ACT-1 logic module structure, explain the architecture of Actels ACT-1 programmable logic device.
4. a) Perform the realization of state machine charts using PAL. Consider a suitable example.
b) Compare linked state machine with encoded state machine with respect to various constructional features. Illustrate the same with an example.
5. a) Design and implementation of one-to-three-pulse generator using Field Programmable Gate Array. Draw the relevant logic diagram.
b) Explain the basic properties of Petri nets for state machines. Explain with an example of Nonlive Petri net.
6. a) What is meant by Meta Stability? Explain its significance with proper illustration.
b) Describe a traffic light controller using the Petri net notation which allows the basic controller function.
7. a) Draw and explain a typical FPGA design flow. Present the Xilinx based FPGA design approach.
b) Draw and explain the controller or data-path architecture for digital system design.
8. Perform the design, development and implementation of 4-bit parallel adder using CPLD. Give the design considerations, ASM chart, state diagram and necessary source code to implement the same. Write notes on necessary EDA tool required.



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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

DIGITAL SYSTEM TESTING AND TESTABILITY

[VLSI]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

1. a) Explain in detail how static hazards can be detected.
b) Compare and contrast compiled and event driven simulations.
2. a) Explain in detail how a fault in a combinational circuit can be activated and propagated to the PO with a suitable example
b) Define fault equivalence.
3. a) Compare D- algorithm, 9V algorithm and PODEM used for ATG.
b) Differentiate between random TG and deterministic TG.
4. a) Explain any three compression techniques in detail.
b) Explain various operational modes of a boundary scan cell.
5. a) Define compression with respect to DFT. Explain its need.
b) Explain the functions of the TAP controller.
6. a) Classify BIST techniques and explain each of them briefly.
b) Explain various ORAs used for digital circuit testing.
7. a) Write a brief note on memory test architectures and techniques.
b) Explain in detail testing techniques for RAM.
8. Write a brief note on 1) ICT 2) Delay models.



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LOW POWER VLSI DESIGN

[VLSI]

Time: 3 hours

Max Marks: 60

**Answer any FIVE questions
All questions carry equal marks**

1. Explain the limitation of low voltage low power design of CMOS/BiCMOS circuits.
2.
 - a) Explain why isolation is needed in CMOS and BiCMOS process.
 - b) Discuss different techniques used in bipolar transistor isolation.
3. What are the performance improvement factors and challenges with copper interconnects for deep sub - micron CMOS/BiCMOS.
4. Derive I-V and Capacitor characteristics of n-MOSFET in all operating regions.
5.
 - a) Describe MOSFET device behavior in a hybrid mode environment.
 - b) Draw and explain the cross-sectional view of the hybrid-mode LDD pMOS device.
6.
 - a) Explain different power dissipation in CMOS logic.
 - b) Discuss how to achieve low power in full swing multidrain and multi collector complimentary BiCMOS buffers.
7.
 - a) What is the need for low power latches and flipflops.
 - b) Design negative edge triggered D- flip flop using pass transistors and discuss its operation with waveforms.
8. Explain the power reduction techniques for high speed bus.



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M.Tech II Semester (SVEC10) Regular Examinations October - 2011

SCRIPTING LANGUAGE FOR VLSI DESIGN AUTOMATION

[VLSI]

Time: 3 hours

Max Marks: 60

**Answer any FIVE questions
All questions carry equal marks**

1. a) Explain how digital circuits are parsed with scripting languages?
b) Explain the VB Script procedure with an example?
2. a) Explain the shift operators of Perl with a suitable example?
b) Explain the range operator of Perl with an example?
3. a) Explain the variable scoped declaration in Perl with an example in Perl?
b) Explain the various quantifiers with an example?
4. a) What is hash in Perl? How they are different from Arrays?
b) Write a simple Perl script using hashes to find the average of student grades?
5. a) Explain the clustering and capturing mechanism of a regular expression pattern in Perl?
b) Write a Perl script to find the maximum number in an array using subroutine?
6. a) How to access a particular variable from the Array of Arrays data structure of Perl?
b) Write a Perl scripting to construct an Array of Arrays using each word as an element parse from the input file consisting of line of text, where each word in a line separated with a whitespaces?
7. a) Explain the hashes of function? And its construction mechanism?
b) Explain how to access and print the particular functions from hashes of functions?
8. a) Explain Process Model and Thread Model?
b) Explain compiling and execution procedure of Perl code?



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NANO ELECTRONICS

[VLSI]

Time: 3 hours

Max Marks: 60

**Answer any FIVE questions
All questions carry equal marks**

1. a) Explain the Chemical Vapour Deposition Method.
b) Briefly discuss about Chemical mechanical Polishing.
2. Explain the fabrication and electronic, vibrational, mechanical properties of Carbon Nanotubes.
3. Explain about Complementary CNTFET. Design an inverter using CNTFET and explain I-V curves.
4. With suitable diagram explain the operation of DRAM cells.
5. With the constructional details of Magneto Optical Disks, explain how it can be used for mass data storage.
6. Explain the following optical processes
 - a) Writing of a Holographic Grating
 - b) Read-Out of Holographic Grating
7. a) List out the properties of High-Permittivity Dielectrics.
b) Explain the working principle of X-Ray Lithography and list its merits and demerits.
8. Explain the purpose of channel encoding with example.

