

Code No: K0125 /R07

R07

Set No.1

IV B.Tech II Semester Supplementary Examinations, July, 2011

PRESTRESSED CONCRETE

(Civil Engineering)

Time: 3 hours

Max. Marks: 80

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

1. a) Distinguish between the terms (a) uniaxial (b) Biaxial and (c) Triaxial prestressings?
b) What are the main factors influencing the design of high strength concrete mixes?

2. a) Explain with sketches 'Hoyer's long line system of pretensioning.'
b) A prestressed concrete beam with a rectangular section 150 mm wide by 350 mm deep supports a uniformly distributed load of 4 kN/m, which includes the self-weight of the beam. The effective span of the beam is 6m. The beam is concentrically prestressed by a cable carrying a force of 250 kN. Locate the position of the pressure line in the beam.

3. a) What is anchorage slip? How do you compute the loss of stress due to anchorage slip?
b) A pre-tensioned concrete beam, 120 mm wide and 350 mm deep is prestressed by straight wires carrying an initial force of 200 kN at an eccentricity of 50 mm. The modulus of elasticity of steel and concrete are 210 and 35 kN/mm² respectively. Estimate the percentage loss of stress in steel due to elastic deformation of concrete if the area of steel wires is 188 mm².

4. A bonded prestressed concrete beam is of rectangular section of width 400 mm and overall depth 1200 mm. The tendons consisting of 3300 mm² of standard strands with a characteristic strength of 910 N/mm². The strands are located 870 mm from the top face of the beam. The characteristic cube strength of concrete is 60 N/mm². Estimate the ultimate moment capacity of the section using Indian code provisions.

5. a) What is the 'pressure of thrust line'? Explain its significance with sketches.
b) What are the different types of flexural failure modes observed in prestressed concrete beams? Explain with sketches.

Code No: K0125 /R07

R07**Set No.1**

6. The end block of a prestressed concrete beam, rectangular in sections, is 100 mm wide and 200 mm deep, the prestressing force of 100 KN is transmitted to concrete by a distribution plate, 100 mm wide and 50 mm deep, concentrically stress on the horizontal section through the centre and edge of the anchor plate. Compute the brushing tension on these horizontal planes.
7. A rectangular pre-tensioned concrete beam has a breadth of 100 mm and depth of 230 mm, and the prestress after all losses have occurred is 12 N/mm^2 at the soffit and zero at the top. The beam is incorporated in a composite T-beam by casting a top flange of breadth 300 mm and depth 50 mm. Calculate the maximum uniformly distributed live load that can be supported on a simply supported span of 4.5 m, without any tensile stresses occurring, if
- The slab is externally supported while casting, and
 - The pre-tensioned beam supports the weight of the slab while casting.
8. A prestressed concrete beam of rectangular section, 120 mm wide and 300 mm deep, spans over 6m. the beam is prestressed by a straight cable carrying an effective force of 180 KN at an eccentricity of 500 mm. if it supports an imposed load of 4KN/m and the modulus of elasticity of concrete is 38 KN/mm^2 , compute the deflection at the following stages and check whether they comply with the IS code specifications.

Code No: K0125 /R07

R07

Set No.2

IV B.Tech II Semester Supplementary Examinations, July, 2011

PRESTRESSED CONCRETE

(Civil Engineering)

Time: 3 hours

Max. Marks: 80

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

1. a) Bring out the difference between concentric and eccentric prestressing?
b) Distinguish between low, medium and high strength concrete.

2. a) Explain the principle of post- tensioning.
b) A prestressed concrete beam of section 120 mm wide by 300 mm deep is used over an effective span of 6 m to support a uniformly distributed load of 4 KN/m, which includes the self-weight of the beam. The beam is prestressed by a straight cable carrying force of 180 KN and located at an eccentricity of 50 mm. determine the location of the thrust-line in the beam and plot its position at quarter and central span sections.

3. a) What are the factors influencing the loss of stress due to creep of concrete?
b) A rectangular concrete beam, 360 mm deep and 200 mm wide, is of prestressed by means of fifteen 5 mm diameter wires located 65 mm from the bottom of the beam and three 5 mm wires, located 25 mm from the top of the beam. If the wires are initially tensioned to a stress of 840 N/mm^2 , calculate the percentage loss of stress in steel immediately after transfer, allowing for the loss of stress due to elastic deformation of concrete only.

4. A double T-section having a flange 1200 mm wide and 150 mm thick is prestressed by 4700 mm^2 of high-tensile steel located at an effective depth of 1600mm. The ribs have a thickness of 150mm each. If the cube strength of concrete is 40 N/mm^2 and tensile strength of steel is 1600 N/mm^2 , determine the flexural strength of the double T-girder using IS: 1343 provisions.

5. a) Explain the difference between the load carrying mechanisms of reinforced and prestressed concrete beam sections with sketches.
b) What is 'Effective reinforcement ratio'? In what will it influence the stress in tendons and the neutral axis depth at the limit state of collapse of prestressed concrete sections?

Code No: K0125 /R07

R07

Set No.2

6. The end block of a prestressed beam, 200 mm wide and 300 mm deep, has two Freyssinet anchorages (100 mm diameter) with their centers at 75 mm from the top and bottom of the beam. The force transmitted by each anchorage being 200 KN, estimate the maximum tensile stress and the bursting tension developed.
7.
 - a) Sketch some typical cross-sections of composite bridge decks with precast pre-stressed elements
 - b) What is differential shrinkage? Explain its importance in composite construction.
8.
 - a) Briefly explain the importance of creep of concrete in long term deflections of prestressed members.
 - b) List the various factors influencing the deflections of prestressed concrete members.

Code No: K0125 /R07

R07**Set No.3**

IV B.Tech II Semester Supplementary Examinations, July, 2011

PRESTRESSED CONCRETE**(Civil Engineering)****Time: 3 hours****Max. Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. a) What is the necessity of using high strength concrete and high tensile steel in prestressed concrete?
 b) What is the minimum concrete strength requirements prescribed for prestressed concrete members in IS: 1343 code?
2. a) What are supplementary anchoring devices?
 b) Distinguish between concentric and eccentric tendons, indicating their practical applications.
3. a) How do you compute the loss of stress due to elastic deformation of concrete?
 b) A concrete beam is prestressed by a cable carrying an initial prestressing force of 300 KN. The cross-sectional area of the wires in the cable is 300 mm^2 . Calculate the percentage loss of stress in the cable only due to shrinkage of concrete using IS: 1343 recommendations assuming the beam to be,
 - (i) Pre-tensioned and
 - (ii) Post-tensioned. Assume $E_s = 210 \text{ KN/mm}^2$ and age of concrete at transfer = 8 days
4. A concrete beam of rectangular section, 250 mm wide and 650 mm overall depth, is subjected to a torque of 20 KN m and a uniform prestressing force of 150 KN. Calculate the maximum principal tensile stress. Assuming 15 per cent tensile stress to 0.4 N/mm^2
5. a) Explain the concept of internal resting couple in a prestressed concrete beam supporting dead and live loads.
 b) How do you estimate the ultimate shear strength of prestressed concrete sections with web shear cracks?
6. A Freyssinet anchorage (125 mm diameter), carrying 12 wires of 7 mm diameter stressed to 950 N/mm^2 , is embedded concentrically in the web of an I-section beam at the ends. The thickness of the web is 225 mm. Evaluate the maximum tensile stress and the bursting tensile force in the end block using Rowe's method. Design the reinforcement for the end block.

Code No: K0125 /R07

R07

Set No.3

7. a) What are the advantages of using composite construction with prestressed and in situ concrete in structural members?
b) Distinguish between propped and unpropped construction methods in composite construction using stress diagrams at various stages of construction.

8. a) Distinguish clearly between short-term deflections of prestressed concrete members.
b) A concrete beam is prestressed by a parabolic cable having an eccentricity of e_1 towards the soffit at centre of span and an eccentricity of e_2 towards the top near support sections. Find the ratio of these eccentricities for zero deflection at the centre of span due to prestress only.

FirstRanker

Code No: K0125 /R07

R07**Set No.4****IV B.Tech II Semester Supplementary Examinations, July, 2011****PRESTRESSED CONCRETE****(Civil Engineering)****Time: 3 hours****Max. Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. a) Why did the basic principle of prestressed concrete?
b) Distinguish between creep and shrinkage of concrete.

2. a) What are the post-tensioning anchorages?
b) An unsymmetrical I-section beam is used to support an imposed load of 2 KN/m over a span of 8 m. The sectional details are top flange, 300 mm wide and 60 mm thick; thickness of the web=80 mm; overall depth of the beam = 400 mm. At the centre of the span, the effective prestressing force of 100 KN is located at 50 mm from the soffit of the beam. Estimate the stresses at the centre of span section of the beam for the following load conditions;
(i) Pressure + self-weight
(ii) Pressure + self-weight+ live load

3. a) List the various types of loss of prestress in pretensioned and post-tensioned members.
b) A pretensioned prestressed concrete sleeper 300 mm wide by 250 mm deep is prestressed using 9 wires of 7 mm diameter. Four wires are located at top and 5 wires near the soffit. The effective cover being 40 mm. the initial stress in the wires is 1256 N/mm^2 . Assuming the modular ratio as 6, estimate the percentage loss of stress in the top and bottom wires due to elastic deformation of concrete.

4. A concrete box section girder has an overall depth and width of 800 and 600 mm respectively. The concrete walls are 100 mm thick on both the horizontal and vertical parts of the box. Determine the maximum permissible torque if the section is uniformly prestressed by a force of 200 KN. Assume the maximum permissible diagonal tensile stress as 0.7 N/mm^2 .

Code No: K0125 /R07

R07**Set No.4**

5. a) Explain the terms- prestress, Dead load stress, Live load stress and resultant stress.
b) Distinguish between web shear, flexural and flexure-shear cracks in concrete beams with sketches.
6. The end block of a prestressed beam 500 mm wide and 1050 mm deep contains 6 Freyssinet cables, each carrying a force of 266 KN anchored through 100 mm diameter anchorages, which are spaced 150 mm apart at the end of the beam. Calculate the maximum tensile stress and the bursting tension and design the reinforcement for the end block using Rowe's method. Adopt yield stress in mild steel reinforcement as 260N/mm^2 .
7. A composite tee beam is made up of pretensioned rib 300 mm thick and 1000 mm deep and a cast in situ slab of 200 mm thickness and 1500 mm width. The modulus of elasticity of cast in situ slab is 28 KN/mm^2 . If the differential shrinkage is 0.0001 units, estimate the shrinkage stresses developed in precast and cast in situ units
8. A concrete beam with a cross-sectional area of $32 \times 10^3\text{ mm}^2$ and radius of gyration of 72 mm is prestressed by a parabolic cable carrying an effective stress of 1000N/mm^2 . The span of the beam is 8m. The cable, composed of 6 wires of 7 mm diameter, has an eccentricity of 50 mm at the centre and zero at the supports. Neglecting all losses, find the central deflection of the beam as follows:
 - i) Self-weight + pressure, and
 - ii) Self-weight + pressure+ live load of 2 KN/m.

Code No: K0126 /R07

R07**Set No.1**

IV B.Tech II Semester Supplementary Examinations, July, 2011

PAVEMENT ANALYSIS AND DESIGN

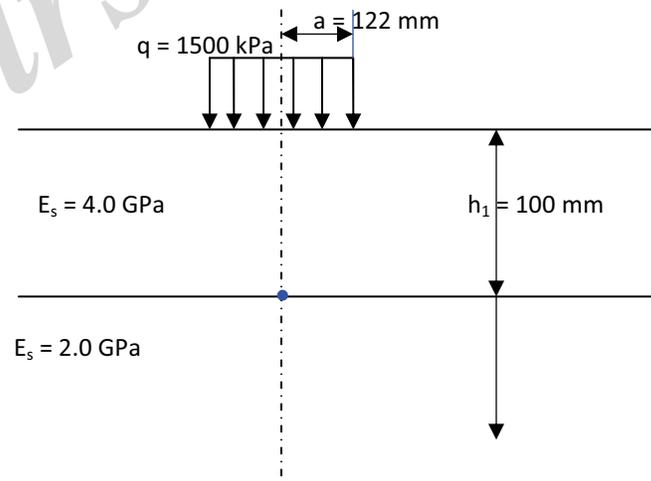
(Civil Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. a) Explain how wheel load repatriations and equivalent load factors are useful for pavement design?
b) Why is the shape contact area used for the design of flexible pavements different that from the rigid pavements?
c) Differentiate between climatic factors and environmental factors.
2. a) Prove that when $\mu = 0.5$, the volume change of a unit element is zero when subjected to a triaxial state of stress.
b) Given two layer system shown in Fig. with $a = 122$ mm, $q = 1500$ kPa, $h_1 = 100$ mm, $E_1 = 4.0$ GPa, and $E_2 = 2.0$ GPa. Determine all the stresses and strains at the interface on the axis of symmetry.



Code No: K0126 /R07**R07****Set No.1**

3. a) Explain the critical wheel load locations considered in Westergaard's theory? Write the significance of each location in the analysis of load stresses?
b) Compute the stresses due to loading at salient locations on a cement concrete slab using Westergaard's equations from the below given data.
Poisson's ratio of concrete = 0.15
Pavement slab thickness = 22cm
Modulus of elasticity of concrete $2.77 \times 10^5 \text{ kg/cm}^2$
Modulus of subgrade reaction = 4.35 kg/cm^3
Radius of contact of tire = 16 cm
Wheel load = 4950 kg.
4. Explain the design steps of flexible pavements by IRC and design a flexible pavement for the CBR value of 6.5 %.
5. Find the spacing between the contraction joints for a 3.5 m slab width having a thickness of 22 cm for (a) plain concrete slab (b) R.C.C. slab. The allowable tensile stress values in concrete and steel are 0.8 and 1400 kg/cm^2 , coefficient of friction is 1.50.
6. a) What is the importance for a highway engineer to study the behavior of soil? What are the desirable properties of subgrade soil? Enumerate the identification and classification tests of soils.
b) Explain the CBR and the test procedure for the laboratory and field tests. How are the results of the test obtained and interpreted?
7. a) Explain the need of Highway Construction?
b) Write a short note on the gravel and WBM roads with help of neat sketches.
8. a) What are the various types of failures in flexible pavements? Explain the causes.
b) What are the general causes of pavement failures?

Code No: K0126 /R07

R07**Set No.2**

IV B.Tech II Semester Supplementary Examinations, July, 2011

PAVEMENT ANALYSIS AND DESIGN

(Civil Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. a) Explain the flexible and rigid pavements and bring out the points of difference.
b) Draw a sketch of flexible pavement cross section and show the component parts. Enumerate the functions and importance of each component of the pavement.

2. a) Explain the concept of Burmister's theory in relation with layered soils?
b) Determine the complete state of stress (σ_z , σ_r and σ_t) using one layer theory under the centerline of a tire having a 5000 kg load. 7 kg/cm² pressure for the following depth tire radius: 0, 0.5, 1.5, 2.50, 5.0, 10.0, 20.0. Assume the pavement is characterized by $\mu = 0.15$ and $E = 210 \text{ kg/cm}^2$.

3. a) Discuss the procedure to Compute the tensile stress resulting from a wheel load on a rigid pavement.
b) What are the critical locations of rigid pavements for the wheel loads ? Discuss them in Brief.

4. The CBR Value of subgrade soil is 8 %. Calculate the total thickness of flexible pavement using design charts developed by IRC.

5. a) Explain how the dimension and spacing of tie bars are designed.
b) A cement concrete pavement 20 cm thick and 7.5 m width has a longitudinal joint along the center line. Design the diameter, length and spacing of the tie bars, if the allowable working stress in steel 1400 kg/cm² in tension allowable bond strength of deformed bars in concrete is 24.6 kg/cm² and coefficient of friction is 1.2. Assume unit weight of concrete as 2400 kg/cm³.

Code No: K0126 /R07

R07

Set No.2

6. a) Explain the desirable properties of aggregate to be used in different types of pavements construction.
b) Explain briefly the Marshall method of design.
7. a) Write down the construction steps for waterbound macadam roads.
b) What are the various types of bituminous construction in use? Discuss the advantages and limitations of each?
8. Explain how the maintenance of the following pavements are carried out
 - (i) Bituminous surface
 - (ii) Cement concrete pavements

FirstRanker

Code No: K0126 /R07

R07

Set No.3

IV B.Tech II Semester Supplementary Examinations, July, 2011

PAVEMENT ANALYSIS AND DESIGN

(Civil Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. a) Explain how wheel load repetitions and equivalent load factors are useful for pavement design?
b) Explain how design period is considered for flexible and rigid pavement designs in India? How design traffic is estimated from the traffic survey data?
2. a) State assumptions made in Boussinesq and Burmister methods of pavement analysis? Discuss the limitations of using the methods in the analysis of stresses in a soil mass?
b) Determine the complete state of stress (σ_z , σ_r and σ_t) using one layer theory under the centerline of a tire having a 8000 kg load. 7 kg/cm² pressure for the following depth tire radius in cm: 0, 0.5, 1.5, 2.50, 5.0, 10.0, 20.0. Assume the pavement is characterized by $\mu = 0.2$ and $E = 210 \text{ kg/cm}^2$.
3. a) Explain stresses due to friction on rigid pavements
b) What are the critical locations of rigid pavements for the wheel loads? Discuss them in Brief.
4. a) What are the factors considered in the AASHTO procedure for the design of flexible pavement design? Explain them in detail.
b) Design the pavement for construction of a new bypass with the following data: Two lane carriage way, Initial traffic in the year of completion of construction = 400 CVPD (sum of both directions) Traffic growth rate = 7.5 %, Design life = 15 years, Vehicle damage factor based on axle load survey = 2.5 standard axle per commercial vehicle, Design CBR of subgrade soil = 4%.

Code No: K0126 /R07

R07**Set No.3**

5. Estimate the thickness of cement concrete using the method suggested by Indian road congress.
- | | |
|-----------------------------------|--|
| Modulus of elasticity of concrete | = 3.0×10^5 kg/cm ² |
| Modulus of rupture of concrete | = 40 kg/cm ² |
| Poisson's ratio of concrete | = 0.15 |
| Modulus of subgrade reaction | = 6 kg/cm ² |
| Wheel load | = 5100 kg |
| Radius of contact pressure | = 15 cm |
6. a) Discuss the desirable properties of the bitumen. Compute tar and bitumen.
b) The properties of a subgrade soil are given below
Liquid limit = 75 %
Plastic limit = 55 %
Passing No. 200 sieve = 70 %
(i) Determine the group index and classify the soil by HRB soil classification system.
(ii) Determine the suitability of the soil as a subgrade material.
7. Compare the following methods of bituminous road construction
(i) Central plant mix and road mix methods
(ii) Hot mix and cold mix
8. a) Discuss briefly the importance of highway maintenance.
b) What are the general causes of pavement failures?

Code No: K0126 /R07

R07

Set No.4

IV B.Tech II Semester Supplementary Examinations, July, 2011

PAVEMENT ANALYSIS AND DESIGN

(Civil Engineering)

Time: 3 hours

Max. Marks: 80

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

1. a) What are the various factors to be considered in pavement design?
Discuss the significance of each.
b) Differentiate between climatic factors and environmental factors.
2. a) What do you understand about the Boussinesq Two layer concept and explain?
b) Explain the concept of Burmister's theory in relation with layered soils?
3. a) Explain in detail about radius of relative stiffness of a rigid pavement.
b) Determine the stress induced at the bottom of the slab directly under the load wheel load of 500 kg imposed during the night and located at the edge of a concrete pavement with the following dimensions and properties by using Westergaard equation.
4. a) Explain how the sub-base thickness varies in the design of flexible pavements?
b) Design the pavement for construction of a new two lane carriageway for design life 15 years using IRC method. The initial traffic in the year of completion in each direction is 150 CVPD and growth rate is 5%. Vehicle damage factor based on axle load survey = 2.5 standard axle per commercial vehicle. Design CBR of subgrade soil=4%.
5. a) Explain how the dimension and spacing of tie bars are designed.
b) A cement concrete pavement 20 cm thick and 7.5 m width has a longitudinal joint along the center line. Design the diameter, length and spacing of the tie bars, if the allowable working stress in steel 1400 kg/cm^2 in tension allowable bond strength of deformed bars in concrete is 24.6 kg/cm^2 and coefficient of friction is 1.2. assume unit weight of concrete as 2400 kg/cm^3 .

Code No: K0126 /R07

R07

Set No.4

6. a) What are the desirable properties of the bitumen mixes? What are the steps on bituminous mix design? Discuss briefly?
b) Explain the CBR and the test procedure for the laboratory and field tests. How are the results of the test obtained and interpreted?
7. a) Discuss the principles and scope of soil cement stabilization
b) Compare the alternate bay and continuous bay methods construction of cement concrete roads
8. a) Explain the procedure for patch repair works in WBM pavement
b) What are the various causes of formation of waves and corrugations in flexible pavements? Suggest the remedial measures.

FirstRanker

Code No: K0222 /R07

R07**Set No.1**

IV B.Tech II Semester Supplementary Examinations, July, 2011

ADVANCED CONTROL SYSTEMS**(Electrical and Electronics Engineering)****Time: 3 hours****Max. Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. a) Explain the solution of state equation?
 b) What is the significance of the state transition matrix? State and prove the state transition matrix properties? [6+10]
2. a) Explain the concept of Principle of duality?
 b) Describe the controllability and observability of state model in Jordan canonical form? [6+10]
3. a) Explain the popular intentional nonlinear elements and their functionalities.
 b) Derive the Describe function for Saturation nonlinearity. [6+10]
4. a) Explain the graphical method for constructing trajectories by using Isocline method?
 b) Obtain a phase plane portrait of the system given by

$$\ddot{x} + \dot{x} + |x| = 0$$
 [8+8]
5. a) State stability in the sense of Lyapunov?
 b) Describe the Lyapunov's stability and instability theorem in detail? [6+10]

Code No: K0222 /R07

R07**Set No.1**

6. a) A single-input system is described by the following state equation.

$$\dot{X} = \begin{bmatrix} -1 & 0 & 0 \\ 1 & -2 & 0 \\ 0 & 1 & -3 \end{bmatrix} x + \begin{bmatrix} 10 \\ 1 \\ 0 \end{bmatrix} u$$

Design a state feedback controller which will give closed-loop poles at $1 \pm j2, -6$.

- b) "The state feedback system is controllable for any feedback gain matrix k if and only if the linear time-invariant system is controllable" [8+8]

7. a) Explain the control and state variable inequality constraints? [8+8]
b) Write about the Euler lagrangian equation?
8. Write short note on the following [8+8]
a) Minimum energy and minimum fuel problem.
b) Tracking and output regulator problem.

Code No: K0222 /R07

R07**Set No.2**

IV B.Tech II Semester Supplementary Examinations, July, 2011

ADVANCED CONTROL SYSTEMS
(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. What are the techniques are available for obtaining the state space representation of transfer function systems in detail? [16]
 2. Define Minimum energy control. State the theorem and prove the same? [4+4+8]
 3. a) Explain the effect of inherent nonlinearities on static accuracy?
b) Derive the Describe function for dead zone nonlinearity? [6+10]
 4. a) Describe the singular points in phase plane analysis?
b) Draw a phase-plane portrait of the following system? [6+10]
- $$\ddot{\theta} + \dot{\theta} + \sin \theta = 0$$
5. a) State stability in the sense of Lyapunov?
b) Explain the direct method of Lyapunov for the linear continuous time autonomous systems? [8+8]
 6. a) Explain the design of state feedback control through pole placement in detail?
b) Design a full-order state observer for the given state model, given

$$A = \begin{bmatrix} 1 & -1 \\ -2 & 1 \end{bmatrix}; C = [1, 0]$$
 and given values are $\mu_1 = -5, \mu_2 = -5$ [8+8]
 7. a) Describe the constrained minimization and minimum principle?
b) Explain the minimization of functional of single function? [8+8]
 8. a) Explain Minimum time problem?
b) Explain State Regulator problem in brief? [8+8]

Code No: K0222 /R07

R07**Set No.3**

IV B.Tech II Semester Supplementary Examinations, July, 2011

ADVANCED CONTROL SYSTEMS
(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. a) Explain the solution of state equation?
b) What is the significance of the state transition matrix? State and prove the state transition matrix properties? [6+10]
2. a) Explain the concept of Principle of duality?
b) Describe the controllability and observability of state model in Jordan canonical form? [6+10]
3. a) Explain the popular intentional nonlinear elements and their functionalities.
b) Derive the Describe function for Saturation nonlinearity. [6+10]
4. a) Explain the graphical method for constructing trajectories by using Isocline method?
b) Obtain a phase plane portrait of the system given by [8+8]

$$\ddot{x} + \dot{x} + |x| = 0$$
5. a) State stability in the sense of Lyapunov?
b) Describe the Lyapunov's stability and instability theorem in detail? [6+10]
6. a) A single-input system is described by the following state equation.

$$\dot{X} = \begin{bmatrix} -1 & 0 & 0 \\ 1 & -2 & 0 \\ 0 & 1 & -3 \end{bmatrix} x + \begin{bmatrix} 10 \\ 1 \\ 0 \end{bmatrix} u$$
 Design a state feedback controller which will give closed-loop poles at $1 \pm j2, -6$.
b) "The state feedback system is controllable for any feedback gain matrix k if and only if the linear time-invariant system is controllable" [8+8]

Code No: K0222 /R07

R07

Set No.3

7. a) Explain the control and state variable inequality constraints?
b) Write about the Euler lagrangian equation? [8+8]
8. Write short note on the following
- a) Minimum energy and minimum fuel problem.
b) Tracking and output regulator problem. [8+8]

FirstRanker

Code No: K0222 /R07

R07**Set No.4**

IV B.Tech II Semester Supplementary Examinations, July, 2011

ADVANCED CONTROL SYSTEMS**(Electrical and Electronics Engineering)****Time: 3 hours****Max. Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. What are the techniques are available for obtaining the state space representation of transfer function systems in detail? [16]
2. Define Minimum energy control. State the theorem and prove the same? [4+4+8]
3. a) Explain the effect of inherent nonlinearities on static accuracy?
b) Derive the Describe function for dead zone nonlinearity? [6+10]
4. a) Describe the singular points in phase plane analysis?
b) Draw a phase-plane portrait of the following system? [6+10]

$$\ddot{\theta} + \dot{\theta} + \sin \theta = 0$$

5. a) State stability in the sense of Lyapunov?
b) Explain the direct method of Lyapunov for the linear continuous time autonomous systems? [8+8]
6. a) Explain the design of state feedback control through pole placement in detail?
b) Design a full-order state observer for the given state model, given

$$A = \begin{bmatrix} 1 & -1 \\ 2 & 1 \end{bmatrix}; C = [1, 0]$$

and given values are $\mu_1 = -5, \mu_2 = -5$ [8+8]

Code No: K0222 /R07

R07

Set No.4

7. a) Describe the constrained minimization and minimum principle?
b) Explain the minimization of functional of single function? [8+8]
8. a) Explain Minimum time problem?
b) Explain State Regulator problem in brief? [8+8]

FirstRanker

Code No: K0223

R07**Set No.1**

IV B.Tech II Semester Supplementary Examinations, July, 2011

DIGITAL CONTROL SYSTEMS**(Electrical and Electronics Engineering)**

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions

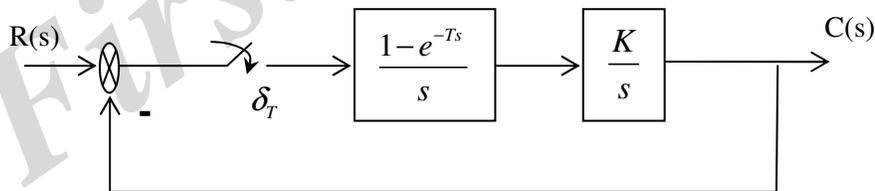
All Questions carry equal marks

1. a) Illustrate the discrete data digital control system with microprocessor controlled system.
b) With the help of diagram explain the successive approximation analog to digital converter.
2. a) What are the important properties and theorems of Z – transform and prove them.
b) Obtain the inverse Z –transform of the following

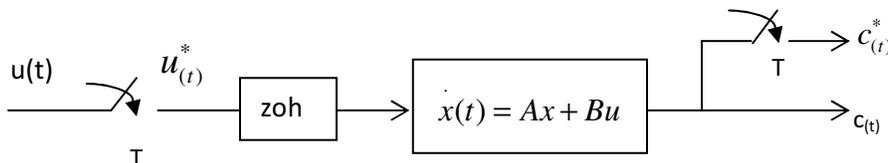
$$(i) X(z) = \frac{z^2 + z + 2}{(z-1)(z^2 - z + 1)} \quad (ii) X(z) = \frac{(1-e^{-at})z}{(z-1)(z-e^{-at})}$$

using partial fraction expansion method.

3. Consider the discrete –time control system show in below figure .Obtain the output Sequence $c(kT)$ of the system when it is subjected to a unit step input. Assume that the sampling period T is 1sec.



4. The block diagram of an open loop discrete data control system is show in below figure .Find the $X(N)$ as functions of $x(0)$ and $u(k)$ for $x=0,1,2,\dots,N$.



Code No: K0223

R07**Set No.1**

5. a) State and explain controllability of linear time – invariant discrete data system.
b) Check the controllability and observability of the following system.

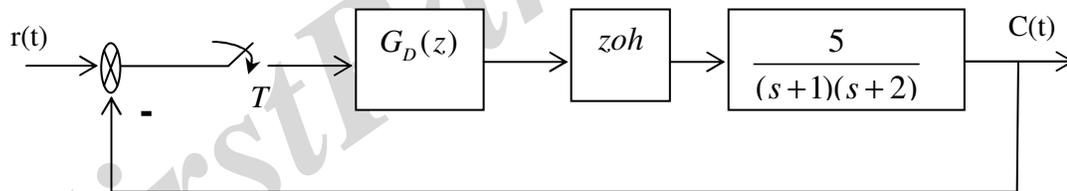
$$[x(k+1)] = \begin{bmatrix} 0 & -2 \\ -1 & 1 \end{bmatrix} [x(k)] + \begin{bmatrix} -1 & 1 \\ 0 & 0 \end{bmatrix} [u(k)]$$

$$[y(k)] = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} [x(k)]$$

6. a) Explain the stability analysis of closed loop system in the z- plane.
b) Examine the stability of the following characteristic equation.

$$F(z) = z^4 - 1.2z^3 + 0.07z^2 + 0.3z - 0.08 = 0.$$

7. Consider the digital control system show in below figure. Using the bode diagram approach in the ω plane, design a digital controller such that the phase margin is 60° , gain margins is 12db or more and velocity error constant is 5sec^{-1} . The sampling Period $T=0.1$ sec.



8. Explain the state observer and derive its necessary and sufficient conditions with neat block diagram.

Code No: K0223

R07**Set No.2**

IV B.Tech II Semester Supplementary Examinations, July, 2011

DIGITAL CONTROL SYSTEMS**(Electrical and Electronics Engineering)**

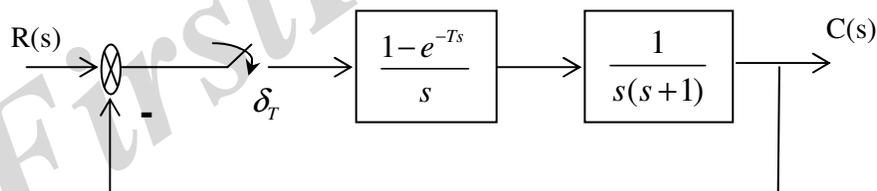
Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions

All Questions carry equal marks

- Illustrate the discrete data digital control system with single axis autopilot control system.
 - With help of diagram explain the weighted resistor digital to analog converter.
- How to element the drawbacks of Z-transform Explain the modified Z-transform
 - Obtain the Z- transform of the following $x(k)$
 $x(k) = 9k(2^{k-1}) - 2^k + 3, k = 0, 1, 2, \dots$
 assume $x(k) = 0$, for $k < 0$.
- Obtain in a closed form the response sequence $c(kT)$ of the system show in figure below when it is subjected to unit step input, assume $T=1$ sec.



- Determine the matrix given below is candidate as state transition matrix of linear discrete - data system, obtain by descritizing the linear system:

$$\frac{dx(t)}{dt} = Ax(t) + Bu(t)$$

$$\Phi(T) = \begin{bmatrix} -e^{-T} + 2e^{-2T} & e^{-T} - e^{-2T} \\ -2e^{-T} + 2e^{-2T} & 2e^{-T} - e^{-2T} \end{bmatrix}$$

Code No: K0223

R07**Set No.2**

5. a) Explain the controllability and observability for pulse transfer function.
b) Check whether the discrete data system.

$$x(k+1) = Ax(k) + Bu(k)$$

$$y(k) = Dx(k)$$

Where $A = \begin{bmatrix} -1 & 2 \\ -1 & 1 \end{bmatrix}$, $B = \begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix}$, $D = \begin{bmatrix} 0 & 1 \\ 0 & 1 \end{bmatrix}$ is

- (i) State controllable
(ii) Observable

6. a) State and explain the Jury stability criterion.
b) Consider the following characteristic equation

$$F(z) = z^3 - 1.2z^2 - 0.08z + 0.24 = 0.$$

Determine whether or not any of the roots of the characteristic equation lie outside the unit circle in the Z-plane. Use the bilinear transformation and the Routh stability criterion.

7. Explain the design procedure of lead compensation and lag compensation by the frequency response approach and also derive necessary transfer function.
8. Consider the system

$$x(k+1) = Ax(k) + Bu(k)$$

$$y(k) = Cx(k)$$

Where $A = \begin{bmatrix} 0 & 0.16 \\ -1 & 1 \end{bmatrix}$, $B = \begin{bmatrix} 1 \\ 0 \end{bmatrix}$, $C = [0 \ 1]$

Design a full order state observer the desired eigenvalues of the observer matrix are $z = 0.5 \pm j0.5$.

Also derive the necessary expressions.

Code No: K0223

R07**Set No. 3**

IV B.Tech. II Semester Supplementary Examinations, July, 2011

DIGITAL CONTROL SYSTEMS**(Electrical and Electronics Engineering)****Time: 3 Hours****Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. a) Explain the sample and hold operations with neat circuit diagram and also discuss tracking and hold modes of operation.
 b) Describe the successive approximation type analog to digital converter.
2. a) Illustrate the steps of modified z-transform with suitable wave forms.
 b) Determine the inverse z-transform for the following

$$\text{i) } X(z) = \frac{z^{-1}(0.5 - z^{-1})}{(1 - 0.5z^{-1})(1 - 0.8z^{-1})^2}$$

$$\text{ii) } X(z) = \frac{z^{-3}}{(1 - z^{-1})(1 - 0.2z^{-1})}$$

3. a) Explain the mapping between s-plane and z-plane with suitable diagram.
 b) Solve the following difference equation

$$2x(k) - 2x(k-1) + x(k-2) = u(k)$$

Where $x(k) = 0$, for $k < 0$

$$\text{And } u(k) = \begin{cases} 1, & k = 0, 1, 2, \dots \\ 0, & k < 0 \end{cases}$$

4. Given the state equation

$x(k+1) = A x(k)$, find the state transition matrix $\Phi(k)$ for the following case

$$A = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0 & -0.5 & 1.5 \end{bmatrix}$$

Code No: K0223

R07**Set No. 3**

5. a) State and explain observability of linear time invariant discrete data system.
b) Check whether the discrete data system

$$x(k+1) = A x(k) + B u(k)$$

$$C(k) = D x(k)$$

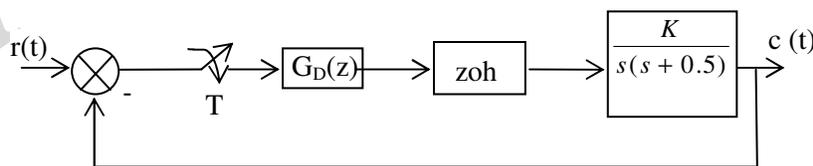
$$\text{Where } A = \begin{bmatrix} 0 & 2 \\ -1 & -1 \end{bmatrix}, B = \begin{bmatrix} -1 \\ 1 \end{bmatrix}, D = [0 \quad 1] \text{ is}$$

- (i) State controllable
(ii) Output controllable
(iii) Observable
6. Consider the discrete time unity, feedback control system with $T=1$ sec, whose open loop transfer function is

$$G(z) = \frac{K(0.3679z + 0.2642)}{(z - 0.3679)(z - 1)}$$

Determine the range of gain K for stability by use of Jury stability test.

7. Using the bode diagram approach in the ω plane, design a digital controller for the system shown in below figure. The design specifications are that the phase margin be 50° , the gain margin be at least 10db and static velocity error K_v be 20 Sec^{-1} . The sampling period is $T = 0.1$ sec, After the controller is designed, calculate the number of samples per cycle of damped sinusoidal oscillations.



8. Explain necessary and sufficient conditions to design of state feedback controller through pole placement with neat block diagrams.

Code No: K0223

R07**Set No. 4**

IV B.Tech. II Semester Advanced Supplementary Examinations, July, 2011
DIGITAL CONTROL SYSTEMS
(Electrical and Electronics Engineering)

Time: 3 Hours**Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. a) Draw the block diagram of a digital control system and explain each component.
 b) What are the advantages and disadvantages of discrete system.
2. a) Explain the inverse z-transform by using partial fraction expansion method.
 b) Show that

$$Z[k(k-1)a^{k-2}] = \frac{(2!)z}{(z-a)^3}$$

$$\text{and } Z[k(k-1)\dots(K-h+1)a^{k-h}] = \frac{(h!)z}{(z-a)^{h+1}}$$

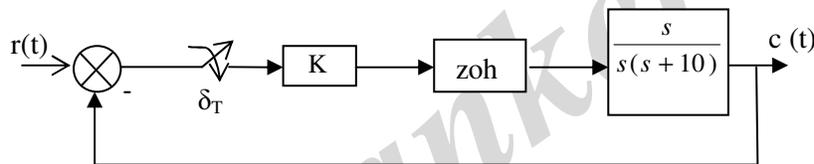
3. The input- output of a sampled data system is described by the difference equation
 $C(k+2) + 3C(k+1) + 4C(k) = r(k+1) - r(k)$
 Determine the z-transform. Also obtain the weighting sequence of the system.
4. a) Derive the state equations of discrete data systems with sample and hold devices.
 b) Write the state equation and output equation of the following difference equation.
 $C(k+3) + 5C(k+2) + 7C(k+1) + 2C(k) = u(k+1) + u(k)$
5. a) Prove that the duality between controllability and observability in discrete data system.
 b) Consider a discrete data control system, whose input – output relation is described by the difference equation
 $y(k+2) + 3y(k+1) + 4y(k) = u(k+1) + u(k)$
 Test for state controllable and output controllable.

Code No: K0223

R07**Set No. 4**

6. a) Explain the stability analysis by use of bilinear transformation and Routh stability criterion
 b) Consider the system described by

$$y(k) - 0.6y(k-1) - 0.81y(k-2) + 0.67y(k-3) - 0.12y(k-4) = x(k)$$
 Determine the stability of the system.
7. Consider the digital control system shown in below figure. Draw the bode diagram in the ω -plane. Set the gain K so that the phase margin becomes equal to 50° . With the gain K so set, determine the G.M and static error constant K_v . The sampling period $T=0.1$ sec.



8. Consider the system

$$x(k+1) = Ax(k) + Bu(k)$$

$$\text{Where } A = \begin{bmatrix} 0 & -1 \\ 0.16 & -1 \end{bmatrix}, B = \begin{bmatrix} 1 \\ 0 \end{bmatrix}$$

Determine a suitable state feedback gain matrix K such that the system will have the closed loop poles at $z = 0.5 \pm j0.5$.

Code No: K0224

R07**Set No.1**

IV B.Tech II Semester Supplementary Examinations, July, 2011

**OPTIMIZATION TECHNIQUES
(Electrical and Electronics Engineering)**

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. a) Discuss the typical applications of Optimization techniques in Electrical Engineering. [8]
- b) Find the maxima and minima, if any, of

$$f(x) = 4x^3 - 18x^2 + 27x - 7$$
 [8]
2. a) Solve the following using the Kuhn-Tucker conditions: [8]

Minimize $Z = y_1^2 + y_2^2 + y_3^2$

Subject to

$y_1 + y_2 + y_3 \geq 15$ and $y_1, y_2, y_3 \geq 0$

- b) Maximize $Z = 9 - x - 6y - 4z + 2x^2 + 2y^2 + 2z^2 + 2xy + 2xz$
subject to $x + y + z = 3$ [8]
3. Apply Two-phase Simplex method to

$$\text{Minimize } Z = x_1 + x_2$$
 [16]

Subject to $2x_1 + x_2 \geq 4; x_1 + 7x_2 \geq 7$ and $x_1, x_2 \geq 0$
4. a) How does the problem of degeneracy arise in a transportation problem?
Explain how one can overcome it. [6]

Code No: K0224

R07**Set No.1**

- b) The following is the information that concerns the operations of the XYZ manufacturing company. The production cost of the company is estimated to be Rs. 5 per unit.

Particulars	Month 1	Month 2
Units on order	800	1400
Production Capacity		
Regular time	920	920
Overtime	250	250
Excess cost/unit (overtime)	1.25	1.25
Storage cost/unit	0.50	0.50

Formulate and solve the above problem as transportation problem. [10]

5. Show that the function $f(x)=x^2$, $0 \leq x \leq 1$, $f(x)=2-x$, $0 \leq x \leq 1$, is unimodal in $(0,2)$. Use the Fibonacci method to find its maximal point with in an interval of uncertainty 0.1. [16]
6. Minimize $f = 3x+4y$ subject to $x + 2y = 8$ using an exterior penalty function method with the calculus method of unconstrained minimization. [16]
7. a) What is Gradient? Represent it graphically. How is it utilized in search in for the optimum in steepest descent method? [8]
 b) Write about the convergence criterion in Powells's Method. [8]
8. a) What is a dynamic recursive relation? Describe the general process of backward recursion. [6]
 b) Solve the following Linear programming problem by dynamic programming approach.

$$\text{Maximize } Z = 8x_1 + 7x_2$$

$$\text{Subject to}$$

$$2x_1 + x_2 \leq 8; 5x_1 + 2x_2 \leq 15 \text{ and } x_1, x_2 \geq 0$$
 [10]

Code No: K0224

R07**Set No.2**

IV B.Tech II Semester Supplementary Examinations, July, 2011

**OPTIMIZATION TECHNIQUES
(Electrical and Electronics Engineering)**

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. a) What do you mean by design vector? [4]
b) What do you mean by objective function surfaces? Explain with example. [6]
c) Write the engineering applications of optimization. [6]
2. Solve the following non-linear programming problem using the method of Lagrange multipliers. [16]

$$\text{Min. } Z = x_1^2 + x_2^2 + x_3^2$$

subjected to

$$x_1 + x_2 + 3x_3 = 2,$$

$$5x_1 + 2x_2 + x_3 = 5,$$

$$x_1, x_2, x_3 \geq 0$$

3. A manufacturer produces two different models, X and Y of the same product. Model X makes a contribution of Rs. 50 per unit and model Y Rs. 30 per unit, towards total profit. Raw materials r_1 and r_2 are required for production. At least 18 kg of r_1 and 12 kg of r_2 must be used daily. Also at most 34 hours of labour are to be utilized. A quantity of 2 kg of r_1 is needed for model X and 1kg of r_1 for model Y. For each of X and Y, 1 kg of r_2 is required. It takes 3 hours to manufacture model X and 2 hours to manufacture model Y. How many units of each model should be produced [16]

Code No: K0224

R07**Set No.2**

4. In order to maximize the profit? A company has factories at F1, F2 and F3 that supply products to warehouses at W1, W2 and W3. The weekly capacities of the factories are 200, 160 and 90 units respectively. The weekly warehouse requirements are 180, 120 and 150 units respectively. The unit shipping cost (in rupees) are as follows:

		Warehouse			Supply
		W1	W2	W3	
Factory	F1	16	20	12	200
	F2	14	8	18	160
	F3	26	24	16	90
Demand		180	120	150	450

Determine IBFS by North-West corner rule and optimum solution by MODI method. [16]

5. Minimize $f(x) = 0.65 - [0.75/(1+x^2)] - 0.65x \tan^{-1}(1/x)$ in the interval $[0, 3]$ by the Fibonacci method using $n=6$. [16]

6. Minimize $f(x_1, x_2) = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2$ with the starting point $(0, 0)$ by Univariate method. [16]

7. Solve the following constrained optimization problem using interior penalty function method.

$$\text{Minimize } f(x_1, x_2) = \frac{1}{3}(x_1 + 1)^3 + x_2$$

$$\text{Subject to } g_1(x_1, x_2) = -x_1 + 1 \leq 0 \quad [16]$$

$$g_2(x_1, x_2) = -x_2 + 1 \leq 0$$

8. Illustrate the calculus method of solution in dynamic programming with an example. [16]

Code No: K0224

R07**Set No.3**

IV B.Tech II Semester Supplementary Examinations, July, 2011

**OPTIMIZATION TECHNIQUES
(Electrical and Electronics Engineering)**

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. a) Give the historical development of optimization methods. [6]
b) Explain about the design vector and design constraints. [10]
2. a) Give the necessary and sufficient conditions for a multi-variable optimization problem without constraints. [10]
b) Find the extreme points of the function

$$f(x_1, x_2) = x_1^3 + x_2^3 + 2x_1^2 + 4x_2^2 + 6$$
 [6]
3. a) Give the standard form of a linear programming problem. [6]
b) Find all the basic solutions corresponding to the system of equations.

$$2x_1 + 3x_2 - 2x_3 - 7x_4 = 1$$

$$x_1 + x_2 + x_3 + 3x_4 = 6$$
 [10]

$$x_1 - x_2 + x_3 + 5x_4 = 4$$
4. A company has factories at F1, F2 and F3 that supply products to warehouses at W1, W2 and W3. The weekly capacities of the factories are 200, 160 and 90 units respectively. The weekly warehouse requirements are 180, 120 and 150 units respectively. The unit shipping cost (in rupees) are as follows:

		Warehouse			Supply
		W1	W2	W3	
Factory	F1	16	20	12	200
	F2	14	8	18	160
	F3	26	24	16	90
Demand		180	120	150	450

Determine IBFS by Vogel's approximation method and optimum solution by MODI method. [16]

5. Find the minimum of $f = \lambda^5 - 5\lambda^3 - 20\lambda + 5$ by quadratic interpolation method. [16]

Code No: K0224

R07**Set No.3**

6. Minimize $f(x_1, x_2) = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2$ from the starting point $X_1 = \begin{Bmatrix} 0 \\ 0 \end{Bmatrix}$ using Powell's method. [16]

7. Solve the following constrained optimization problem using exterior penalty function method.

$$\text{Minimize } f(x_1, x_2) = \frac{1}{3}(x_1 + 1)^3 + x_2$$

$$\text{Subject to } g_1(x_1, x_2) = 1 - x_1 \leq 0$$

$$g_2(x_1, x_2) = -x_2 \leq 0$$

[16]

8. Explain the concept of sub-optimization and the principle of optimality in dynamic programming with an example. [16]

Code No: K0224

R07**Set No.4**

IV B.Tech II Semester Supplementary Examinations, July, 2011

OPTIMIZATION TECHNIQUES
(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Give the classification of optimization problems by giving examples. [16]
2. A manufacturing firm producing small refrigerators has entered into a contract to supply 50 refrigerators at the end of the first month, 50 at the end of the month, and 50 at the end of the third. The cost of producing x refrigerators in any month is given by $\$(x^2+1000)$. The firm can produce more refrigerators in any month and carry them to a subsequent month. However, it costs \$20 per unit for any refrigerator carried over from one month to the next. Assuming that there is no initial inventory, determine the number of refrigerators to be produced in each month to minimize the total cost by using Kuhn-Tucker conditions. [16]
3. a) Give the applications of linear programming. [8]
b) What is the difference between the simplex algorithm and the simplex method? [4]
c) How do you identify the presence of multiple optima in the simplex method? [4]
4. A company has factories at F1, F2 and F3 that supply products to warehouses at W1, W2 and W3. The weekly capacities of the factories are 200, 160 and 90 units respectively. The weekly warehouse requirements are 180, 120 and 150 units respectively. The unit shipping cost (in rupees) are as follows:

		Warehouse			Supply
		W1	W2	W3	
Factory	F1	16	20	12	200
	F2	14	8	18	160
	F3	26	24	16	90
Demand		180	120	150	450

Determine IBFS by least cost entry method and optimum solution by MODI method. [16]

Code No: K0224

R07**Set No.4**

5. a) What is an one-dimensional minimization problem? [4]
b) What are the limitations of classical methods in solving a one-dimensional minimization problem? Explain with example. [8]
c) Distinguish between Fibonacci method and quadratic interpolation methods. [4]
6. Minimize $f(x_1, x_2) = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2$ from the starting point $X_1 = \begin{Bmatrix} 0 \\ 0 \end{Bmatrix}$ using steepest descent method. [16]
7. What do you understand by convex programming and explain it with an example. [16]
8. Explain the computational procedure in dynamic programming with an example. [16]

Code No: K0322/R07

R07**Set No.1**

IV B.Tech II Semester Supplementary Examinations, July, 2011

NEURAL NETWORKS AND FUZZY LOGIC SYSTEMS

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. a) Using Mc-Culloch Pitts model implement logic functions for NAND and NOR gates.
b) Discuss in detail about Hodgkin-Huxley neuron model and spiking neuron model. [8+8]
2. a) Explain in detail about different Artificial neural network architectures with their block diagrams.
b) Elucidate on different learning strategies in training a neural network. [8+8]
3. a) Explain about continuous perceptron training algorithm in detail
b) Discuss different categories of perceptron model with neat architectural diagrams. [8+8]
4. a) State and explain in detail about kolmogorov theorem.
b) Explain generalized delta rule in detail. [8+8]
5. a) Discuss in detail about bidirectional associative memory architecture and its training algorithms.
b) Discuss Hebbian learning in detail. [8+8]
6. a) If the fuzzy set $\tilde{A} = \{(x_1, 0.4), (x_2, 0.6), (x_3, 0.8)\}$ is multiplied with a crisp number $a = 0.3$. Find the new fuzzy set formed along with its membership function.
b) Explain the following terms in sets:
 - i) CON
 - ii) DIL
 - iii) Membership function
 - iv) CRISP. [8+8]

Code No: K0322/R07

R07

Set No.1

7. a) Explain different defuzzification methods with examples.
b) What is fuzzification? Discuss about fuzzy quantifiers & their classes. [8+8]
8. a) Design and develop a pressure process control by FLC model. Formulate necessary Membership functions and required fuzzy rules for the application.
b) Explain in detail about the application of fuzzy logic used in washing machine controller. [8+8]

FirstRanker

Code No: K0322/R07

R07**Set No.2**

IV B.Tech II Semester Supplementary Examinations, July, 2011
NEURAL NETWORKS AND FUZZY LOGIC SYSTEMS
(Mechanical Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. a) Explain in detail about Mc-Culloch Pitts model for basic gates?
 b) Discuss in detail about the historical developments of neural networks. [8+8]
2. a) What is artificial neuron? Discuss in detail about the operations of artificial neurons.
 b) Explain different neuron activation functions and also compare them. [8+8]
3. a) What is hard problem and why it is hard to solve for perceptron network.
 b) Discuss about multi category single layer perceptron network. [8+8]
4. a) Give derivation for back propagation training.
 b) Describe in detail about continuous and multi category single layer feed forward neural networks. [8+8]
5. a) Analyze on stability for Hopfield network and also find how to find capacity of Hopfield network.
 b) Discuss in detail about storage and recall algorithms in Hopfield networks. [8+8]
6. a) Consider the fuzzy sets \tilde{A} and defined on the interval $X=[0,5]$ of real numbers, by the membership grade functions.
 $\mu_{\tilde{A}}(x) = x/(x+1)$
 $\mu_{\tilde{B}}(x) = 2^{-x}$
 b) Determine the mathematical formulae and graphs of the membership grade functions of each of the following sets.
 i) A^C, B^C
 ii) $A \cap B$
 iii) $A \cup B$
 iv) $(A \cup B)^C$ [8+8]

Code No: K0322/R07

R07

Set No.2

7. a) What is fuzzy inference? Discuss two important inferring procedures.
b) What is meant by defuzzification? Discuss few widely used methods of defuzzification. Give examples. [8+8]
8. a) Briefly discuss about the applications of neural networks in process identification and control.
b) Discuss in detail about the applications of fuzzy logic. [8+8]

FirstRanker

Code No: K0322/R07

R07**Set No.3**

IV B.Tech II Semester Supplementary Examinations, July, 2011
NEURAL NETWORKS AND FUZZY LOGIC SYSTEMS
(Mechanical Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. a) Explain in detail about biological and artificial neuron models.
 b) Describe in detail about the organization of human brain. [8+8]
2. a) Give and explain about classification taxonomy of artificial neural networks.
 b) Explain Widrow-Hoff and delta learning rule in detail. [8+8]
3. a) Discuss in detail about different perceptron models .
 b) Explain the architecture and algorithm of discrete perceptron network. [8+8]
4. a) Give suggestions to improve and modify back propagation network.
 b) Which criteria is followed to decide the number of neurons in back propagation network? [8+8]
5. a) Explain why linear associative network provides no means of suppression of cross talk noise.
 b) Give architectural details of Hopfield networks for different versions. [8+8]
6. a) Let $X = \{1, 2, 3, \dots, 10\}$. Determine the cardinalities and relative cardinalities of the following fuzzy sets.
 i) $\tilde{A} = \{(3, 10), (4, 0.2), (5, 0.3), (6, 0.4), (7, 0.6), (8, 0.8), (10, 1), (12, 0.8), (14, 0.6)\}$
 ii) $\tilde{B} = \{(2, 0.4), (3, 0.6), (4, 0.8), (5, 1.0), (6, 0.8), (7, 0.6), (8, 0.4)\}$
 iii) $\tilde{C} = \{(2, 0.4), (4, 0.8), (5, 1.0), (7, 0.6)\}$
 b) Discuss in detail about member ship and member ship functions in fuzzy sets.
 Discuss in detail the methods to generate membership functions. [8+8]

Code No: K0322/R07

R07

Set No.3

7. a) Explain in detail about the components of fuzzy logic system.
b) Mention the need for the De-Fuzzification. Explain the three types of De-Fuzzification with its formulae. [8+8]
8. a) Explain how ANN is used for process Identification.
b) Explain in detail how classification is done using Fuzzy logic. [8+8]

FirstRanker

Code No: K0322/R07

R07**Set No.4**

IV B.Tech II Semester Supplementary Examinations, July, 2011
NEURAL NETWORKS AND FUZZY LOGIC SYSTEMS
(Mechanical Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. a) Explain about characteristics of artificial neural networks.
b) Describe in detail about the operation of organization of the brain and biological neuron. [8+8]

2. a) Give and explain different types of neuron activation functions. Explain the role of bias in activation function.
b) Compare supervised and unsupervised learning strategies. [8+8]

3. a) Derive and explain in detail about equation for weight change for discrete perceptron network.
b) What is perceptron model and also discuss on limitations of perceptron model. [8+8]

4. a) Explain in detail about learning difficulties and improvements of multilayer feed forward neural networks.
b) State and explain in detail about credit assignment problem. [8+8]

5. a) State and prove BAM theorem.
b) The following uni-polar binary vectors must be stored in the recurrent auto associative memory using the outer product method with the nullification of the diagonal.

$$S^{(1)} = [1 0 0 1 0]^t$$

$$S^{(2)} = [0 1 1 0 1]^t$$

$$S^{(3)} = [1 1 0 1 0]^t$$
 - i) Compute matrix W.
 - ii) Find the analytical expression for the energy function that the memory is minimizing. [8+8]

Code No: K0322/R07

R07**Set No.4**

6. a) Describe in detail about properties and operations of classical sets and fuzzy sets.
Why fuzzy set theory is effective to tackle the problem of uncertainty? Explain.
- b) Let R, S be defined on the sets $\{1, 3, 5\} \times \{1, 3, 5\}$.
Let R: $\{(x, y) | y = x + 2\}$,
i) S : $\{(x, y) | x < y\}$. Using max-min composition .find R o S
ii) S o R. [8+8]
7. a) Discuss in detail about development of rule base and decision making system.
b) Delineate about defuzzification of crisp sets. [8+8]
8. a) Describe in detail about fuzzy logic control and fuzzy classification using fuzzy logic. Explain the operation of the fuzzy logic control with the process inference block.
b) Explain about the application of neural network for fault diagnosis. [8+8]

Code No: K0323 /R07

R07**Set No.1**

IV B.Tech II Semester Supplementary Examinations, July, 2011

TRIBOLOGY

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. With the help of a neat sketch explain the construction and working of capillary viscometer.
2. A hydrostatic circular pad bearing operating under a minimum oil film thickness of $50 \mu\text{m}$ supports a vertical load of 55 kN at a shaft speed of 2000 rpm . The lubricant's viscosity at the operating temperature is 8.8 centi poise , the recess oil pressure is 2 MPa and the external pressure outside the bearing is $P_0=0$. Assuming that $D/D_0=3$, calculate the capillary dimensions necessary to maintain the minimum film thickness. The pump supply pressure is 3.3 MPa .
3. Derive the generalized Reynold's equation applied to viscous fluids.
4. A full journal bearing is having the following specifications:
Journal diameter = 105 mm
Length to diameter ratio = 1.0
Radial clearance = 0.035 mm
Journal speed = 3200 rpm
Operating eccentricity ratio = 0.6
Average viscosity of lubricant = 0.02 Pa s
Assuming the bearing to be infinitely long and using
 - i) full Somerfield and
 - ii) half-Somerfield boundary conditions find bearing characteristics.
5.
 - a) Explain the disadvantages of air-lubricated bearings.
 - b) Discuss about the dynamic characteristics of air-lubricated bearings.
6.
 - a) What is the significance of molecular polarity in boundary lubrication?
 - b) Are liquid properties such as viscosity relevant to the mechanism of boundary lubrication? Discuss.

Code No: K0323 /R07

R07

Set No.1

7. a) With the help of a neat diagram illustrate the pressure distribution in a flexible pad.
b) Explain the effect of elastic deformation of the pad on load carrying capacity and film thickness.

8. What material properties influence the life of a bearing? Explain.

FirstRanker

Code No: K0323 /R07

R07**Set No.2**

IV B.Tech II Semester Supplementary Examinations, July, 2011

TRIBOLOGY

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. With the help of a neat sketch explain the construction and working of efflux viscometer.
2. A pump capable of maintaining 18MPa of pressure is supplying oil of viscosity 80 centipoises to a circular hydrostatic thrust bearing of an outside diameter of 0.1m at a rate of $0.4 \times 10^{-5} \text{ m}^3/\text{s}$, generating a steady film thickness of 30 μm . The bearing supports a weight of 60kN and rotates at 1050rpm. Calculate a suitable recess radius and pumping power. Also calculate the percentage in load increase that would cause a 16% decrease in film thickness.
3. Derive an equation for maximum load in a plane slider bearing.
4. A full journal bearing has the following specifications:

Journal diameter	=	65mm
Bearing length	=	70mm
Radial clearance	=	0.02mm
Journal speed	=	900rpm
Mean viscosity	=	0.025Pa s
Eccentricity ratio	=	0.8

 Neglecting side leakage and using half-Sommerfeld boundary conditions, determine
 - i) load carrying capacity
 - ii) attitude angle
 - iii) power loss due to viscous friction
5.
 - a) Explain the working principle of externally pressurized air-lubricated bearing.
 - b) Write a detailed note on the whirl instability of air lubricated bearings.
6. What is heat streaking? What is the probable solution to the heat streaking problem? Explain.
7. What are the different types of oil rings used in bearing? Explain their practical utility and advantages.
8. Give the complete classification of bearing materials? Explain their areas of application.

Code No: K0323 /R07

R07**Set No.3**

IV B.Tech II Semester Supplementary Examinations, July, 2011

TRIBOLOGY

(Mechanical Engineering)

Time: 3 hours**Max. Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. With the help of a neat sketch explain the construction and working of falling sphere viscometer.
2. A circular hydrostatic bearing with an outside diameter of 140mm, recess diameter of 50mm and rotating at 500rpm supports a load of 50kN. The bearing is lubricated by a mineral oil of density 800kg/m^3 delivered to the bearing by a constant flow rate delivery pump operating at $50 \times 10^{-9} \text{m}^3/\text{s}$. The operating temperature of the bearing is 30°C . Calculate the recess pressure and select an SAE oil such that the film thickness will never be less than $10 \mu\text{m}$.
3. A plane slider bearing with fixed shoe is operating under the following conditions:

Width of bearing, B	= 50mm
Length to width ratio, L/B	= 1.0
Sliding velocity	= 5 m/s
Minimum film thickness	= 0.02mm
Absolute viscosity of lubricant	= 0.02Pa s
Attitude	= 2.0

 Neglecting side leakage, find load carrying capacity and coefficient of friction
4. A rectangular slider bearing with pivoted shoe has the following specification:

Length of shoe	= 60mm
Width of shoe	= 55mm
Slider speed	= 5m/s
Load	= 25kN
Absolute viscosity	= 0.012Pa s.

 Determine i) minimum film thickness and
 ii) Power loss due to viscous friction. Neglect side leakage.
5. Derive an equation for the load bearing capacity of hydrostatic gas bearing. Consider compressibility effect also.

Code No: K0323 /R07

R07

Set No.3

6. a) Under what conditions of load and speed is boundary lubrication most likely to occur?
b) What parameter determines the fundamental limit to boundary lubrication? Discuss.
7. a) What do elastic and thermal distortions of the pivoted pads have adverse effect on load carrying capacity?
b) Explain the working of externally pressurized bearings.
8. What are the different types of materials used as bearings? Explain their relative merits and demerits.

FirstRanker

Code No: K0323 /R07

R07**Set No.4**

IV B.Tech II Semester Supplementary Examinations, July, 2011

TRIBOLOGY

(Mechanical Engineering)

Time: 3 hours**Max. Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. a) Discuss the effect of temperature on viscosity index.
b) Explain the phenomenon of decrease of viscosity of oil with increase in temperature.
2. A circular pad hydrostatic bearing has an outside radius of 0.1m and circular recess radius of 0.02m. The viscosity of the lubricant used is 30 cP. The oil is supplied to the bearing by a pump at constant flow rate of 18l/min. Calculate the load capacity for a uniform film thickness of 100 μm and the percentage increase in load capacity if the film thickness is reduced by 10%.
3. Discuss the impact of oil whirl on the stability of bearings.
4. A rectangular slider bearing has the following specifications:
Bearing width=95mm
Bearing length=80mm
Load=20kN
Sliding speed=2.5m/s
Inclination=0.0004rad
Absolute viscosity of the oil=0.015Pa s
Find i) minimum film thickness ii) power loss due to viscous friction.
Neglect side leakage
5. a) List advantages of air lubricated bearings.
b) A circular hydrostatic bearing with an outside diameter of 150mm, recess diameter of 60mm and rotating at 500rpm supports a load of 50kN. The bearing is lubricated by a mineral oil of density 900kg/m³ delivered to the bearing by a constant flow rate delivery pump operating at $50 \times 10^{-9} \text{m}^3/\text{s}$. The operating temperature of the bearing is 30⁰C. Calculate the recess pressure and select an SAE oil such that the film thickness will never be less than 10 μm .

Code No: K0323 /R07

R07

Set No.4

6. a) What is the significance of molecular polarity in boundary lubrication?
b) Are liquid properties such as viscosity relevant to the mechanism of boundary lubrication? Discuss.
7. What is the working principle of partial bearings?
What are its advantages and limitations?
8. Discuss the general requirements of bearing materials.

FirstRanker

Code No: K0324/R07

R07

Set No.1

IV B.Tech II Semester Supplementary Examinations, July, 2011

NANOTECHNOLOGY

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 80

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

1. a) Briefly explain about Mossbauer and Spectroscopy Phenomena.
b) Solve the Schrodinger's equation for a linear harmonic Oscillator and obtain eigen energy values. Discuss the significance of zero point energy?
2. a) Mention important applications of Silicon carbide and also discuss their advantages and disadvantages.
b) Explain in detail about Zirconia nano material preparation and write about their characterization.
3. a) Write in detail procedure about determination of Tensile and Impact strength of nano crystalline SiC.
b) Discuss about the Magnetic properties like Diamagnetics and Paramagnetics with neat sketches?
4. a) Mention in detail about Electrical data of nano particles of Bismuth and Selenium.
b) Mention in detail about Accidental Anisotropy – Birefringence-Elasto – Optic effect?
5. a) Describe Sol – gel processing of Synthesis of Nano powders.
b) Write in detail procedure about synthesis of Nano powders using Electro deposition method.
6. a) How do you characterize a material with transmission electro microscope (TEM) with a neat sketch? Discuss about sample preparation.
b) Write in detail about Optical microscopes.

Code No: K0324/R07

R07

Set No.1

7. a) List out various medical and biotechnology applications of Nano technology.
b) Describe interaction between biomolecules and nanoparticle surface.

8. a) Discuss in details about protocols of Nanodrug and their importance.
b) List out various nanoprobes for analytical applications and explain with practical examples.

FirstRanker

Code No: K0324/R07

R07

Set No.2

IV B.Tech II Semester Supplementary Examinations, July, 2011

NANOTECHNOLOGY

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 80

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

1. a) Explain in detail about Optical phenomena bonding in solids.
b) Discuss the solution and results of wave equation for a particle in a one dimensional box?
2. a) Discuss in detail about Silicon carbide sintering and their characterization using Electron microscopy.
b) Write in detail about Microwave sintering of Nano particles with neat diagrams.
3. a) Describe in detail about Weibull theory and Stress intensity factor with reference to strength of nano crystalline SiC.
b) Discuss in detail about the Magnetic properties of nano particle with neat sketches?
4. a) Write in detail about Electron conduction with nano particles.
b) Write in detail about coloured glasses.
5. a) Describe in detail about Quantum wells, Quantum wires and Quantum dots.
b) Explain in detail about Electro deposition of Nano composites
6. a) With neat sketch describe about X- ray diffraction.
b) Describe in detail about characterize a material with Scanning electron microscope (SEM).
7. a) List out various applications of Nanotechnology and also discuss current status of nanotechnology related to biomolecules.
b) Write in detail about current status of biotechnology and nano biotechnology.
8. a) Discuss studying tribology at nanoscale and list out various Nanotribology applications.
b) Write in detail about Nano materials used for diagnostics and therapeutic applications.

Code No: K0324/R07

R07

Set No.3

IV B.Tech II Semester Supplementary Examinations, July, 2011

NANOTECHNOLOGY

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 80

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

1. a) Briefly explain about Diamagnetism and Paramagnetism with neat Sketches..
b) Obtain ground state wave function for hydrogen atom using Schroedinger's equation and evaluate the most probable distance of electron from the nucleus.
2. a) Write in detail about characterization of SiC nano particle using TEM and SEM .
b) Discuss wear behaviour phenomena of nano composite Ceramics materials?
3. a) Write in detail about Mechanical properties of nano crystalline SiC.
b) Discuss about the Magnetic properties like Super paramagnetism and ESR Spectroscopy with neat sketches?
4. a) Mention in detail about Electrical data of nano particles of Bismuth and Selenium.
b) Write in detail about Basic Optical properties and special properties.
5. a) Describe different Synthesis techniques of Nano powders.
b) Explain in detail about Electro deposition of Inorganic Materials.
6. a) How do you characterize a material with Scanning electron microscope (SEM) with a neat sketch.
b) Explain with examples and neat sketches about X-ray Diffraction of nano particles
7. a) List out various applications of Nano in biology and their future perspectives.
b) Write in detail about future perspectives of nanobiology and nanosensors.
8. a) Discuss in details about nanotechnology in Diagnostic applications and their importance.
b) Write in detail about Molecular nanomechanics, devices and their application.

Code No: K0324/R07

R07

Set No.4

IV B.Tech II Semester Supplementary Examinations, July, 2011

**NANO TECHNOLOGY
(Mechanical Engineering)**

Time: 3 hours

Max. Marks: 80

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

1. a) Briefly explain about Anisotropy in a single crystal
b) Give an account of important postulates and theorems of quantum mechanics?
2. a) Write in detail about characterization of SiC nano particle using SEM with neat diagram.
b) Discuss wear behaviour phenomena of nano composite Alumina Ceramics?
3. a) Mention in detail about comparison of Mechanical data of α – and β – SiC.
b) Write in detail about Magnetization of Nano particles of magnetite.
4. a) Describe in detail about AC and DC conduction data of nano particles.
b) Mention in detail about Electro – Optic and Acoustic – Optic effect?
5. a) Describe Sol – gel processing of Synthesis of Nano powders.
b) Explain in detail about Nano magnetics with neat diagrams.
6. a) Write detailed comparison between Optical Microscopy and Electron Microscopy.
b) Explain with examples and neat sketches about functional advantages and applications of SPM.
7. a) List out various medical applications of Nanotechnology and their future perspective.
b) Describe in detail about current status and future perspectives of Nano biotechnology
8. a) Discuss in details about Nanomedicins and nanosystems applications.
b) Write in detail about nanotribology and its applications in the present generation.

Code No: K0325 /R07

R07**Set No.1**

IV B.Tech II Semester Supplementary Examinations, July, 2011
COMPUTER ORGANIZATION AND ARCHITECTURE
(Mechanical Engineering)

Time: 3 hours**Max. Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. a) Differentiate between multi programming and multitasking.
b) Describe the steps involved in running one application program on a processor.
c) Show that the exclusive - nor function, with four inputs A, B, C and D, is an even function.
2. a) A digital computer has a common bus system, for 16 registers of 32 bits each, constructed with Multiplexers. Show all the connections and answer the following.
b) How many selection inputs are there in each multiplexer?
c) What is the size of each multiplexers?
d) How many multiplexers are needed to connect the bus?
3. a) Give the internal organization of a 2Mx8 dynamic memory chip.
b) Explain how data is stored into a ROM cell.
c) Name different designs of ROM. How do they differ?
4. a) What are the advantages and disadvantages of using micro programmed design over hardwired Control Design?
b) Give a sample of 20 bit micro instruction code format.
c) Explain how mapping from instruction code micro instruction address is done in a micro Programmed control unit.
5. a) Give the features of a RISC. What are its relative merits over CISC?
b) Give any three important instruction formats of a 16 bit basic computer.
6. a) Explain, how communication is made between I/O and computer?
b) Explain the interrupt driven data transfer.
7. a) Give the instruction format of a vector processor for performing matrix multiplication and give the Pipeline for calculating the inner products.
b) Explain four possible hardware schemes that can be used in an instruction pipeline in order to Minimize the Performance degradation caused by instruction branching.
8. a) Describe the following terminology associated with multiprocessors.
 - i) Mutual exclusion
 - ii) critical section
 - iii) Hardware locks
 - iv) Semaphoreb) How inter processor communication is performed in multiprocessors?

Code No: K0325 /R07

R07**Set No.2**

IV B.Tech II Semester Supplementary Examinations, July, 2011
COMPUTER ORGANIZATION AND ARCHITECTURE
(Mechanical Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. a) What are the parameters that dictate the execution time of a program? Does replacement of a processor with another processor of higher frequency provide better performance? Comment.
 b) What are the functions performed by system software?
2. a) Show the block diagram of the hardware that implements the following register transfer statement $T_2 : R_2 \leftarrow R_1, R_1 \leftarrow R_2$
 b) With the help of a diagram, explain the working of a 4-bit combinational circuit shifter.
3. a) What is a cache memory? Discuss the important considerations of a good cache performance.
 b) With the help of a diagram, explain how read/ write operations are performed on synchronous DRAM.
4. a) A computer uses a memory unit with 256k words of 32 bit each. A binary instruction code is stored in one word of memory. The instruction has four parts: an indirect bit, an operation code, a register code part to specify one of 64 registers and an address part.
 b) How many bits are there in the operation code, the register code part, and the address part?
 c) Draw the instruction format and indicate the no of bits in each part.
 d) How many bits are there in the data and address inputs of the memory?
5. a) With the help of a block diagram, explain the working of a 16 bit hardwired control unit.
 b) Give the sequence of micro operations for the fetch and decoding of an instruction using register transfer statements and how these are implemented in the bus system.
6. a) What are the different ways that computer buses can be used to communicate with memory and I/O? Explain the use of I/O port.
 b) Explain Asynchronous data transfer between two components of a computer system using handshaking.
7. a) What are the pipeline conflicts? How does it deal with data dependences?
 b) How SIMD array processor enhances performance of a computer?
 c) How RISC pipeline deals with branch instructions?
8. a) What are the characteristics of multiprocessors?
 b) What is Cache cohesion?
 c) Draw the diagram of a 8x8 omega switching network.

Code No: K0325 /R07

R07**Set No.3**

IV B.Tech II Semester Supplementary Examinations, July, 2011
COMPUTER ORGANIZATION AND ARCHITECTURE
(Mechanical Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. a) What is the basic performance equation of a computer system? Discuss the dependability of the performance on different parameters.
 b) How multiprocessors and multi computers are different? What is the property that distinguishes them?
 c) With the help of a flow chart, explain how floating point addition is performed?
2. a) Draw the diagram of a bus system, for 4 registers of 4 bits each, using 3 state buffers.
 b) Represent the following conditional control statement by register transfer statements with control functions.
 If (P=1) then (R1 ← R2) else if (Q =1) then (R1 ←R3)
3. a) Compare and contrast the use of “Cache” and “Virtual memory” concepts in memory organization Of a computer.
 b) Differentiate between static and dynamic memories.
4. a) Draw the flow chart, showing the way an interrupt is handled by a computer.
 b) What is the difference between a direct and an indirect address instruction? How many references to memory are needed for each type of instruction to bring an operand into a processor register? Give examples.
5. a) Explain with the help of a suitable diagram the address sequencing in micro programmed control.
 b) Explain the different configurations of a storage system based on multiple disks.
6. a) Differentiate between isolated I/O and memory – mapped I/O
 b) Describe the asynchronous communication between different components of computer using strobe Signal.
7. a) What is memory interleaving? What are the advantages of it?
 b) How branch instructions are handled in pipeline computers?
 c) What are the applications of vector processing?
8. a) Draw the diagram of a hyper cube structure with 3 nodes.
 b) Explain the daisy chain arbitration with a suitable diagram.

Code No: K0325 /R07

Set No.4

IV B.Tech II Semester Supplementary Examinations, July, 2011
COMPUTER ORGANIZATION AND ARCHITECTURE
(Mechanical Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. a) Derive the circuits for a 3-bit parity generator and a 4 bit party checker using an even parity bit.
b) Explain, with an examples, how 2's complement binary multiplication is performed.
2. a) A digital computer has a common bus system, for 16 registers of 32 bit each, and has been constructed with the help of 3 state bus buffers. Show the connectivity. How many buffers are needed? What are the other basic components required for the construction.
b) Design a 4 bit combination circuit decrementer using four half adder circuits.
3. a) With the help of a diagram, explain working of a static RAM cell.
b) Explain the concept of virtual memory and explain the mapping of virtual and physical spaces.
4. Demonstrate the most basic requirement for input and output communication from a terminal unit with a keyboard and printer and explain how the communication takes place.
5. a) Differentiate among control memory, cache memory and main memory.
b) Explain with the help of suitable diagram the branch logic of a micro program control.
6. a) What are the major difference in the characteristics of central computer and I/O devices so as to use interfaces for communication .
b) How RS 232 can be used for serial communication?
c) Explain the data communications using DMA.
7. a) Derive the expression for speed up and efficiency of a K-stage pipeline.
b) How array processor, Vector processor and pipeline processor differ? When are they be preferred over the others?
8. a) Explain the bus parallel arbitration
b) How inter processor synchronomization is performed using semaphores?

Code No: L0421/R07

Set No. 1

IV B.Tech II Semester Supplementary Examinations, July 2011
EMBEDDED AND REAL TIME SYSTEMS
 (Common to Electronics & Communication Engineering and Electronics &
 Instrumentation Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Design a 3 - bit counter that counts the following sequence: 1, 2, 4, 5, 7, 1, 2, etc.,. This counter has an output called "Odd" whose value is 1 when the current count value is odd. Use the sequential design technique. Start from a state diagram, draw the state table, minimize the logic and draw the final circuit? [16]
2. (a) What is DMA operation in a computer? Why it is required in a computer? Clearly explain how it is implemented?
 (b) Write notes on microcontrollers and the peripherals usually associated with in the processor. [8+8]
3. (a) Explain briefly about Synchronization among Processes.
 (b) Write a note on Scheduling Processes. [8+8]
4. Explain about Ethernet LAN Protocol Architecture and give brief description about each protocol. [16]
5. (a) Explain different states of tasks [8+8]
 (b) Explain about the following scheduling algorithms
 - i. Primitive multitasking
 - ii. Shortest-job first.
6. With suitable examples explain how to :
 - (a) Set an event flag
 - (b) Clear an event flag
 - (c) Query an event flag. [5+5+6]
7. (a) Explain different timer management function calls.
 (b) Explain different memory management function calls. [8+8]
8. Show behavior and structures (at the same abstraction level) for a design that finds the minimum of three input integers, by showing the following descriptions
 - (a) A Sequential program behavior.
 - (b) A processor/memory structure
 - (c) A Register Transfer Behavior

Code No: L0421/R07

Set No. 1

- (d) A Register /FU/MUX structure
- (e) A logic equation/FSM behavior
- (f) A gate /Flip-flop structure

Label each description associate each label with a point on Gajski's Y- chart
[3+3+3+3+2+2]

FirstRanker

Code No: L0421/R07

Set No. 2

IV B.Tech II Semester Supplementary Examinations, July 2011
EMBEDDED AND REAL TIME SYSTEMS
 (Common to Electronics & Communication Engineering and Electronics &
 Instrumentation Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Design a Soda Machine controller given that a soda costs 75 cents and your machine accepts quarters only. Draw a black - box view, come up with a state diagram and state table, minimize the logic and then draw the final circuit. [16]
2. (a) Explain about CISC and RISC?
 (b) Give note on
 - i. DMA
 - ii. Sensors
 - iii. Transducers. [7+3+3+3]
3. (a) Explain about Suspending and Resuming Processes.
 (b) Explain how to synchronize consumer-producer problem using monitors. Write and explain the C Program for it. [6+10]
4. (a) What are the advantages of USB over RS232.
 (b) Draw and Explain Bluetooth State Transition Diagram.
5. (a) Explain about context switching with examples.
 (b) Explain about the following scheduling algorithms
 - i. Round -Robin
 - ii. Non primitive multitasking. [8+8]
6. With suitable examples explain how to
 - (a) Send a signal to another Task
 - (b) Block a signal from being delivered.
 - (c) Unblock a blocked signal. [5+5+6]
7. (a) Explain the difference between pre-emptive and non-pre-emptive operating systems.
 (b) What are the objects of Operating System Kernel. [8+8]
8. (a) Explain the software - hardware trade off?
 (b) What are the advantages and disadvantages of software implementation and Hardware implementation? [8+8]

Code No: L0421/R07

Set No. 3

IV B.Tech II Semester Supplementary Examinations, July 2011
EMBEDDED AND REAL TIME SYSTEMS
 (Common to Electronics & Communication Engineering and Electronics &
 Instrumentation Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Explain why NAND and NOR gates are more common than AND and OR gates?
 (b) Design a 3X8 decoder, start from a truth table use K - maps to minimize logic and draw the final circuit? [4+12]
2. (a) Give note on
 - i. Watchdog Timers
 - ii. ADC and DAC.
 (b) Explain about hybrid memory devices? [5+5+6]
3. (a) Define the following terms : finite - state machines, concurrent processes, real - time systems and real-time operating systems.
 (b) Explain about Synchronization among Processes. [8+8]
4. (a) Explain about the communication between nodes in wireless LAN.
 (b) Explain about Bluetooth System and its Specifications. [8+8]
5. With suitable examples explain how do you:
 - (a) Enable the interrupt
 - (b) Disable the interrupt
 - (c) Set the variable
 - (d) Access the stored resource. [5+6+5]
6. With suitable examples explain how to :
 - (a) Set an event flag
 - (b) Clear an event flag
 - (c) Query an event flag. [5+5+6]
7. (a) Explain the steps in developing Applications using Real Time Operating System.
 (b) Compare and contrast RTOS Vs LINUX. [8+8]
8. (a) Explain the system Synthesis.
 (b) Explain how emulators solve problems associated with simulators. [8+8]

Code No: L0421/R07

Set No. 4

IV B.Tech II Semester Supplementary Examinations, July 2011
EMBEDDED AND REAL TIME SYSTEMS
 (Common to Electronics & Communication Engineering and Electronics &
 Instrumentation Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
 All Questions carry equal marks

1. (a) What is an Embedded System? Differentiate between a general purpose computing system and an embedded system?
 (b) what are the designer trade- offs among the advantages and disadvantages of various available processor technologies and IC technologies? [8+8]
2. Suppose that your system has two ROM chips and two RAM chips whose sizes and addresses are as shown in the following table. Design a decoder circuit that takes appropriate chips address lines as inputs and produce the chip select signals for each of these four memory parts. [16]

	Size	Low Address	High Address
ROM	128 KB	0x00000	0x1FFFF
ROM	128 KB	0x20000	0x3FFFF
RAM	64 KB	0x80000	0x8FFFF
RAM	64 KB	0x90000	0x9FFFF

3. (a) Give the differences between Computation model and languages.
 (b) Write notes on Windows CE and QNX. [8+8]
4. (a) Explain about Bluetooth transport protocol. Briefly explain the Bluetooth specification and limitations.
 (b) Give notes on the following Bluetooth topics
 - i. Piconet
 - ii. Scatternet. [8+8]
5. (a) Explain the importance of Semaphores in RTOS.
 (b) Explain the difference between Semaphores and Mutex. [8+8]
6. (a) Explain different applications of Message Queues.
 (b) Explain the procedure to create and delete a Message queue with examples. [8+8]
7. (a) Analyze the out-put of following programs on Linux Machime

Code No: L0421/R07

Set No. 4

```
int main (void)
{
printf("Hello /n");
If(fork()==0)
printf("world /n");
}
```

- (b) If the above program is Redirected to a file, analyze how the output could be. [8+8]
8. Explain different general approaches to improve designer productivity with respect to embedded system design. [16]

FirstRanker

Code No: K0422/R07

Set No. 1

IV B.Tech II Semester Supplementary Examinations, July 2011
BIOMEDICAL INSTRUMENTATION
(Electronics & Communication Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) With neat diagrams explain the terms Resting Potential and Active potential . How are these generated in Muscles?
(b) With the help of sketches explain about polarized cell and depolarized cell. [8+8]
2. (a) With the help of a neat sketch explain the functioning of the heart.
(b) With the help of a neat diagram explain the working principle of heart lung machine. [8+8]
3. (a) Discuss the application of biochemical transducers in medical field.
(b) What is ink jet recorder? What are the advantages of ink jet over direct writing recorder? [6+10]
4. (a) Draw and explain a typical strength-duration curve.
(b) Derive the expressions for rheobase and chronaxie. [8+8]
5. (a) Discuss the various lead configurations of ECG recording.
(b) Give the six positions of the chest electrodes used in the precordial lead system. [10+6]
6. (a) Explain the clinical value of the EEG and also describe the various characteristics of an abnormal EEG.
(b) Discuss about the type of electrodes used in the measurement of EEG and also different locations of these electrodes on the skull in order to take the EEG. [8+8]
7. (a) What is pacemaker? Explain its principle of working and types of pace makers.
(b) Describe with the help of a neat diagram the working of a blood flow and blood pressure monitor. [8+8]
8. (a) Explain the types of leakage currents.
(b) What are the precautions to be taken to minimize electric shock hazards? [8+8]

Code No: K0422/R07

Set No. 2

IV B.Tech II Semester Supplementary Examinations, July 2011
BIOMEDICAL INSTRUMENTATION
(Electronics & Communication Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Give an account on the different chemical compositions in the intra and extra cellular fluids and their effects in the case of blood serum.
(b) How does the blood circulate through out the body. [8+8]
2. (a) With the help of a neat block diagram explain the principle of operation of heart lung machine.
(b) Explain how the ECG wave form helps in assessing the functioning of the heart. [8+8]
3. (a) Discuss the significance of time constant, damping coefficient and frequency response with respect to biomedical transducers.
(b) What are active and passive transducers? [10+6]
4. (a) Explain the qualitative requirements of the different blocks of a muscle stimulator.
(b) Explain the various types of stimulating and recording electrodes used in a muscle stimulator. [8+8]
5. (a) Draw the block diagram of an ECG recording system and explain its working.
(b) Give the specifications of an ECG machine. [10+6]
6. (a) List out typical EEG recording artifacts.
(b) With a neat block diagram explain the principle of operation of an EEG telemetry system. [6+10]
7. (a) Write a note on the power sources employed in implantable pacemakers.
(b) With a functional block diagram, explain programmable pacemaker. [8+8]
8. (a) Explain the single channel telemetry system.
(b) Describe the working of FM Telemetry transmitter used in medical field. [8+8]

Code No: K0422/R07

Set No. 3

IV B.Tech II Semester Supplementary Examinations, July 2011
BIOMEDICAL INSTRUMENTATION
(Electronics & Communication Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Explain in detail about the electro physical properties of different types of muscles.
(b) Explain how the action potentials are transmitted through the muscles. [8+8]
2. (a) With the help of a neat sketch explain the functioning of the heart.
(b) With the help of a neat diagram explain the working principle of heart lung machine. [8+8]
3. (a) What are the factors which should be taken into account during designing of a medical equipment.
(b) Draw the block diagram of a bio-medical instrument system and briefly explain its components. [8+8]
4. (a) Describe the components of a typical EMG recording system.
(b) What are the technical differences between the recorders used for EMG and ECG? [8+8]
5. (a) Explain in detail the genesis of the ECG signal.
(b) Draw and explain the Einthoven triangle and prove the Einthoven triangle. [6+10]
6. (a) Discuss in detail about the various types of electrodes used in EEG measurements.
(b) Discuss in detail about the standard amplitudes and frequency bands of EEG signals. [8+8]
7. Write short notes on the following:
 - (a) Pace makers
 - (b) Defibrillators. [8+8]
8. (a) What is the basic principle of computerized tomography ? Explain.
(b) Write a note on CT number scale used in CT. [8+8]

Code No: K0422/R07

Set No. 4

IV B.Tech II Semester Supplementary Examinations, July 2011
BIOMEDICAL INSTRUMENTATION
(Electronics & Communication Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) With the help of a neat diagram explain the relationship between the action potential and muscle contraction.
(b) What is stimulus threshold? Explain the terms absolute refractory period and relative refractory period. [6+10]
2. (a) With the help of a neat sketch explain the functioning of the heart.
(b) With the help of a neat diagram explain the working principle of heart lung machine. [8+8]
3. (a) Discuss the application of biochemical transducers in medical field.
(b) What is ink jet recorder? What are the advantages of ink jet over direct writing recorder? [6+10]
4. (a) What are the different types of muscles? Explain the importance of motor unit in the muscular contraction.
(b) Discuss about the various electrodes used in EMG. [10+6]
5. (a) Discuss about the computer analysis of ECG.
(b) With a neat block diagram explain the operation of an ECG equipment. [8+8]
6. (a) Explain the system of placement of electrodes while recording the brain activity of a human.
(b) Describe the features EEG
(c) What are the characteristics of an abnormal EEG [6+5+5]
7. (a) With the help of a neat block diagram explain the working of an external pacemaker.
(b) Write short notes on short wave diathermy. [8+8]
8. (a) Describe a digital computer along with its biomedical applications.
(b) Describe any one of the biomedical equipment controlled by a microprocessor. [8+8]

Code No: K0521

R07

Set No. 1

IV B.Tech. II Semester Supplementary Examinations, July, 2011

IMAGE PROCESSING

(Computer Science and Engineering)

Time: 3 Hours

Max Marks: 80

Answer any FIVE Questions

All Questions carry equal marks

1. a) What is digital image processing? Explain fundamental steps in digital image processing.
b) What are the applications of digital image processing?
2. a) What are basic gray level transformations? Explain in detail
b) What is meant by image enhancement? What are various image enhancement techniques?
3. Explain how Fourier transform for a given image is continuous irrespective of spatial domain.
4. a) Discuss the functional block diagram for pseudocolor image processing
b) Briefly explain full color image processing.
5. a) What is lossy and lossless image compressing? Explain Huffman coding with example.
b) Explain about image compression standards.
6. a) Explain the meaning of morphological image processing and list out at least four morphological algorithms
b) Explain opening and closing operations
7. a) What is image segmentation? Explain in detail
b) Explain the role of Gradient and laplacian operators in image segmentation.
8. a) Explain the role of optimum statistical classifiers in object recognition.
b) How string matching is done? Explain with an example.

Code No: K0521

R07

Set No. 2

IV B.Tech. II Semester Supplementary Examinations, July, 2011

IMAGE PROCESSING

(Computer Science and Engineering)

Time: 3 Hours

Max Marks: 80

Answer any FIVE Questions

All Questions carry equal marks

1. a) List out the components of image processing system. Explain with neat diagram.
b) Explain the process of Image acquisition
2. a) What is histogram of an image? Explain histogram equalization
b) Briefly explain about the basic gray level transformations.
3. Discuss the limiting effect of repeatedly applying a 3X3 low pass spatial filter to a digital Image
4. a) Briefly explain various color models existing in image processing.
b) What is color image segmentation? Explain with an example.
5. a) List out the areas where error-free compression techniques are used. Discuss in general operations involved in this technique
b) Explain about lossy compression.
6. Explain the morphological operations: dilation, erosion and thinning. How can these be used in obtaining skeleton of an image? Explain each with an example.
7. a) Define thresholding and explain the various methods of thresholding in detail.
b) Write short notes on edge detection and edge linking.
8. a) Explain how object recognition be done based on decision theoretic methods?
b) Write short notes on the structural methods for object recognition.

Code No: K0521

R07

Set No. 3

IV B.Tech. II Semester Supplementary Examinations, July, 2011
IMAGE PROCESSING
(Computer Science and Engineering)

Time: 3 Hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. a) Discuss different elements used in digital image processing system
b) Explain sampling and quantization process during digitization of an image
2. a) Describe histogram modeling method for image enhancement.
b) Write short notes on smoothing frequency domain filters
3. a) Explain important properties of 2 dimensional Fourier Transform
b) Explain the constrained least mean square filtering
4. What is image compression? Explain any four variable length coding compression schemes.
5. a) List down various image compression models existing in image processing.
b) Explain about error free compression.
6. a) What are Dilation and Erosion morphological operators? Explain with examples.
b) List down various basic morphologic algorithms.
7. a) Discuss about region based image segmentation techniques. Compare threshold region based techniques.
b) Explain the role of boundary detection in image segmentation with an example.
8. a) Write short notes on patterns and pattern classes.
b) How Object recognition is done using structural methods? Explain.

Code No: K0521

R07

Set No. 4

IV B.Tech. II Semester Supplementary Examinations, July, 2011

IMAGE PROCESSING

(Computer Science and Engineering)

Time: 3 Hours

Max Marks: 80

Answer any FIVE Questions

All Questions carry equal marks

1. a) Explain the various elements of digital image processing systems with a suitable diagram.
b) Briefly explain basic relationships between pixels.
2. a) Explain spatial filtering. How smoothing and sharpening is done in spatial filtering?
b) How image transformation be done using arithmetic and logic operators?
3. a) What is image restoration? Explain restoration/degradation model for continuous functions.
b) Give a general procedure to implement filtering in frequency domain
4. What is pseudo coloring? Explain its applications. Explain how a pseudo colored image can be obtained.
5. a) What is the use of image compression? What are the different classes of compression?
b) Write short notes on error free compression.
6. a) Discuss dilation and erosion operations.
b) For what purpose Hit-or-Miss transformation is used in morphological image processing? Briefly explain Hit-or-Miss transformation
7. a) What do you mean by image segmentation? List various segmentation techniques.
b) Explain the segmentation techniques that are based on finding the regions directly.
8. Write short notes on following:
 - a) matching shape numbers
 - b) optimum statistical classifiers

Code No: K0522/R07

Set No. 1

**IV B.Tech II Semester Supplementary Examinations, July 2011
E-COMMERCE**

(Computer Science & Engineering)

Time: 3 hours

Max Marks: 80

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

1. What is e-commerce? State how e-commerce differ from traditional commerce. [16]
2. How do you convert a visitor to your website into buyer or your customer? [16]
3. What is a smart card? What are their types and uses? [16]
4. Describe the informaion flow between organisations with EDI. [16]
5. State the advantages and disadvantages of intra organisational commerce? Suggest remedial measures to overcome the limitations. [16]
6. Enumerate the difficulties faced in on-line marketing and advertisement. [16]
7. Explain the utility of business information. In this context explain Wide Area Information service engine (WAIS). [16]
8. Explain Networks. Discuss in detail the Integrated Digital Networks (ISDN). [16]

Code No: K0522/R07

Set No. 2

**IV B.Tech II Semester Supplementary Examinations, July 2011
E-COMMERCE**

(Computer Science & Engineering)

Time: 3 hours

Max Marks: 80

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

1. Define e-commerce. What are its functions? Mention its significance. [16]
2. Why is it difficult to categorise e-commerce business models? What are the difficulties? [16]
3. What is electronic cash? Explain its properties and advantages. [16]
4. How do companies eliminate the potential limitations and risks associated with Internet based EDI? [16]
5. What is integrated logistics and distribution? Develop a model for cement industry. [16]
6. Explain the benefits and costs associated with on-line marketing? [16]
7. What do you mean by filtering? Who are the filtering agents? [16]
8. How e-commerce helps as a provider of interactive training, marketing, financial and legal solutions [16]

Code No: K0522/R07

Set No. 3

**IV B.Tech II Semester Supplementary Examinations, July 2011
E-COMMERCE**

(Computer Science & Engineering)

Time: 3 hours

Max Marks: 80

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

1. How does e-commerce benefit a company and how by e-commerce a company can serve its customer better? [16]
2. How do you convert a visitor to your website into buyer or your customer? [16]
3. Explain different types of electronic payment systems. [16]
4. What are the various requirements of EDI? How does it differ from e-mail? [16]
5. Explain the role of efficient customer response in Supply chain management. [16]
6. What is online market research? Explain the process of carrying out online market survey. [16]
7. Explain the probabilistic information retrieval models. [16]
8. Explain the process and procedure of setting up desktop video conferencing [16]

Code No: K0522/R07

Set No. 4

**IV B.Tech II Semester Supplementary Examinations, July 2011
E-COMMERCE**

(Computer Science & Engineering)

Time: 3 hours

Max Marks: 80

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

1. What are the major limitations on the growth of e-commerce in India? How do you over come them? [16]
2. What is catalog based shopping? State its advantages. [16]
3. What are the problems a company might encounter if it were to conduct international transactions using electronic cash? [16]
4. What is EDI? How does it build up relationship between organizations? [16]
5. Explain the role of efficient customer response in Supply chain management. [16]
6. Describe a banner. Compare banner swapping to a banner exchange. [16]
7. Explain the probabilistic information retrieval models. [16]
8. Explain various types of Codecs. In this context explain various moving pictures experts group (MPEG). How MPEG different from JPEG [16]

Code No: K0523/R07

Set No. 1

IV B.Tech II Semester Supplementary Examinations, July 2011
DISTRIBUTED DATA BASES
(Computer Science & Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Write in brief about the following:
 - (a) Security issues in distributed databases
 - (b) Privacy issues in distributed databases.
 - (c) Redundancy problem in distributed databases. [3+3+10]
2. Explain the following for distributed databases
 - (a) Simplification of horizontally fragmented relations
 - (b) Simplification of vertically fragmented relations. [8+8]
3.
 - (a) Discuss the problems with query optimization in DDB.
 - (b) Explain optimization graphs for DDB. [8+8]
4.
 - (a) Explain the following:
 - i. Crash recovery
 - ii. Transaction recovery
 - iii. Database recovery.
 - (b) Write about the concurrency control based on locking in distributed databases. [8+8]
5.
 - (a) Explain distributed wait-for graph and local wait-for graph with diagrams?
 - (b) Classify 2- phase locking, time stamps and optimistic methods. [8+8]
6.
 - (a) Explain about Nonblocking 2-phase-commitment protocol with state diagram.
 - (b) Explain in detail 3-phase-commitment protocol with state diagram. [8+8]
7. Describe in detail cash consistency and object identifier management in object management? [16]
8. Can any type of global optimization be performed on global queries in a multi-database system? Discuss and formally specify the conditions under which such optimization would be possible. [16]

Code No: K0523/R07

Set No. 2

IV B.Tech II Semester Supplementary Examinations, July 2011
DISTRIBUTED DATA BASES
(Computer Science & Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Briefly explain the following related to DDB
 - (a) DBA
 - (b) data independence
 - (c) conceptual schema
 - (d) redundancy. [4+4+4+4]

2. (a) For given EMP and DEPT relations, assuming the necessary attributes a query to give the names of employees who work in a department whose manager has number 373 but who do not earn more than Rs.100000/- is as given below. Simplify the query explaining the steps involved.

$$P^J \text{EMP.NAME}((\text{EMP}^{JN} \text{DEPTNUM}=\text{DEPTNUM}^{SL} \text{MGRNUM}=373^{DEPT})$$

$$\text{DF}$$

$$(\text{S}^L \text{SAL} > 100000 \text{EMP}^{JN} \text{DEPTNUM}=\text{DEPTNUM}^{SL} \text{MGRNUM}=373^{DEPT})$$

 (b) Discuss query processing in detail with an example. [8+8]

3. (a) Discuss the problems in Query Optimization.
 (b) Discuss how query optimisation is useful in distributed databases. [8+8]

4. (a) Discuss concurrency control for distributed structures.
 (b) Explain the following:
 - i. Granularity of locking
 - ii. Checkpoints and recovery. [8+8]

5. (a) Explain the conservative timestamp method.
 (b) Consider the data item x. Let $\text{RTM}(x)=25$ and $\text{WTM}(x)=20$. Let the pair $(\text{Ri}(x), \text{TS})$ $(\text{Wi}(x), \text{TS})$ denote the read(write) request of transaction T_i on the item x with timestamp TS. Indicate the behavior of the basic timestamp method with the following sequence of requests.
 $(\text{R1}(x), 19), (\text{R2}(x), 22), (\text{w3}(x), 21)$
 $(\text{W4}(x), 23), (\text{R5}(x), 28), (\text{W6}(x), 27).$ [6+10]

6. (a) Define Reliability.
 (b) Explain in detail about various basic concepts. [2+14]

7. Write short notes on:

Code No: K0523/R07

Set No. 2

- (a) Object Clustering.
- (b) Pointer Swizzling.
- (c) Object Migration.

[5+5+6]

8. Explain the following in detail:

- (a) World Wide Web Architecture and Protocols
- (b) Database Access in World Wide Web
- (c) Semistructured data
- (d) Mediator - wrapper architecture.

[4×4]

FirstRanker

Code No: K0523/R07

Set No. 3

IV B.Tech II Semester Supplementary Examinations, July 2011
DISTRIBUTED DATA BASES
 (Computer Science & Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
 All Questions carry equal marks

1. Discuss the levels of distribution transparency. [16]
2. (a) What is query Translation? Explain classification equivalence Transformations.
 (b) How is distributed grouping and aggregate function evaluation done? [8+8]
3. (a) What are the effects of commuting Joins and Unions?
 (b) Assume the following query which requires the supplier number of suppliers that have issued a supply order in the North area of a company
 $P^J SNUM^{SL} AREA = \text{“North”} (SUPPLY^{JN} DEPTNUM = DEPTNUM^{DEPT})$ Draw the operator tree, optimization graph. Also, give the reducer program statements and then the reduced profiles. [8+8]
4. (a) Write about log-write-ahead protocol.
 (b) Write about checkpoint operations in recovery procedures. [8+8]
5. (a) Consider the data item x. Let $RTM(x) = 25$ and $WTM(x) = 20$. Let the pair $(R_i(x), TS)$ $(W_i(x), TS)$ denote the read(write) request of transaction T_i on the item x with timestamp TS. Indicate the behaviour of the basic timestamp method with the following sequence of requests.
 i. $(R_1(x), 19), (R_2(x), 22), (w_3(x), 21)$
 ii. $(W)_4(x), 23), (R_5(x), 28), (W_6(x), 27)$
 (b) Explain the conservative timestamp method. [10+6]
6. (a) How can we maximize the number of transactions which are executed during a failure by the operational part of the system?
 (b) What is the limitation on the execution of transaction in the presence of failures?
 (c) Explain about Nonredundant Databases? [8+2+6]
7. (a) Explain about transaction models and object structures?
 (b) Explain the terms
 i. Commutativity
 ii. Invalidation. [8+4+4]
8. Explain the following :

Code No: K0523/R07

Set No. 3

- (a) Propagating updates
- (b) Client cache management.

[8+8]

FirstRanker

Code No: K0523/R07

Set No. 4

IV B.Tech II Semester Supplementary Examinations, July 2011
DISTRIBUTED DATA BASES
 (Computer Science & Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
 All Questions carry equal marks

1. (a) How is redundancy controlled in distributed databases
 (b) Write about the different ways to access distributed databases. [8+8]
2. Explain the following for Distributed Data bases
 (a) Operations in a parametric query
 (b) GROUP BY operation for evaluating aggregate functions. [8+8]
3. (a) What are the effects of commuting Joins and Unions?
 (b) Assume the following query which requires the supplier number of suppliers that have issued a supply order in the North area of a company
 $P^J SNUM^{SL} AREA = \text{“North”} (SUPPLY^{JN} DEPTNUM = DEPTNUM^{DEPT})$ Draw the operator tree, optimization graph. Also, give the reducer program statements and then the reduced profiles. [8+8]
4. (a) Write about transaction management in DDB.
 (b) Write about the concurrency control based on locking in distributed databases. [8+8]
5. (a) Explain the Conservative Timestamp Method.
 (b) Explain Validation using Timestamps on Data Items and Transactions. [8+8]
6. (a) What is Catalog and Usage of Catalog in distributed databases?
 (b) List out and Explain various Contents of Catalogs? [6+10]
7. Explain about client - server architecture types. [16]
8. Can any type of global optimization be performed on global queries in a multi-database system? Discuss and formally specify the conditions under which such optimization would be possible. [16]

Code No: K0822

R07

Set No. 1

IV B.Tech. II Semester Supplementary Examinations, July, 2011
INDUSTRIAL SAFETY AND HAZARD MANAGEMENT
(Chemical Engineering)

Time: 3 Hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Write short notes on the following related to safety
a) Safety program [8]
b) Accident and loss statistics [8]

2. (a) Define the following terms related to Toxicology [6]
'toxicology', 'toxic hazard', 'ingestion'
(b) Explain in detail how the toxicants enter Biological organisms and plays a significant role? [10]

3. (a) List out all the Government regulations related to Industrial Hygiene and explain briefly [8]
(b) Discuss about the industrial hygiene evaluation and control in a process industry [8]

4. (a) What is MOC and inerting and explain briefly about Auto ignition [8]
(b) Discuss about the flammability characteristics of liquids & vapours [8]

5. Discuss the following [8+8]
a) Sprinkler systems
b) Explosion proof equipment

Code No: K0822

R07

Set No. 1

6. Define the following terms related to relief: [8x2 = 16]
- | | |
|--------------------|-------------------------|
| i) MAWP | v) Relief system |
| ii) Over pressure | vi) Accumulation |
| iii) Back pressure | vii) Operating pressure |
| iv) Blow down | viii) Set pressure |
7. (a) Discuss about conventional spring operated relief's in liquids. [8]
(b) Explain briefly about Rupture disc relief's in liquid [8]
8. Write brief note on the following [8+8]
a) Hazard check lists
b) Hazard surveys

FirstRanker

Code No: K0822

R07**Set No. 2**

IV B.Tech. II Semester Supplementary Examinations, July, 2011
INDUSTRIAL SAFETY AND HAZARD MANAGEMENT
(Chemical Engineering)

Time: 3 Hours**Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Define the following related to safety [6]
i) OSHA incidence rate ii) Fatal accident rate (FAR) iii) Fatality rate
(b) What are the factors to be considered in a successful safety program? [10]
Explain
2. What is toxicology? How toxicants enter biological organisms? Discuss [16]
in detail
3. Explain the government regulations related to industrial hygiene? [16]
4. (a) Discuss about the following [8]
i) Ignition energy ii) Auto ignition iii) Auto oxidation iv) Adiabatic
compression
(b) Explain the Fire triangle concept and Distinguish fire and Explosions [8]
briefly
5. Discuss about 'ventilation method' used to prevent fires and explosion [16]
6. What are the steps involved in a relief method and also discuss relief [16]
concepts
7. Discuss about rupture disc relief's in liquid, vapour or gas service [16]
8. Write short notes on
a) 'hazard surveys' [8]
b) Hazop safety reviews [8]

Code No: K0822

R07

Set No. 3

IV B.Tech. II Semester Supplementary Examinations, July, 2011
INDUSTRIAL SAFETY AND HAZARD MANAGEMENT
(Chemical Engineering)

Time: 3 Hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) What are the professional ethics to be followed by engineers in a chemical industry according to AIChE? Explain briefly [8]
- (b) What do you mean by "Engineering Ethics"? Explain the concept related to safety briefly [8]

2. (a) What is toxicology? Explain the terminology of Toxicology related to Human body briefly [6]
- (b) How toxicants enter biological organisms and give it's methods of control. [10]

3. Write short notes on the following
 - a) OSHA [4]
 - b) Process hazard analysis (PHA) [4]
 - c) Risk management plan [4]
 - d) Industrial Hygiene identification [4]

4. (a) What is an explosion? Discuss about different types of explosions [8]
- (b) What are the parameters affecting the behavior of explosions [8]

Code No: K0822

R07

Set No. 3

5. What are the different types of Sprinkler system used for fire protection? Explain any one of them with a neat sketch [16]
6. Discuss about the different types of relief devices in detail [16]
7. (a) Derive the equations related to conventional spring-operated relief's in vapour or gas service [8]
(b) Explain Rupture disc relief's in liquid and its consideration briefly [8]
8. Describe about Hazop safety reviews [16]

Code No: K0822

R07

Set No. 4

**IV B.Tech. II Semester Supplementary Examinations, July, 2011
INDUSTRIAL SAFETY AND HAZARD MANAGEMENT
(Chemical Engineering)**

Time: 3 Hours

Max Marks: 80

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

1. (a) Define the terms 'safety', hazard and risk? [6]
(b) If twice as many people used motorcycles for the same average amount of time each, what will happen to [10]
 - i) The OSHA incidence rate,
 - ii) The FAR,
 - iii) The fatality rate, and
 - iv) The total number of fatalities?

2. How toxicants can be eliminated from biological organisms? Explain in detail? [16]

3. (a) Define 'industrial hygiene'? Explain the different phases of industrial hygiene [8]
(b) What are the highlights of OSHA enforcement rights act [8]

4. (a) Define the following [8]
 - i) Auto ignition temperature
 - ii) Flash point
 - iii) Fire point
 - iv) Explosion
(b) Explain the design concepts used to prevent fires and explosions [8]

Code No: K0822

R07

Set No. 4

5. Describe about the following fire protection systems with a neat sketch
 - a) Ventilations [8]
 - b) Sprinkler systems [8]

6. Discuss the following in detail related to industrial Relief's
 - a) Data for sizing relief's [8]
 - b) Relief systems [8]

7. Distinguish Conventional spring operated relief's in liquids and vapor or gas service [16]

8. Explain about hazards identification and risk assessment procedure in detail. [16]

FirstRanker

Code No: L1022/R07

Set No. 1

IV B.Tech II Semester Supplementary Examinations, July 2011
MICRO CONTROLLERS AND APPLICATIONS
 (Common to Electronics & Instrumentation Engineering and
 Instrumentation & Control Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
 All Questions carry equal marks

1. How do you program external interrupts in 8051. [16]
2. Give the detail that were depicted for the following instructions along with encoding. [4×4]
 - (a) ANLA, direct
 - (b) CJNEA, #datarel
 - (c) CLR Δ
 - (d) DA Δ
3. What are the sequence of steps involved in program mode 1 in hex and in decimal? [2×8]
4. How do you find the TH & TL Values when crystal frequency is 12MHz for the system 8051? [16]
5. Draw a neat interface circuit that controls the speed and direction of a DC motor. Explain the operation of this circuit that controls the angle/movement of the servomotor. [16]
6. (a) Explain round robin and pre emptive scheduling with examples. When do we use each of them?
 (b) How does a semaphore handles a critical section of a task? [10+6]
7. (a) Explain the software times interrupt in 80196
 (b) Justify the priority orders provided in 80196 for the maskable interrupts
 (c) What are vector addresses for Interrept servicing to timer 1 and timer 2 in Intel 80196? [5+5+6]
8. (a) What are the Thumb data processing instructions? List and explain them with an example.
 (b) Explain the branch and branch with link instructions with examples. When do we use them. [8+8]

Code No: L1022/R07

Set No. 2

IV B.Tech II Semester Supplementary Examinations, July 2011
MICRO CONTROLLERS AND APPLICATIONS
(Common to Electronics & Instrumentation Engineering and
Instrumentation & Control Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) What are the common features of 8051 family.
(b) How you can improve the upward compatibility in the 8051 software. [8+8]
2. Discuss RAM memory space allocation in the 8051. [16]
3. Discuss the hardware requirements to needed to implement vectored or polled interrupts. [16]
4. (a) Write short notes on TCON register.
(b) Give instructions to set the register PSW & PC. [8+8]
5. (a) What is the difference between “polling the busy line” and “software delay” in case of an LCD interfacing problem?
(b) Explain the advantages of an optoisolator circuit. [8+8]
6. How do we initiate pre emptive scheduling and assign prioritieus to the tasks for scheduling? Give two examples of the need for pre emptive scheduling? [16]
7. (a) What is an internal RAM in microcontroller? How does it differ from the addressable registers in a microcontroller 80196. Do these occupy a common space?
(b) What are the differences between a Harvard architecture and a Princeton architecture? Is it possible to have externally a processor princeton architecture for its buses and internally the Harvard architucture? [8+8]
8. (a) What are the Thumb version load-store multiple instructions? Explain them with example.
(b) Explain how Thumb state changes to ARM state and vice verse. [8+8]

Code No: L1022/R07

Set No. 3

IV B.Tech II Semester Supplementary Examinations, July 2011
MICRO CONTROLLERS AND APPLICATIONS
 (Common to Electronics & Instrumentation Engineering and
 Instrumentation & Control Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Explain the details of different kinds of memories given in 8051 microcontroller. [16]
2. (a) Write a program to add data in memory location and data in register. [8+8]
 (b) Write short notes on instruction set of 8051. [8+8]
3. List the interrupts of the 8051 and discuss in detail. [16]
4. Bring out programming aspects in utilizing time 0 & 1 as counters. [16]
5. A transducer interfaces an 8 bit ADC of an MCU and output to the LED display unit. Transducer generates 5mv/kmph car speed in an automobile. Lower limit of the car speed is Kmph and upper limit is 120kmph. The speed display is on four 7 segment LED display units: Draw the interface circuit for the above design and generate an assembly code to initialize the operation. [16]
6. (a) When do we use cooperative scheduling and do we use preemptive scheduling?
 (b) Explain the importance of each of the following metrics of a real time system
 - (i) through put
 - (ii) interrupt latencies,
 - (iii) average response times and
 - (iv) deadline misses [8+8]
7. (a) Why should the input to timer 2 from an external event be slower than $4\mu s$? Assume a 12 MHZ crystal is available with 80196.
 (b) What is a high speed input (HSI) interrupt? Why do we call it high speed? [10+6]
8. (a) Explain the stack operations in ARM.
 (b) What happens if a software interrupt instruction SWI is executed?
 (c) Explain BIC instruction of ARM. [5+6+5]

Code No: L1022/R07

Set No. 4

IV B.Tech II Semester Supplementary Examinations, July 2011
MICRO CONTROLLERS AND APPLICATIONS
 (Common to Electronics & Instrumentation Engineering and
 Instrumentation & Control Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Bring out the functional difference between microprocessors and microcontroller by drawing their basic block diagrams. [16]
2. Write a program to convert hex numbers to decimal numbers using 8051 μ C. [16]
3. How do you access RAM, I/O, ports using bit addresses? [16]
4. How do you find the TH & TL Values when crystal frequency is 12MHz for the system 8051? [16]
5. (a) A lookup table is used in the program "codekey". It uses 120 bytes to form a table for the valid keys. Write a subroutine using a series of "CJNE" instructions that will obtain the same result.
 (b) When are the scan lines, encoded scan lines and return lines used? [8+8]
6. (a) Define task, task characteristics, task priority and task state
 (b) Describe the RTOS functions in RTx5 tiny. [8+8]
7. (a) Explain IOCO and IOSO register for timer 1 in 80196
 (b) what are the interrupt sources for synchronous serial transmission and reception in 80196? What are the identification flags and local enable bits for these sources? [8+8]
8. (a) What is meant by Thumb state and ARM state? What are the advantages and disadvantages of using Thumb state?
 (b) Explain how ARM -Theve Interworking takes place. [10+6]

Code No: K1224/R07

Set No. 1

**IV B.Tech II Semester Supplementary Examinations, July 2011
BIO-INFORMATICS
(Information Technology)**

Time: 3 hours

Max Marks: 80

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

1. Describe the following:
 - (a) Uniform Resource Locator (URL)
 - (b) Role of Internet in Bioinformatics. [8+8]
2. Describe the following:
 - (a) Sequence Homology
 - (b) Differences between orthologs and paralogs. [8+8]
3. Describe the steps involved in sequence assembly? [16]
4. Describe the steps in Needleman-Wunsch algorithm for Global sequence alignment? [16]
5. Compare the search engines available at NCBI Vs EMBL. State their similarities and differences? [16]
6. Discuss how secondary databases organization and applications in bioinformatics is different from primary databases. [16]
7. Describe in brief about KEGG and describe any one metabolic pathway with respect to enzyme you have studied. [16]
8. Explain how would you trace out ancestors using multiple sequence alignments and phylogenetic trees? [16]

Code No: K1224/R07

Set No. 2

**IV B.Tech II Semester Supplementary Examinations, July 2011
BIO-INFORMATICS
(Information Technology)**

Time: 3 hours

Max Marks: 80

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

1. What is File Transfer Protocol (FTP)? Describe different types of FTP's? [16]
2. What is homology and how this homology is helpful for evolutionary theories. [16]
3. What is genome sequencing? Describe its application? [16]
4. Describe the following:
 - (a) Importance of GAPS and GAP penalties in sequence alignment
 - (b) Edit distance of two strings. [8+8]
5. Describe the parameters available in the flat file of NCBI. [16]
6. What is Swissprot? Discuss bioinformatics tools available in it and their applications. [16]
7. Describe in brief about the biochemical databases. [16]
8. Explain briefly about CLUSTALX & CLUSTALW programs in construction of protein profiles and motifs. [16]

Code No: K1224/R07

Set No. 3

**IV B.Tech II Semester Supplementary Examinations, July 2011
BIO-INFORMATICS
(Information Technology)**

Time: 3 hours

Max Marks: 80

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

1. Write short notes on the following:
 - (a) Domain and Domain name
 - (b) Modem. [8+8]
2. Describe the Richard Owen's Contribution to Evolutionary Theory? [16]
3. What is genome sequencing? Describe its application? [16]
4. What do you understand k-tuple method? Explain its use in similarity searching? [16]
5. What parameters you can find in PDB files. Explain with one example you have studied. [16]
6. How a secondary database is organized? Discuss about the major secondary databases and their applications? [16]
7. Describe in brief about KEGG and describe any one metabolic pathway with respect to enzyme you have studied. [16]
8. What is dynamic programming method. Briefly Explain. [16]

Code No: K1224/R07

Set No. 4

**IV B.Tech II Semester Supplementary Examinations, July 2011
BIO-INFORMATICS
(Information Technology)**

Time: 3 hours

Max Marks: 80

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

1. Write short notes on the following:
 - (a) Domain and Domain name
 - (b) Modem. [8+8]
2. Describe the Richard Owen's Contribution to Evolutionary Theory? [16]
3. Describe the following:
 - (a) Physical mapping of DNA
 - (b) Genetic mapping of DNA. [8+8]
4. What is local alignment? Describe the Smith - Waterman algorithm? [16]
5. Discuss in briefly about NCBI and discuss its importance in biological research. [16]
6. What is KEGG? Discuss the types of bioinformatics tools available and state their applications. [16]
7. Describe in brief about Enzymatic databases and how they are useful in research. [16]
8. How would you construct phylogenetic trees using clustal programs. Explain briefly. [16]

Code No: K1225 /R07

R07

Set No.1

IV B.Tech II Semester Supplementary Examinations, July, 2011

PATTERN RECOGNITION

(Information Technology)

Time: 3 hours

Max. Marks: 80

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

1. a) What is the difference between learning by distance learning and traditional classroom learning?
b) How do principles of observational learning work to create learning?
2. a) How do you change categorical data to continuous data?
b) Feature x is uniformly distributed in the range $0 \leq x \leq 2$ for a class A, uniformly distributed in the range $1 \leq x \leq 4$ for class B. The prior probabilities are $P(A) = 0.6$ and $P(B) = 0.4$. Find $P(A/x)$ when $x = 1.5$.
3. a) Why naive bayes classifier used?
b) Derive the probability density function for the case when the components of feature space are binary, ternary or higher dimensional.
4. What is the difference between maximum likelihood estimator and Bayesian estimator? Explain?
5. a) How can we estimate unknown variance using maximum likelihood estimation?
b) Explain how the similarity measures are useful in clustering problems.
6. Explain non linear component analysis? Explain where these analysis are used?
7. Explain Discrete-Time markov process?
8. Differentiate between Continuous and Discrete HMM?

Code No: K1225 /R07

R07

Set No.2

IV B.Tech II Semester Supplementary Examinations, July, 2011

PATTERN RECOGNITION

(Information Technology)

Time: 3 hours

Max. Marks: 80

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

1. a) Which is best in supervised and unsupervised learning? Explain?
b) What is Pattern Recognition? Explain with suitable example.

2. Feature x is normally distributed with for class A with $\mu_A=0$ and $\sigma_A=1$ and normally distributed for class B with $\mu_B=1$ and $\sigma_B=2$
 - (i) What is decision boundaries will optimally divide x into decision regions if $P(A)=P(B)$?
 - (ii) Is this a density function?

3. a) How the discriminate function is useful in Pattern Recognition.
b) Explain about how the multivariate normal density is useful in classification problem.

4. Explain the general theory of Bayes parameter estimation.

5. a) What do you mean by optimal decision regions? Explain?
b) What is error rate ?
c) How can we estimate unknown mean vector (θ) using mixture density?

6. Explain Low dimensional representations? Where these representations are best used? Explain?

Code No: K1225 /R07

R07**Set No.2**

7. Consider an HMM representation of coin tossing experiment shown in below figure, assume a three-state model with probabilities

	State-1	Stae-2	Stae-3
P(H)	0.6	0.7	0.35
P(T)	0.6	0.5	0.4

What is probability that the observation sequence came entirely from state-1?

8. Explain different types of Continuous Hidden Markov Models?

Code No: K1225 /R07

R07

Set No.3

IV B.Tech II Semester Supplementary Examinations, July, 2011

PATTERN RECOGNITION

(Information Technology)

Time: 3 hours

Max. Marks: 80

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

1. a) What are some advantages of distance learning and face to face learning?
b) Explain about multi -category classification.

2. a) Derive the discriminate function for two-category classification.
b) What is loss function? Explain with suitable example.
c) Can median describe both categorical data and numerical data? Explain

3. We wish to find discriminantfunction that will be positive for members of class A and negative for class B using adaptive decision boundaries to find weight. At some point in training, function is $D= 5 - 3x + 2y + z$ and a sample from class B with $x=1$, $y=-2$, and $z=3$. If $c=1$ and $k=2$, what will the function D become after adaptive if $c=k=1$?

4. How do you find maximum likelihood function? Explain?

5. a) Explain the general theory of Bayes parameter estimation.
b) Explain about sum-of- squared error criterion function.

6. What do you mean by multi dimensional scaling? Explain?

7. Explain solution for three problems of HMMs.

8. Explain Testing of Continuous Hidden Markov Models?

Code No: K1225 /R07

R07**Set No.4**

IV B.Tech II Semester Supplementary Examinations, July, 2011

PATTERN RECOGNITION

(Information Technology)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. a) Which is best in supervised and unsupervised learning?
b) Explain learning and adaptation?
2. a) Can the range represent numerical and categorical data? Explain with example?
b) What gives the best representation of frequencies of categorical data from large data sets? Explain?
3. a) What are the differences between logistic regression and Naive Bayes model?
b) Consider the discriminate function and case when covariance matrix for all classes are identical but otherwise arbitrary , then examine the resulting classification.
4. a) Consider the discriminate function and case when covariance matrix for all classes are identical but otherwise arbitrary, then examine the resulting classification.
b) Explain about Multivariate normal density for classification problem
5. a) Explain the algorithm for k-mean clustering.
b) Explain how the similarity measures are useful in clustering problems.
6. Explain Principal Component analysis? How they are calculated? Explain?
7. Consider an HMM representation of coin tossing experiment shown in below figure, assume
afour-state model with probabilities

	State-1	State-2	State-3	State-4
P(H)	0.4	0.6	0.3	0.5
P(T)	0.45	0.5	0.6	0.55

What is probability that the observation sequence came entirely from state-2?

8. Explain Training of Continuous Hidden Markov Models?