

May 2019

B. Tech
ME

Roll No.

Total No. of Pages : 03

Total No. of Questions : 07

B.Tech. (Marine Engg.) (2013 Onwards)/(ME)(2011 Onwards) (Sem.-3)

MACHINE DRAWING

Subject Code : BTME-303

M.Code : 59113

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of NINE questions carrying TWO marks each.
2. SECTION-B contains FOUR questions carrying FOUR marks each and students have to attempt any THREE questions.
3. SECTION-C contains TWO questions carrying THIRTY marks each and students have to attempt any ONE question.
4. First angle projection to be used. You may assume any missing dimension.

SECTION-A

Q1. Answer briefly :

- a) What is the purpose of Fullering in riveted joint?
- b) Draw the freehand sketch of Metric thread profile giving its important proportions.
- c) What is the advantage of Plummer block over a simple bushed bearing?
- d) Draw the symbols for single butt weld.
- e) What are permanent fastenings?
- f) Describe the aligned system of dimensioning.
- g) What is a left hand thread?
- h) What is chamfering?
- i) What is the advantage of providing protective flanges?

SECTION-B

- Q2. Sketch freehand the top view and sectional front view of a single riveted double cover butt joint. Take rivet diameter as 24 mm.
- Q3. Draw the three views of a hexagonal nut and show all the proportions.
- Q4. Sketch freehand the full sectional front view of spigot and socket joint.
- Q5. Draw Knuckle and Buttress threads and give their full details.

SECTION-C

- Q6. Figure-1 shows the details of Eccentric. Assemble the component and draw :
- (i) Full sectional front view
 - (ii) Top view

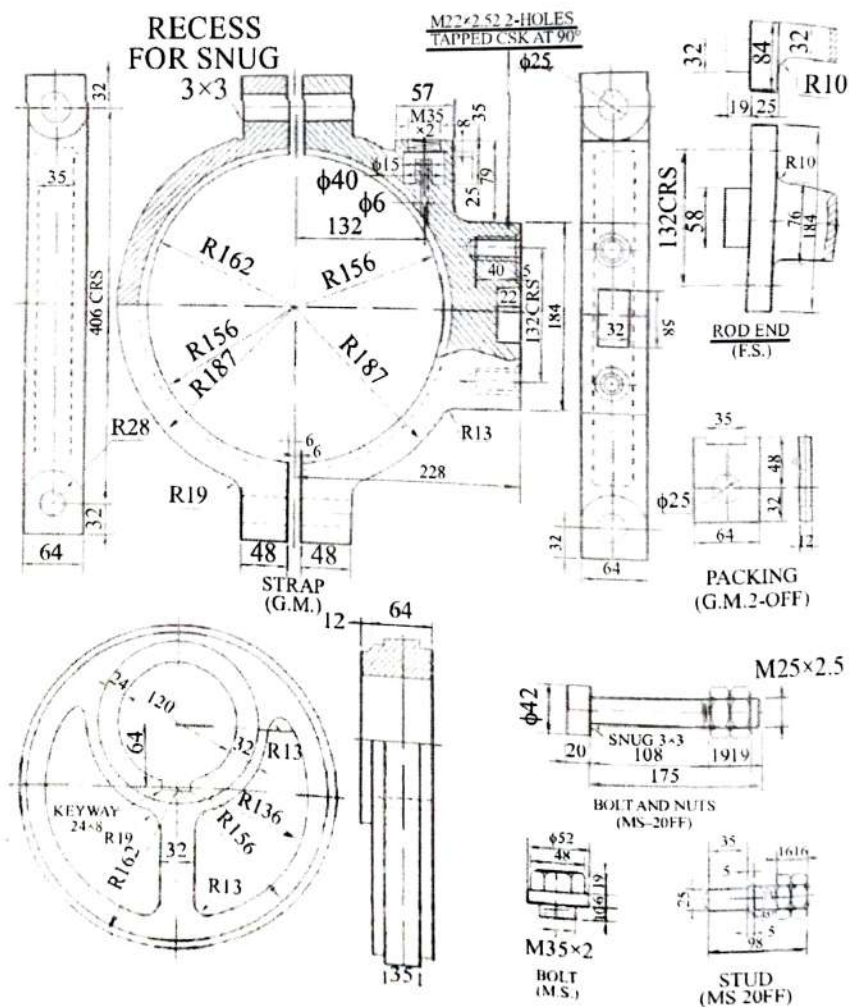


Fig.1

Q7. Figure-2 shows the details of a hand drill. Assemble the components and draw :

- (i) Front view, left half in section
- (ii) Right side view

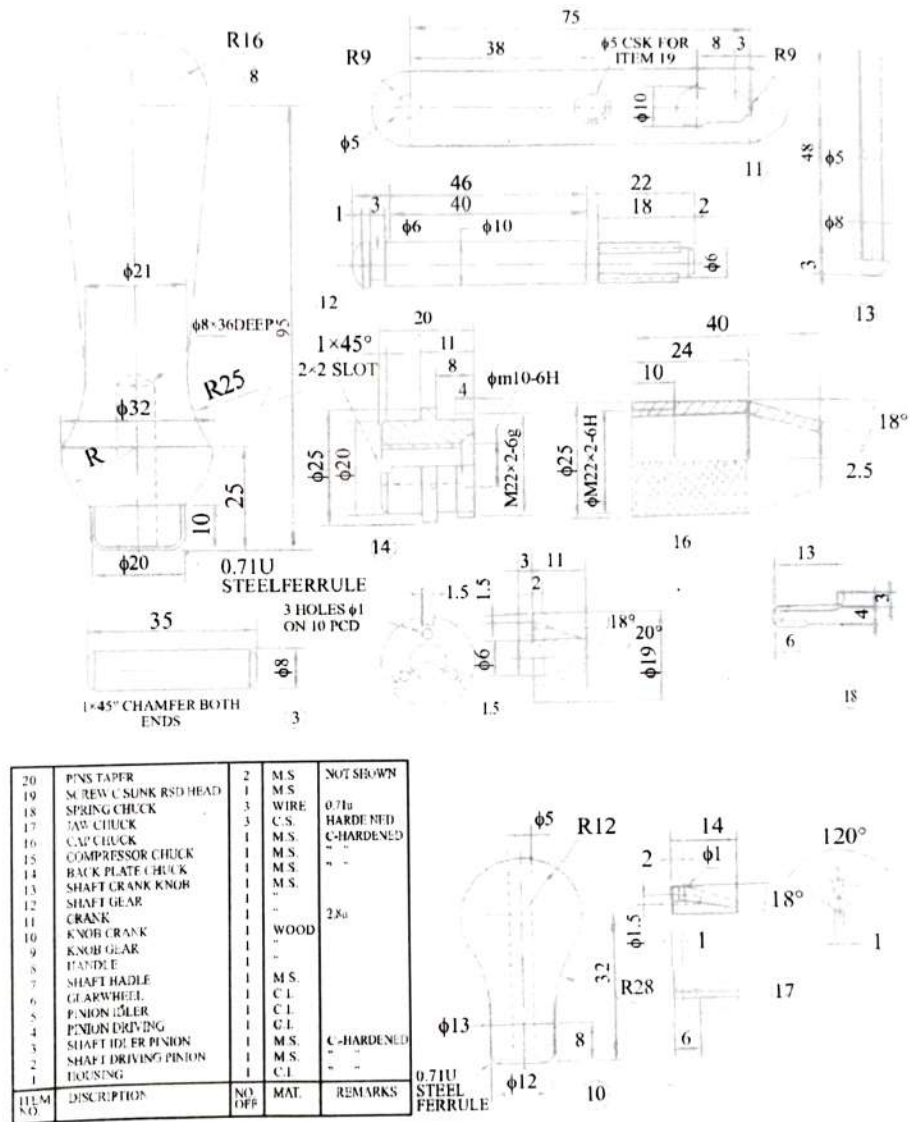


Fig.2

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Total No. of Pages : 03

Total No. of Questions : 09

B.Tech.(ME) (2011 Onwards)
B.Tech.(Marine Engg.) (2013 Onwards)
(Sem.-3)

THEORY OF MACHINES-I

Subject Code : BTME-302

M.Code : 59112

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

- a. Write two inversions of double slider crank chain.
- b. What is the difference between machine and mechanism?
- c. What is the difference between Whitworth and crank and slotted quick return motion mechanisms?
- d. Name any two lower pairs.
- e. Define the term creep in belts.
- f. Why cycloidal motion of follower is preferred in high speed engines?
- g. What is the difference between brakes and dynamometers?
- h. Why electric motors do not have flywheels?
- i. What is the range of speed in governors?
- j. Can a Porter governor be isochronous? Explain with the help of mathematical expression.

SECTION-B

2. A simple quick return mechanism is shown in Fig.1. The forward to return ratio of the quick return mechanism is 2 : 1. If the radius of the crank O_1P is 125 mm, determine the distance d .

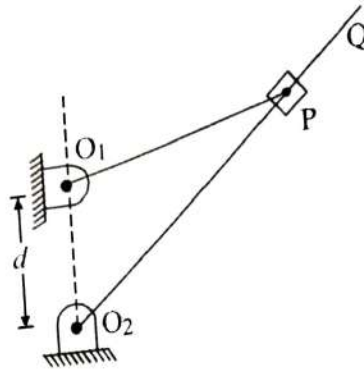


Fig.1

3. For the four-bar linkage shown in Fig.2., the angular velocity of link AB is 1 rad/sec, the length of link CD is 1.5 times the length of link AB. In the configuration shown, find the angular velocity of link CD in rad/sec.

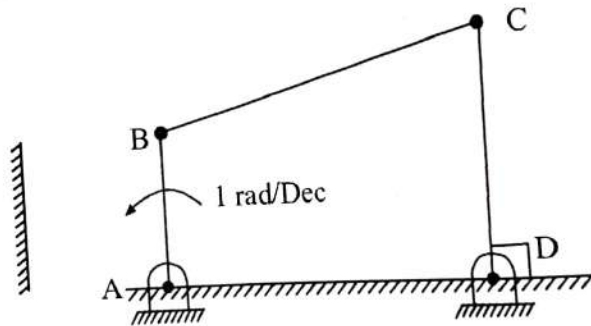


Fig.2

4. For universal joint plot maximum and minimum speeds of driven shaft in an ellipse. Write the formula used.
5. A V-belt of 6.0 cm^2 cross section has a groove angle of 40° and an angle of lap of 150° . $\mu = 0.10$. The mass of belt per meter run is 1.2 kg. The maximum allowable stress in belt is 850 N/cm^2 . Calculate the power that can be transmitted at a belt speed of 30m/sec.
6. The mean diameter of square threaded screw jack is 60 mm. The pitch of the threads is 10 mm. The coefficient of friction is 0.15. What force must be applied at the end of a 0.5 m long lever, which is perpendicular to longitudinal axis of the screw to raise a load of 20 kN and to lower it?

SECTION-C

7. In a spring controlled governor mass of each ball is 6.8 kg and moves radially under the action of a controlling force $F = a + br$ where r is the ball path radius. If the speed range is 42.5 to 44.0 rad/sec and the corresponding values of r are 12.38 and 13.01 cm, obtain the value of a and b .

Find the equilibrium speed in rad/sec for $r = 12.7$ cm.

8. A C.I. flywheel is fitted to a punching press to run at 90 r.p.m. and must supply 12000 N.m of energy during $\frac{1}{5}$ th revolution and allow 15% change of speed. The rim speed is limited to 350 m/min. Find the mean diameter and mass of the flywheel and motor power. Assume overall efficiency as 80%.

9. The following particulars relate to a symmetrical circular cam operating a flat faced follower.

Least radius = 25 mm, nose radius = 8 mm, lift of value = 10 mm, angle of action of cam = 120° , cam shaft speed = 1000 rpm. Determine the flank radius and maximum velocity, acceleration and retardation of the follower. If the mass of the follower and valve with which it is in contact is 4 kg, find the minimum force to be exerted by the spring to overcome inertia of the valve parts.

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Total No. of Pages : 02

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B.Tech.(Marine Engineering) (2013 Onwards)/(ME) (2011 Onwards)
(Sem.-3)

ENGINEERING MATERIALS AND METALLURGY

Subject Code : BTME-306

M.Code : 59116

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

- a. Draw a BCC unit cell and calculate the number of atoms in this unit cell.
- b. What is co-ordination number?
- c. Differentiate between polymorphism and allotropy.
- d. Explain the activation energy of diffusion.
- e. What are elastic and plastic deformations?
- f. Define phase.
- g. What do you mean by critical cooling rate?
- h. Discuss the utility of lever rule in the context of phase diagrams.
- i. What do you mean by harden-ability?
- j. What are austenite stabilizers?

SECTION-B

2. Differentiate between edge dislocation and screw dislocation.
3. Give a comparison between slip and twinning.
4. With the help of suitable phase diagram, explain binary isomorphous system.
5. Differentiate between Annealing and normalizing processes.
6. Explain how Jominy end-quench test is used to determine harden-ability of steel.

SECTION-C

7. Draw Fe-C equilibrium diagram. Label all the phases and temperatures properly. Describe the phase changes during solidification of 0.40% C steel from liquid state to room temperature.
8. On what basis the alloying elements are classified? Discuss the effects of adding Si, Mn and Mo as alloying elements in steels.
9. Write brief notes on the following :
 - a. Carburizing heat treatment
 - b. Mechanisms of diffusion (**Any TWO**)

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B.Tech.(Marine Engineering) (2013 Onwards)/

B.Tech.(ME) (2011 Onwards) (Sem.-3)

APPLIED THERMODYNAMICS-I

Subject Code : BTME-304

M.Code : 59114

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Q1. Answer briefly :

- a) What is the method to determine the calorific value of Gaseous fuels? Give its principle.
- b) How does the engine temperature and pressure influence the knocking in Spark Ignition Engines?
- c) What is the purpose of supercharging in Engines?
- d) Differentiate among wet, dry and saturated and superheated steam.
- e) Give the examples of Modern High Pressure Boils.
- f) Give a sketch of Binary vapour cycle.
- g) How are steam nozzles different from liquid nozzles?
- h) How do you define degree of reaction and its calculation?
- i) What is the objective of reheating in a steam turbine?
- j) List the various types of condensers giving its principle.

SECTION-B

- Q2. Explain the working of La-Mont Boiler giving its principle and schematic sketch.
- Q3. What is critical pressure ratio in a steam nozzle? What is its significance and its effect on discharge.
- Q4. Define the terms axial thrust, work and black efficiency for a reaction turbine.
- Q5. What is the role of air pump in condensers? How do you calculate its capacity?
- Q6. What is meant by Octane and Cetane rating of fuels? Discuss.

SECTION-C

- Q7. A steam generator evaporates 18000 kg/h of steam at 12.5 bar and a quality of 0.97 from feed water at 105°C when coal is fired at the rate of 2040 kg/χ. If the higher calorific value of the coal is 27400 kJ find.
- The heat rate of boiler in kJ/n
 - The Equivalent Evaporation
 - The Thermal Efficiency.
- Q8. A steam nozzle is supplied steam at 15 bar 350°C and discharges steam at 1 bar. If the diverging portion of the nozzle is 80 mm long and the throat is 6mm, determine the cone angle of the divergent portion. Also determine the velocity and temperature of the steam at throat.
- Q9. A 50% reaction turbine with symmetrical velocity triangles running at 400 rpm has the exit angle of the blades as 20° and the velocity of steam relative to the blades at the exit is 1.35 times the mean blade speed. The steam flow rate is 8.33 kg/s and at a particular stage the specific volume is 1.381 m³/kg. Calculate for this stage
- A suitable blade height, assuming rotor mean diameter 12 times the blade height. And
 - The Diagram work.

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B.Tech.(Marine Engg.) (2013 Onwards)/
B.Tech.(ME) (2011 Onwards)
(Sem.-3)

STRENGTH OF MATERIALS – I

Subject Code : BTME-301

M.Code : 59111

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Answer briefly :

- a. Define yield stress.
- b. Explain the significance of modulus of rigidity.
- c. What are principal planes?
- d. What do you mean by point of contraflexure?
- e. What is a flitched beam?
- f. Discuss the factors affecting flexural rigidity of a beam.
- g. Why a hollow shaft is preferred over a solid shaft?
- h. What is the equivalent length of a column?
- i. Differentiate between a column and a strut.
- j. A cantilever beam carries a load 'W', which is distributed uniformly over its entire length. If the same load is placed at the free end of the same cantilever, then what will be the ratio of maximum deflection in the first case to that in the second case?

2. Explain :
 - (a) Factor of safety and its significance.
 - (b) Slenderness ratio and its significance.

3. A square bar of 25 mm side is held between two rigid plates and loaded by an axial pull P equals to 300 kN, as shown in Fig. 1. Determine the reactions offered by supports A. Take $E = 200$ GPa.

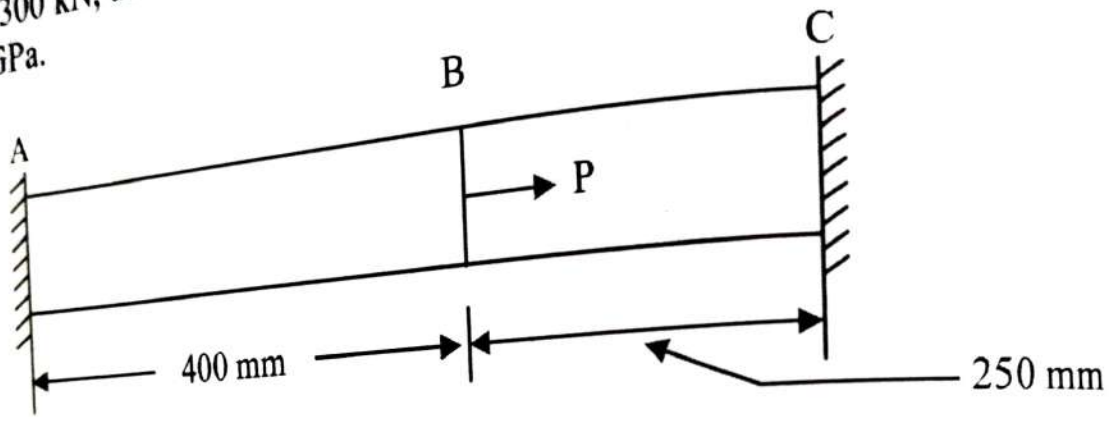


Fig.1

4. Determine the diameters of a hollow shaft transmitting 300 kW at 250 rpm. The maximum shear stress in the shaft should not exceed 30 MPa. Assume the ratio of inner to outer diameter $(d_i/d_o) = 0.75$ and modulus of rigidity $(C) = 100$ GPa.
5. Find the Euler's crippling load for a hollow cylindrical cast iron ($E = 80$ GPa) column having 150 mm external diameter and 20 mm thickness. The column is 6 m long and hinged at both ends.
6. The mid span deflection of a simply supported beam (span = 5 m) loaded with a concentrated load 20 kN at the centre, is 2.5 mm. Determine the maximum deflection if the concentrated load is replaced by a UDL of intensity 4 kN/m acting over the whole span of the beam.

SECTION-C

7. The state of stress on an element is shown in Fig. 2. Determine the magnitudes and directions of principal stresses and also the greatest shear stress. Show all the results on properly oriented planes.

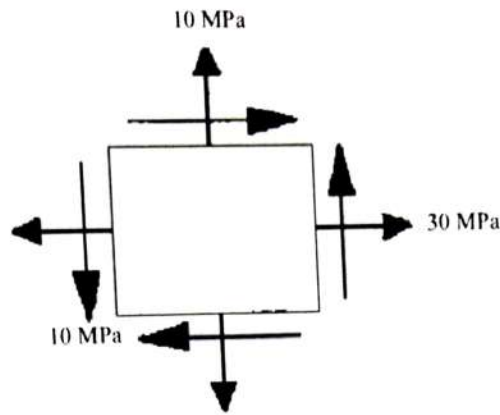


Fig. 2

8. Draw shear force and bending moment diagrams for the beam loaded in Fig. 3. Label the salient points.

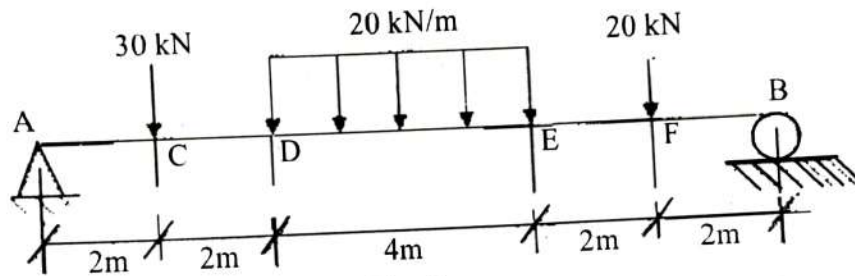


Fig. 3

9. Stating the assumptions made, derive the complete flexural formula : $\frac{M}{I_{NA}} = \frac{\sigma}{y} = -\frac{E}{r}$.
The symbols have their usual meaning.

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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ME) (2011 Onwards) (Sem.-3)

MANUFACTURING PROCESSES-I

Subject Code : BTME-305

M.Code : 59115

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Answer briefly :

- a. What is the function of core in metal casting?
- b. Write different types of casting furnaces.
- c. What is weldability?
- d. Name different types of patterns.
- e. Write the principle of resistance welding.
- f. State the difference between upset and flash welding.
- g. How heat is generated in Thermit welding process?
- h. List five welding defects.
- i. Differentiate destructive and non-destructive testing.
- j. Write classification of electrodes.

SECTION-B

2. What is the principle of gas welding? Also, explain about various types of flames in gas welding.
3. Describe in detail about the general trend in manufacturing.
4. Explain arc welding processes. Also, write short notes on (i) Soldering (ii) Brazing
5. Explain ultrasonic inspection and dye penetrate test.
6. Explain explosive welding with suitable sketch and write its applications.

SECTION-C

7. a) What is the difference between directional and progressive solidification?
b) What is welding arc? Explain the characteristics of welding arc.
8. Explain the principle of submerged arc welding with the help of neat sketch. Discuss its applications, merits and demerits.
9. a) Explain investment casting. Also write its advantages and disadvantages.
b) Define welding defects. Write causes and remedies of following welding defects;
 - i) Spatter
 - ii) Overlap
 - iii) Undercut

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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ME) (Sem.-4)

STRENGTH OF MATERIALS-II

Subject Code : BTME-401

M.Code : 59129

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt ANY FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt ANY TWO questions.

SECTION-A

1. Answer briefly :

- a) What is energy of distortion?
- b) What is the necessity of theory of failure?
- c) Define stiffness of the spring.
- d) For what purposes cylindrical and spherical shells are used?
- e) State Lamé's equation.
- f) Which type of stresses are produced in a rotating thin disc of uniform thickness?
- g) What is meant by trapezoidal section?
- h) Where does the maximum vertical shear stress occur in an I-section?
- i) Discuss the importance of shear centre.
- j) Identify three principal stresses in a thick cylinder.

SECTION-B

2. Compare the strains produced in a body subjected to same amount of load when applied gradually and when suddenly.
3. A closed coil helical spring has mean diameter of 75 mm and spring constant of 80 kN/m. It has 8 coils. What is the suitable diameter of the spring wire if maximum shear stress is not to exceed 250 MN/m²? Modulus of rigidity of the spring wire material is 80 GN/m². What is maximum axial load the spring can carry?
4. For a thin cylindrical shell, the length/diameter ratio is 3 and its volume is 20 m³. The safe tensile stress, for the shell material is 100 MPa. Determine the cylinder diameter and wall thickness if it is to contain water at an absolute pressure of 2 MPa.
5. Two closed coiled helical steel springs are connected in series to form a composite spring of stiffness 1.5 kN/m. In both the springs, mean coil radius is 4 times the wire diameter. One spring is made out of 3 mm diameter wire and has 20 turns, whereas the other spring has 15 turns. Determine the wire diameter in case of second spring. $C = 80 \text{ GPa}$.
6. Write a brief note on stress in rotating discs.

SECTION-C

7. A bar of mild steel carries an axial pull of 10 kN and a transverse shear force of 5 kN. Taking the elastic limit in tension as 240 MPa, a factor of safety 3 and Poisson's ratio 0.3, calculate the diameter of the bar if the criterion is (i) Maximum principle stress theory, (ii) Maximum strain energy theory.
8. A thick cylinder of 150 mm outside radius and 100 mm inside radius is subjected to an external pressure of 30 MN/m² and internal pressure of 60 MN/m². Calculate the maximum shear stress in the material of the cylinder at the inner radius.
9. A beam 100 mm wide and 150 mm deep in cross-section is simply supported and carries a uniformly distributed load over its entire span of 2 m. If the allowable stresses for the beam material are 30 MPa in bending and 2 MPa in shear, calculate the maximum load which the beam can carry.

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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ME) (2011 Onwards) (Sem.-4)

FLUID MECHANICS

Subject Code : BTME-403

M.Code : 59131

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write in short on following :
 - (i) Define Velocity potential function.
 - (ii) Define Mach number.
 - (iii) Write Beroulli's equation
 - (iv) Explain Differential Manometers.
 - (v) Explain Dynamic Viscosity
 - (vi) Kinematic Viscosity.
 - (vii) Laminar boundary layer.
 - (Viii) Pathlines, Steaklines and Streamlines
 - (ix) Rotational and irrotational flow
 - (x) Meta Centre

SECTION-B

Q.2 The velocity component of a 2-D incompressible flow field are expressed as :

$$u = (y^3/3) + 2x - x^2y \text{ and } v = xy^3 + (-2y) - (x^3/3)$$

- (i) Is the flow physically Possible?
(ii) What is the discharge between stream lines passing through (1,3) and (2, 3)?
(iii) Is the flow irrotational?
- Q.3 Find the convective acceleration at the middle of a pipe which converges uniformly from 0.4 m diameter to 0.2 m diameter over 2 m length. The rate of flow is 20 lit/s. If the rate of flow changes uniformly from 20 l/s to 40 l/s in 30 seconds, find the total acceleration at the middle of the pipe at 15th second.
- Q.4 Derive the Bernoulli's theorem along with its assumptions. How it is modified for practical applications?
- Q.5 A horizontal venturimeter with inlet diameter 30 cm and throat diameter 10 cm is used to measure the flow of water. The pressure intensity at the inlet is 13.734 N/cm² while the vacuum pressure head at the throat is 37 cm of mercury. Find the rate of flow. Find also the value of C_d for the venturimeter. Assume that 4% of the differential head is lost between the inlet and throat.
- Q.6 An external cylindrical mouthpiece of diameter 150 mm is discharging water under a constant head of 6 m. Determine the discharge and absolute pressure head of water at vena-contracta. Take $C_d = 0.855$ and C_c for vena contracta = 0.62. Atmospheric pressure head = 10.3 m of water.

SECTION-C

- Q.7 A body has the cylindrical upper portion of 3 m diameter and 1.8 m deep. The lower portion is a curved one, which displaces a volume of 0.6 m³ of water. The centre of buoyancy of the curved portion is at a distance of 1.95 m below the top of the cylinder. The centre of gravity of the whole body is 1.20 m below the top of the cylinder. The total displacement of water is 3.9 tonnes. Find the meta-centric height of the body.
- Q.8 For a town water supply, the main pipe line of diameter 0.4 m is required. As pipes more than 0.35 m diameter are not readily available, two parallel pipes of same diameter were used for water supply. If the total discharge in the parallel pipe is same as in the single main pipe. Find the diameter of the parallel pipe. Assume the co-efficient of friction same for all pipes.
- Q.9 The frictional torque T of a disc of diameter D rotating at a speed N in a fluid of viscosity μ and density ρ in a turbulent flow is given by $T = D^5 N^2 \rho \phi \left[\frac{\mu}{D^2 N \rho} \right]$.
- Prove this by the method of dimensions.

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B.Tech.(ME) (2011 Onwards) (Sem.-4)

THEORY OF MACHINES – II

Subject Code : BTME-402

M.Code : 59130

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
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SECTION-A

Q1. Write briefly :

- a. What is free body diagram?
- b. What is dynamically equivalent system?
- c. Classify gears based on the position of teeth on wheel.
- d. Reciprocating masses cannot be balanced completely. Why?
- e. Give two applications of worm gears.
- f. Name two phases of kinematic synthesis.
- g. Compare involute and cycloidal tooth profiles.
- h. What do you understand by dimensional synthesis of pre-conceived type of mechanism?
- i. Define transmission angle.
- j. Write the right hand screw rule for determining the gyroscopic motion parameters.

SECTION-B

2. How is the friction effect taken into account at the turning and sliding pairs of a mechanism? Explain in detail.
3. Four masses m_1 , m_2 , m_3 and m_4 are 200 kg, 300 kg, 240 kg and 260 kg respectively. The corresponding radii of rotation are 0.2 m, 0.15 m, 0.25 m and 0.3 m respectively and the angles between successive masses are 45° , 75° , and 135° . Find the position and magnitude of the balance mass required, if its radius of rotation is 0.2 m.
4. Explain how are the gear train classified. Give atleast one distinguished feature of each type.
5. A pinion of 20 involute teeth and 125 mm pitch circle diameter drives a rack. The addendum of both pinion and rack is 6.25 mm. What is the least pressure angle which can be used to avoid interference? With this pressure angle, find the length of the arc of contact and the minimum number of teeth in contact at a time.
6. Prove that the resultant unbalanced force is minimum when half of the reciprocating masses are balanced by rotating masses.

SECTION-C

7. In a epicyclic gear train, an arm carries two gears A and B having 36 and 45 teeth respectively. If the arm rotates at 150 r.p.m in the anticlockwise direction about the centre of the gear A which is fixed, determine the speed of gear B. If the gear A instead of being fixed, makes 300 r.p.m in the clockwise direction, what will be the speed of gear B?
8. The turbine rotor of a ship has a mass of 3500 kg. It has a radius of gyration of 0.45 m and a speed of 3000 r.p.m. clockwise when looking from stern. Determine the gyroscopic couple and its effect upon the ship : (a) when the ship is steering to the left on a curve of 100 m radius at a speed of 36 km/h. (b) when the ship is pitching in a simple harmonic motion, the bow falling with its maximum velocity. The period of pitching is 40 seconds and the total angular displacement between the two extreme positions of pitching is 12 degrees.
9. Explain the following :
 - (a) Two and Three point synthesis.
 - (b) Simple and compound gear trains.

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B.Tech.(ME) (2011 Onwards) (Sem.-4)

MANUFACTURING PROCESSES-II

Subject Code : BTME-405

M.code : 59133

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

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SECTION-A

1. Answer briefly :

- a) Define metal forming.
- b) Write various applications of rolling.
- c) Distinguish between piercing and blanking.
- d) What is meant by shear on punch/die in press tool operations?
- e) What is the significance of shear angle?
- f) List the various cutting forces.
- g) Write the composition of alloy carbon steel.
- h) Distinguish between up milling and down milling.
- i) Define significance of dressing of grinding wheels.
- j) Define feed, and write its units.

SECTION-B

2. Describe various rolling defects, causes and remedies.
3. Explain extrusion process in detail with neat sketch.
4. What do you mean by powder metallurgy? Write advantages and limitations of powder metallurgy.
5. Explain the geometry of single point cutting tool with help of neat sketch.
6. Describe the working of a broaching machine with suitable sketch.

SECTION-C

7. Explain the following sheet metal forming operations with neat sketches :
 - a) Embossing,
 - b) Squeezing,
 - c) Coining,
 - d) Bending
 - e) Drawing.
8. a) Explain the following types of tool wear with neat sketches :
 - i) Crater wear
 - ii) Flank wear.
b) Briefly explain the desirable properties of a cutting tool material.
9. Briefly explain various lathe operations with neat sketches.

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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ME) (2011 Onwards) (Sem.-4)

APPLIED THERMODYNAMICS-II

Subject Code : BTME-404

M.Code : 59132

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Answer briefly :

- a) Write the different applications of compressed air.
- b) List the advantages of multistage compression.
- c) Define 'degree of reaction' in relation to axial flow compressor.
- d) What is surging?
- e) Write the merits and demerits of axial flow compressor.
- f) Mention the application of gas turbine.
- g) Name the various modes of energy transfer in impeller.
- h) List the requirements of a gas turbine combustion chamber.
- i) Define 'angle of attack'.
- j) Write name of different fuels used in the gas turbine.

10 × 2 = 20

SECTION-B

2. Explain with a neat sketch the working of a single stage reciprocating compressor. 5
3. Distinguish between positive and non-positive displacement type compressors. 5
4. Comment on the validity of the statement : 'The thermodynamic efficiency of a centrifugal compressor is referred to adiabatic condition where as that of reciprocating compressor is referred to isothermal condition'. 5
5. A jet propulsion system has to create a thrust of 90 tonnes to move the system at a velocity of 650 km/hr. Find the exit gas velocity and propulsion efficiency if the gas flow rate through the system is restricted to 25 kg/s.
6. State the difference between the jet propulsion and rocket propulsion system. 5

SECTION-C

7. Set up the following expression for volumetric efficiency with respect to free air delivery,

$$\eta_{vol} = \frac{p_1 T_0}{p_0 T_1} \left[1 + C - C \left(\frac{p_2}{p_1} \right)^{1/n} \right]$$

Where the symbols in the expression have their usual meanings. 10

8. A two-cylinder double acting reciprocating compressor sucks in air at pressure 0.98 bar and temperature 300 K. The delivery of the compressed air to the receiver is at 6 bar. The breathing capacity of the compressor is stated to be 2.5 m³/min when measured at 1 bar and 228 K. The mean speed of the compressor is limited to 120 mm/minute and the stroke is 0.75 times the cylinder diameter. If the law of compression is $pV^{1.3}$, make calculation for (a) Cylinder diameter and stroke length (b) Compressor speed in rev/min (c) Shaft power if the mechanical efficiency is 85% (d) isothermal efficiency.

Neglect the effect of clearance and piston rod diameter. 10

9. Sketch Brayton cycle on $p-v$ and $T-s$ plots and derive a relation for its thermal efficiency in terms of pressure ratio. 10

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Total No. of Pages : 02

Total No. of Questions :

B.Tech (Mechanical Engineering) Onwards) (Sem.-5)
MECHANICAL ENGINEERING AND METROLOGY

Code : BTME-503

M.Code : 70604

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. SECTION-B contains **FIVE** questions carrying **FIVE** marks each and students has to attempt any **FOUR** questions.
3. SECTION-C contains **THREE** questions carrying **TEN** marks each and students has to attempt any **TWO** questions.

SECTION-A

Q1 Answer briefly :

- a. Differentiate primary, secondary and tertiary types of measurements.
- b. Define hysteresis in measurement systems.
- c. What is difference between accuracy and precision?
- d. Define threshold and resolution.
- e. How the least count of a vernier caliper is calculated?
- f. Define gauge factor of a strain gauge.
- g. What is the working principle of a thermocouple?
- h. What is Mcleod gauge?
- i. What is comparator? Name any two of them.
- j. Explain the function of a driving dynamometer.

SECTION-B

2. What are systematic and random errors? How these errors are measured? What are various precautions for minimizing these errors?
3. Describe zero, first and second order measuring instruments.
4. What is a dynamometer? Explain various types of dynamometers.
5. What is a sine bar? Explain its application in measurements.
6. What is flow visualization? Briefly explain various flow visualization techniques.

SECTION-C

7. (a) Explain the construction and working of a Bourden tube pressure gauge with a neat sketch.
(b) Explain the working principle of piezo-electric transducer. What are its advantages and limitations?
8. What is dynamometer? How they are classified? Describe transmission and driving dynamometers.
9. Write short notes on :
 - (a) Stroboscope
 - (b) Optical pyrometer

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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ME) (2011 Onwards) (Sem.-5)
COMPUTER AIDED DESIGN AND MANUFACTURING
Subject Code : BTME-502
M.Code : 70603

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Answer briefly :

- a) Give the flowchart of basic design process.
- b) What is Geometric Transformation?
- c) What is constructive solid geometry (CSG) in geometric modelling?
- d) What is an interpolant curve?
- e) Define a part program.
- f) What is fixed and floating zero?
- g) What is part family?
- h) Give the data selection systems in CAPP.
- i) Discuss the benefits of FMS.
- j) What is the function of shading in design?

SECTION-B

2. Discuss the functions of Software Graphic package.
3. Discuss and two types of Geometric Transformations using suitable 2-D examples.
4. What is a wireframe model and discuss hidden line removal concept in it?
5. Explain the importance of Adaptive control in machining operations.
6. Discuss various part classification and coding systems used in GT.

SECTION-C

7.
 - a) What is CAPP and discuss the benefits of CAPP.
 - b) Discuss various types of CAPP systems.
8.
 - a) Discuss the types of manufacturing systems in CIMS.
 - b) Discuss different types of layout considerations of FMS.
9.
 - a) Discuss the parametric representation of B-spline curve.
 - b) Discuss the equation and characteristics of Bezier curve.

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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ME) (2011 Onwards) (Sem.-5)

MATHEMATICS-III

Subject Code : BTAM-500

M.Code : 70601

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt ANY FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt ANY TWO questions.

SECTION-A

1. Write briefly :

- a) Expand $\pi x - x^2$ in half range series in interval $(0, \pi)$ upto first three terms.
- b) Find Laplace transform of $t^3 e^{-3t}$
- c) Find the inverse Laplace Transform of $\left(\frac{4s+15}{16s^2-25} \right)$
- d) Describe the conditions required for the Fourier expansion.
- e) Express $f(x) = x^4 + 3x^3 - x^2 + 5x - 2$ in terms of Legendre polynomials.
- f) Evaluate $\int x^3 j_0(x) dx$
- g) Form the partial differential equation $z = (x + y) \phi(x^2 - y^2)$
- h) Solve $\frac{\partial^2 z}{\partial x^2} + z = 0$ given that $x = 0, z = e^y$ and $\frac{\partial z}{\partial x} = 1$.
- i) Define harmonic function
- j) Check whether $f(z) = \sqrt{|xy|}$ is analytic at origin or not?

SECTION-B

2. Obtain Fourier series to represent $f(x) = \frac{1}{4}(\pi-x)^2$, $0 < x < 2\pi$.
3. Solve the initial value problem

$$y'' - 5y' + 4y = e^{2t}, y(0) = \frac{19}{12}, y'(0) = \frac{8}{3}$$

4. Find the Frobenius series solution about $x = 0$ of equation

$$(1-x^2)y'' - 2xy' + 6y = 0$$

5. Find bilinear transformation which maps the points $z = 1, i, -1$ onto the points $w = i, 0, -i$. Hence find

a) The image of $|z| < 1$

b) Invariant points of transformation.

6. Solve $(x^2 - yz)p + (y^2 - zx)q = z^2 - xy$

SECTION-C

7. State and prove convolution theorem. Apply convolution theorem to evaluate

$$L^{-1}\left(\frac{s}{(s^2+a^2)^2}\right)$$

8. Find the residue of $f(z) = \frac{z^3}{(z-1)^4(z-2)(z-3)}$ at its poles and hence evaluate $\oint_c f(z) dx$

where c is circle $|z| = 2.5$

9. Solve the Laplace equation $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0$ subject to the conditions

$$u(0, y) = u(x, y) = u(x, 0) = 0, u(x, a) = \frac{\sin n\pi x}{l}$$

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Total No. of Pages : 02

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B.Tech.(ME) (2011 Onwards) (Sem.-5)

AUTOMOBILE ENGINEERING

Subject Code : BTME-505

M.Code : 70606

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Answer briefly :
 - a. Draw a neat sketch of three quarter floating axle.
 - b. Why camber is provided in the vehicles?
 - c. What are the causes of stiff steering?
 - d. Define brake split.
 - e. What are advantages of tubeless tyres?
 - f. What are disadvantages of frameless chassis?
 - g. Why shackle is provided in leaf spring?
 - h. What is the function of differential?
 - i. What is the function of propeller shaft?
 - j. What are advantages of Anti lock braking system?

SECTION-B

2. Explain hotch kiss drive with neat sketch.
3. Explain double wishbone type suspension system with diagram.
4. What is wheel balancing and why it is necessary?
5. Define: Toe-in, positive castor, negative camber and dog tracking.
6. Explain general layout of front wheel drive automobile.

SECTION-C

7. Explain hydraulic power steering with neat sketch and also write down its advantages.
8. Explain different types of chassis and frames.
9. Explain different types of front and rear axles with neat diagrams.

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B.Tech. (ME) (2011 Onwards) (Sem.-5)

DESIGN OF MACHINE ELEMENTS-I

Subject Code : BTME-501

M.Code : 70602

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.

SECTION-A

1. Answer briefly :

- a) What are the factors considered for selection of materials?
- b) Name most commonly used engineering material.
- c) What is meant by shaft basis system?
- d) Define factor of safety.
- e) How the stress concentration in a component can be reduced?
- f) What is an eccentric riveted joint?
- g) What are flexible coupling?
- h) What do you understand by torsional rigidity?
- i) Write the principle on which lever work.
- j) What are the functions of gaskets?

SECTION-B

2. A double riveted double cover butt joint in plates 20 mm thick is made with 25 mm diameter at 100 mm pitch. The permissible stresses are:

$$\sigma_t = 120 \text{ MPa}; \quad \tau = 100 \text{ MPa}; \quad \sigma_c = 150 \text{ MPa}$$

Find the efficiency of joint, taking the strength of the rivet in double shear as twice than that of single shear.

3. Write the procedure for designing an axially loaded unsymmetrical welded section.
4. A 100 mm shaft rotating at 100 rev/min transmits 224 kW. Power is taken off through a gear whose hub is 200 mm long. The key is made of steel having an ultimate shearing stress of 350 N/mm^2 . Using a factor of safety of 5, determine the key desired.
5. Design a cottor joint to connect two mild steel rods for a pull of 30 kN. The maximum permissible stresses are 55 MPa in tension, 40 MPa in shear and 70 MPa in crushing.
6. A solid circular shaft is subjected to a bending moment of 3000 N-m and a torque of 10000 N-m. The shaft is made of 45 C8 steel having ultimate tensile stress of 700 MPa and a ultimate shear stress of 500 MPa. Assuming a factor of safety as 6, determine the diameter of shaft.
7. A foot lever is 1 m from the centre of shaft to the point of application of 800 N load. Find :
- Diameter of the shaft.
 - Dimensions of the key and
 - Dimensions of rectangular arm of the foot lever at 60 mm from the centre of the shaft assuming width of the arm as 3 times thickness. The allowable tensile stress may be taken as 73 MPa and allowable shear stress as 70 MPa.

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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ME) (2011 Onwards) (Sem.-5)
INDUSTRIAL AUTOMATION AND ROBOTICS

Subject Code : BTME-504

M.Code : 70605

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

SECTION - A

1. Answer briefly :

- a. What is mechanization?
- b. What do you mean programmable automation?
- c. What is pneumatic motor?
- d. What is non return valve?
- e. What is proximity sensor?
- f. What is tandem cylinder?
- g. Draw the symbol of 5/3 solenoid operated spring return DC valve.
- h. Give the symbol of NOR gate with truth table.
- i. What is Roll in robotics?
- j. Define Robot.

SECTION-B

2. What is Ladder Logic Diagram? Explain.
3. What is time delay valve? How it is used in pneumatic circuits?
4. What are the applications of transfer devices?
5. What are the different types of end effectors used in robots?
6. What do you mean by low cost Automation? How it is useful for industry?

SECTION-C

7. What is work volume? Explain the work volume and working of two robotic configurations with neat sketch.
8. What are the different types of cylinder mounting? Explain each with neat sketch.
9. Write short note on :
 - a. Socio economic impacts of automation.
 - b. Robot programing.

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Total No. of Pages : 02

Total No. of Question

B.Tec (Sem.-6) 1 Onwards)

DESIGN MACHINE ELEMENTS-II

Subject Code : BTME-601

M.Code : 71185

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.
3. Use of a standard design data book is permitted.

SECTION-A

Q1. Answer briefly :

- a) Differentiate between open belt and crossed belt drives.
- b) Give any four advantages of V-belt over flat belt drive.
- c) What is the main function of a flywheel in an engine?
- d) Define coefficient of fluctuation of energy.
- e) What is nipping in a leaf spring?
- f) Name **any two** materials that are used for the lining of friction surfaces in clutches.
- g) What is a self-energizing brake?
- h) What are the advantages of involute gears over cycloidal gears?
- i) Describe the 20° stub involute system of gear teeth.
- j) What are journal bearings?

SECTION-B

- Q2. A centrifugal clutch is to be designed to transmit 15kW at 900 rpm. The shoes are four in number and the speed at which the engagement begins is $\frac{3}{4}$ th of the running speed. The inside radius of the pulley rim is 150 mm. Taking coefficient of friction as 0.25, find out the mass and size of the shoes.
- Q3. Discuss the different types of brakes giving at least one practical application for each type.
- Q4. An open belt 100 mm wide connects two pulleys mounted on parallel shafts with their centres 2.4 m apart. The diameter of the larger pulley is 450 mm and that of smaller pulley is 300 mm. Coefficient of friction is 0.3 and the maximum stress in the belt is limited to 14 N/mm width. If the larger pulley rotates at 120 rpm, find the maximum power that can be transmitted.
- Q5. Design a helical compression spring for a maximum load of 1000 N and deflection of 25mm taking Wahl's factor into consideration. Assume spring index as 5, maximum permissible shear stress for spring wire as 420 MPa and modulus of rigidity as 84 kN/mm².
- Q6. a) Mention four important types of gears and discuss their applications.
b) Explain the phenomenon of interference in involute gears. What are the conditions to be satisfied in order to avoid interference?
- Q7. Select a single row deep groove ball bearing for a radial load of 4000 N and an axial load of 5000 N, operating at a speed of 1600 rpm for an average life of 5 years at 10 hours per day. Assume uniform and steady load.

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B.Tech. (ME) (2011 Onwards) (Sem.-6)

HEAT TRANSFER
Subject Code : BTME-602
M.Code : 71186

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

- a) State Stefan – Boltzman law.
- b) Define transient state of heat transfer.
- c) What is meant by contact thermal resistance?
- d) What type of boundary conditions is used at the fin edge?
- e) What is the utility of extended surface?
- f) Differentiate between laminar and turbulent flow.
- g) Define thermodynamic boundary layer thickness.
- h) What do you understand by nucleation?
- i) Define absorptivity.
- j) What is meant by radiation shield?

SECTION-B

2. Distinguish between conduction, convection and radiation modes of heat transfer.

3. State the effect of impurities on the thermal conductivity of a material.
4. Compute the heat loss per square meter surface area of a 40 cm thick furnace wall having surface temperature of 300°C and 50°C, if the thermal conductivity k of the wall material is given by,

$$k = 0.005T - 5 \times 10^{-6}T^2; \text{ where } T = \text{temperature in } ^\circ\text{C}$$

5. Air at 20°C flows over a flat plate maintained at 75°C. Measurements show that temperature at a distance of 0.5 mm from the surface of plate is 50°C. Presuming thermal conductivity of air as 0.0266 W/m-deg, estimate the value of local heat transfer coefficient.
6. A thermos flask has a double walled bottle and the space between the walls is evacuated so as to reduce the heat flow. The bottle surfaces are silver plated and the emissivity of each surface is 0.025. If the contents of the bottle are at 375 K, find the rate of heat loss from the thermos bottle to the ambient air at 300 K. What thickness of cork ($k = 0.03$ W/m-deg) would be required if the same insulating effect is to be achieved by the use of cork?

SECTION-C

7. The door of a domestic refrigerator has an area of 0.7 m² and it basically consists of a thin metal sheet with a 25 mm thick layer of insulation on the inside. The thermal conductivity of this insulation is 0.25 W/m-deg and heat transfer on each side of the door is 10 W/m²-deg. Determine the heat flow rate through the door and the temperature of the metal sheet. The refrigerated chamber and the room are at 0°C and 20°C respectively. Neglect thermal resistance due to the sheet metal.
8. A rod of 10 mm diameter and 80 mm length with thermal conductivity 16 W/m-deg protrudes from a surface at 160°C. The rod is exposed to air at 30°C with a convection coefficient of 25 W/m²-deg. How does the heat flow from this rod get affected if the same material volume is used for two fins of the same length? Assume short fin with end insulated.
9. Air flow through a long rectangular (30 cm height × 60 cm width) air conditioning duct maintains the outer surface temperature at 15°C. If the duct is uninsulated and exposed to air at 25°C, calculate the heat gained by the duct per meter length, assuming it to be horizontal.

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Total No. of Pages : 02

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B.Tech.(ME) (2011 Onwards) (Sem.-6)

STATISTICAL AND NUMERICAL METHODS IN ENGINEERING

Subject Code : BTME-604

M.Code : 71188

Max. Marks : 60

Time : 3 Hrs.

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

- a) The mean of 5 observations is 7. Later on it was found that two observations 4 and 8 were wrongly taken instead of 5 and 9. Find the correct mean.
- b) Define Conditional Probability.
- c) Find the mean and the standard deviation of the number of heads in 100 tosses of a fair coin.
- d) Define level of Significance.
- e) If $u = 2v^6 - 5v$, find the percentage error in u at $v = 1$ if error in v is 0.05.
- f) Show that the following rearrangement of the equation :
$$x^3 + 6x^2 + 10x - 20 = 0$$
 does not yield a convergent sequence of successive approximations by iteration method near $x = 1$, $x = \frac{(20 - 6x^2 - x^3)}{10}$.
- g) Prove $\Delta = E - 1$.
- h) Write Simpson's $1/3^{\text{rd}}$ formula for numerical integration.
- i) Define Pivoting and type of Pivoting.
- j) Show that Euler's formula is R-K method of first order.

SECTION-B

2. It is known from the past experience that the average number of industrial accidents in a factory per month in a plant is 4. Find the probability that during a particular month, there will be lower than 4 accidents. Use Poisson Distribution (Given $e^{-4} = 0.0183$).
3. Evaluate $\sqrt{12}$ to four decimal places by Newton's iterative method.
4. Find $y(10)$ from the following table :
- | | | | | |
|---|----|----|----|----|
| X | 5 | 6 | 9 | 11 |
| Y | 12 | 13 | 14 | 16 |
5. The table given below reveals the velocity 'v' of a body during the time 't' specified. Find its acceleration at $t = 1.1$
- | | | | | | |
|---|------|------|------|------|------|
| T | 1.0 | 1.1 | 1.2 | 1.3 | 1.4 |
| V | 43.1 | 47.7 | 52.1 | 56.4 | 60.8 |
6. Solve the following system of equations using Gauss Elimination Method.
- $$x + y + z = 7$$
- $$3x + 3y + 4z = 24$$
- $$2x + y + 3z = 16$$

SECTION-C

7. In a test given to two groups of students the marks obtained are as follows :
- | | | | | | | | | | |
|--------------|----|----|----|----|----|----|----|----|----|
| First group | 18 | 20 | 36 | 50 | 49 | 36 | 34 | 49 | 41 |
| Second group | 29 | 28 | 26 | 35 | 30 | 44 | 46 | | |
- Examine the significance of difference between the mean marks secured by students of the above two groups. (The value of t at 5% level for $4d.f = 2.14$).
8. Find the smallest Eigen value of the matrix
- $$A = \begin{bmatrix} 1 & 2 & -2 & 4 \\ 2 & 12 & 3 & 5 \\ 3 & 13 & 0 & 7 \\ 2 & 11 & 2 & 2 \end{bmatrix}$$
- using Power Method.
9. Use Milne's method to solve $y = 1 + y^2$ with:
 $y(0) = 0$, $y(0.2) = 0.2027$, $y(0.4) = 0.4228$, $y(0.6) = 0.6841$ obtain $y(0.8)$, $y(1)$ and $y(-0.2)$.

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B.Tech.(ME) (E-I 2011 Onwards) (Sem.-6)
NON CONVENTIONAL ENERGY RESOURCES
Subject Code : DE/ME-1.3
M.Code : 71245

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A is COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. **SECTION-C** contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

SECTION-A

1. Answer briefly :

- a. Write the advantage of using renewable energy sources.
- b. Define solar constant.
- c. What is the principle of power generation through wind energy?
- d. What is Peltier effect?
- e. What are the disadvantages of MHD technology?
- f. How biomass conversion takes place?
- g. What is the working principle of tidal energy plants?
- h. What are the beneficial properties of biomass?
- i. What is attenuation of solar radiations?
- j. Define lift and drag in case of wind energy.

SECTION-B

- 2) Give the classification of non-conventional machining processes.
- 3) What are the main process elements of water jet machining?
- 4) Explain with suitable diagrams the working principle of electrochemical machining.
- 5) Discuss the mechanism of material removal in laser beam machining process.
- 6) What are the advantages of hybrid machining processes? Discuss any one type of hybrid machining process.

SECTION-C

- 7)
 - a) Explain the mechanism of metal removal in electric discharge machining process.
 - b) What factors should be considered while selecting EDM electrode material?
- 8) Describe principle, process parameters, capabilities and applications of Ultrasonic machining.
- 9) Write short note on **Any Two** of the following :
 - a) Principle of abrasive flow machining.
 - b) Electrochemical honing.
 - c) Generation of electron beam.

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Total No. of Questions : 0

B.Tech.(Mechanical Engineering) (Sem.-7,8)
REFRIGERATION AND AIR CONDITIONING

Subject Code : BTME-802

Paper ID : 71995

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Q1. Write briefly :

- a. Define C.O.P of refrigerator.
- b. Difference between heat engine/refrigerator and heat pump.
- c. Explain sub cooling, super heating with sketch.
- d. What are secondary refrigerants?
- e. Define :
 - i. Dry bulb
 - ii. Degree of saturation
- f. Define absolute humidity.
- g. Name the processes B, C, E, G from the figure 1 below.

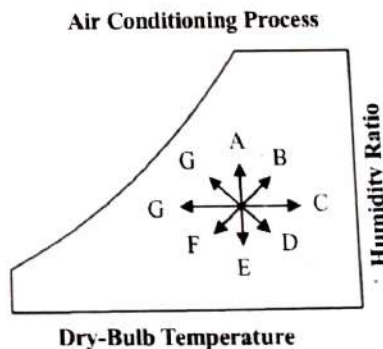


Figure. 1

- Q7.
- h. Which material is commonly used for making ducts in the air conditioning system and why?
 - i. Write chemical formula and names of refrigerant R-114?
 - j. Name four refrigerants?

SECTION-B

- Q2. Discuss in detail the desirable Physical properties of Refrigerant
- Q3. Explain regenerative Air Cooling System with the help of a neat sketch.
- Q4. A quantity of air having a volume of 300 m^3 at 30°C dry bulb temperature and 25°C wet bulb temperature is heated to 40°C dry bulb temperature. Estimate the amount of heat added, final relative humidity and wet bulb temperature. The air pressure is 1.01325 bar.
- Q5. A Carnot cycle machine operates between the temperatures limits of 47°C and -30°C . Determine C.O.P. when it operates as :
 - a. a refrigerating machine
 - b. a heat pump and
 - c. a heat engine
- Q6. The humidity ratio of atmospheric air at 28°C dry bulb temperature and 760 mm of mercury is 0.0016kg/kg of dry air. Determine :
 - a. partial pressure of water vapour
 - b. relative humidity
 - c. dew point temperature
 - d. specific enthalpy
 - e. vapour density

SECTION-C

- Q7. Explain in detail the Lithium Bromide absorption refrigeration system with the help of a neat sketch.
- Q8. An aircraft refrigeration plant has to handle a cabin load of 30 tonnes. The atmospheric temperature is 17°C . The atmospheric air is compressed to a pressure of 0.95 bar and temperature of 30°C due to ram action. This air is then further compressed in a compressor to 4.75 bar, cooled in a heat exchanger to 67°C , expanded in a turbine to 1 bar pressure and supplied to the cabin, the air leaves the cabin at a temperature of 27°C . The isentropic efficiencies of both compressor and turbine are 0.9. Calculate the mass of air circulated per minute and the C.O.P. for air, $C_p = 1.004 \text{ kJ/kg K}$ and $C_p/C_v = 1.4$.
- Q9. A vapour compression refrigerator works between the pressure limits of 60 bar and 25 bar. The working fluid is just dry at the end of compression and there is no under cooling of the liquid before the expansion valve. Determine :
- C.O.P. of the cycle;
 - Capacity of the refrigerator if the fluid flow is at the rate of 5 kg /min.

Data :

Pressure (bar)	Saturation temperature(K)	Enthalpy (kJ /kg)		Entropy (kJ/kg K)	
		Liquid	Vapour	Liquid	Vapour
60	295	151.96	293.29	0.554	1.0332
25	261	56.32	322.58	0.226	1.2464

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ME) (2011 Onwards) (Sem.-7,8)
INDUSTRIAL ENGINEERING AND MANAGEMENT
Subject Code : BTME-801

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt ANY FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt ANY TWO questions.

SECTION-A

Q1. Answer briefly:

- a) What are the chief functions of Industrial Engineering department? List them.
- b) What is the difference between MC-Gregor's Theory X and Theory Y?
- c) What do you mean by Hierarchy of human needs?
- d) What is purpose of designing organizational structure?
- e) What are the various dimensions of planning function?
- f) What is the principle of Group Technology?
- g) What advantage is obtained by Method study?
- h) What is the purpose of work sampling?
- i) What is intrinsic value of a product?
- j) How does product layout differ from process layout?

SECTION-B

- Q2. Explain the qualities of an Industrial Engineer.
- Q3. Discuss all the relevant factors in Taylor's Scientific Management.
- Q4. Discuss the factors affecting plant location.
- Q5. What are the methods of recording of data? Explain.
- Q6. Discuss the elements of Decision support systems.

SECTION-C

- Q7. What is the contribution of Taylor in managing an enterprise? What are the further evolutions in the theory given by him?
- Q8. Compare and contrast among product, process and combination layouts. Elucidate your answer with relevant example from industry.
- Q9. What is the role of questioning technique in work analysis? What is the eventual outcome of this task?

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Roll No.

Total No. of Pages : 03

Total No. of Questions : 09

B.Tech. (ME) (2011 Onwards) (Sem.-7,8)

MECHANICAL VIBRATIONS

Subject Code : BTME-803

M.Code : 71996

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
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3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Q1. Answer briefly :

- a) Define harmonic series.
- b) What is time period?
- c) What is logarithmic decrement?
- d) Define semi definite system.
- e) What is transverse vibration?
- f) Define eigen value.
- g) What is a continuous system?
- h) Define principal mode of vibration.
- i) Write two uses of vibration.
- j) Write one advantage of critical damping.

SECTION-B

- Q2. An instrument has a natural frequency of 10 Hz. It can stand a maximum acceleration of 10m/s^2 . Find maximum amplitude of displacement.
- Q3. A spring-mass system with mass m kg and stiffness k N/m has a natural frequency of 1Hz. Determine the value of stiffness k_1 of another spring which when arranged in conjunction with spring of stiffness k in series will lower the natural frequency by 20% and in parallel will raise the natural frequency by 20%.
- Q4. Describe centrifugal pendulum vibration absorber.
- Q5. Find the lowest natural frequency of transverse vibrations for the system shown in Fig. 1. By Rayleigh's method.

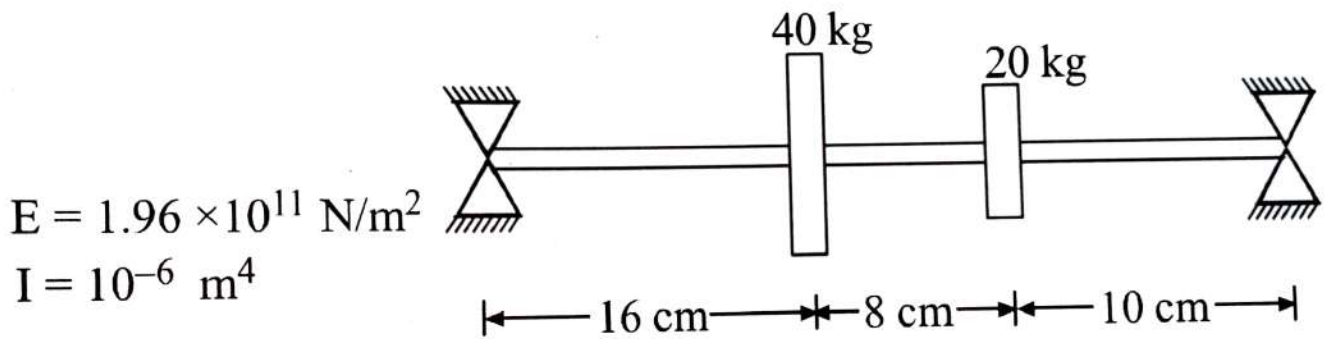


Fig. 1

- Q6. Derive frequency equation for a beam with both ends free and having transverse vibration.

SECTION-C

- Q7. An air craft radio weighing 118 N is to be isolated from engine vibrations ranging in frequencies from 1600 to 2200 epm. What static deflection must the isolator have for 85% isolation?
- Q8. A gun barrel of mass 600 kg has a recoil spring of stiffness 294000 N/m. If the barrel recoils 1.3 m on firing, determine @ initial recoil velocity of the barrel and the time required for the barrel to return to a position 5cm from the initial position.

Q9. A four rotor system is represented in Fig. 2. Find the amplitude of vibration when the external torque acts on the first rotor.

$$J_1 = 817 \text{ kg-m}^2$$

$$J_2 = 608 \text{ kg-m}^2$$

$$J_3 = 100 \text{ kg-m}^2$$

$$J_4 = 120 \text{ kg-m}^2$$

$$K_{t1} = 30 \times 10^6 \text{ N-m/rad}$$

$$K_{t2} = K_{t3} = 42 \times 10^6 \text{ N-m/rad}$$

$$T_0 = 12,000 \text{ N-m}$$

$$\omega = 200 \text{ rad/sec}$$

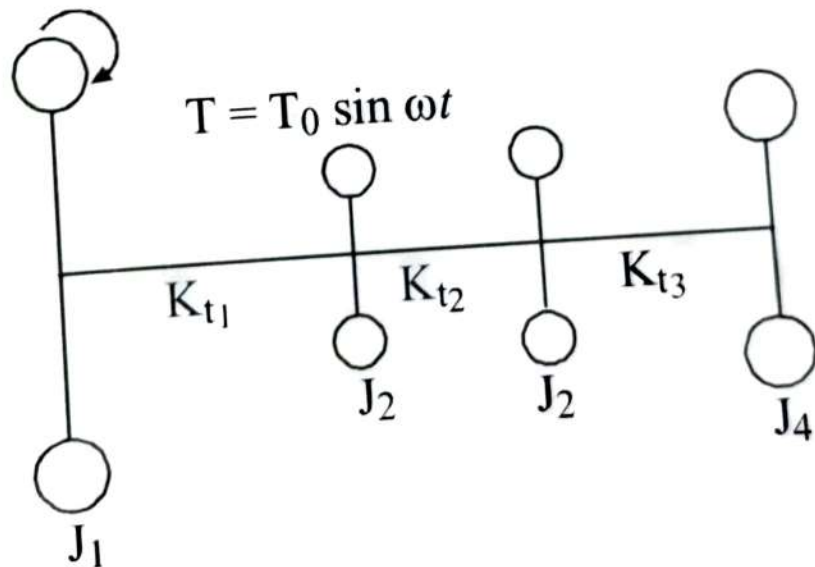


Fig.2

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ME) (2011 Onwards E-II) (Sem.-7,8)

NON-DESTRUCTIVE TESTING

Subject Code : DE/ME-2.4

M.Code : 72010

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write a short note on following :

- a) The term NDT.
- b) Eddy current testing.
- c) Magnetic hysteresis.
- d) Acoustic emission testing.
- e) Destructive testing
- f) Visual testing
- g) Dye penetration technique
- h) Magnetic hysteresis
- i) Capillary action
- j) Shot blasting

SECTION-B

2. Explain two ultrasonic inspection techniques for detection of sub layer cracks in the materials.
3. Explain Plane Polarization of electromagnetic waves.
4. What are the advantages and disadvantages of ultrasonic testing?
5. What is known as acoustic emission technique of NDT?
6. Explain the steps followed when conducting magnetic particle inspection?

SECTION-C

7. Discuss the various parameters in radiograph technique. How radiograph technique is used for non destructive testing?
8. Derive the Bragg's equation for detecting inter planer spacing and inter-atomic spacing of material by reflection of X-ray to the crystal plane.
9. What is plane and circular polarization? Discuss its application in non destructive testing.

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Roll No.

Total No. of Pages :02

Total No. of Questions : 09

B.Tech.(ME) (2011 Onwards E-II) (Sem.-7,8)

I.C.ENGINES

Subject Code :DE/ME-1.1

M.Code :71997

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
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3. SECTION-C contains THREE questions carrying TEN marks each and a student has to attempt any TWO questions.

SECTION-A

1. Answer briefly :

- a. Draw diagram of air standard cycle.
- b. Write a difference between two stroke and four stroke engine.
- c. Write two differences between SI and CI engines.
- d. Define calorific value of fuel.
- e. What is air fuel mixture?
- f. What is air filter?
- g. Define knocking
- h. What is supercharging?
- i. Define engine blow.
- j. What is the function of turbocharger?

SECTION-B

2. Explain the properties of air fuel mixture.
3. What is carburetor? And write down basic requirements from it.
4. Explain the difference between actual and fuel air cycle.
5. How a turbocharger works? Explain.
6. Explain methods used to determine minimum air quantity supplied to gases.

SECTION-C

7. Explain thermodynamics analysis of sterling, Ericson, Dual and otto cycle.
8. Explain different types of fuel injection systems.
9. Explain all the devices used to meet the requirements of an ideal carburetor.

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ME) (2011 Onwards E-II) (Sem.-7,8)

TOTAL QUALITY MANAGEMENT

Subject Code : DE/ME-2.5

M.Code : 72011

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
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3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Answer briefly :

- a) Explain the difference between terms "quality" and "total quality".
- b) List any two principles of TQM.
- c) Distinguish between TQC and TQM.
- d) What are the costs of quality?
- e) What is Quality Council?
- f) Write the benefits of just in time.
- g) What do you mean by Plan Formulation?
- h) Write the benefits of customer surveys.
- i) What is the function of ISO 9000?
- j) List the benefits of team work.

SECTION-B

2. Describe Joseph M. Juran's contribution toward TQM.
3. What is Kanban System? How does Kanban help in operationalizing JIT manufacturing? What are its advantages and disadvantages?
4. Describe the system of recognition and rewards followed in an organization.
5. Discuss Failure mode effect analysis in brief with neat sketches.
6. Write a note on relevance and origin of ISO 9000.

SECTION-C

7. *"TQM is a total system approach and is an integral part of corporate strategy. It works horizontally across functions and departments involving all employees from top to bottom"*. Explain and elucidate the ramifications of the statement.
8. What is Benchmarking? Classify benchmarking based on the nature of firms against which benchmarking could be done?
9. Write short notes on the following :
 - a) Design of experiments.
 - b) Significance of team building in successful implementation of TQM.

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (CHE) (2011 Onwards O.E.)/
(ME) (O.E. 2011 Onwards)/(AE)/(BME) (Open E)
(Sem.-7,8)

HUMAN RESOURCE MANAGEMENT

Subject Code : AE-414/DE-1.3/HU-251

M.Code : 54067

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt ANY FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt ANY TWO questions.

SECTION-A

1. Answer briefly :
 - a. Role of Personnel Manager
 - b. Contract Labour
 - c. Principles of Training
 - d. Job Specification
 - e. Job Satisfaction
 - f. Induction
 - g. Job Evaluation
 - h. Performance Appraisal
 - i. Role of Trade Union
 - j. Social security

SECTION-B

2. Discuss the nature and scope of Human Resource Management.
3. Discuss the utility of different types of psychometric tests.
4. The Payment of Wages Act, 1936 provides that the wages are to be paid in a particular form at regular intervals and without any unauthorized deductions. Explain.
5. What do you mean by Job Analysis? Explain the process of Job Analysis.
6. Give a summary of the provisions of the Factory Act, 1948 relating to Safety of the workers.

SECTION-C

7. What are the various methods for prevention and settlement of industrial disputes in India?
8. Define Collective Bargaining. What are the different approaches and strategies to Collective Bargaining?
9. What is the relationship between selection, recruitment and job analysis?

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May 2019

B. Tech
ECE

Roll No.

Total No. of Pages : 02

Total No. of Question

B.Tech. (Electronics Engg.) (2012 Onwards)
B.Tech.(ECE)/(Electronics & Computer Engg.)/(ETE) (2011 Onwards)
(Sem.-3)

DIGITAL CIRCUITS AND LOGIC DESIGN

Subject Code : BTEC-302

M.Code : 57584

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Q1. Answer briefly :

- a) Convert $(7D2.1A)_{16}$ to its decimal equivalent?
- b) Convert gray code 11011 into its binary equivalent?
- c) Prove that $A + \bar{A}B = A + B$ by the use of Boolean algebra
- d) Which gates are called used as universal gates and why?
- e) Define Noise Margin.
- f) Describe the operation performed by an encoder and a decoder.
- g) State the important characteristics of TTL family
- h) The t_{pd} for each flip flop is 30 ns determine the maximum operating frequency MOD-32 ripple counter?
- i) Give the specifications of D/A converters?
- j) What is a universal shift register? Explain.

SECTION-B

Q2. Simplify the expression by Quine-McClusky method

$$f = \sum m(0, 2, 3, 6, 7, 8, 9, 10, 13)$$

Q3. Explain the construction and working of Master-Slave JK-flip flop.

Q4. What is half adder? Write its truth table and develop its logic circuit. What are its limitations?

Q5. Explain the operation of Counter type of A/D converter.

Q6. Design a J-K counter that goes through states 2,4,5,7,2,4,.....

SECTION-C

Q7. a) A four bit D/A converter produces an output voltage of 4.5 volt for an input code of 1001. What will be the value of the output voltage for an input code of 0011?

b) Draw the circuit diagram of a three input TTL NAND gate and explain its operation.

Q8. a) With the help of neat diagram, explain the working of two-input ECL OR/NOR gate.

b) Explain how you will use 8 to 1 multiplexer to implement the logic function

$$F = AB + \bar{B}C + \bar{A}BC$$

Q9. Write short notes on **Any Two** :

a) Shift registers

b) Charged coupled device memory

c) ECL logic family

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Roll No.

Total No. of Pages : 03

Total No. of Questions : 09

B.Tech.(ECE / Electronics & Computer Engg. / ETE) (2011 Onwards)
B.Tech. (Electronics Engg.) (2012 Onwards) (Sem.-3)

NETWORK ANALYSIS AND SYNTHESIS

Subject Code : BTEC-303

M.Code : 57585

Max. Marks : 60

Time : 3 Hrs.

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
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SECTION-A

Q1. Answer briefly :

- a. State various properties of LC networks.
- b. Define h-parameters and draw its equivalent h-model.
- c. Find $f(\infty)$ if $F(s) = \frac{5s + 3}{s(s+1)}$
- d. A series RL circuit has $R = 10K\Omega$, $L = 10mH$ and $C = 1\mu F$. Find the Transfer function of the circuit.
- e. Check the positive realness of $F(s) = \frac{s^2 + 50s + 14}{s + 12}$
- f. Differentiate between Network Analysis and Network Synthesis. Name the methods to solve them.
- g. Using nodal analysis in Fig. 1 find the value of current in 20Ω resistor.

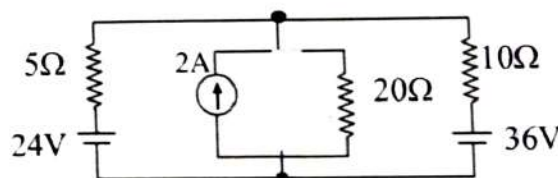


Fig.1

h. If two circuits X and Y are to be connected in cascade. Give the two port parameters of the combination with diagram cascade combination.

i. Find response of $H(s) \frac{s^2 + 4s + 3}{s^2 + 6s + 8}$ for step input.

j. Find condition for a 2-port network using Z and Y-Parameters to be reciprocal.

SECTION-B

Q.2 Find the value of Z_L in Fig. 2 so that maximum power is transferred to it. Also find the value of maximum power transferred.

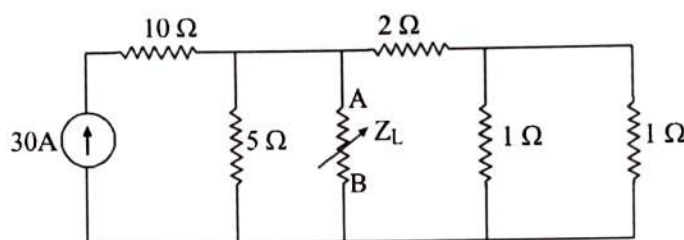


Fig. 2

Q.3 Find Y-parameters of the network of Fig. 3.

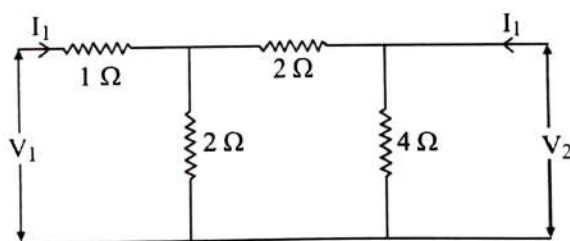


Fig. 3

Q.4 Steady state is achieved in the given circuit of Fig. 4 with switch, S open. Find the value of $I(t)$ for $t > 0$, if switch S is closed at $t = 0$.

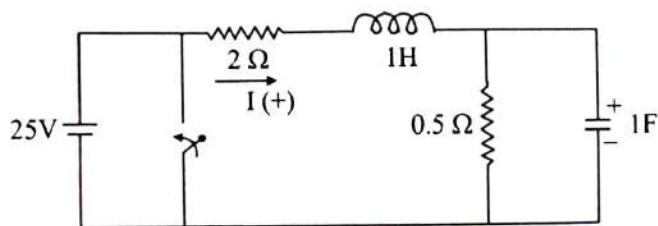


Fig. 4

Q.5 Using Nodal analysis, find I in the circuit of Fig. 5.

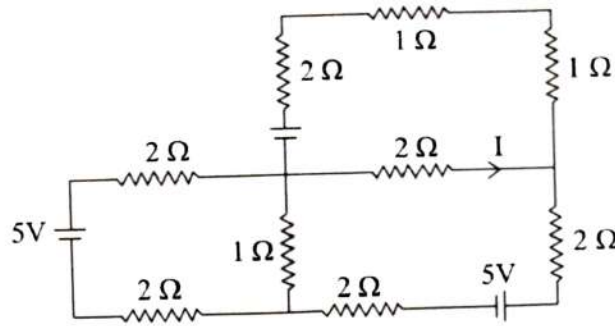


Fig. 5

Q.6 Classify filters and analyze any one type of filter in detail.

SECTION-C

Q.7 Synthesize a network using Foster-I and Foster -II forms for the impedance function :

$$Z(s) = \frac{s(s^2 + 9)}{(s^2 + 5)(s^2 + 13)}$$

Q.8 If an m-derived high pass filter has design impedance of 500Ω and cut off frequency of 3.5 KHz and infinite attenuation at 2.6 KHz, design the filter.

Q.9 Find current through Z_L in Fig. 6 using Norton's theorem and verify the result using Thevenin Theorem.

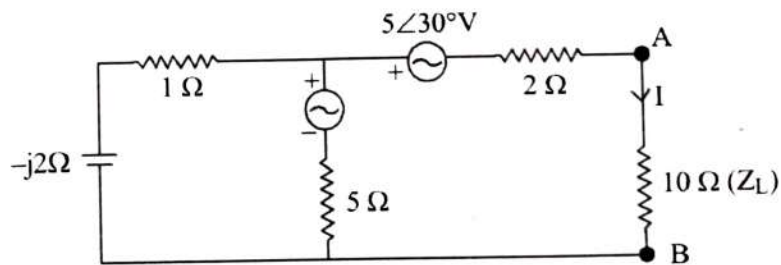


Fig. 6

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(Electronics Engg.) (2012 Onwards)
B.Tech.(ECE)/(Electronics & Computer Engg.)/(ETE) (2011 Onwards)
(Sem.-3)

ANALOG DEVICES & CIRCUITS

Subject Code : BTEC-301

M.Code : 57583

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Q1. Write briefly :

- a) Explain how Zener diode can be used as a voltage regulator.
- b) What is the principle behind the working of an oscillator?
- c) Explain the working of a transistor as a switch.
- d) What do you mean by dc load line?
- e) Give the V-I characteristics of PN diode.
- f) Calculate I_c and I_E for a transistor that has $\alpha_{dc} = 0.99$ and $I_B = 150\mu A$. Determine the value of β_{dc} for the transistor,
- g) Define Transconductance of MOSFET.
- h) What is pinch off voltage?
- i) State Barkhausen criteria for oscillators.
- j) What is diffusion capacitance?

SECTION-B

- Q2. Explain the effect of using negative feedback on various parameters of amplifiers.
- Q3. What are h-parameters? Explain how these are used for making equivalent transistor model.
- Q4. Discuss the factors involved in the selection of I_c , R_c and R_E for a single stage common emitter BJT amplifier circuit, using voltage divider bias.
- Q5. Explain in detail with diagrams, the difference between LED and Photo-diodes.
- Q6. Explain construction, operation and characteristics of JFETs.

SECTION-C

- Q7. Explain the construction and working of MOSFET.
- Q8. Explain the working of Colpitts oscillator. Derive the expression for its frequency.
- Q9. Describe in detail with diagram and characteristics:
- UJT
 - RC phase shift oscillator.

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(Electron (2012 Onwards) /
(ECE)/(ETE) (2011 Onwards) (Sem.-4)

ANALOG COMMUNICATION SYSTEMS

Subject Code : BTEC-401

M.Code : 57593

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
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3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Q1. Answer briefly :

- a) Define modulation. Why is modulation required in communication system?
- b) The carrier swing of a frequency-modulated signal is 70 KHz and the modulating signal is a 7 KHz sine wave. Determine the modulation index of the FM signal.
- c) Justify that AM is a linear modulation system.
- d) Draw the phasor diagram of narrowband frequency modulation.
- e) What is white noise?
- f) Explain why PM is not used for Broadcasting.
- g) Write the role of Limiter in FM system.
- h) What do you mean by synchronization in PAM system?
- i) Draw only the circuit diagram of Phase shift method of SSB generation.
- j) A bandwidth of 20 MHz is to be considered for the transmission of AM signals. If the highest audio frequencies used to modulate the carriers are not to exceed 3kHz, how many stations could broadcast within this band simultaneously without interfering with one another?

SECTION-B

2. A SSB transmission contains 10kW. This transmission is to be replaced by a standard amplitude modulated signal with the same power content. Determine the power content of the carrier and each of the sidebands, when the percent modulation is 80%.
3. Explain the Principle involved in generating AM-DSB-SC signal using Ring modulator.
4. Justify that the Angle modulation is a Non-linear modulation method and why don't broadcast stations transmit at audio frequencies?
5. Explain the Armstrong method for the generation of Wideband FM system.
6. Give comparison of PAM, PPM and PWM pulse Analog modulation methods.

SECTION-C

7. Write a note on following :
 - a) Tracking and Alignment
 - b) FM stereo transmission and reception
8.
 - a) Give comparison of SSB transmission system to conventional AM system.
 - b) A 107.6 MHz carrier is frequency modulated by a 7-kHz sine wave. The resultant FM signal has a frequency deviation of 50kHz.
 - i. Find the carrier swing of FM signal.
 - ii. Determine the highest and lowest frequencies attained by the modulated signal.
 - iii. What is the modulation index of FM wave?
9.
 - a) Give comparison of AM & FM system.
 - b) Explain pre-emphasis and De-emphasis circuit of FM system.

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Roll No.

Total No. of Pages : 03

Total No. of Questions : 09

B.Tech.(Electronics Engg.) (2012 Onwards)
B.Tech.(ECE/ETE/Electronics & Computer Engg.) (2011 Onwards)
(Sem.-4)

SIGNAL AND SYSTEMS

Subject Code : BTEC-402

M.Code : 57594

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Q1. Answer briefly :

- a) Differentiate between continuous time and discrete time systems.
- b) Determine whether the system is linear or non-linear $y(n) = x(n^2)$.
- c) State Parseval's relation for discrete-time aperiodic signals.
- d) Give the significance of ROC in Z-transform.
- e) Determine the Nyquist sampling rate and Nyquist sampling interval for the signal $x(t) = \sin^2(200\pi t)$.
- f) What is the necessary and sufficient condition on impulse response for stability of a causal LTI system?
- g) What do you mean by statistical independence?
- h) What are the Dirichlet's conditions of Fourier series?
- i) How can you classify Random processes?
- j) List two properties of DTFT.

SECTION-B

Q2. Find the trigonometric Fourier series for the periodic signal shown

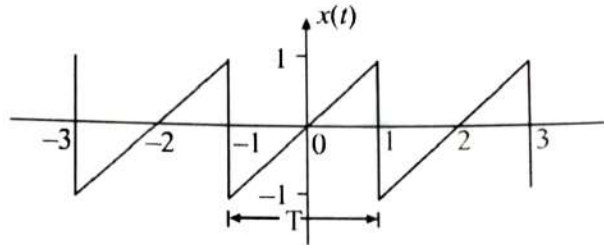


Fig.1

Q3. Consider the probability density $f(x) = ae^{-b|x|}$ where x is a random variable whose allowable value range from $x = -\infty$ to $x = +\infty$. Find :

- The cumulative distribution function $F(x)$
- The relationship between a and b and
- The probability that the outcome x lies between 1 and 2.

Q4. Determine the Z-transform and sketch the ROC of :

$$x(n) = \begin{cases} \left(\frac{1}{3}\right)^n, & n \geq 0 \\ \left(\frac{1}{2}\right)^{-n}, & n < 0 \end{cases}$$

Q5. What is Fourier transform? Write down its properties.

Q6. A discrete random variable has k equally likely possible values $0, a, 2a, 3a$

$(k-1)a$. Find mean, second moment and standard deviation.

SECTION-C

Q7. The input and output of a causal LTI system are related by the differential equation,

$$d^2y(t)/dt^2 + 6dy(t)/dt + 8y(t) = 2x(t)$$

- a) Find the impulse response of the system.
- b) What is the response of this system if $x(t) = t e^{-2t} u(t)$

Q8. a) Find whether the following signals are periodic or not?

i) $x(t) = 2\cos(10t + 1) - \sin(4t - 1)$

ii) $x(t) = 3\cos 4t + 2\sin t$

b) Determine whether the following signals are energy signals or power signals and why?

i) $x(t) = e^{-at}$

ii) $x(t) = \sin \omega_1 t + \cos \omega_2 t$

Q9. a) A box contains 3 red, 4 white and 5 black balls. One ball is drawn at random. Find the probability that it is :

i) red ball

ii) not black ball

iii) black or white ball.

b) In a random experiment a trial consists of five successive tosses of a coin. If we define a random variable X as the number of tails appearing in a trial, determine and plot CDF for the random variable.

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ECE / ETE) (2011 Onwards) (Sem.-4)

PULSE WAVE SHAPING AND SWITCHING

Subject Code : BTEC-405

M.Code : 57597

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.
4. Any missing data can be assumed appropriately.

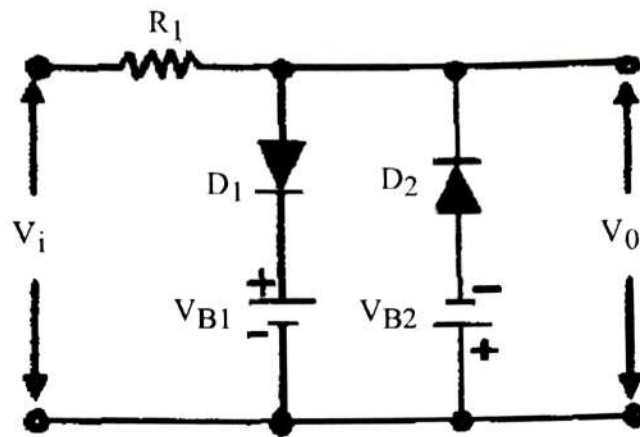
SECTION-A

1. Answer briefly :

- a) Differentiate between RC low pass and RC high pass filter.
- b) Write the output voltage expression and draw input and output waveform for the input voltage ($V_m \sin \omega t$) applied to a pure inductor.
- c) What is the role of feedback in electronics circuits.
- d) What do you mean by self bias bistable multivibrator?
- e) What is the difference between average and RMS values.
- f) Define resolution time in multivibrator.
- g) Define switching time in PN diode.
- h) Define UTP and LTP.
- i) Differentiate between linear and non-linear wave-shaping circuits.
- j) List the applications of attenuator.

SECTION-B

- Q2. The fig shows double Clipper circuit. Determine its output waveform. Assume diode drop of 0.7 V with sinusoidal input with ± 20 V. Also V_{B1} and V_{B2} are 4V and 9V respectively.



- Q3. Explain the working of bistable multivibrator as “T” flip flop?
- Q4. State and prove Clamping Circuit Theorem.
- Q5. Explain the working of Schmitt trigger.
- Q6. How the BJT work as switch?

SECTION-C

- Q7. With waveforms, derive the expression for the frequency of oscillation of an astable multivibrator.
- Q8. Derive the response of low pass RC circuit for pulse input voltage and draw the waveform.
- Q9. Explain any two with necessary diagrams :
- Passive and active elements
 - Positive and negative clamper
 - Diode comparator

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ECE)/(ETE) (2011 Onwards)/
(Electronics Engg.) (2012 Onwards)
(Sem.-4)

ELECTROMAGNETICS AND ANTENNAS

Subject Code : BTEC-403

M.Code : 57595

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Answer briefly :

- a) Write the wave equation for free space propagation.
- b) What is waveguide? What is its importance and applications?
- c) Differentiate between ordinary end fire array and Hansen-wood yard end-fire antenna.
- d) Define Babinet's principle.
- e) What is the significance of Poynting theorem?
- f) What is propagation constant?
- g) Define Retarded Vector and scalar potential.
- h) Define Radiation Pattern of an antenna.
- i) Define Maximum Usable Frequency.
- j) Define Skip Distance.

SECTION-B

2. Explain and derive the general solution of transmission line terminated with any load impedance.
3. Derive the expression for direction of pattern maxima and minima for array n isotropic sources of equal amplitude and spacing (for broadside).
4. What is distortion less transmission line? Derive the expression for the distortion less condition.
5. Describe the mapping of constant resistance and constant reactance circle on reflection coefficient plane.
6. Derive relation between E and H in uniform plane wave propagation.

SECTION-C

7. Explain the concept of polarisation. What are the conditions for different types of polarisation?
8. Explain the structure of atmosphere. Discuss the range of space wave propagation.
9. Discuss the construction and operation of paraboloid reflector antenna.

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Roll No.

Total No. of Pages : 02

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B.Tech.(ETE) / (ECE) / (Electronics & Computer Engg.) (2011 Onwards)/
B Tech.(Electronics Engg.) (2012 Onwards)
(Sem.-4)

ELECTRONIC MEASUREMENT & INSTRUMENTATION

Subject Code : BTEC-404

M.Code : 57596

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Answer briefly :

(2×10=20)

- a. Compare Hay's Bridge and Maxwell's Bridge.
- b. Write the working principle of a non planar display device.
- c. Describe the terms: resolution and hysteresis.
- d. What will be the output on screen of CRO if a sinusoidal voltage is applied to vertical deflection plates but no voltage is applied to horizontal deflection plate?
- e. Explain the terms: Dissipation Factor and Q factor.
- f. What is the principle of photoelectric transducers? Give examples.
- g. What controls the frequency of the displayed signal on CRO?
- h. What are the various dynamic characteristics of instrumentation system?
- i. What do you understand by LVDT?
- j. Find the series equivalent inductance and resistance of the network that causes such a bridge to null with following bridge arms: $\omega = 3\text{KHz}$, R and C in series of $2\text{K}\Omega$ and $1\mu\text{F}$ in one arm, two other opposite arms have $10\text{K}\Omega$ in one and $1\text{K}\Omega$ in other arm.

SECTION-B

2. With the help of Block diagram and suitable waveforms explain Integrating type digital voltmeters. 5
3. Explain the working and applications of Piezoelectric crystal. 5
4. Explain the principle and various components used for magnetic recorders? 5
5. How can the frequency be measured? Give its circuit and derive the relations. 5
6. What is telemetry? Explain **any two** applications of telemetry. 5

SECTION-C

7. a) Give construction and working of PMMC instruments with torque equation. 7
b) A PMMC has a coil dimension of $17\text{mm} \times 13\text{mm}$. the flux density in the air gap is $1.9 \times 10^{-3} \text{ Wb/m}^2$ and spring constant is $0.17 \times 10^{-6} \text{ Nm/rad}$. Determine the number of turns required to produce an angular deflection of 90° when a current of 7mA flowsthrough the coil. 3
8. a) Explain the working of Schering bridge and derive an expression for measurement of unknown capacitance and its loss angle. Draw the phasor diagram under null conditions. 6
b) Determine the value of R_1 and L_1 of the inductor connected in Maxwell capacitance bridge circuit. One arm has C_4 and R_4 in parallel of $0.5\mu\text{F}$ and $1 \text{ K}\Omega$. Other two opposite arms have resistance of $R_2 = 400\Omega$ and $R_3 = 600\Omega$. Also find the Q factor of the coil if $f = 1 \text{ KHz}$. 4
9. a) Explain the block diagram of CRO in detail. Give the application of CRO for measurement of phase and frequency. 7
b) Describe Harmonic distortion analyzer. 3

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Roll No.

Total No. of Pages : 02

Total No. of Questions :

B.Tech.(Electronics & Computer Engg.) (2012 Onwards) (Sem.-5)
B.Tech.(Electronics & Computer Engg.)/(ETE)
(2011 Onwards)

LINEAR INTEGRATED CIRCUITS

Subject Code : BTEC-503

M.Code : 70547

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Answer briefly :

- a. An operational amplifier has slew rate of $2V/\mu s$. If peak output voltage is 12 volts, what is the bandwidth of operational amplifier?
- b. Differentiate between the open and closed frequency response.
- c. How the input impedance of an ac voltage follower can be increased significantly?
- d. Draw a circuit to find $V_0 = (V_1 + V_2) - (V_3 + V_4)$.
- e. What is log amplifier? Draw the circuit of basic log amplifier.
- f. Why we go for higher order filters.
- g. What is VCO?
- h. Define resolution of D/A converter.
- i. List the applications of 555 timer in monostable mode of operation.
- j. What is the working principle of switching regulator?

SECTION-B

2. What is level translator circuit? Why is it used with cascaded differential amplifier?
3. What is the effect of variation in power supply voltages on offset voltage?
4. How does negative feedback affect the performance of an inverting amplifier?
5. Draw and explain circuit diagram of voltage-to-current converter. Also explain **any two** applications of this converter.
6. Discuss with circuit diagram operation of square wave generator.

SECTION-C

7.
 - a. Explain how 555 timer used as Schmitt trigger.
 - b. Draw and explain circuit diagram of an integrator circuit. Derive an expression for the output voltage.
8. What is the operating principle of PLL? Explain its applications.
9. Write a note on voltage regulators.

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (Electronics Engg.) (2012 Onwards)
B.Tech. (ECE/ETE) (2011 Onwards) (Sem.-5)

DIGITAL SIGNAL PROCESSING

Subject Code : BTEC-502

M.Code : 70546

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt ANY FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt ANY TWO questions.

SECTION-A

1. Write briefly :

- a) Whether the signal $y(n) = \sin 3n$ is periodic or non-periodic?
- b) Is the system $y(n) = x(n) \cos(\omega n)$ linear or non-linear?
- c) Give two advantages of digital signal processing over analog signal processing.
- d) Why the ROC of Z-transform cannot contain any pole ?
- e) Why it is not possible to take the DFT of sequency having infinite length?
- f) In the implementation of a digital system what are the effects of finite-word-length?
- g) Give the various steps involved in the design of IIR filter.
- h) Differentiate between FIR and IIR filter.
- i) What is Gibbs Phenomenon?
- j) List the various features of DSP processors.

SECTION-B

2. Compute the convolution of $x(n) = u(n) - u(n - 5)$, $h(n) = [1, 2, 2, 1]$

3. Determine the Z-transform and sketch the ROC of :

$$x(n) = -\alpha^n u(-n-1)$$

4. Obtain inverse Z-transform using partial fraction expansion method where :

$$X(z) = \frac{3}{z - \frac{1}{4} - \frac{1}{8}z^{-1}}; x(n) \text{ is causal}$$

5. The transfer function of analog filter is :

$$H_a(s) = \frac{3}{(s+2)(s+3)}$$

With $T = 0.1$ sec. Design the digital filter using Bilnear Transformation Technique.

6. Obtain the direct form I, direct form II, cascade & parallel structure for the following system :

$$y(n) = -0.1y(n-1) + 0.2y(n-1) + 3x(n) + 3.6x(n-1) + 0.6x(n-2)$$

SECTION-C

7. Explain the different types of structures for the realization of FIR filter.

8. Compute the 8-point DFT of a sequence

$$x(n) = \left\{ \frac{1}{2}, \frac{1}{2}, \frac{1}{2}, \frac{1}{2}, 0, 0, 0, 0 \right\}$$

Using in-place radix-2 decimation-in-time (DIT) FFT algorithm.

9. With the help of neat diagram describe the memory architecture of TMS320C54X and give the comparison between DSP processor and general purpose microprocessor.

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Total No. of Questions : 09

B.Tech.(ECE)/(ETE) (2011 Onwards)
B.Tech.(Electronics Engg.) (2012 Onwards)
(Sem.-5)

DATA STRUCTURES

Subject Code : BTCS-304

M.Code : 70544

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Q1 Answer briefly :

- a) Dangling pointers
- b) Queue
- c) Complexity of Linear Search
- d) Heaps
- e) Out degree in graphs
- f) Linked Lists
- g) Sparse matrix
- h) Rehashing
- i) Big 'O' notation
- j) AVL Trees

SECTION-B

- Q2. Write a note on Arrays.
- Q3. Write an algorithm to insert an item in the beginning of a circular queue.
- Q4. Differentiate between BFS and DFS in graphs.
- Q5. Discuss various operations on a queue.
- Q6. Write an algorithm for binary search.

SECTION-C

- Q7. Create a BST of 15 nodes. Write all 3 traversals.
- Q8. What do you mean by infix, prefix and postfix expressions? How to evaluate postfix?
- Q9. Discuss with an example procedure of radix sort.

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Total No. of Pages : 02

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B.Tech.(ECE)/(ETE) (2011 Onwards)
B.Tech.(Electronics Engg.) (2012 Onwards) (Sem.-5)

DIGITAL COMMUNICATION SYSTEM

Subject Code : BTEC-501

M.Code : 70545

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt ANY FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt ANY TWO questions.

SECTION-A

Q1. Write briefly :

- a. What do you mean by Additive White Gaussian Noise?
- b. Write the basic difference between delta modulation and Adaptive delta modulation.
- c. What is Entropy and Information rate?
- d. What is HDB signaling?
- e. Draw block diagram of Coherent ASK detector.
- f. Discuss noise effect in PCM.
- g. What do you mean by EYE diagram?
- h. Write advantages of MSK as compared to QPSK.
- i. What is Schwarz's inequality?
- j. Write Nyquist first criterions for Zero ISI.

SECTION-B

- Q2. Write a note on Statistical TDM, Codecs and Combo chips.
- Q3. Prove that in BPSK receiver Phase shift θ increases with increase in probability of Error and for the same signal energy and noise spectral density, which of BPSK and BFSK have better error probability, comment on it.
- Q4. Write a note on Slope over load distortion and Granular noise.
- Q5. A communication signal having a band width of 6.2MHz is transmitted using binary PCM system. Quantization levels are given as 512. Determine:
- Code Word length
 - Transmission band width
 - Final bit rate
 - Output signal to quantization noise ratio.
- Q6. Calculate probability of error for ASK, PSK and FSK schemes.

SECTION-C

- Q7. Explain BPSK demodulator circuit. Give Geometrical representation of BPSK signal, Calculate Band Width from frequency Spectrum, write advantages, disadvantages and probability of error of BPSK signal. 10
- Q8. Apply the Huffman coding procedure for the following message ensemble
- (X) = (X1 X2 X3 X4 X5 X6 X7)
- (P) = (0.2 0.4 0.12 0.08 0.06 0.08 0.04) 10
- Q9. a) What is power spectral density? State its properties with formula. 6
- b) Draw the line code formats for the bit stream 10101101 using 1) Bipolar NRZ 2) Split Phase Manchester 3) Polar RZ 4) Unipolar RZ. 4

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ECE)/(ETE) (2011 Onwards)
B.Tech.(Automation & Robotics) (2011 & Onwards)
B.Tech.(Electronics Engg.) (2012 Onwards)
(Sem.-5)
MICROPROCESSORS & MICROCONTROLLERS
Subject Code : BTEC-504
M.Code : 70480

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Answer briefly :

- (a) What is the function of RST and ALE signals?
- (b) What do you understand by Embedded Systems?
- (c) Enlist some salient features of 8085.
- (d) List the different flags of 8085 microprocessor.
- (e) How many ways an 8051 can be interrupted?
- (f) Discuss the difference between ADD and ADDC instruction.
- (g) If the frequency of the crystal connected to 8085 is 6MHz, calculate the time to fetch and execute NOP instruction.
- (h) What is the significance of SWAP instruction?
- (i) What is the use of SMOD bit in 8051?
- (j) What is the use of DPTR?

SECTION-B

2. Differentiate between memory mapped I/O and peripheral mapped I/O in case of 8085 microprocessor.
3. Draw and explain the timing diagram of memory read cycle.
4. A switch is connected to pin P1.0 and LED to pin P2.7. Write a program to get the status of the switch and send it to the LED. At the same time, generate a waveform of 100 microsecond at pin p3.2.
5. Write a program to generate a square wave of 2 KHz frequency at pin 2.3 of 8051 microcontroller.
6. Discuss the various registers of 8051 microcontroller.

SECTION-C

7. What is the function of SBUF register? Discuss the various steps to transfer data serially.
8. Classify and explain different types of 8085 instructions with examples.
9. Show the connections for Interfacing of DAC with 8051 and write a program to demonstrate its working.

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Roll No.

Total No. of Pages : 02

Total No. of Questions :

B.Tech (Computer Science) (2011 Onwards) (Sem.-6)

OPERATING SYSTEMS

Subject Code : BTCS-401

M.Code : 71120

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Q1 Answer briefly :

- a) List various functions of an Operating System.
- b) Write atleast two advantages of layered architecture of Operating System.
- c) Define the term Turnaround time and waiting time.
- d) Explain the term PCB.
- e) Explain in brief about the term Fragmentation in reference to memory management.
- f) Explain in brief about Thrashing.
- g) Define the term seek time and rotational latency time.
- h) Differentiate between Network operating System and Distributed operating System.
- i) Why is disk scheduling important?
- j) List various goals of Protection.

SECTION-B

- Q2 Write a note on the functions of kernel and shell.
- Q3 Define the term deadlock. Explain deadlock prevention in detail.
- Q4 Explain the concept of distributed operating system in detail.
- Q5 Differentiate between LINUX and Windows based operating systems.
- Q6 Define the term security. Explain various goals of security

SECTION-C

- Q7 Explain the paging scheme of memory management in detail.
- Q8 Write a detailed note on File System Architecture.
- Q9 a) Write a detailed note on Device management policies.
b) Explain the concept of Process synchronization in detail.

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ECE)/(ETE) (2011 Onwards) (Sem.-6)

WIRELESS COMMUNICATION SYSTEM

Subject Code : BTEC-602

M.Code : 71122

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1) Answer briefly :

- a. What is guard space?
- b. What are the advantages of cellular system?
- c. What is authentication centre?
- d. What are bearer services?
- e. What is Doppler spread?
- f. Which modulation formats are used for high data rate and low data rate in EDGE?
- g. How much there is increased in spectrum efficiency offered by 3G compared to 2G?
- h. If the cluster size N is reduced while the cell size is kept constant then what is the effect on capacity?
- i. How will you define PN sequences used in CDMA?
- j. What is LTE?

SECTION-B

- 2) Generalized 4G key challenges and their proposed solutions.
- 3) Explain orthogonal covering in CDMA.
- 4) Explain the frame structure in GSM along with different burst format.
- 5) What are the various physical factors which influence small scale fading?
- 6) Write short note on paging system.

SECTION-C

- 7) With the help of neat block diagram explain forward CDMA channel modulation process.
- 8) Consider a cellular system with four cell reuse pattern. Let the bandwidth allocated is 60 MHz to a FDD cellular telephone system using two 30 KHz simplex channels for providing full duplex control of one channel. Calculate the total number of channels available in one cell.
- 9) Compare with tabular format HSCSD, GPRS, EDGE, W-CDMA, IS-95B and CDMA-2000 taking these parameters (1) Channel bandwidth (2) duplexing (3) infrastructure change (4) required new spectrum (5) required new handsets.

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ETE)/(ECE) (2011 Onwards) (Sem.-6)

MICROWAVE AND RADAR ENGINEERING

Subject Code : BTEC-601

M.Code : 71121

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
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SECTION-A

1. Answer briefly :

- a) Conventional tubes
- b) PIN
- c) Phase shifter
- d) SWR
- e) Radar range ambiguities
- f) Blind speed
- g) Range tracking system
- h) Doppler velocity determination
- i) Matched termination
- j) CW radar

SECTION-B

2. Write a note on TWT microwave tube.
3. Describe various ferrite devices in detail.
4. Explain the principle and operation of MTI radars.
5. Describe PRF with the help of diagram.
6. How can the microwave components be analyzed using s-parameters?

SECTION-C

7. Write a note on Microwave bridges.
8. Define scanning. Describe different types of scanning techniques.
9. Explain MASER in detail. Also write its advantages and disadvantages.

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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ECE/ETE) (E-I 2011 Onwards)
(Sem.-6)

INFORMATION THEORY AND CODING

Subject Code : BTEC-907

M.Code : 71236

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Answer briefly :

- a) Define mutual information and its properties.
- b) Define Hamming weight and Hamming distance. Find the hamming weight of 10110 and the hamming distance between 1111 and 0000.
- c) Define bandwidth efficiency.
- d) Explain in brief Go Back N ARQ system.
- e) Define code efficiency.
- f) Enumerate the properties of a syndrome.
- g) Write the properties of information.
- h) What is meant by constraint length and free distance of a convolution code?
- i) What is the significance of a syndrome vector in the context of error control coding?
- j) Consider $G = [100111; 010110; 001101]$, find out parity check matrix.

SECTION-B

- Q2. What do you understand by information? What are its units? How does it relate to the entropy?
- Q3. Explain the encoding method of a (7, 4) linear block code.
- Q4. A BSC has the error probability $p = 0.2$ and the input to the channel consists of 4 equiprobable messages $x_1 = 000$; $x_2 = 001$; $x_3 = 011$; $x_4 = 111$. Calculate :
- $p(0)$ and $p(1)$ at the input
 - Efficiency of the code
- Q5. What is meant by stop-and-wait ARQ? Explain.
- Q6. Explain the working of (2,1,3) convolutional encoder using transform domain approach.

SECTION-C

- Q7. Discuss Shanon's Hartley theorem based on channel capacity. How does channel capacity change if bandwidth is increased to infinity? Comment on the orthogonal signaling performance on the basis of theorems.
- Q8. For a (7, 4) cyclic code, the generating polynomial $g(x) = 1 + x + x^3$. Find the code word if data word is :
- 0011
 - 0100

Show that how cyclic code is decoded to get word for previous case (a).

- Q9. Construct the Huffman code with minimum code variance for the following probabilities and also determine the code variance and code efficiency :

{0.25, 0.25, 0.125, 0.125, 0.125, 0.0625, 0.0625}

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ECE/ETE) (2011 Onwards) (Sem.-6)
ENGINEERING ECONOMICS & INDUSTRIAL MANAGEMENT
Subject Code : BTEC-603
M.Code : 71123

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. **SECTION-C** contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

SECTION-A

Q1) Answer briefly :

- a) Define Variable Cost.
- b) What is minimum cost analysis?
- c) What is Uncertainty?
- d) Define Industrial Management.
- e) What is project matrix?
- f) Define Depreciation.
- g) What are the duties of store manager?
- h) What is span of control?
- i) What is motivation?
- j) Explain the importance of delegation of authority.

SECTION-B

- Q2) What is Taylor's scientific management?
- Q3) Discuss Mayo's Hawthorne study.
- Q4) What are the types of depreciation?
- Q5) Explain the types of organization along with characteristics.
- Q6) Explain the estimating procedure for material cost and labor cost.

SECTION-C

- Q7) Define Motivation. Explain Maslow's hierarchy of need theory along with diagram.
- Q8) Discuss the methods of cost estimation used in various manufacturing operations.
- Q9) Define Inventory Control System. Differentiate between continuous review system and periodical review system.

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ECE)/(ETE) (2011 Onwards) (Sem.-6)

VLSI DESIGN

Subject Code : BTEC-604

M.Code : 71124

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Answer briefly :

- a) With one example each differentiate between STD_LOGIC and STD_ULONGIC.
- b) Perform the following using *sra* and *sll* shift operators :
 - (i) 10100101
 - (ii) 01011010
- c) Explain subtype for any data type with an example.
- d) Define pull-up and pull-down ratios of NMOS.
- e) Explain scalar data type in VHDL with an example.
- f) Describe the significance of process statement.
- g) What is propagation delay?
- h) Differentiate between Arrays and Records in VHDL.
- i) Discuss the wiring capacitances,
- j) What is meant by body effect?

SECTION-B

2. Explain various data objects in VHDL language each with two examples.
3. What is the significance of process statement in VHDL? Explain with an example.
4. Write a VHDL code for full adder using behavioural modelling style.
5. Does the inverter with a lower V_{OL} always have the shorter high-to-low switching time? Justify your answer.
6. Describe in detail twin tub CMOS process of fabrication.

SECTION-C

7. Design 8×1 MUX using two $4:1$ MUX and one $2:1$ MUX along with its diagram. Implement 8×1 multiplexer in VHDL using structural modelling style.
8. Consider a CMOS inverter circuit with the following parameters :
 $V_{DD} = 3.3V$, $V_{TO,n} = 0.6V$, $V_{TO,p} = -0.7V$, $k_n = 200\mu A/V^2$, $k_p = 80\mu A/V^2$ Calculate the noise margins of the circuit. Notice that the CMOS inverter being considered here has $k_R = 2.5$ and $V_{TO,n} \neq |V_{TO,p}|$ hence it is not a symmetric inverter.
9. Discuss about the effects of scaling down the dimensions of MOS circuits and systems.

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Total No. of Pages : 02

Total No. of Questions :

B.Tec (2011 Batch E-II) (Sem.-7, 8)
ARTIFICIAL INTELLIGENCE TECHNIQUES & APPLICATIONS

Subject Code : BTEC-911
M.Code : 71915

Max. Marks : 60

Time : 3 Hrs.

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Answer briefly :

- a) What do you mean by the term perceptron?
- b) What is the significance of neural networks in the evolution of AI?
- c) What is an expert system?
- d) Differentiate between crisp and fuzzy set theory.
- e) Define Adaline and Madaline.
- f) What is Inferential Knowledge?
- g) What are the phases involved in designing a problem solving agent?
- h) What is rule based learning?
- i) Define Mutation.
- j) Define any two Fuzzy set operations with example.

SECTION-B

2. Draw and explain the Hopfield Neural network.
3. Write an algorithm for calculating min-max decisions. What is the role of alliances in multiplayer games?
4. Explain the string coding and selection methods of chromosomes.
5. Differentiate between Mamdani and Sugeno fuzzy inference system.
6. How forward chaining is different from backward chaining inference method?

SECTION-C

7. Explain the various defuzzification methods.
8. Discuss various learning methods in neural networks.
9. Write short note on :
 - a) Conditional planning
 - b) Reinforcement learning

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ECE) (2011 Batch E-III)
B.Tech.(ETE) (2011 Onwards E-III) (Sem.-7,8)

MOBILE COMPUTING

Subject Code : BTEC-919

M.Code : 71924

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

SECTION-A

1) Answer briefly :

- a. What is encapsulation?
- b. List any two advantages of I-TCP.
- c. List the problem related with reverse tunneling.
- d. Explain the use of broadcast control channel.
- e. Mention the different entities in mobile IP.
- f. List the various approaches for security.
- g. State hidden terminal problem.
- h. What happens to the standard TCP in case of disconnection?
- i. What is WAP gateway?
- j. List out various value added services through GSM.

SECTION-B

- 2) What is Handoff? What is roaming? How do you perform handoff during roaming?
- 3) How can DHCP be used for mobility and support to mobile IP? Explain.
- 4) Explain function of each layer in WAP architecture.
- 5) What is Bluetooth? Where it is used? Also describe the general format of packet and packet header in Bluetooth technology.
- 6) Explain the term mobile computing and also give any suitable live example with merit of mobile computing.

SECTION-C

- 7) What are MAC issues? What is Hidden node and exposed node problem? How it is resolved?
- 8) Name the main difference between ad-hoc networks and other networks. What advantages do Ad-hoc networks offer? Explain in detail by giving suitable example.
- 9) Explain dynamic secure routing in detail.

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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ECE)(2011 Batch)/(ETE) (2011 Onwards) (Sem.-7,8)

COMPUTER NETWORKS

Subject Code : BTCS-403

M.Code : 71909

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Q1 Answer briefly :

- a) Differentiate connection oriented and connectionless services.
- b) Define Intranet.
- c) What is use of bridge?
- d) Why do we need framing in networking?
- e) What causes jitter on a network?
- f) What is the purpose of ALOHA protocol?
- g) What is the purpose of load shedding?
- h) How does packet switching work?
- i) What is multicast IP routing?
- j) What is difference between IPv4 & IPv6?

SECTION-B

- Q2 What is a VLAN and what is the purpose of a VLAN?
- Q3 How HDLC protocols are used for transmitting data between network points?
- Q4 What are congestion prevention policies? Explain congestion control in virtual circuit subnets.
- Q5 Give the introduction of routing in mobile Ad Hoc network.
- Q6 How virtual private networks enable users to send and receive data across networks?

SECTION-C

- Q7 Explain the communication protocols and standards in details. What is need of TCP/IP reference model?
- Q8 Write short notes on following :
- a. Shortest Path Routing
 - b. Flooding
- Q9 What is IPSec and how it works? What are the protocols used to provide IP security?

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B.Tech.(ECE) (2011 Batch)/(ETE) (2011 Onwards) (Sem.-7,8)

OPTICAL COMMUNICATION

Subject Code : BTEC-702

M.Code : 71911

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

- a) Modulation formats
- b) Fiber modes
- c) Non-radiative combination
- d) Sensitivity degradation
- e) Fiber bandwidth
- f) Reflection feedback noise
- g) SCM
- h) Source fiber coupling
- i) Optical fiber as a communication channel
- j) Limitations on BER

SECTION-B

2. Write a note on design issues during fiber manufacturing.
3. A multimode graded index fiber exhibits total pulse broadening of $0.1 \mu\text{s}$ over a distance of 15km. Estimate the maximum possible bandwidth on the link assuming no intersymbol interference, pulse dispersion per unit length.
4. Differentiate between p-i-n and avalanche photodiodes.
5. Define power budget. Describe the various sources of power penalty.
6. Write a note on WDM lightwave systems.

SECTION-C

7. Describe attenuation and its types in detail.
8. Differentiate between LED and Lasers. Explain different types of lasers in detail.
9. Explain optical receiver design by considering various issues and components used in it.

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B.Tech
C&A

Roll No.

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B.Tech.(3D Animation & Graphics) (2012 Onwards)

B.Tech.(CSE)/(IT) (2011 Onwards)

(Sem.-3)

DATA STRUCTURES

Subject Code : BTCS-304

M.Code : 56594

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

SECTION-A

Answer briefly :

- 1) How pointers are used to manage address of memory?
- 2) What is dangling pointer give example?
- 3) Give some applications of stack.
- 4) How time complexity of an algorithm is computed?
- 5) Discuss recursive procedures in trees.
- 6) Discuss AVL trees.
- 7) Write use of heap sort.
- 8) What is undirected graph?
- 9) Discuss rehashing in hash tables.
- 10) Give the syntax of selection sort.

SECTION-B

11. How queues are represented in memory? Write their applications.
12. What are the tree traversal techniques? Explain each with an example.
13. What is Stack? Why it is known as LIFO? Write an algorithm using PUSH and POP.
14. Give idea of hashing and its use as hashing function.
15. Explain Inorder, Preorder and Postorder Traversal operation on Binary tree with example.

SECTION-C

16.
 - a. Write the procedure to implement the adjacent matrix.
 - b. Define data structure graph. How they are represented in memory?
17. What do you mean by Link list? Write an algorithm to insert and delete a node in Singly Linked List.
18. How does a linear search algorithm work? Give the syntax by taking an example set. Compute the complexity of linear search algorithm.

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Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(CSE/IT) (2011 Batch) (Sem.-3)

DISCRETE STRUCTURES

Subject Code : BTCS-302

M.Code : 56592

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Answer briefly :

1. Multigraph
2. Total order relation
3. Order of recurrence relation
4. Cutset
5. Bijective function
6. Boolean ring
7. Semigroup
8. Chromatic ring
9. Group
10. Complexity of linear search

SECTION-B

11. Define Hashing? Explain its advantages.
12. Prove that intersection of two equivalence relations is an equivalence relation.
13. Show that the intersection of two left ideals of a ring is again a left ideal of a ring.
14. Solve the recurrence relation $a_n + 5a_{n-1} + 6a_{n-2} = 3n^2 - 2n + 1$
15. Prove that a connected graph G is Eulerian if and only if all vertices are of even degree.

SECTION-C

16. Define abelian group. Discuss its properties.
17. Show that union of two subgroups is a subgroup if and only if one is contained in other.
18. Show that S is an ideal of $S+T$, where S is an ideal of ring R and T any subring of R .

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(CSE)/(IT) (2011 Onwards)

B.Tech.(3D Animation & Graphics) (2012 Onwards)
(Sem.-3)

COMPUTER ARCHITECTURE

Subject Code : BTCS-301

M.Code : 56591

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

- Q1 Differentiate between Computer Architecture and Organization.
- Q2 What do you understand by Fetch Cycle?
- Q3 Differentiate between Arithmetic Shift Left and Arithmetic Shift Right.
- Q4 What is a microprogram sequencer?
- Q5 What is instruction-level parallelism?
- Q6 Why does increasing the capacity of cache tend to increase its hit rate?
- Q7 What do you mean by memory hierarchy?
- Q8 Draw a neat diagram for handshaking mode of data transfer.
- Q9 How many 128×8 ROM memory chips are needed to provide a memory capacity of 4096×16 ?
- Q10 What do you mean by Inter-processor Communication?

SECTION -B

- Q11 Give the comparison between hardwired control unit and micro programmed control unit.
- Q12 Compare RISC and CISC architecture.
- Q13 Explain all the phases of instruction cycle.
- Q14 What are the various types of interrupts? Explain.
- Q15 Formulate a six-segment instruction pipeline for a computer. Specify the operations to be performed in each pipeline.

SECTION -C

- Q16 Explain with an example, how effective address is calculated in different types of addressing modes?
- Q17 Explain in detail the different mappings used for cache memory. Compare them.
- Q18 With neat block diagram, explain how DMA controller is initialized for DMA data transfer?

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B.Tech.(Electronics Engg.)/(3D Animation & Graphics) (2012 Onwards)
B.Tech.(CSE)/(ECE)/(Electronics & Computer Engg.)/(ETE)/(IT)
(2011 Onwards) (Sem.-3)

OBJECT ORIENTED PROGRAMMING USING C++

Subject Code : BTCS-305

M.Code : 56595

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Answer briefly :

- 1) Destructor
- 2) Dangling pointer
- 3) Arrays
- 4) Class
- 5) Static Class
- 6) Friend function
- 7) Call by value
- 8) Data types
- 9) Identifier
- 10) Pure virtual function

SECTION-B

- 11) Discuss the features of Constructors.
- 12) Differentiate between virtual and pure virtual functions.
- 13) Write a program to overload "+" operator.
- 14) Differentiate between static and dynamic memory allocation.
- 15) Discuss the use of exceptional handling in programming.

SECTION-C

- 16) Write a note on templates.
- 17) What are the various file opening modes? Explain.
- 18) What are different types of inheritance? Explain.

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Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(3D Animation & Graphics)(CSE/IT) (2012 Onwards)
(Sem.-3)

MATHEMATICS – III
Subject Code : BTAM-302
M.Code : 70808

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Answer briefly :

1. What do you mean by periodic functions? Also write period of $\sin 100x$.
2. Explain properties of Laplace transformation.
3. Define limit & Continuity of the function of complex variables.
4. Write down Runge-kutta Method.
5. Explain Poisson distributions.
6. Evaluate $L[t^3 e^{-3t}]$.
7. Find the differential equation of all spheres of fixed radius having their centres in the xy-plane.
8. Discuss the conditions for a fourier expansion.
9. Explain t-distribution.
10. Define mean & variance.

SECTION-B

11. If $f(x) = |\cos x|$, expand $f(x)$ as a fourier series in the interval $(-\pi, \pi)$.
12. Evaluate the integral by using Laplace transform $\int_0^{\infty} t e^{-2t} \sin t dt$.
13. Solve the following partial differential equations :
 - a) $p-q = \log(x+y)$
 - b) $xp-yq = y^2-x^2$
14. Solve : $r-4s+4t = e^{2x+y}$ where symbol's have their usual meaning
15. Determine the analytic function whose real part is $e^{2x} (x \cos 2y - y \sin 2y)$

SECTION-C

16. Apply Gauss-Seidel iteration method to solve the equations
 $20x + y - 2z = 17, 3x + 20y - z = -18, 2x - 3y + 20z = 25$
17. What do you mean by normal distribution, 31% of the items are under 45 & 8% are over 64. Find the mean & standard deviation of the distributions.
18. Two random samples are drawn from two normal populations are shown below :

A	17	27	18	25	27	29	13	17
B	16	16	20	27	26	25	21	

Test whether the samples are drawn from the same normal population.

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Total No. of Pages : 02

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B.Tech.(CSE)/(IT) (2011 Onwards) (Sem.-3)

DIGITAL CIRCUITS & LOGIC DESIGN

Subject Code : BTCS-303

M.Code : 56593

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Answer briefly :

1. Multiply 1011.01 with 110.1.
2. Discuss the principle of duality.
3. Distinguish between combinational and sequential logic circuits.
4. Define R-2R ladder DAC.
5. What is the purpose of state diagram?
6. Discuss race around condition in JK flip flop.
7. Draw logic diagram of 3-line to 8-line decoder.
8. Explain level triggering.
9. What is serial-out shift register?
10. Write short note on Programmable Logic Arrays.

SECTION-B

11. Explain the working of Gray code? Write its importance and uses.
12. Solve the following Boolean functions by using K-Map.
$$F = (w,x,y,z) = \Sigma (0,1,4,5,6,8,9,10,12,13,14)$$
13. With a neat block diagram explain the function of encoder. Explain parity checker.
14. Discuss the advantages and disadvantages of TTL Logic Family.
15. How does a Dynamic RAM cell works? Write its applications.

SECTION-C

16. a) What are Mealy and Moore models of sequential circuits?
b) Give the introduction of Quine-McCluskey method of minimization.
17. Explain the types of counter. Write the steps to design a Synchronous Counter using JK flip flops.
18. What are the types of analog to digital converter techniques? Explain any one in detail.

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Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(CSE) (2011) (Sem.-4)

MATHEMATICS - III

Subject Code : BTCS-402

M.Code : 56605

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Answer briefly :

1. Find the Fourier series expansion of the periodic function $f(x) = x$, $-2 < x < 2$.
2. Find inverse Laplace transform of $\frac{(s+1)^2}{(s-2)^4}$.
3. Find Laplace transform of $(t-2)^2 e^{3t}$.
4. Eliminate the arbitrary constants a and b from $z = ax + by + a^2b^2$, to obtain the partial differential equation governing it.
5. Find general solution of linear partial differential equation $2yz p + zx q = 3xy$
6. Show that the function $f(z) = \bar{z}$ is continuous at the point $z = 0$ but differentiable at $z = 0$.
7. Define Eigen Values and Eigen vectors of a square matrix.
8. The number of emergency admissions each day to a hospital is found to have Poisson distribution with mean 4. Find the probability that on a particular day there will be no emergency admissions.
9. Obtain the approximate value of $y(1.2)$ for the initial value problem $y' = -2xy^2$, $y(1) = 1$ using Euler's method.
10. Derive the expression of moment generating function about origin of a normal distribution.

SECTION-B

11. Obtain the Fourier series expansion of the function $f(x) = 4 - x^2$, $-2 \leq x \leq 2$ and hence show that $\frac{\pi^2}{12} = 1 - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \dots$

12. Using Laplace transform, solve the initial value problem

$$y'' + y = t, y(0) = 1, y'(0) = 0.$$

13. Find the solution of the given homogeneous partial differential equation

$$(D^4 - 2D^2 D'^2 + D'^4)z = 0.$$

14. Using Gauss Seidel iteration method, solve $4x + 2z = 6$, $5y + 2z = -3$, $5x + 4y + 10z = 11$.

15. Find the approximate values of $y(x)$ at the given points using Runge-Kutta method of fourth order for the initial value problem $y' = \sqrt{x+y}$, $y(0.4) = 0.41$ and given is $h = 0.2$ and $x \in [0.4, 0.8]$.

SECTION-C

16. i) State and prove second shifting property of Laplace transformation.

- ii) Show that the function $u(x, y) = 2x + y^3 - 3x^2y$ is harmonic. Find its conjugate harmonic function $v(x, y)$ and the corresponding analytic function $f(z)$.

17. i) Solve $5x \frac{dy}{dx} + y^2 - 2 = 0$ given is $y(4) = 1$ for $y(4.1)$ and $y(4.2)$, taking $h = 0.1$ using Modify Euler methods.

- ii) A continuous random variable X is normally distributed with mean 16 and standard deviation 5. Find the probability that $X \leq 25$ and $0 \leq X \leq 16$.

18. i) The heights of 8 males participating in an athletic event are found to be 175cm, 168cm, 165cm, 170cm, 167cm, 160cm, 173cm and 168cm. Can we conclude that the average height is greater than 165cm? Test at 5% level of significance.

- ii) Two random samples of sizes 9 and 7 gave the sum of squares of deviations from their respective means as 175 and 95 respectively. Can they be regarded as drawn from normal populations with the same variance?

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(CSE)/(IT) (2011 Onwards) (Sem.-4)

OPERATING SYSTEMS

Subject Code : BTCS-401

M.Code : 56604

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Explain the need of an Operating System.
2. Explain the term deadlock in brief.
3. Differentiate between External and Internal Fragmentation.
4. Write advantages of virtual memory concept.
5. Explain the term PCB in brief.
6. Differentiate between seek time and rotational latency.
7. Write two advantages of LINUX Operating System.
8. Why is disk scheduling important?
9. Define the term file. List various attributes of a file.
10. Write various goals of Protection.

SECTION-B

11. Explain different roles of operating system in brief. (5)
12. Explain in detail the following CPU scheduling algorithms : (2.5)
- (a) Shortest Job First. (2.5)
- (b) Multilevel feedback Queue scheduling. (5)
13. Write a brief note on Segmentation scheme of memory management. (5)
14. Differentiate between UNIX and Windows based operating systems. (5)
15. Define the term security. Explain various goals of security (5)

SECTION-C

16. Explain in detail the various Algorithms of Disk Scheduling with an example. (10)
17. (a) Explain in detail the Layered Architecture of an OS. (5)
- (b) Write a brief note on Logical File System. (5)
18. Explain **any three** Page Replacement algorithms with an example. (10)

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(CSE)/(IT) (2011 Onwards) (Sem.-4)

COMPUTER NETWORKS-I

Subject Code : BTCS-403

M.Code : 56606

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt ANY FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt ANY TWO questions.

SECTION-A

Answer briefly :

1. Explain in brief about Network Topologies.
2. Differentiate between Wired and Wireless Networks.
3. What are Advantages and Disadvantages of Infrared wireless transmission?
4. Explain in brief the term Noise in reference to transmission impairments.
5. Explain the term checksum in reference to error detecting codes.
6. Differentiate between TCP and UDP Protocols.
7. What is IP addressing? How it is classified?
8. Define the term HDLC.
9. What do you mean by congestion? Also explain the cause of congestion?
10. Explain in brief about the term FTP.

SECTION-B

11. Write a brief note on following Differentiate between Circuit Switching, Packet Switching and Message switching. (5)
12. Write a detailed note on Go-back-N ARQ Sliding window protocol. (5)
13. Write a brief note on Network Layer Design Issues. (5)
14. Write a detailed note on connection establishment in case of transport Layer.
15. Write a brief note on following terms :
 - (a) Domain Name System (3)
 - (b) World Wide Web (2)

SECTION-C

16. Write a detailed note on TCP/IP reference Model. Also compare TCP/IP and OSI reference model. (10)
17. (a) Write a brief note on Frequency Division and Time Division Multiplexing techniques. (5)
(b) Write a detailed note on ALOHA. (5)
18. Write a detailed note on Distance Vector Routing. (10)

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Total No. of Pages : 02

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B.Tech.(CSE)/(Electronics & Computer Engg.)/(IT) (2011 Onwards)
(Sem.-4)

MICROPROCESSOR & ASSEMBLY LANGUAGE PROGRAMMING

Subject Code : BTCS-404

M.Code : 56607

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Explain the following :

1. Interrupt
2. Data Bus
3. Flags
4. DAD Instruction
5. 3-byte Instruction
6. DMA
7. Use of 8251
8. PUSH Instruction
9. ANI
10. Latch Signal

SECTION-B

11. Write a note on Motorola 68000.
12. Describe serial and parallel data transfer techniques.
13. What is the use of DMA controller?
14. Differentiate between instruction, machine and clock cycle.
15. Write an assembly language program to swap two numbers.

SECTION-C

16. Explain the architecture and pin diagram of 8085.
17. Explain USART in detail.
18. Explain how traffic light system can be interfaced with 8085.

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 18

B.Tech. (CSE/IT) (2012 Onwards) (Sem.-4)

DISCRETE STRUCTURES

Subject Code : BTCS-402

M.Code : 71106

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Answer briefly :

- 1) Demorgan's Law
- 2) Chromatic number of K_n graph (Complete Graph)
- 3) Group
- 4) B-Tree
- 5) Heaps
- 6) Complexity of binary search
- 7) Find distinct number permutations formed from all letters of word "ENGINEERING"
- 8) Simple graph
- 9) Total order relation
- 10) Commutative Ring

SECTION-B

- 11) How many bit strings of length 8 either start with 1-bit or ends with two bits 00?
- 12) Show that the intersection of two left ideals of a ring is again a left ideal of a ring.
- 13) Solve the recurrence relation $a_n + 5a_{n-1} + 6a_{n-2} = 3n^2 - 2n + 1$
- 14) Prove that a connected graph G is Eulerian if and only if all vertices are of even degree.
- 15) Prove distributive law for sets.

SECTION-C

- 16) Describe cut point, spanning tree and bridges each with example
- 17) Show that union of two subgroups is a subgroup if and only if one is contained in other.
- 18) Prove that sum of degree of all vertices in a graph is equal to twice the number of edges in G .

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(CSE) (2011 Onwards) (Sem.-5)
COMPUTER PERIPHERALS & INTERFACES

Subject Code : BTCS-505

M.Code : 70538

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Answer briefly :

1. What is serial communication?
2. Parallel ports are prone to crosstalk. Explain.
3. Compare ISA and EISA I/O bus system.
4. Which port is specially designed for graphics adapters?
5. What is the role of the cooling system?
6. What is IEEE 1394?
7. What is ATA standard?
8. What is the need for a TV tuner?
9. List the various video adapter types.
10. What is the role of the interrupt?

SECTION-B

11. Assume that you own a hardware company; a customer approaches you seeking whether to use IDE or SCSI. Which of the two will you recommend and why?
12. When designing a hardware component, cost plays a critical role. Explain how cost performance analysis is done?
13. What is the purpose of Interrupt Request Line (IRQ)?
14. A keyword is used to get input from the user. Explain the working of a keyword starting from a key pressed to displaying it on the monitor.
15. Write a short note on using USB to interface a mouse.

SECTION-C

16. What is the role of a device driver? Explain w.r.t. DOS-based system.
17. What is DMA? Explain its working in detail.
18. Explain the various steps to test serial and parallel ports.

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(CSE) (2011 Onwards) (Sem.-5)

COMPUTER GRAPHICS

Subject Code : BTCS-504

M.Code : 70537

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Answer briefly :

1. Write a general function for Rasterization.
2. Explain the role of pixel and frame buffer in graphics devices.
3. How much time is spent scanning across each row of pixels during screen refresh on a raster system with resolution and refresh rate of 60 frames per second?
4. What is the meaning of aspect ratio?
5. Explain how to display file structure and control test.
6. Compare the computation done in Digital Difference Analyzer (DDA) algorithm with Bresenham's line drawing algorithm.
7. What is the difference between pointing and positioning devices?
8. How a character is formed in graphics.
9. What is the need for a graphics device driver?
10. How world coordinate system is converted to screen coordinate system.

SECTION-B

11. The sum of a point and a vector is well defined, but is it a point or a vector. Explain with proper sketches.
12. What is a curve interpolation? As far as Splines are concerned, what do Hermite, Bezier and B-Splines curves indicate?
13. a) Explain parametric representation of geometry with examples.
b) List the different input and output components that are typically used with virtual reality system.
14. Explain in detail different illumination methods and different Rendering methods.
15. What is event handling enchoing? Explain in details with examples.

SECTION-C

16. Derive simple illumination model. Include the contribution of Diffuse, ambient and specular reflection. What are the various logical graphics input primitives?
17. Define vanishing points. Is the location of vanishing point directly related to the giving point? Explain how?
18. a) What is Segmentation? Give an example of a Segmentation table.
b) Write the algorithm for filling polygons and explain it with a suitable example.

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(CSE) (2011 Onwards) (Sem.-5)

RELATIONAL DATABASE MANAGEMENT SYSTEM-I

Subject Code : BTCS-502

M.Code : 70535

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. What are DML commands in SQL?
2. What is a multi-valued dependency?
3. What is a lock in concurrency control?
4. What are attributes?
5. Explain 'C' in 'ACID' properties?
6. What is the difference between B -Trees and B + Trees?
7. Define transaction.
8. Differentiate between Grant and Revoke.
9. Define Normalization?
10. What is a Sparse Index?

SECTION-B

11. Draw any ER Diagram which demonstrates the following :

- a. Entity
- b. Attribute
- c. Multi-valued attribute
- d. Composite attribute
- e. Derived attribute

(5)

12. What is a precedence graph? What is a conflict serializable schedule? Can precedence graph be used to detect a conflict serializable schedule? (5)
13. Consider a relation R with attribute set {A, B, C, D} and functional dependency set $F = \{A \rightarrow B, B \rightarrow C, C \rightarrow D\}$. This relation is decomposed into three sub relations {AB, BC, CD}. Check if the decomposition is dependency preserving or not. Discuss. (5)
14. Attempt the following :
 - a. Explain Lost-Update Problem? (2)
 - b. How can Lost-Update problem be solved? (3)
15. What are the properties of decomposition? Explain in detail with the help of examples. (5)

SECTION-C

16. Consider the following relation for published books : (10)

BOOK (Book_title, Author_name, Book_type, List_price, Author_affil, Publisher)

Author_affil refers to the affiliation of author. Suppose the following dependencies exist :

Book_title \rightarrow Publisher,

Book_type Book_type \rightarrow List_price

Author_name \rightarrow Author_affil

 - a. What normal form is the relation in? Explain your answer.
 - b. Apply normalization until you cannot decompose the relations further. State the reasons behind each decomposition.
17. Explain the following : (10)
 - a. Update Anomaly
 - b. Deletion Anomaly
 - c. Insertion Anomaly
 - d. Transitive Dependency
18. Answer the following :
 - a. Why is indexing required for a Database? (4)
 - b. Explain multi-level indexing. Is it true that all the levels of multi-level index are primary index? Discuss. (6)

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Total No. of Pages : 02

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B.Tech.(CSE) (2011 Onwards) (Sem.-5)
DESIGN & ANALYSIS OF ALGORITHMS

Subject Code : BTCS-503

M.Code : 70536

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Answer the following questions :

1. What is an algorithm?
2. If $f(n) = n!$ and $g(n) = 2n$, indicate whether $f = O(g)$, or $f = \Omega(g)$, or both ($f = \theta(g)$).
3. What do you mean by dynamic programming?
4. State the time complexity of Bubble sort.
5. Explain the applications of depth first search algorithm.
6. Describe asymptotic notation.
7. What is order statistics?
8. What do you mean by randomization?
9. What is convex hulls?
10. Explain the time complexity of binary search.

SECTION-B

11. Take the following list of functions and arrange them in ascending order of growth rate. That is, if function $g(n)$ immediately follows function $f(n)$ in your list, then it should be the case that $f(n)$ is $O(g(n))$.
 $f_1(n) = n^{2.5}$, $f_2(n) = \sqrt{2n}$, $f_3(n) = n + 10$, $f_4(n) = 10^n$, $f_5(n) = 100^n$, and $f_6(n) = n^2 \log n$
12. Sort the list 415, 213, 700, 515, 712, 715 using Merge sort algorithm. Also explain the time complexity of merge sort algorithm.
13. Explain breadth first search algorithm with an example.
14. Write a short note on approximation algorithms.
15. Explain the classes of P and NP.

SECTION-C

16. Explain Strassen's algorithm for matrix multiplication with the help of an example.
17. Write a short note for the following :
 - a. Divide and conquer technique
 - b. Greedy algorithm
18. a. Why do we perform topological sorts only on DAGs? Explain.
b. Using Dijkstra's algorithm find the shortest path from A to D for the following graph.

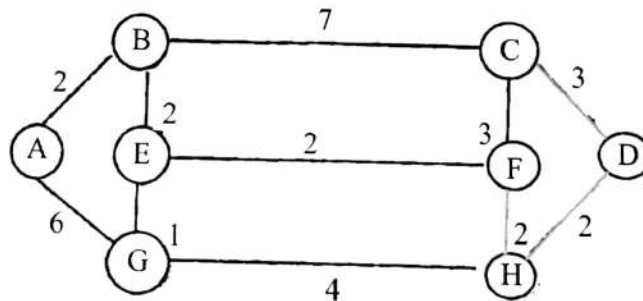


Fig.1

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Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(CSE/IT) (2011 Onwards) (Sem.-5)

COMPUTER NETWORKS-II

Subject Code : BTCS-501

M.Code : 70534

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

SECTION-A

1. Mention the protocols used by IPSec to provide security.
2. Why does ESP include a padding field?
3. What is meant by CBC-MAC?
4. What is fading?
5. List different IKE phases.
6. What is IS-95B for 2.5G CDMA?
7. List advantages of Wireless Local Loop?
8. Will Bluetooth and Wireless LAN interfere with each other?
9. Define Personal Area Network?
10. What is Authentication header?

SECTION-B

11. Provide a simple overview of IPv6 and compare it with IPv4.
12. Write a note on Internet Key Exchange protocol.
13. Compare Adhoc and Cellular networks.
14. Explain different types of Handoff strategies. What are the problems addressed by these techniques.
15. Write down a note on the evolution of wireless communication systems.

SECTION-C

16. List the order of various extension headers used in IPv6. Also explain their formats.
17.
 - a) Describe the evolution of 2.5 G TDMA standards.
 - b) Write a note on Bluetooth technology.
18. What is the difference between proactive and reactive routing protocols? Explain in detail **any two** routing protocols used in Adhoc networks?

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Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(CSE) (2011 Onwards) (Sem.-6)

SIMULATION AND MODELING

Subject Code : BTCS-601

M.Code : 71107

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt ANY FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt ANY TWO questions.

SECTION-A

Answer briefly :

1. How can we offset the disadvantages of simulation?
2. Define "Attribute" and "Activity" in the context of system simulation.
3. Describe Kendal-Lee notation for a queuing system.
4. What is hold and store block GPSS?
5. Mean and variance of Weibull distribution.
6. System capacity in context of queue system.
7. Define Chi-square test.
8. What is confidence interval estimation?
9. How the sample size is decided in simulation.
10. Dynamic mathematical model.

SECTION-B

11. Explain Steady State behaviour of Finite population.
12. Explain auto correlation Test for random numbers.
13. How can you select input model without data? Explain with example.
14. Describe in detail the three step approach for model validation?
15. What do you mean by time advance mechanisms in simulation? Discuss next-event time advance approach with flowchart.

SECTION-C

16. What is system simulation? Explain the steps involved in simulation study with flowchart.
17. What is inverse transformation technique? Explain how it is used for producing random variants from exponential distribution.
18. Explain the following :
 - a. Disadvantages of simulation.
 - b. Monte Carlo Simulation.

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(CSE) (2011 Onwards E-I) (Sem.-6)

WEB TECHNOLOGIES

Subject Code : BTCS-901

M.Code : 71110

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. **SECTION-C** contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

SECTION-A

1. Differentiate cookies from session variables.
2. What are interfaces in JAVA?
3. Differentiate between SMTP and POP.
4. What is a Scriptlet?
5. Write the JAVA script to print "Good-Day" using IF-ELSE condition.
6. What is meant by dynamic HTML?
7. When the namespace is called in XML? Why?
8. Differentiate between 'Get' and 'Post' methods in PHP.
9. Explain the role of web browser.
10. What are the major advantages and disadvantages of AJAX?

SECTION-B

11. Explain HTML text formatting tags with example.
12. Discuss the concept of function overloading in JAVA with example.
13. What are the drawbacks of HTML? How are they addressed in XML?
14. Elaborate Internet addressing and types of Internet connections.
15. Explain the concept of Exception Handling. How will you create your own exception?

SECTION-C

16.
 - a. Write a JavaScript that scrolls a text message in the status bar of the browser window.
 - b. Explain the frames and table tags of HTML with suitable example.
17.
 - a. Write a PHP program to print reverse of any number.
 - b. Give a note on need and applications of XML.
18. Discuss AJAX architecture and compare it with DOM.

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Total No. of Pages : 02

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B.Tech.(CSE)(2011 Onwards) (Sem.-6)

RDBMS-II

Subject Code : BTCS-602

M.Code : 71108

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

- Q1 What are the four important properties of transaction that a DBMS must ensure to maintain database?
- Q2 Discuss the two phase locking protocol.
- Q3 Compare OLTP and OLAP systems.
- Q4 Distinguish between ORDBMS and OODBMS.
- Q5 What is data mart? How it differs from a data warehouse?
- Q6 What do you mean by database independence? Discuss its types.
- Q7 What is normalization? Discuss 1NF.
- Q8 What do you mean by big data? Write its main properties.
- Q9 Discuss types of database failure.
- Q10 What do you mean by query optimization? Discuss.

SECTION-B

- Q11 Compare DDL, DML and DCL. Give two examples of each.
- Q12 What is a timestamp? How does the system generate timestamps? Discuss the timestamp ordering protocol for concurrency control.
- Q13 What is Data Mining? Discuss different phases in the data mining process.
- Q14 Explain the architecture of a data warehouse with the help of a diagram.
- Q15 Explain the steps involved in query processing.

SECTION-C

- Q16 Explain various recovery techniques in detail.
- Q17 What is Normalization? Explain in detail different forms of normalization with suitable example.
- Q18 Explain the architecture of a distributed database system with the help of a diagram. Write advantages and disadvantages of Distributed databases in comparison to centralized database.

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Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(CSE) (O.E. 2011 Onwards) (Sem.-6)
TOTAL QUALITY MANAGEMENT
Subject Code : ME-251
M.Code : 71553

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Answer briefly :

- 1) What do you understand by Total Quality Management?
- 2) Discuss the features of TQC.
- 3) What is waste elimination?
- 4) How computer can be useful in controlling the quality of a product?
- 5) Enumerate the steps involved in problem identification and solving process.
- 6) Define internal benchmarking and competitive benchmarking.
- 7) Define quality policy.
- 8) Enlist benefits of Material Requirement Planning.
- 9) What is the relevance of ISO 9000 in an organization?
- 10) Define FMEA.

SECTION-B

- 11) How employees can be empowered in industry to implement TQM?
- 12) Describe briefly the steps involved in Quality function deployment study.
- 13) Define Just-in-time (JIT) system. Describe key elements of JIT manufacturing system.
- 14) What are various types of problems and how they are identified in an organization?
- 15) What are the reasons behind undertaking a benchmarking study in an organization?
Describe briefly the steps involved in the benchmarking process.

SECTION-C

- 16) Write elements of TQM. What are different TQM models? Explain **any one** in detail.
- 17) a) What are the aims, benefits and weaknesses of ISO-9000?
b) What are ISO-9000 requirements for implementations?
- 18) a) Write a short note on Taguchi Methods.
b) Differentiate between working of Push and Pull Kanban's deployed in Just in time (JIT) system.

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Total No. of Questions : 18

Total No. of Pages : 03

B.Tech.(CSE) (O.E. 2011 Onwards) (Sem-6)

OPTIMIZATION TECHNIQUES

Subject Code : CH-304

M.Code : 71555

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Define the property of continuity.
2. What are the six steps used to solve optimization problem.
3. What is constrained problem and give one example.
4. Give the classification of optimization problems.
5. Are the following functions continuous? (a) $f(x) = 1/x$ and (b) $f(x) = \ln(x)$
6. State disadvantages of Newton's method for one-dimensional search?
7. State the Kuhn-Tucker conditions.
8. What is the difference between local optimal point and global optimal point?
9. Is it necessary that the Hessian matrix of the objective function always be positive definite in an unconstrained minimization problem?
10. Find two non-negative numbers whose sum is 9 and so that the product of one number and the square of the other number is a maximum.

SECTION-B

11. Does the following set of constraints form a convex region?

$$g_1(x) = -(x_1^2 - x_2^2) + 9 \geq 0 \text{ and } g_2(x) = -x_1 - x_2 + 1 \geq 0$$

12. Apply golden section one dimensional search technique to reduce the interval of uncertainty for the maximum of the function $f = 6.64 + 1.2x - x^2$ from $[0, 1]$ to less than 2 percent of its original size.
13. Consider the objective function,

$$f(x) = x_1^2 + 2x_1 + 3x_2^2 + 6x_2 + 4$$

Find the stationary points and classify them using the Hessian matrix.

14. Minimize $f(x) = x^2 - x$ using Secant method, with the two points $x = -3$ and $x = 3$.
15. Find the dimensions of a cylindrical tin (with top and bottom) made up of a sheet metal to maximize its volume such that the total surface area is equal to 22π .

SECTION-C

16. In crystal NaCl, each Na^+ or Cl^- ion is surrounded by 6 nearest neighbors of opposite charge and 12 nearest neighbors of the same charge. Two sets of forces oppose each other: the coulombic attraction and the hard-core repulsion. The potential energy $u(r)$ of the crystal is given by the Lennard-Jones potential expression,

$$u(r) = 4\epsilon \left[\left(\frac{\sigma}{r} \right)^{12} - \left(\frac{\sigma}{r} \right)^6 \right] \text{ where } \sigma > 0, \epsilon > 0 \text{ are constants.}$$

- a) Does the Lennard-Jones potential $u(r)$ have stationary points (s)? If it does, locate it (them).
- b) Identify the nature of the stationary point(s) min, max, etc.
- c) What is the magnitude of the potential energy at the stationary point(s).

Roll No.

Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(CSE/IT) (O.E. 2011 Onwards) (Sem.-6)

HUMAN RESOURCE MANAGEMENT

Subject Code : HU-251

M.Code : 71556

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Write briefly :

- 1) Scope of Human Resource Management.
- 2) Discuss the role of personnel function.
- 3) What is the objective of Contract labour (Regulation and abolition) Act, 1970?
- 4) How minimum wages are calculated as per Minimum wages act?
- 5) Social Assistance.
- 6) What is e- recruitment?
- 7) Differentiate between Industrial relations and human relations.
- 8) Career development and planning.
- 9) Job analysis/Job evaluation.
- 10) Can wages be paid in kind?

SECTION-B

- 11) Define HRM. How HRM is linked with other functions of management?
- 12) What are the various benefits under ESI Act, 1948?
- 13) Explain employee grievances and their redressal.
- 14) What is gratuity? How is it measured and who is eligible to get the gratuity as per Payment of Gratuity Act, 1972?
- 15) Give the importance of performance appraisal.

SECTION-C

- 16) Explain Employee Development. What are different methods of employees development?
- 17) What are various do's and don'ts in interviewing for interviewer and interviewee?
- 18) "*Over the period of time, Indian corporate world has witnessed a seismic change in workforce due to digitalization*", Explain how this change will affect the HRM systems of India Inc.

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Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(CSE) (2011 Onwards) (Sem.-7,8)

THEORY OF COMPUTATION

Subject Code : BTCS-702

M.Code : 71894

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt ANY FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt ANY TWO questions.

SECTION-A

Answer briefly :

1. Justify this statement " L is a subset of closure of alphabet".
2. Define automation.
3. Acceptability of a string by FA?
4. What is a yield of a derivation tree?
5. What is decidability?
6. Write formal definition of DFA.
7. Define regular expression.
8. Give definition of GNF.
9. List some properties of LR (K) grammars.
10. What is meant by halting problem?

SECTION-B

11. Explain NDPDA and DPDA with the help of example.
12. What do you mean by parsing? How Left most and Right most derivation helps to find out the ambiguity in a grammar?
13. Explain pumping lemma for Context free languages with the help of example.
14. Explain Chomsky classification of Grammars.
15. What are properties of regular languages?

SECTION-C

16. What is a context free grammar and explain closure properties of context free grammar?
17. What are Turing machines? Explain different ways by which we can represent the Turing machines.
18. Write short notes on :
 - a. Top Down parsing
 - b. LR(K) Grammars
 - c. NFA
 - d. Recursively enumerable language.

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Total No. of Pages : 02

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B.Tech.(CSE) (2011 Onwards) (Sem.-7,8)

ARTIFICIAL INTELLIGENCE

Subject Code : BTCS-701

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt ANY FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt ANY TWO questions.

SECTION-A

1. What is an expert system?
2. Explain fuzzy set.
3. What is the relevance of search and control strategies in problem solving?
4. What are the Problem Characteristics of Artificial Intelligence?
5. What is Heuristics?
6. Distinguish between fact and Predicate.
7. Explain the Bayesian Networks.
8. Explain Fuzzy logic.
9. What is conditional planning?
10. What is state space?

SECTION-B

11. Describe briefly the applications of reinforcement learning.
12. Explain with examples 'Decision Trees'.
13. Explain Bayesian networks with example.
14. What are the advantages of Genetic Algorithms?
15. Distinguish between Forward and backward chaining.

SECTION-C

16. Explain A* algorithm with example.
17. List various components of natural language understanding process. Describe syntactic analysis and semantic analysis in brief.
18. What are the limitations of Predicate logic as a tool for Knowledge representation? Illustrate through examples.

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B.Tech.(ECE) (2011 Batch) (Sem.-7,8)

EMBEDDED SYSTEMS

Subject Code : BTEC-701

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt ANY FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt ANY TWO questions.

SECTION-A

Write briefly :

- a) Compare little and big-endian modes in ARM processor.
- b) Differentiate between CPSR and SPSR.
- c) Implement the statement $x = (a+b) - c$, using ARM instructions.
- d) Discuss the role of write-back cache in ARM processors.
- e) Explain the instructions LDC and MRC with an example.
- f) Assume that x is an array of integers. Convert the following C statements into ARM assembly language.
 - (a) $x[8] = 100;$
 - (b) $x[10] = x[0];$
- g) Explain Jazelle mode of ARM.
- h) How is ARM processor different from other processors?
- i) Give different applications of ARM processors.
- j) List down the differences between ARM and Thumb Instructions.

SECTION-B

2. Which are the different conditional flags of ARM processor?
3. Explain the use of pointers with example.
4. Calculate the effective address of the following instructions if register R3=0x4000 and register R4 = 0x20 (i) STRH R9,[R3,R4] (ii) LDR R8,[R3,R4,LSL#3] (iii)LDR R7,[R3],R4
5. Differentiate between conditional jump and unconditional jump instructions using appropriate examples.
6. Write an embedded C program to rotate stepper motor in clockwise direction. Draw a neat interfacing diagram of stepper motor with ARM7 processor.

SECTION-C

7. Use ldm and stm to write a short sequence of ARM assembly language to copy 16 words of data from a source address to a destination address. Assume that the source address is already loaded in r0 and the destination address is already loaded in r1. You may use registers r2 through r5 to hold values as needed. Your code is allowed to modify r0 and/or r1.
8. With a neat diagram explain the different general purpose registers of ARM processors.
9. Write a program to display "ENGINEERING" on LCD using LPC2148 ARM processor. Also draw interfacing diagram.

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B.Tech.(CSE/IT) (2011 Onwards E-II) (Sem.-7,8)
SOFTWARE TESTING AND QUALITY ASSURANCE
Subject Code : BTCS-905
M.Code : 71897

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Answer briefly :

1. Explain the objective of project planning process.
2. Distinguish software faults and software failures.
3. What is defect severity?
4. Explain product quality metrics.
5. How would formulate the cost of defect?
6. Explain debugging process in short.
7. Differentiate verification and validation.
8. How to identify and refine the risk?
9. Explain SQA activities in short.
10. How to perform client/server system testing.

SECTION-B

11. Units and stubs are not needed for unit testing because the modules are tested independently of one another. Comment on the statement.
12. How would you classify integration testing and system testing? Explain with example.
13. Differentiate alpha testing from beta testing and discuss in detail about the phases in which alpha and beta testing is done and how it is related to milestone and deliverable.
14. Discuss the object oriented metrics. What is the importance of metrics in object oriented software development?
15. Why does software fail after it has passed from acceptance testing? Explain.

SECTION-C

16. Determine and prepare the test cases for acceptance, usability and accessibility testing with the help of real time example.
17. Explain the SCM process with version control and change control with the help of suitable example.
18. Write short notes on the list given below :
 - a) CMM
 - b) Formal Technical Reviews
 - c) BVA
 - d) ISO 9126

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Roll No.

Total No. of Pages : 02

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B.Tech.(CSE/IT) (2011 Onwards E-II) (Sem.-7,8)

BUSINESS INTELLIGENCE

Subject Code : BTCS-908

M.Code : 71900

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Define the following :

1. Differentiate between OLTP and OLAP systems..
2. What is Support Vector Machine?
3. List the legal and ethical limits of BI software.
4. State the uses of BI in crime management.
5. What is meant by CRM?
6. What are the uses of mining in banking industry?
7. Distinguish between private and public intelligence?
8. What is K-Nearest Neighbor classification technique?
9. What are Balanced Scorecards?
10. What are Genetic Algorithms?

SECTION-B

11. Differentiate between ER modelling and Multi-dimensional modelling with suitable examples.
12. What is snow flake scheme? Give an example.
13. Write short note on data mining tools.
14. Explain virtual data warehouse with an example.
15. Write short note on Meta data models.

SECTION-C

16. Explain in detail the extract/transform/load (ETL) design of an automated warehouse.
17. Explain the role of BI in healthcare industry.
18. Explain data mining and the various processes of data mining.

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Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(CSE) (2011 Onwards E-II) (Sem.-7,8)

SOFTWARE PROJECT MANAGEMENT

Subject Code : BTCS-907

M.Code : 71899

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Write briefly :

- 1) COCOMO2
- 2) PERT and CPM
- 3) Software Project Management
- 4) Test Automation
- 5) ISO
- 6) Explain the use of Gantt Charts in Scheduling with an example.
- 7) What options do we have when defining the structure of a software team? Explain in detail.
- 8) Explain the Nominal Group Technique and its use.
- 9) Discuss various effects of schedule compression.
- 10) Discuss the importance of ethics in a project.

SECTION-B

- 11) Give the difference between product-oriented deliverables and project-oriented deliverables.
- 12) Explain the steps required to build a Work Breakdown Structure.
- 13) Describe five software application areas in which software safety and hazard analysis would be a major concern. Also, discuss how each can be tackled?
- 14) What do you mean by critical path analysis? Explain with the help of suitable example.
- 15) What factors need to be considered to organize any software team? How to assign the right task to the right person?

SECTION-C

- 16) What is the project budget? Explain different steps in cost estimation. What are the different types of cost need to be considered in cost estimation?
- 17) As a training manager, you are responsible for the initial programming language training of a new graduate intake to your company whose business is the development of defense aerospace systems. The principal programming language used is Ada, which was designed for defense systems programming. The trainees may be computer science graduates, engineers or physical scientists. Some but not all of the trainees have previous programming experience; none have previous experience in Ada. Explain how you would structure the programming training for this group of graduates.
- 18) What are the various types of contracts? Discuss various stages in contract placement. Explain contract management with the help of examples.

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Total No. of Pages : 02

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B.Tech.(CSE) (2011 Onwards E-III) (Sem.-7,8)

CLOUD COMPUTING

Subject Code : BTCS-912

M.Code : 71904

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

SECTION-A

Answer briefly :

1. What is Cloud Computing replacing?
2. Is Pay Per Use a cloud computing pricing model?
3. What is the major concern about cloud computing?
4. Which company is a leader in cloud computing?
5. Is Hardware as a Service a major type of cloud computing usage?
6. Is Internet connection necessary for cloud computing interaction?
7. "Cloud" in cloud computing represents, what?
8. Does public cloud model meets security and auditing requirements for highly regulated industries.
9. Who manages the Resources and infrastructure in a public cloud model?
10. What are the features of IBM Smart cloud?

(S2)-718

SECTION-B

11. How to manage resources in inter cloud? Explain.
12. Write a note about global exchange of cloud resources.
13. An enterprise needs highly controlled storage and access to their databases as well as managing the infrastructure for web front ends and other applications. They have a large existing IT infrastructure and they are continually expanding the capabilities. Which cloud computing model will satisfy all their current needs and enable them to reduce cost? Discuss.
14. A company has decided to leverage the web conferencing services provided by a cloud provider and to pay for those services as they are used. The cloud provider manages the infrastructure and any application upgrades. This is an example of which type of cloud delivery model? Explain reasons for that
15. Which delivery model is an example of a cloud computing environment that provides users with a web based e-mail service? Explain.

SECTION-C

16. Compare the characteristics of PaaS and SaaS.
17. Explain the virtualization structures. How to virtualize CPU? Explain.
18. Explain the layered cloud architecture development with its design challenges.

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B.T (2011 Onwards) (Sem.-5)

CYBER LAWS & IPR

Subject Code : BTIT-504

M.Code : 70597

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Explain briefly :

- a. Cyber Crime
- b. Copyright
- c. Benefits of E-Commerce
- d. Cyber Crime Scene
- e. Doman Name
- f. Business Software Patents
- g. Cyber Law
- h. Cyber Certifying Authority
- i. Digital Signature
- j. Network Security

SECTION-B

2. What are the functions of the controller of Certifying Authority?
3. Define Cyber Crimes. What are the various categories of cyber-crime?
4. What are patents? Explain the procedure of applying for patent.
5. Write short note on components of cyber laws.
6. Explain different models of E-commerce.

SECTION-C

7. What do you understand by Encryption? Explain its different algorithms?
8. Give a detailed overview of the IT Act 2000.
9. What are IPRs? Briefly explain International treaties and conventions related to IPRs.

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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(IT) (2011 Onwards) (Sem.-5)
DATABASE MANAGEMENT SYSTEM

Subject Code : BTIT-503

M.Code : 70596

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Answer briefly :

1. Differentiate between Strong and Weak entity sets. How are they represented in an E-R Diagram?
2. What do you mean by a Data Base instance and a Data Base schema?
3. What is DDL in SQL? List the different DDL commands used in SQL.
4. Explain the Cartesian Product operation in Relational Algebra.
5. What is a Database View and how does it help in Database Security?
6. Differentiate between char and varchar2 data types in oracle.
7. What do you mean by integrity of data? List any two integrity constraints.
8. What is Two-Phase Locking?
9. What is Data Farming?
10. What are NoSQL Databases?

SECTION-B

2. List various advantages of Data Base approach over Traditional File system approach.
3. What is ER Diagram? What are the symbols used in it? Design and Draw an ER diagram for a banking system.
4. Explain the different set operations used in SQL.
5. Discuss the Shadow Paging Recovery Technique. Under what circumstances does it not require a log?
6. What are Multimedia Databases? How data is stored and indexed in Multimedia Databases?

SECTION-C

7. Explain XML with the help of an example.
8. What do you mean by Normalization? What do you mean by Multi-valued and Join Dependency. Also Explain 4th and 5th Normal forms with the help of examples.
9. Discuss the architecture of Data Warehousing? What are the different challenges in maintaining these? Discuss any two applications of Data Warehouses.

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(IT) (2011 Onwards) (Sem.-5)
SYSTEM ANALYSIS AND DESIGN

Subject Code : BTIT-501

M.Code : 70594

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Q1. Write briefly :

(2×10=20)

- a) Distinguish between manual and automated systems.
- b) What do you mean by Real-time and distributed systems?
- c) Differentiate between Logical and physical design.
- d) Write two advantages of site visits technique for data and fact gathering.
- e) What are structured charts? Explain.
- f) Explain the term System Implementation and Maintenance.
- g) List various threats to computer system.
- h) Differentiate between Top-down and Bottom-up design.
- i) Explain the term Audit trails.
- j) Differentiate between Module Coupling and Cohesion.

SECTION B

- Q2. Write a brief note on various characteristics of a system. 5
- Q3. Explain in brief the types of documentation and their importance. 5
- Q4. Explain in brief the Interviews technique in reference to data and fact gathering techniques. 5
- Q5. Write a brief note on Data Flow diagrams. 5
- Q6. Write a detailed note on Input/output forms design. 5

SECTION-C

- Q7. Explain the different roles of a system analyst in detail. 10
- Q8. Discuss the case study for developing prototype for Hospital Management System. 10
- Q9. Explain the following in brief :
- a) Class Diagram 3
 - b) State Diagram 3
 - c) Sequence Diagramming 4

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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (IT) (2011 Onwards) (Sem.-5)

PROGRAMMING IN JAVA

Subject Code : BTIT-502

M.Code : 70595

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

SECTION-A

Q1 Answer briefly :

- a) Use of wrapper class.
- b) Java tokens.
- c) String buffer.
- d) Limitations of Java programming language.
- e) Layout manager.
- f) Socket.
- g) Difference between throw and throws.
- h) This pointer.
- i) List the different stages in the life cycles of a thread.
- j) What are applets?

SECTION-B

2. Explain Java garbage collection mechanism.
3. How packages are created and accessed in Java. Briefly explain the naming convention in packages?
4. Explain the steps involved in creating and executing a java program.
5. Write a Java code that generates custom exception if any value from its command line arguments is negative.
6. Explain the life cycle of applet.

SECTION-C

7. Write a program in Java to find n^{th} prime number where n is any integer and should be taken as input from the user.
8. Explain the difference between method overriding and method overloading with the help of suitable example.
9. What is multithreading in Java? Explain the inter thread communication with the help of suitable example.

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Total No. of Pages : 02

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B.Tech. (IT) (201...ds) (Sem.-6)

NETWORKING PROGRAMMING

Subject Code : BIT-601

M.Code : 71171

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Q1. Answer briefly :

- a. Which are reliable signals in networks?
- b. Define Groups in Unix.
- c. Write the need of semaphores.
- d. What is difference between pipe and FIFO?
- e. What does Xerox Network Systems (XNS) mean?
- f. What is retransmission in networking?
- g. Discuss select and poll function.
- h. What is difference between IPv4 & IPv6?
- i. What are socket options?
- j. Discuss TLL in transport layer.

SECTION-B

- Q2 Explain the need of shared memory in Interprocess communication.
- Q3 Discuss the use of NetBIOS over TCP/IP in network programming.
- Q4 What is OSI model and how it communicate data in networks?
- Q5 Give some fundamental differences between TCP and UDP sockets.
- Q6 How does pipe work in Unix? Show with example.

SECTION-C

- Q7 What are the functions of a transport layer in networking? How it provides logical communication between application processes running on different hosts?
- Q8 Discuss the basics of shell programming. Write a shell script using while loop to print 10 numbers?
- Q9 Define message queue. How POSIX message queues is used for allowing processes to exchange data in the form of messages?

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B.Tech.(IT)(E-I 2011 Onwards) (Sem.–6)

STORAGE MANAGEMENT

Subject Code : BTIT-901

M.Code : 71175

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Q1. Answer the following :

- a) What is storage infrastructure?
- b) Discuss advantages of RAID 1 level.
- c) Write a short note on performance of disk drive architecture?
- d) Name any two parameters for comparing RAID levels.
- e) Write a short note on FC-SAN.
- f) What is high end storage array?
- g) Name any two companies providing storage management features.
- h) Write the benefits of firewalls.
- i) Define data retention.
- j) What is the Lightweight Directory Access Protocol (LDAP)?

SECTION-B

- Q2 What is importance and value of data to a business?
- Q3 Discuss RAID and how it works.
- Q4 What is disaster recovery? Write backup methods and technologies.
- Q5 Discuss Network Attached Storage. Give the working of NAS.
- Q6 Give the logical and physical components of a storage infrastructure.

SECTION-C

- Q7 Discuss the intelligent storage systems. Write its capability to meet the requirements of today's applications.
- Q8 Explain the content addressed storage. How it is used to access the contents from storage devices?
- Q9 What is the need of storage management? Compare SAN and NAS storage architecture.

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B.Tech.(IT)(E-I 2011 Onwards) (Sem.-6)

MULTIMEDIA DATABASES

Subject Code : BTIT-902

M.Code : 71176

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Q1. Define the following :

- a) Point Quadtree
- b) Trees
- c) Segmentation
- d) Precision
- e) Abstraction
- f) TV-Tree
- g) Video Standards
- h) UML
- i) Frequency Table
- j) Spatial Data

SECTION-B

- Q2. Compare MX-Quadtree and R-Tree.
- Q3. How ER model is extended with spatial concepts?
- Q4. Discuss the process of Video Segmentation.
- Q5. Write a note on Temporal Presentation Constraints.
- Q6. Explain Querying content of video libraries.

SECTION-C

- Q7. Describe the architecture of Multimedia Database in details.
- Q8. Discuss the process of extending the SQL for spatial data.
- Q9. Describe how to create distributed multimedia presentations.

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B.Tech. (IT) (E-I 2011 Onwards) (Sem.-6)

CLOUD COMPUTING

Subject Code : BTCS-912

M.Code : 71179

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1) **Answer briefly :**

- a) Define cloud elasticity.
- b) Why hybrid clouds are so important?
- c) What are cloud tools?
- d) Use of API in cloud.
- e) Give example of (SaaS) Architecture.
- f) Discuss service hijacking?
- g) What is migration in cloud computing.
- h) Discuss the use of SSL?
- i) Define Multitenancy.
- j) Give introduction of Google cloud Platform?

SECTION-B

2. Mention the Layers of cloud Platform as a Server (PaaS) Architecture.
3. What is Virtualization? Discuss the characteristics of Virtualization.
4. Which selection criteria is used for Cloud deployment scenarios?
5. How the internal security breaches can be reduced in cloud Computing?
6. Explain some future developments of Clouds by taking any case study.

SECTION-C

7. What are the characteristics of cloud architecture that differs from traditional architecture? Show with example.
8. Explain the cloud security reference model. What are principle security dangers to cloud computing?
9. Discuss how IBM Smart and its services are used for building clouds?

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B.Tech.(IT) (2011 Onwards) (Sem.-6)

INFORMATION SECURITY AND RISK MANAGEMENT

Subject Code : BTIT-602

M.Code : 71172

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Q1 Answer briefly :

- a) What are Intruders in Information Security?
- b) What do you mean by vulnerability?
- c) Discuss SHA 1 hash function.
- d) What are digital signature standards?
- e) Give the role of Key management in cryptography.
- f) Define message confidentiality.
- g) What is *DoS* attack in information security?
- h) Write the purpose of DMZs?
- i) What is risk assessment process?
- j) Discuss risk value analysis.

SECTION-B

- Q2 List the steps to develop a corporate information security process life cycle.
- Q3 Explain the principle of RSA algorithm by taking an example.
- Q4 What are the message authentication functions? What are its requirements?
- Q5 What is cyber crime and security? Give the examples of cyber crime.
- Q6 Discuss the role of effective risk analysis in risk management.

SECTION-C

- Q7 Explain the importance of DES algorithm using the block diagram. Discuss the modified AES.
- Q8 How Pretty Good Privacy is used for sending secure encrypted messages in network?
- Q9 Show how risk management is used to identifying, monitoring and managing potential risks?

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Total No. of Pages : 02

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B.Tech.(IT) (2011 Onwards) (Sem.-6)

WEB TECHNOLOGIES

Subject Code : BTIT-603

M.Code : 71173

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A is COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. **SECTION-C** contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

SECTION-A

1. Answer briefly :

- a) Define the term ISP.
- b) Explain in brief about URLs.
- c) List the features of HTML5.
- d) What are Java applets?
- e) List the various dialog boxes in JavaScript.
- f) Define function in JavaScript.
- g) What are the common usages of PHP?
- h) What is AJAX? What are the advantages of AJAX?
- i) What is the difference between PHP and JavaScript?
- j) Define the term JSP.

SECTION-B

2. Write a detailed note on Web Browsers.
3. Explain in detail about HTML5 forms.
4. Write a detailed note on J query.
5. Explain in detail about HTTP Request.
6. Write a detailed note on POJO.

SECTION-C

7. Explain in detail about different types of operators available in Java Script.
8. Explain different types of statements available in PHP.
9.
 - a) Write a detailed note on WEB applications.
 - b) Explain in detail about Java servlets.

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B.Tech.(IT) (2 Semesters) (Sem.-7,8)
BUILDING ENERGETICS APPLICATIONS
Subject Code : BTIT-701

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt ANY FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt ANY TWO questions.

SECTION-A

Q1. Write briefly :

- a) ERP
- b) Planning
- c) Business modelling
- d) Technical Architecture
- e) XML
- f) Dynamic code
- g) Interface testing
- h) Build and testing
- i) Why configuration Management plan is used?
- j) Test cases

SECTION-B

- Q2 What are the various key factors which determine successful enterprise application?
- Q3 Write a note on requirements analysis and modelling?
- Q4 Explain principles and practices of data architecture and design.
- Q5 Explain the various code review practices.
- Q6 Explain the use of integration and performance testing in detail.

SECTION-C

- Q7 Compare various SDLC models. Also differentiate cohesion and coupling.
- Q8 Write a brief note on static code analysis?
- Q9 Discuss about various types and methods for testing an enterprise application.

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B.Tech.(IT) (2011 Onwards E-III) (Sem.-7,8)

ENTERPRISE RESOURCE PLANNING

Subject Code :BTCS-916

M.code :71992

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. **SECTION-C** contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

SECTION-A

1. Define the following :

- (a) What are the three fundamental components of CRM?
- (b) Define the term "ERP".
- (c) Expand the term "SAP". What are SAP R/2 and SAP R/3?
- (d) What is the significance of Information Technology in ERP?
- (e) "*ERP is a catalyst of fundamental changes in organizations*". Comment?
- (f) Give few examples of ERP.
- (g) What is impact of free open source software in ERP implementation?
- (h) What are the core components of the SAP system?
- (i) Identify the common functions performed by DBMS in an ERP.
- (j) Name the functional modules of the ERP system.

SECTION-B

2. Explain with a diagram the structure of data warehouse.
3. Explain the benefits of ERP software and systems.
4. What are the ERP implementation challenges? Explain.
5. What do you mean by Enterprise Application integration? Explain.
6. Explain the concept of integrated information system considering an illustrative example.

SECTION-C

7. Discuss various business modules of ERP. Also explain their functionalities.
8. What are the ERP solution software available? Explain their features.
9. Discuss the ERP implementation life cycle in detail.

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Total No. of Questions : 09

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B.Tech.(IT) (2011 Onwards E-III) (Sem.-7,8)
MULTIMEDIA AND APPLICATIONS

Subject Code : BTCS-910

M.Code : 71991

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

SECTION-A

1. Write short notes on :

- a. What is hyper text and hyper media?
- b. List software's for Multimedia.
- c. What is SGML in multimedia?
- d. Write the use of multimedia servers.
- e. Define transform coding.
- f. Differentiate BMP and PNG.
- g. Discuss the role of H.261 standard.
- h. What are advantages of image compression?
- i. Define QOS.
- j. What is transport subsystem?

SECTION-B

2. List various multimedia software development tools with their applications.
3. How RAID is used to increase the performance of storage devices?
4. What is MIDI? Discuss the components of MIDI system hardware.
5. Discuss JPEG compression technique in multimedia.
6. Define following :
 - a. Huffman coding
 - b. Source coding techniques

SECTION-C

7. Explain the basics of Audio compression. List some basic audio compression techniques and standards.
8.
 - a. Write a short note on MPEG video Bit stream.
 - b. How intra frame coding is used in video compression?
9. Explain how distributed multimedia systems is useful in different ways of conveying information such as texts, sounds and videos.

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B.Tech.(IT) (2011 Onwards) (Sem.-7,8)

SOFTWARE PROJECT MANAGEMENT

Subject Code : BTIT-702

Paper ID : 71980

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Q1) Answer briefly :

- a. Who are project management stakeholders?
- b. Discuss project schedule.
- c. What is term task in project management?
- d. Discuss work breakdown structure in project management.
- e. Write the role of Project team.
- f. What is the process of estimating the cost of a project?
- g. How do we manage project quality?
- h. What is risk monitoring?
- i. What is Project Control cycle?
- j. Discuss the impact of good leader.

SECTION-B

- Q2 Explain the process of identifying requirements in planning of project.
- Q3 How organizational influences affects the Project development cycle?
- Q4 State the goals of acquiring and developing the project team to complete a project.
- Q5 Which are the potential risks during planning of project?
- Q6 How would you integrate change management and project management?

SECTION-C

- Q7 Explain Project Management Phases and Processes. Discuss the project initiating process.
- Q8 Discuss steps for project monitoring and control in project management.
- Q9 What is Project closing? How to close a project successfully in Project Management?

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