Dec 2018 MG

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

Total No. of Pages : 02

Total No. of Questions : 09

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

STRENGTH OF MATERIALS – I

Subject Code : BTME-301
Paper ID : [A1138]

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) State and explain Hook's law.

b) Define principal stresses.

c) What do you mean by point of contrafiexure? Briefly explain with a sketch.

d) Write the relation between rate of loading, shear force and bending moment.

e) What are flitched beams? Write their applications.

f) What is meant by bending of circular shafts? Discuss with a suitable sketch.

g) Distinguish between column and strut.

h) Define slenderness ratio.

i) Define slope and deflection of a beam.

j) Name various methods used to find slope and deflection.

SECTION-B

2. Explain stress-strain diagram for ductile materials.

3. The principal stresses at a point across two perpendicular planes are 75MN/m^2 (tensile) and 35 MN/m^2 (tensile). Find the normal, tangential stresses and the resultant stress and its obliquity on a plane at 20° with the major principal stress.

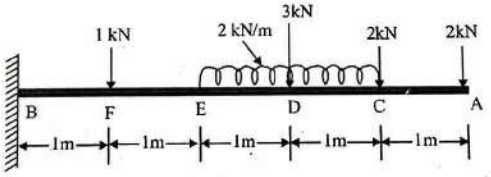
4. Write the assumptions in the simple bending theory, and derive bending formula.

5. Derive Euler's formula for column with both ends hinged.

6. A concentrated load W is acting at free end of a cantilever. The length of the cantilever is L. Derive the formulae to find maximum slope and deflection at free end by double integration method.

SECTION-C

7. Draw the shear force and bending moment diagrams for a cantilever loaded as shown below.



8. A hollow circular shaft 20 mm thick transmits 294 kW at 200 rpm. Determine the diameter of the shaft if shear strain due to torsion is not to exceed 8.6×10^{-4}.Take, modulus of rigidity as 80 GN/m^2.

9. Write short notes on :

   a) Ellipse of stress and its applications.

   b) Macaulay's method to find slope and deflection.

Total No. of Pages : 02

Roll No. [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

Total No. of Questions : 09

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

(Sem.–3)

ENGINEERING MATERIALS AND METALLURGY

Subject Code : BTME-306

Paper ID : [A1143]

Max. Marks : 60

Time : 3 Hrs.

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. State the no. of atoms on a plane having miller indices of (110) in a B.C.C. unit cell.

   b. Define the terms polymorphism and allotropy.

   c. Why is it that theoretical strength of metals is much higher than that observed experimentally?

   d. Write the equations for Gibb's phase rule & modified phase rule.

   e. Differentiate between a eutectic point and a congruent point in relation to binary phase diagrams.

   f. Why there are three curves in TTT diagram for a hypo eutectoid steel but only two curves for a eutectoid steel.

   g. Why is quenching not required while cooling the component during nitriding?

   h. Name two methods to determine the hard enability.

   i. How does Mn affect the grain size during heating the steel above the critical temperatures?

   j. What factor decides whether the cast iron will be grey or white?

SECTION-B

2. Explain how to generate a TTT diagram for an alloy.
3. Differentiate between annealing and normalizing.
4. Describe the various factors affecting the harden ability.
5. Describe the difference between edge dislocation and screw dislocation.
6. Describe phenomena of hot shortness and cold shortness.

SECTION-C

7. Explain the various types of imperfections in crystalline materials in detail.
8. Explain the various ways by which alloying elements can affect the properties of steel.
9. Explain in detail the properties and applications of Ni & Mo steels.

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

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ME) (2011 Onwards) (Sem.–3)

MANUFACTURING PROCESSES-I

Subject Code : BTME-305

Paper ID : [A1142]

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) Give broad classification of manufacturing processes.

b) Explain the selection criteria for manufacturing processes.

c) Enumerate various types of cores used in casting process.

d) Explain metallurgical considerations in casting process.

e) What are various types of rises used in casting process?

f) Explain the working principle of shell mould casting process.

g) What do you understand by MIG welding process?

h) Explain the functions of using fluxes on welding electrodes.

i) What do you understand by welding positions?

j) Define heat affected zone in welding process.

SECTION-B

Q2 Explain various elements of gating system giving a neat sketch.

Q3 Explain the principle, working of oxy acetylene welding process giving details of equipment.

Q4 Explain the working of arc welding process giving a neat sketch. Also explain the relative merits and demerits of AC and DC welding processes.

Q5 Explain the working & elements of friction stir welding process giving a neat sketch.

Q6 Explain the dye penetrant test for inspection of castings giving a neat sketch.

SECTION-C

Q7 a) Explain various types of pattern allowances provided on patterns giving neat sketches.

b) Explain the construction and working of Cupola furnace giving a neat sketch and explaining various zones.

Q8 a) Explain vacuum casting process giving a neat sketch and give its applications.

b) Explain the working principle of MIG welding process giving details of equipment involved, advantages, disadvantages and applications, using a neat sketch.

Q9 a) Describe the working principle of resistance welding process. Also explain the spot welding process giving a neat sketch giving its applications, and advantages.

b) Explain any four casting defects giving neat sketches and suggest their causes & remedies.

Roll No. _____

Total No. of Questions : 09

Total No. of Pages : 02

B.Tech.(Marine Engineering) (2013 Onwards)/
B.Tech.(ME) (2011 Onwards) (Sem.–3)
APPLIED THERMODYNAMICS–I
Subject Code : BTME-304
Paper ID : [A1141]

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 stoichiometric coefficients?

b) Enumerate various types of cooling towers used in industry.

c) How does air fuel ratio affect power and efficiency of engine?

d) Enumerate the methods to reduce/control emissions from SI engines.

e) Explain the function of using fusible plug on steam generators.

f) Enumerate various types of mountings and accessories used in steam boilers.

g) Discuss advantages of binary vapour cycles over single vapour cycle.

h) Discuss briefly the factors limiting thermal efficiency of a steam power plant.

i) Differentiate between impulse and reaction turbines.

j) How condensers can be broadly classified on the basis of type of heat exchange?

SECTION-B

Q2. A blast furnace has the following volumetric composition : CO_2 - 11%, CO - 27%, H_2 - 2%, N_2 - 60%. Determine the theoretical volume of air needed for complete combustion of 1 m^3 of the gas and the percentage composition of dry flue gases by volume, by assuming that air comprises of 21% O_2 and 79% N_2.

Q3. Briefly explain the direct injection MPFI systems in Diesel and Petrol engines giving neat sketches.

Q4. Determine the quantity of heat required to produce 1 kg of steam at a pressure of 6 bar at a temperature of 25° C. under the following conditions: (a) when the steam is wet having a dryness fraction 0.9; (b) when the steam is dry saturated ; and (c) when it is superheated at a constant pressure at 250° C assuming the mean specific heat of superheated steam to be 2.3 kJ/kg K.

Q5. Explain the working principle, constructional details of Lancashire boiler giving a neat sketch.

Q6. How air leakage in condenser is damaging to the performance of condenser? Describe the methods to detect and prevent air infiltration in condensers.

SECTION-C

Q7. a) Briefly describe the methods employed to reduce knock in SI and CI engines.

b) Dry saturated steam at a pressure of 10 bar is expanded in a nozzle to a pressure of 0.7 bar. With the help of Mollier diagram find the velocity and dryness fraction of steam issuing the nozzle, if the friction is neglected. Also find the velocity and dryness fraction of the steam, if 15% of the heat drop is lost in friction.

Q8. Following data refer to a De Laval steam turbine having equiangular blades: Steam entering nozzle = 100 m/s, Nozzle Efficiency = 0.90, Blade speed = 200 m/s, Blade velocity coefficient = 0.85, rate of steam mass flow = 3 kg/s, absolute velocity of steam at exit from stage = 90 m/s, angle of absolute velocity of steam at exit from stage with tangent of wheel = 75°. Determine : (a) the blade angles, (b) the nozzle angle, (c) the absolute velocity of steam at inlet, (d) the axial thrust, (e) the HP developed.

Q9. A steam turbine plant operates on Rankine cycle with steam entering turbine at 40 bar, 350°C and leaving at 0.05 bar. Steam leaving turbine condenses to saturated liquid inside condenser. Feed pump pumps saturated liquid into boiler. Determine the net work per kg of steam and the cycle efficiency assuming all processes to be ideal. Also show cycle on T-s diagram. Also determine pump work per kg of steam considering linear variation of specific volume.

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

Paper ID : [A1140]

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 : (2×9= 18)

a) What is a lock nut? Where is it used?

b) How internal threads are shown in sections? Explain with drawings.

c) What is a drilling jig?

d) What is difference between rigid and flexible coupling?

e) What is a revolved section? Explain with the help of a drawing.

f) What do you understand by :

i) Length of weld.

ii) Size of weld?

g) What do you understand by standard tolerances?

h) Why bushes are made from soft material?

i) What is application and function of a feed check valve?

SECTION-B

Q2. Draw freehand sketches of front view and top view of gib and cottor joint (4)

Q3. Draw a full sectioned freehand sketch of expansion joint. (4)

Q4. Draw freehand sketches of top and front view of universal coupling. (4)

Q5. Draw a free hand sketch of single plate friction clutch. (4)

SECTION-C

Q6. Assemble the parts of a **Connecting rod** given in Fig. 1 and draw the following views :

i) Elevation (30)

ii) Top view (full section)

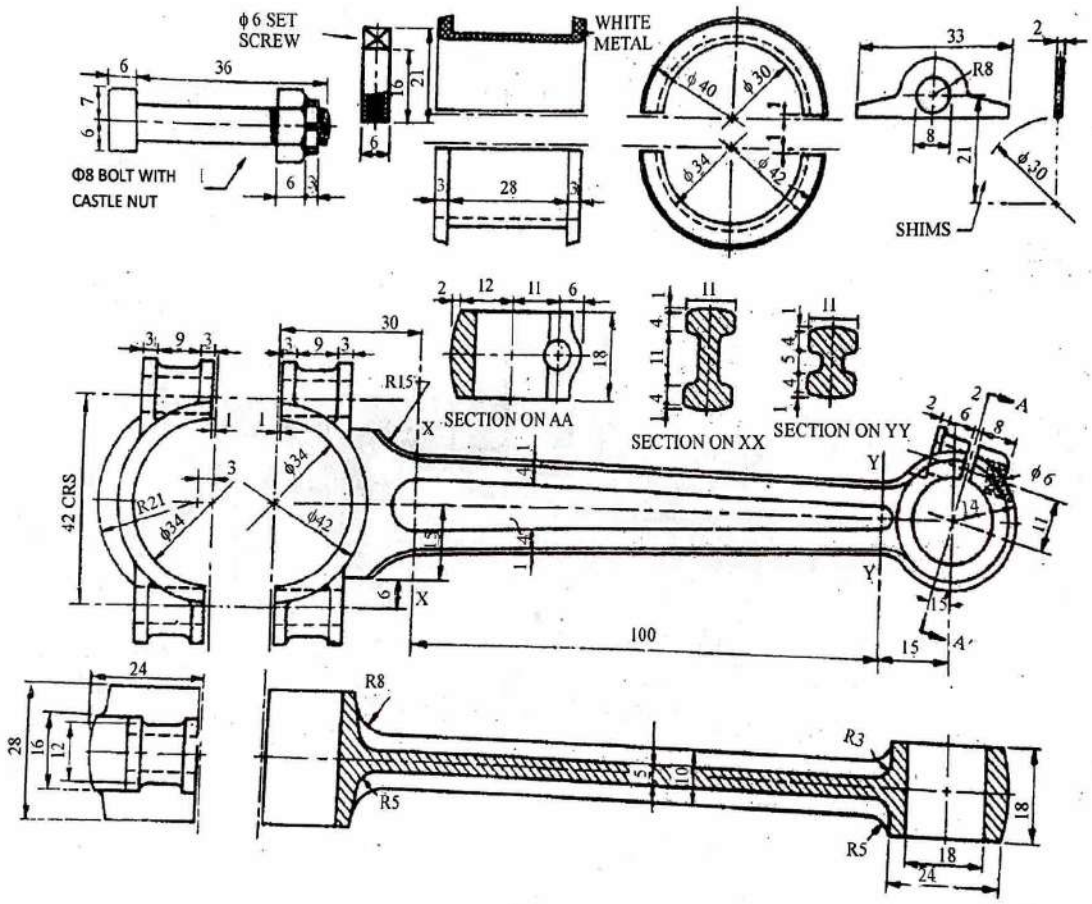


Figure - 1

Q7. Assemble the parts of a **Stop valve** given in Fig.2 and draw the following views :

i) Elevation right half in section (30)

ii) Plan

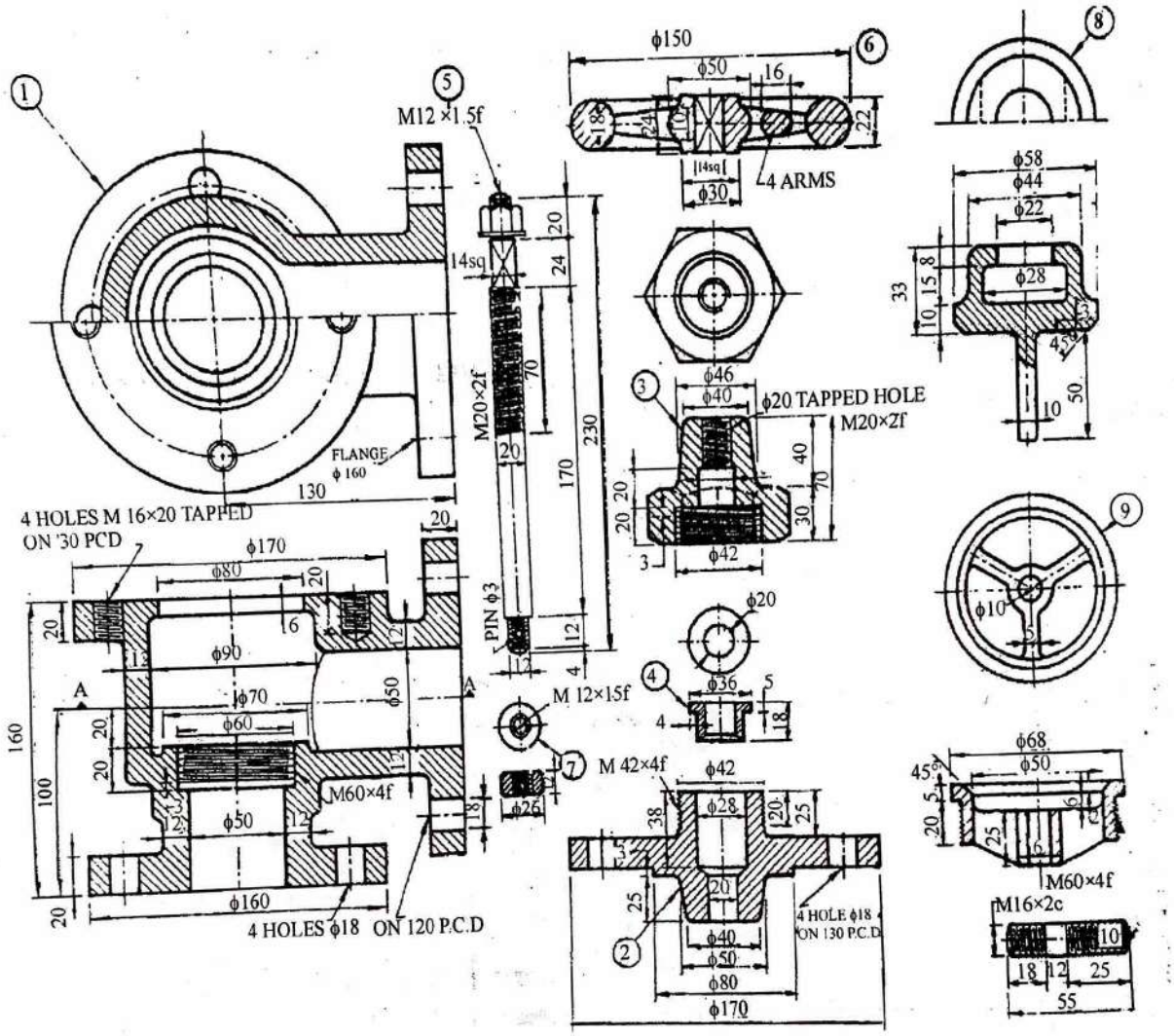


Figure - 2

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

Total No. of Pages : 02

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

Paper ID : [A1139]

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. Give classification of Kinematic link.

b. What do you understand by instantaneous centre of rotation in kinematic of machines?

c. Differentiate between a closed and open pair.

d. Why a double Hooke's joint is used in practice?

e. Define crowning of pulley.

f. Enumerate any four different types of follower motions of a cam.

g. Define the term "*Limiting Friction*".

h. Why single cylinder needs large size flywheel?

i. Define hunting of governors.

j. Write the basic requirements for high speed cams.

SECTION-B

2. Draw a neat sketch and explain working of pantograph.

3. A leather belt is required to transmit 7.5 KW from a pulley 1.2 m in diameter, running at 250 r.p.m. The angle embraced is 165° and the coefficient of friction between the belt and pulley is 0.3. If the safe working stress for the leather belt is 1.5 MPa, density of leather 1 Mg/m^3 and thickness of belt is 10 mm, determine the width of the belt taking centrifugal tension into account.

4. What is the difference between a shoe brake and band brake? Describe them and state their applications.

5. In an engine governor of the Porter type, the upper and lower arms are 200 mm and 250 mm respectively and pivoted on the axis of rotation. The mass of the central load is 15 kg. The mass of each ball is 2 kg and friction of the sleeve together with the resistance of the operating gear is equal to a load of 24 N at the sleeve. If the limiting inclinations of the upper arms to the vertical are 30° and 40°, find, taking friction into account, range of speed of the governor.

6. Explain with diagram Ackerman Steering gear.

SECTION-C

7. Draw neat sketches of crank and slotted lever quick return mechanism and whitworth quick return motion mechanism. Explain the difference between two mechanisms and show the ratio of time taken for cutting and return stroke in both cases.

8. Construct the profile of a cam to suit the following specifications: Cam shaft diameter = 40 mm, Least radius of cam = 25 mm, Diameter of roller = 25 mm, Angle of lift = 120°, Angle of fall = 150°, Lift of the follower = 40 mm, Number of pauses are two of equal interval between motions. During the lift, the motion is S.H.M. During the fall the motion is uniform acceleration and deceleration. The speed of the cam shaft is uniform. The line of stroke of the follower is off-set 12.5 mm from the centre of the cam.

9. a. Explain the following terms as applied to flywheel :

   i) Fluctuation of energy.

   ii) Coefficient of fluctuation of energy.

   iii) Fluctuation of speed.

   iv) Coefficient of Fluctuation of speed.

   b. Explain the importance and use of Turning Moment Diagram of reciprocating engines.

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

Total No. of Questions: 09

Total No. of Pages: 02

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

STRENGTH OF MATERIALS – I

M Code: 59111

Subject Code: BTME-301

Paper ID: [A1138]

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. a) State Hooke's law.

   b) Define lateral strain.

   c) What is the ratio of the torques transmitted by a hollow and a solid shaft of the same material, length and weight?

   d) Draw a stress strain curve for Mild steel.

   e) What are the shapes of bending moment diagrams in case of

      i) Uniformly distributed load

      ii) A couple altered at any point of a beam?

   f) Name various methods to determine slope and deflection in beams.

   g) Define pure bending in beams.

   h) How is 'thermal stress' different from ordinary stress?

   i) Differentiate between neutral layer and neutral axis.

   j) Differentiate between the behavior of a short column and a long column when subjected to axial load.

SECTION B

2. An axial pulls of 40 kN is acting on a bar consisting of three sections of length 30 cm, 25 cm and 20 cm and diameters 2 cm, 4 cm, 5 cm respectively, if E = 2×10^5 N/mm^2 determine (i) Stress in each section (ii) Total extension of the bar.

3. Derive an expression for the Euler' crippling load for a long column with one end fixed and other end free.

4. Drive an expression for shear stress produced in a circular shaft subjected to torsion.

5. A square beam 20mm x 20mm in a section and 2 m long is supported at the ends. The beam fails when a point load of 400 N is applied at the centre of the beam. What uniformly distributed load per meter length will break a cantilever of same material 40 mm wide 60mm deep 3 m long?

6. Two vertical rods one of steel and other of copper are rigidly fixed at the top and 50 cm apart. Diameters and lengths of each rod are 2 cm and 4 m respectively. A cross bar fixed to the roads at the lower end carries a load of 5000 N such that the cross bar remains horizontal even after loading. Find the stress in each rod and the position of the load on the bar. Take E for steel and copper as 2×10^5 N/mm^2 and 1×10^5 N/mm^2.

SECTION C

7. What is Macaulay's method? Derive an expression for deflection at any section of a simply supported beam with eccentric point load, using Macaulay's method.

8. A simply supported beam of length 8 m rests on supports 6 m apart, the right hand end is overhanging by 2 m. The beam carries a uniformly distributed load of 1500 N/m over the entire length. Draw S.F. and B.M. diagram and find the point of contra flexure, if any.

9. Derive the bending equation:

$$\frac{M}{I} = \frac{\sigma}{Y} = \frac{E}{R}$$

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

Total No. of Questions: 09

Total No. of Pages: 02

B.Tech.(ME) (2011 Onwards) (Sem. – 3)

MANUFACTURING PROCESS - I

M Code: 59115

Subject Code: BTME-305

Paper ID: [A1142]

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. a) Name the different types of patterns.

   b) What is the function of a core?

   c) Explain the purpose of chaplet in metal casting.

   d) What is a sprue?

   e) Name any four welding defects.

   f) List down any four functions performed by the coating of welding electrode.

   g) Explain the features of a neutral flame.

   h) What are the merits of AC arc welding?

   i) Give any two applications of ultrasonic inspection.

   j) What is friction stir welding?

SECTION B

2. What is micro-hardness testing? What are the applications of this technique?
3. Briefly describe the principle, working and applications of laser beam welding.
4. What is heat affected zone? What are its implications in arc welding process?
5. Explain the continuous casting process and give its applications.
6. Explain the process of nucleation and grain growth in metal casting. What is directional solidification?

SECTION C

7. Briefly explain the joining processes of soldering, brazing and braze welding. Clearly bring out the differences between them and give specific applications of each type.
8. Differentiate between TIG and MIG welding. Discuss the role of inert gases in these processes and draw a comparison between the commonly used inert gases.
9. List down the various defects that may develop in metal castings. Give the causes and possible remedies for each type of defect.

Roll No. [ ]

Total No. of Questions : 09

Total No. of Pages : 02

B.Tech.(M... ...nwards) (Sem.–4)

FLUID MECHANICS

Subject Code : BTME-403

Paper ID : [A1213]

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 specific volume.

b) Differentiate between dynamic and kinematic viscosity.

c) State Pascal Law.

d) What is a metacentric height?

e) What is the stability criteria of floating body?

f) Obtain Bernoulli's equation from Euler's equation.

g) What is the difference between model and prototype?

h) What are the various losses occurred in pipes?

i) What are the various flow measurement devices?

j) Define weber number.

SECTION-B

2. Derive an expression for the determination of metacentric height analytically.

3. Derive continuity equation in cylindrical coordinates.

4. Check whether the flow defined by stream function 2xy is irrotational? Also determine the corresponding velocity potential.

5. A weir 36 metres long is divided into 12 equal bays by vertical posts, each 60cm wide. Determine the discharge over the weir if the head over the crest is 1.2m and the velocity of approach is 2m/s.

6. Discuss any three similarity model laws.

SECTION-C

7. Derive an expression for loss of head due to friction in pipes.

8. A rectangular tank 6m long, 2m wide and 2m deep contains water to a depth of lm. It is accelerated horizontally at 2.5 m/s^2 in the direction of its length. Determine :

   a) Slope of the free surface,

   b) Maximum and minimum pressure intensities at bottom,

   c) Total force due to water acting on each end of the tank. Check the difference between these forces by calculating the inertia force of the acceleration mass.

9. Derive Euler's equation of motion in Cartesian coordinates.

Roll No.

Total No. of Questions : 09

Total No. of Pages : 02

B.Tech.(ME) (2011 Onwards) (Sem.–4)

MANUFACTURING PROCESSES-II

Subject Code : BTME-405

Paper ID : [A1215]

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) Give broad classification of Metal forming processes.

b) Differentiate between piercing and blanking operations.

c) What do you understand by Impression-die forging?

d) Enumerate various defects encountered in extrusion process.

e) Explain working principle of Smith forging.

f) What do you understand by tool geometry?

g) Differentiate between up milling and down milling operations.

h) Enumerate various types of cutting fluids using in machining operations.

i) How grinding machines are classified?

j) Explain the working of quick return mechanism used in shapers.

Roll No. [ ] Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ME) (2011 Onwards) (Sem.–4)

APPLIED THERMODYNAMICS–II

Subject Code : BTME-404

Paper ID : [A1214]

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. What is the difference between reciprocating and rotary compressor?

b. Draw a neat sketch of actual P-V diagram for a two stage compressor.

c. What is Euler work?

d. What do you understand by surging and choking?

e. When it is necessary to provide prewhirl?

f. Define angle of attack.

g. State the assumptions made for thermal efficiency of a gas power plant.

h. What is degree of reaction?

i. Write down the methods of cooling the turbine blades.

j. Write two differences between jet propulsion and rocket propulsion.

SECTION-B

2. Explain the effect of inter-cooling in a multistage reciprocating compressor.

3. A centrifugal compressor delivers 50 kg of air per minute at a pressure of 2 bar and 97°C. The intake pressure and temperature of the air is 1 bar and 15°C. If no heat is lost to the surrounding, find: a) index of compression and b) power required, if the compression is isothermal. Take R=287 J/Kg K.

4. Explain the function of impeller and diffuser in centrifugal compressor.

5. Derive an expression for air standard efficiency of ideal brayton cycle in terms of pressure ratio.

6. Explain the working of ram jet and pulse jet.

SECTION-C

7. A two stage air compressor compresses air from 1 bar and 20°C to 42 bar. If the law of compression is $pv^{1.35}$ = constant and the intercooling is complete to 20°C, find per kg of air: a) The work done is compressing and b) The mass of water necessary for abstracting the heat in the intercooler, if the temperature rise of cooling water is 25°C. Take R = 287 J/Kg K and c_p= 1 KJ/Kg K.

8. A turbojet engine draws air at the rate of 1 kg/s while flying at a speed of 900 kmph. The velocity of gases at the exit of the nozzle is 620 m/s. The engine uses fuel at the rate of 0.0125 kg/s of calorific value 45000 KJ/Kg. Find :

   a. Fuel-air ratio

   b. Fuel consumption in kg/hr

   c. Thrust, Thrust power and Thrust specific fuel consumption

   d. Propulsive power and propulsive efficiency

   e Thermal and overall efficiency of turbojet.

9. Write a short note on the following :

   a. Clearance in compressor

   b. Free air delivered (F.A.D) and displacement

   c. Compressor performance

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

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ME) (2011 Onwards) (Sem.–4)

STRENGTH OF MATERIALS-II

Subject Code : BTME-401

Paper ID : [A1211]

Max. Marks : 60

Time : 3 Hrs.

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 strain energy.

b) Distinguish between energy of dilation and distortion.

c) Name various theories of failure.

d) State maximum principal stress theory.

e) Explain the importance of full length leaves in a leaf spring.

f) For what purpose compound cylinders are used?

g) Distinguish between longitudinal and hoop stresses in thick cylinders.

h) What do you mean by discs of uniform strength?

i) What is the importance of trapezoidal cross section of a crane hook, explain briefly?

j) Explain the importance of shear centre.

SECTION-B

2. State and explain Castigliano's theorem of reciprocal deflection.

3. State and explain any two theories of failure with their graphical representations.

4. A thick disc whose outer radius is 300 mm and inner radius is 150 mm rotates at 1430 *rpm*. Compute a) maximum radial stress and b) maximum circumferential stress. Assume Poisson's ratio = 0.3, and density = 7700kg/m^3 of its material.

5. A cylindrical air drum is 2.25 m in diameter with plates 1.2 cm thick. The efficiencies of the longitudinal and circumferential joints are respectively 75% and 40%. If the tensile stress in the plating is to be limited to 120 MN/m^2, find the maximum safe air pressure.

6. Derive mathematically Lame's equation.

SECTION-C

7. A pipe of 200 mm internal diameter and 50 mm thickness carries a fluid at a pressure of 10 MN/m^2. Calculate the maximum and minimum intensities of circumferential stresses across the section. Also sketch the radial stress (pressure) distribution and circumferential stress distribution across the section.

8. A leaf spring of semi-elliptic type has 11 plates each 9 cm wide and 1.5 cm thick. The length of spring is 1.5 m. The plates are made of steel having a proof stress (bending) of 650 MN/m^2. To what radius should the plates be bent initially? From what height can a load of 600 N fall on to centre of the spring, if maximum stress is to be one-half of the proof stress? E = 200 GN/m^2.

9. A solid shaft transmits 1000 kW at 300 *rpm*. Maximum torque is 2 times the mean. The shaft is subjected to a bending moment which is 1.5 times the mean torque. The shaft is made of a ductile material for which the permissible tensile and shear stresses are 120 MPa and 60 MPa respectively. Determine the shaft diameter using a suitable theory of failure. Give justification for the theory used.

B-Tech - ME Sem - 5th

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

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ME) (2011 Onwards) (Sem.–5)

AUTOMOBILE ENGINEERING

Subject Code : BTME-505

Paper ID : [A2132]

Max. Marks : 60

Time : 3 Hrs.

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 meant by unitary construction?

   b. What is the use of injectors in fuel supply system?

   c. Define crank case ventilation.

   d. What are the different types of tyre wear?

   e. What is the function of a propeller shaft?

   f. What is the function of a universal joint?

   g. Define camber.

   h. What are primary and secondary brakes?

   i. What do you mean by battery testing?

   j. What do you mean by engine tuning?

SECTION-B

2. Explain Multi point Fuel Injection system with diagram.

3. With the help of a neat diagram explain the working of a radiator.

4. Explain different methods of battery ratings.

5. Describe the constructional features of a centrifugal clutch with a neat diagram.

6. Differentiate between conventional and transistorized ignition systems.

SECTION-C

7. What are the different sources of automobile pollutants? Explain pollution control techniques used in practice.

8. Explain torque tube drive with its advantages.

9. Explain different methods of battery testing.

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

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

Paper ID : [A2131]

Max. Marks : 60

Time : 3 Hrs.

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 do you understand by mechanization and automation?

   b. What do you mean by a fluid power?

   c. What is vane motor?

   d. What is quick exhaust valve?

   e. What is slip sensor in robotics?

   f. List different feeder used for job orientation.

   g. Draw the symbol of 4/2 push button spring return DC valve.

   h. Give the symbol of NAND gate with truth table.

   i. What do you mean by robot work volume?

   j. What are the main areas where robots are used?

SECTION-B

2. Discuss the various types of cylinder mountings.

3. Explain rotary actuators.

4. Explain centrifugal hopper with neat sketch.

5. Discuss about the industrial applications of robots.

6. Discuss the various types of automation with suitable examples.

SECTION-C

7. Compare the pneumatic, hydraulic and electric drives to power the robot.

8. Discuss the various types of Directional control valves used in pneumatic systems with neat sketch.

9. Write short notes on :

   a. Socio economic impacts of automation.

   b. Touch problems.

Roll No. | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ME) (2011 Onwards) (Sem.–5)

MECHANICAL MEASUREMENT AND METROLOGY

Subject Code : BTME-503

Paper ID : [A2130]

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 between primary, secondary and working standards.

b) Explain clearly the terms : Calibration, speed of response, threshold and resolution, fidelity.

c) Discuss in brief-systematic and random errors.

d) Suggest methods for measuring surface roughness with brief working principle.

e) Differentiate between bonded and unbonded type of strain gauges.

f) Describe the working of a clinometers.

g) State the principles of Design of Experiments.

h) How is least count of vernier caliper determined?

i) What is the order of pressure measured by thermal conductivity gauge?

j) Explain the difference between optical and total radiation pyrometer.

SECTION-B

Q2 What is sine bar? How it is used for angle measurement?

Q3 Describe the equations for time response of a first order system when subjected to unit step input.

Q4 A resistance wire strain gauge with a gauge factor of 2 is bonded to a steel structural member subjected to a stress of 100 MN/m^2. The modulus of elasticity of steel is 200 GN/m^2. Calculate the percentage change in the value of the gauge resistance due to applied stress.

Q5 Describe the properties of materials used for piezoelectric transducers.

Q6 Explain the construction and working of Mcleod gauge used for measurement of vacuum.

SECTION-C

Q7 The following 10 observations were recorded when measuring a temperature : 41.7, 42.0, 41.8, 42.0, 42.1, 41.9, 42.0, 41.9, 42.5 and 41.8 °C. Find (i) the mean (ii) the standard deviation (iii) the probable error of one reading (iv) the probable error of mean and (v) range.

Q8 Describe the construction, theory and working of thermocouples. Discuss the different types of compensations used.

Q9 Write a note on the following :

a) Hydraulic load cell.

b) Absorption dynamometer.

Roll No. | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ME) (2011 Onwards) (Sem.–5)

MATHEMATICS-III

Subject Code : BTAM-500

Paper ID : [A2127]

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) Find the Fourier series of $f(x)=\begin{cases}\frac{1}{2}+x, & -\frac{1}{2}<x<0\\ \frac{1}{2}-x, & 0<x<\frac{1}{2}\end{cases}$

(b) Find Laplace transform of $(1+te^{-t})^3$.

(c) Find inverse Laplace transform of $\tan^{-1}\frac{2}{s}$.

(d) Evaluate $\int_0^1 \sqrt[3]{x\ln\left(\frac{1}{x}\right)}\,dx$.

(e) Evaluate $\int x^2 J_1(x)\,dx$.

(f) By eliminating arbitrary function, form a partial differential equation from $z=x^n f\left(\frac{y}{x}\right)$.

(g) Solve the given partial differential equation $p-q=\ln(x+y)$.

(h) Show that imaginary part of an analytic function is harmonic.

(i) Find the orthogonal trajectories of the family of curves $x^3y-xy^3=c=$ constant.

(j) State Cauchy's integral formula.

SECTION-B

2. Find the Fourier series of $f(x) = |\cos x|$ in the interval $(-\pi, \pi)$.

3. Using Laplace transform, solve $y'' + 4y = u(t-2)$, $y(0) = 0$, $y'(0) = 1$, where $u(t)$ is a unit step function.

4. Using Frobenius method, find the general solution of

$$8x^2y'' + 10xy' - (1+x)y = 0.$$

5. Solve given partial differential equation $(2D_x^2 + 5D_xD_y + 2D_y^2)z = 0$.

6. Verify that $u = 3xy^2 - x^3$ is harmonic and find its conjugate harmonic function.

SECTION-C

7. (a) Use Laplace Transform to solve given system of simultaneous differential equations $\frac{dx}{dt} - y = e^t$, $\frac{dy}{dt} + x = \sin t$, where $x(0) = 1$ and $y(0) = 0$.

(b) For Legendre polynomials $P_n(x)$ show that $\int_{-1}^{1} P_m(x)\, P_n(x)\, dx = \frac{2}{2n+1}$

when $m = n$.

8. (a) State and prove Convolution for Laplace transform.

(b) A bar of 30 cm length has its ends kept at 20° and 80° respectively until steady-state condition prevail. The temperature at each end is then suddenly reduced to 0° and maintained thereafter, Find the temperature in bar.

9. (a) Find Laurent series of $\frac{z}{(1+z)(z+2)}$ about $z_0 = -2$.

(b) Using Residue theorem, evaluate $\int_C \frac{\tan z\, dz}{(z^2-1)}$, $C: |z| = \frac{3}{2}$.

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

Total No. of Pages: 02

Total No. of Questions: 09

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

AUTOMOBILE ENGINEERING

M Code: 70606

Subject Code: BTME-505

Paper ID: [A2132]

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. a) What is the advantage of frameless chassis?

   b) Write different types of pistons.

   c) What is the function of MPFI?

   d) What is crank case ventilation?

   e) Write the types of carcass.

   f) What is overdrive?

   g) Define positive castor.

   h) Write different types of brakes used.

   i) Define capacity rating.

   j) Define engine tuning.

SECTION B

2. Explain power steering with neat diagram.
3. Explain trailing link type suspension system with diagram.
4. Explain principle of automatic transmission.
5. Explain construction and working of differential.
6. Explain general layout of front wheel drive automobile.

SECTION C

7. Explain common rail direct injection system with neat sketch.
8. Explain constant mesh and synchromesh gearbox.
9. Explain different types of front and rear axles with neat diagrams.

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

Total No. of Questions: 09

Total No. of Pages: 03

B.Tech. (ME) (Sem. – 5)

MACHINE DESIGN-I

M Code: 59042

Subject Code: ME-301

Paper ID: [A0814]

Time: 4 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. a) How is grey cast iron designated as per Indian Standards? Give one example.

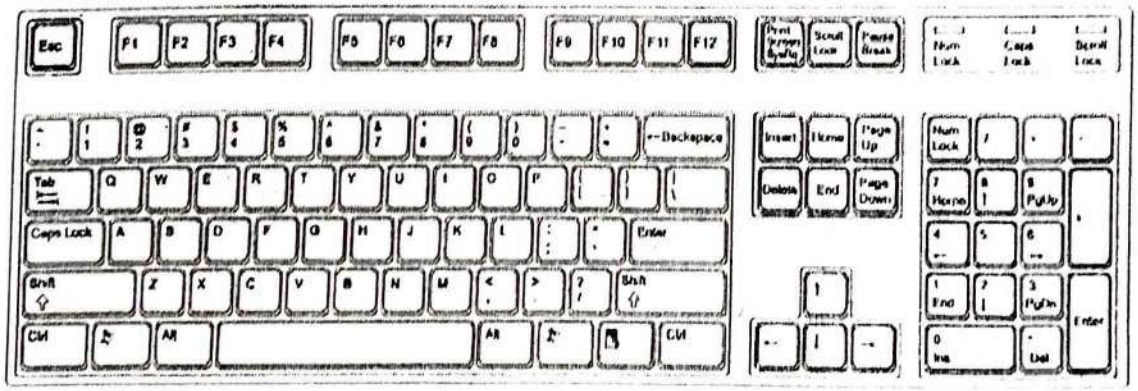
   b) Make a list of the components of pin type flexible coupling indicating their material and function.

   c) A hollow machine shaft with diameter's ratio of 0.6 is required to transmit 42 kW at 1500 rpm. The allowable angle of twist is 1 degree per meter length. Find suitable diameter.

   d) Where are stepped shafts employed? Draw two configurations of stepped shafts and discuss the advantages of respective configuration.

   e) Draw triple riveted butt joint with chain riveted and single cover plate. Label the diagram.

   f) Explain how ergonomics is involved in the design and placements of different keys in a computer or laptop keyboards.



g) Can we connect two square rods with spigot and socket cotter joint? If, NO, why? If, YES, how?

h) Draw free body diagram of a shaft of length L is supported on two bearing on its ends. The shaft carries two pulleys at L/4 from its end. The pulley near left bearing receives power from a motor from below and delivers it to another shaft which is located vertically above it. Assume equal tensions tight side and slack sides. The weights of both pulleys are same.

i) The working pressure in a cylinder of 240 mm inside diameter is 2.5 MPa. Design the stud required to fix the cylinder head. The permissible tensile stress is 60 MPa.

j) Derive the expression between weld length and throat thickness.

SECTION B

2. a) What do you understand by key way effect? How it affects the shaft design?

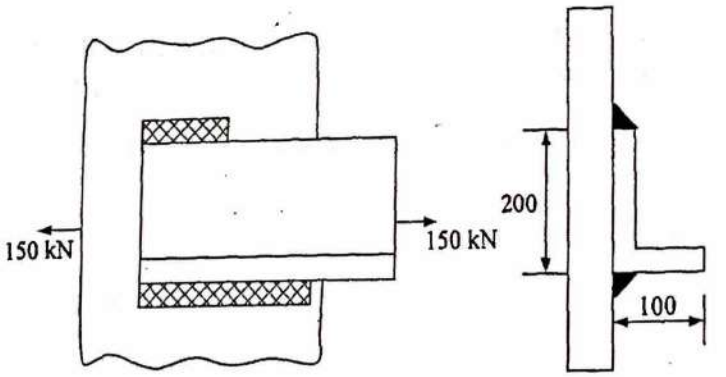
   b) A circular shaft is subjected to bending and twisting moments of 10 kN.m and 30 kN.m respectively. Design the shaft and key using maximum shear stress theory and considering the effect of keyway. The material of shaft and key is plain carbon steel (S_{ut} = 400 MPa; S_{yt} = 260MPa).

3. A double riveted lap joint for a pair of steel plate 12 mm thick has to transmit a force 250 kN. Design the joint.

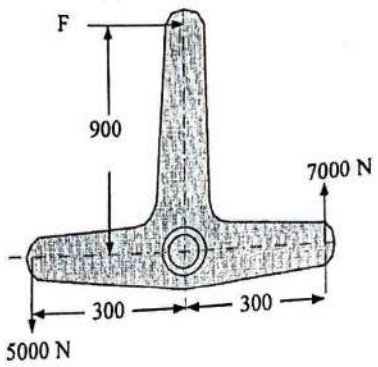
   Take $\sigma_d = 120 N/mm^2$ $\tau_d = 100 N/mm^2$ $\sigma_c = 160 N/mm^2$

4. Two mild steel rods of circular cross section are required to connected permitting angular movement. The allowable stresses for the material used may be considered as below: 70 MPa in tension and compression, 45 MPa in shear and 40 MPa in bearing.

5. An angle of size 200 mm x 100 mm x 10 mm is required to be welded to a steel plate by a fillet weld as shown in the following figure. If the angle is subjected to an axial static load of 150 kN and the permissible shear stress for the weld is 70 N/mm^2, determine the top and bottom weld lengths.



6. A cross lever is loaded as shown. Design the cross sections of the lever keeping the thickness of the lever uniform assuming design stress in tension is 75 MPa.



SECTION - C

7. Derive the design equations for the following failure modes with appropriate figure
   a) Failures of key in foot lever (01)
   b) Failure of cotter joint due to crushing between cotter and socket end (01)
   c) Failure of Pin type flexible coupling due to bearing of bush. (01)
   d) Shearing failure of sleeve in Muff coupling (01)
   e) Failure of bolted joint in the base plate of a pillar crane. (01)
   f) Failure of rivets in circumference joint of boiler. (02)
   g) Failure of shaft under repeated loading. (03)

8. a) Design an oval flanged joint for a pipe of 60 mm bore. It is subjected to a fluid pressure of 10 MPa. Your design should include diameter of packing, outside diameter of pipe, separating force, number and size of bolts, thickness of flange using bending consideration. (05)

   b) If a completely reversed bending load is applied on a rotating hot rolled steel bar (S_{ut} = 600 MPa) of 120 mm diameter such that the maximum stress produced is 100 Mpa. Determine the safe number of cycles for 99.9% reliability and operating temperature is 370 °C. (05)

9. a) A MS key is to couple two shaft of 16 mm diameter. Find the torque capacity of key in shear and crushing. Length of the key is 90 mm. Assume suitable material of the key.

   b) Draw neat sketches of following couplings and specify the commonly used materials and FOS for each.
      i) Muff coupling
      ii) Solid flange coupling
      iii) C.I. Flange coupling
      iv) Oldhum coupling
      v) Bush type flexible coupling

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

Total No. of Pages : 02

Total No. of Questions : 09

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

INDUSTRIAL AUTOMATION AND ROBOTICS

M Code: 70605

Subject Code: BTME-504

Paper ID: [A2131]

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. a) State the advantages of industrial automation.

   b) Distinguish between hydraulic and pneumatic systems.

   c) Write major robot applications.

   d) What is a Pressure sequence valve?

   e) What is a truth table?

   f) What is an end-effector in a robot?

   g) State the role of transfer devices in material handling.

   h) What do you mean by ladder logic diagrams?

   i) Sketch the standard symbol for a 3/2 direction control pilot operates valve.

   j) State the need for sensors in robotics.

[illegible]

4 a) Distinguish between a transducer and a sensor

b) By means of a neat sketch, describe the working of any piezoelectric sensor.

5. What do you mean by time delay valve? Also explain its working.

6. What is meant by sonic sensor? Sketch any fluidic device and explain its operation. State its application.

7. Write a brief note on fixed and flexible automation.

8. Discuss the use of vibratory bowl feeder with the help of diagram.

[illegible]

1. Draw double handed pneumatic safety circuit for clamping and explain its working. Compare this circuit a single handed circuit for the same purpose.

2. What are the different fluid power control elements? Discuss.

3. Write short note on the following:

a) Material handling

b) Welding operation

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

Total No. of Questions: 09

Total No. of Pages: 02

B.Tech.(IE) (ALL) / B.Tech. (ME) (2010 Batch) (Sem. – 5)

MECHANICAL MEASUREMENT AND METROLOGY

M Code: 59027

Subject Code: ME-307

Paper ID: [A0817]

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. a) What is instrumentation?

   b) What is sensitivity?

   c) What is Dead time?

   d) What are Instrumental errors?

   e) What is the use of gauge block?

   f) What is absolute pressure?

   g) What is a bimetallic thermometer?

   h) What is thermistor?

   i) What is Pitot tube?

   j) What is the function of a tachometer?

SECTION B

2. What are primary, secondary and tertiary measurements? Explain with examples.
3. Drive expression for time response of first order system when subjected to Unit step input.
4. How errors are classified? Explain.
5. Describe with a neat sketch the working of an electromagnetic flow meter.
6. What are the various methods to measure torque?

SECTION C

7. What is comparator? Explain any two comparators with neat sketch.
8. What are the precautions to be taken while making temperature measurements? And discuss temperature measurement errors.
9. Write short note on:
   a) Load cell
   b) Knudsen gauge

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

Total No. of Questions: 09

Total No. of Pages: 02

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

MECHANICAL MEASUREMENT AND METROLOGY

M Code: 70604

Subject Code: BTME-503

Paper ID: [A2130]

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. a) Give the significance of measurements.

   b) What do you mean by transfer function?

   c) Differentiate between 'Line Standard' and 'End Standard' with suitable examples.

   d) Enlist various types of comparators.

   e) What do you mean by Gauge Factor in resistance strain gauges?

   f) State the working principle of dead weight gauge tester.

   g) Draw a schematic view of radiation pyrometer.

   h) What do you understand by randomized block design in Design of Experiments.

   i) A moving coil voltmeter has a uniform scale with 100 divisions, the full scale reading is 200 V and 1/10 of a scale division can be estimated with a fair degree of certainty. Determine the resolution of instrument in volt?

   j) What are interferometers?

SECTION B

2. What are the basic blocks of a generalized measurement system? Draw the various blocks and explain their functions.

3. The following 10 observations were recorded when measuring a temperature: 41.7, 42.0, 41.8, 42.0, 42.1, 41.9, 42.0, 41.9, 42.5 and 41.8 °C.

   Find

   a) the mean

   b) the standard deviation

   c) the probable error of one reading

   d) the probable error of mean

   e) range.

4. What is clinometer? How it can be used for measuring angles. Illustrate your answer with sketches.

5. Explain how null deflection type of bridges can be used for measurement of strain.

6. What are thermistors? Explain their different forms of construction. Draw their resistivity versus temperature characteristics.

SECTION C

7. Derive an expression for magnitude and phase of a first order system when subjected to a sinusoidal input signal. Describe how a time constant of the system influences the frequency response of a first order system.

8. Describe the principle of working of ionization gauges. Describe how vacuum can be measured by using them. List their advantages and disadvantages.

9. Describe the construction and functioning of pneumatic load cells. Explain their advantages and disadvantages.

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

Total No. of Pages : 02

Total No. of Questions : 09

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

NON-TRADITIONAL MACHINING

Subject Code : DE/ME-2.0

Paper ID : [A2411]

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) Enumerate the situations in which conventional machining process give better results than non- conventional machining processes.

b) Enumerate the applications of non-conventional manufacturing processes.

c) Enumerate various applications of water jet machining process.

d) Name the tool materials used in ultrasonic machining process.

e) Enumerate limitations of water jet machining.

f) What are the prime requirements of tool material in EDM?

g) Enumerate various Etchants used in chemical machining.

h) What are the gases commonly used in LASER?

i) Explain the material removal mechanism in electron beam machining.

j) What is the necessity of hybrid machining?

SECTION-B

Q2 How the unconventional machining processes are classified?

Q3 Describe the working of electro-chemical grinding process with the help of a neat sketch.

Q4 Explain the working and metal removal mechanism of electric discharge machining with the help of a neat sketch.

Q5 What do you understand by hybrid machining processes? Explain the classification, advantages and applications of hybrid machining processes.

Q6 Describe laser beam machining process with the help of a neat sketch.

SECTION-C

Q7 Discuss the working principle, material removal mechanism, and main components of an Ultrasonic machine with the help of a neat sketch.

Q8 a) Explain hot machining process and give various applications of hot machining.

b) Explain the working principle and material removal mechanism in Plasma Arc machining process.

Q9 Describe the working principle of main components of an Electron Beam Machining process with the help of a neat sketch and give its advantages, disadvantages and applications.

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

Total No. of Pages : 02

Total No. of Questions : 09

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

NON CONVENTIONAL ENERGY RESOURCES

Subject Code : DE/ME-1.3

Paper ID : [A2404]

Max. Marks : 60

Time : 3 Hrs.

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 do you mean by renewable energy resources?

b) Define attenuation.

c) Distinguish between beam and diffuse radiation.

d) *"Solar photovoltaic power generation is not commercially viable"*. Comment on this statement.

e) Explain the principle of wind energy.

f) State the merits of wind energy.

g) List the limitations of geothermal energy.

h) What is the function of a magnetic hydrodynamic generator?

i) What is bio-mass? Give examples.

j) Distinguish between tidal and wave energy.

SECTION-B

2. Briefly discuss the need of non-conventional energy resources for the future power needs of India.

3. Describe the principle and working of a solar pond with neat sketch.

4. Give the detailed classification of wind machine. Explain anyone type of wind machine with neat sketch.

5. Explain the principle and working of a Magnetic Hydrodynamic Generator with the help of neat sketch.

6. What is a direct energy conversion system? Explain the working of thermionic converter with a neat sketch.

SECTION-C

7. a) Define solar constant. What are the reasons for variation in solar radiation reaching the earth than received at the outside of atmosphere?

   b) Describe in brief, the different energy storage methods used in the solar system.

8. a) Explain the working of fuel cell and their applications.

   b) Explain anyone type of biogas plant with neat sketch.

9. Write brief notes on the following :

   a) Single basin and double basin tidal power plants.

   b) Economic aspects of various direct energy conversion systems.

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

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ME) (2011 Onwards) (Sem.–6)

STATISTICAL AND NUMERICAL METHODS IN ENGINEERING

Subject Code : BTME-604

Paper ID : [A2364]

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) A class consists of 6 girls and 8 boys. If a committee of 3 is chosen at random from the class, find the probability that exactly 2 boys are selected.

b) A fair die is tossed 7 times. Find the probability of getting a 5 or 6 exactly 3 times.

c) A population consists of four numbers 2, 8, 14, 25. Find the population mean and the population standard deviation.

d) Find $P(-t_{0.025} < t < t_{0.01})$.

e) If the number p is correct to 3 significant digits, what is the maximum relative error?

f) State Newton-Gregory forward difference interpolation formula.

g) State Simpson's 1/3 rule.

h) Find the mean and mode of the set 2, 4, 7, 4, 9, 9, 5, 9.

i) Define a random variable.

j) Give two properties of a Binomial distribution.

SECTION-B

2. Find a positive root of $x^2 - 12 = 0$ using Newton-Raphson's method.

3. Compute $f'(x)$ and $f''(x)$ at $x = 16$ from the following table :

x	15	17	19	21	23	25
$f(x) = \sqrt{x}$	3.873	4.123	4.359	4.583	4.796	5.0

Compare with the exact values.

4. Using Taylor series expansion find $y(0.1)$ when $y' = x - y^2$, $y(0) = 0$.

5. On an average, 1.3 Gamma particles / millisecond come out of a radioactive substance. Determine the a) mean b) variance c) probability of more than one Gamma particle/millisecond come out of the substance.

6. Calculate the probability that $\overline{X}$ will be greater than 66.75 if a random sample of size 36 is taken from an infinite population having the mean $\mu = 63$ and variance $\sigma^2 = 81$.

SECTION-C

7. Determine the largest eigen value and the corresponding eigen vector of the matrix

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

8. Using Milne's predictor-corrector method evaluate the integral of $y' - 4y = 0$ at $x = 0.4$, 0.5 given that $y(0) = y_0 = 1$, $y(0.1) = y_1 = 1.492$, $y(0.2) = y_2 = 2.226$; $y(0.3) = y_3 = 3.320$.

9. Given the values of $u(x, y)$ on the boundary of the square of figure below, evaluate the function $u(x, y)$ satisfying the Laplace equation at the pivotal points of this figure by Jacobi's method.

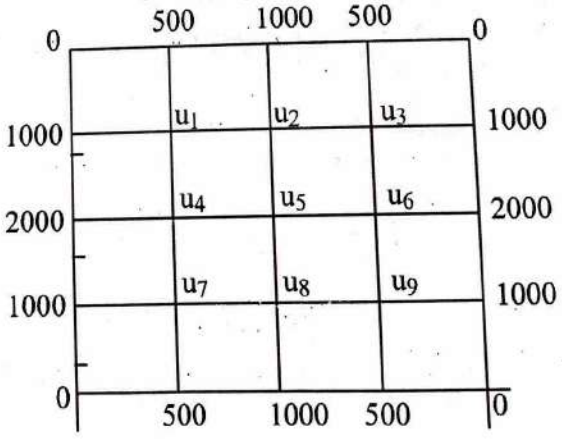


Fig.1

Roll No. [ ]

Total No. of Pages : 03

Total No. of Questions : 09

B.Tech.(ME) (2011 Onwards) (Sem.–6)

FLUID MACHINERY

Subject Code :BTME-603

Paper ID : [A2363]

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 the terms Euler's head, and degree of reaction.

b) What is the function of Braking jet?

c) Differentiate between Kaplan and Propeller turbine.

d) What is the function of a draft tube in hydraulic turbine?

e) Define specific speed of pump and write its expression.

f) Define slip in relation to pumps.

g) What is the need for priming of a pump?

h) Define utility of Surge shaft.

i) Define Net Positive Suction Head (NPSH) and write its expression.

j) Why Air lift pumps have been phased out?

SECTION-B

Q2 State "*Impulse momentum equation*", also give its applications. Why the case of jet striking single moving vane is not feasible?

Q3 Derive an expression for efficiency and maximum efficiency of Francis Turbine.

Q4 A single acting reciprocating pump of 20cm bore and 30cm stroke handles water. The suction pipe diameter and length are 12 cm and 8m respectively. The delivery pipe diameter and length 12cm and 24m respectively. The speed of operation is 32 *rpm:* Determine friction power with or without air vessels. Take Darcy's friction factor, f, as 0.02.

Q5 Derive expressions for model relationships in case of centrifugal pump.

Q6 With the help of neat diagram, explain the working principle of fluid coupling. Also, describe the slip and the efficiency of the fluid coupling.

SECTION-C

Q7 The impeller of a centrifugal pump has an outer diameter of 25 cm and an effective outlet area of 170 cm^2. The blades are backward curved and direction of relative velocity at outlet makes an angle of 148° with the direction of vane motion. The diameters of suction and delivery pipes are 15 cm and 10 cm respectively. The pump delivers 1860 liter/min. at 1450 *r.p.m.* The gauges attached at suction and delivery pipes close to the pump inlet and outlet show heads of 4.6 m below and 18.0 m above atmospheric pressure respectively. The head losses in the suction and delivery pipes are 2.0 m and 2.9 m respectively. The motor driving the pump supplies 8.67 KW. Find the manometeric efficiency assuming that water enters the pump without shock and whirl. Also, find the overall efficiency of the pump.

Q8 a) Show from the first principles that work saved in a single-acting reciprocation pump, by fitting an air vessel is 84.8 per cent.

b) A single acting reciprocating pump has a plunger diameter of 75 mm and stroke length 150 mm. It takes supply of water from a sump 3 m below the pump through a pipe 5m long and 40 mm diameter. It delivers water to a tank 12 m above the pump through a pipe 30 mm diameter and 15m long. If the separation takes place at 75KN/m^2 below atmospheric pressure, find the maximum speed at which the pump may be operated without separation, plunger operates with S.H.M.

Q9 In a Pelton Wheel the bucket deflects the jet by 170° and the relative velocity is reduced by 12% due to bucket friction. For a speed ratio of 0.47, calculate from first principle the hydraulic efficiency of the wheel. The bucket diameter of the wheel is 90cm and there is one jet for which $C_v = 0.98$. The actual efficiency of the wheel is 0.9 times its theoretical efficiency. The wheel develops 1700kW under a head of 550m. Calculate :

a) The speed of the wheel in *r.p.m.* and

b) The diameter of the nozzle.

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

Total No. of Questions : 09

Total No. of Pages : 02

B.Tech. (ME) (2011 Onwards) (Sem.–6)

HEAT TRANSFER

Subject Code : BTME-602

Paper ID : [A2362]

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) Define Thermal conductivity. What is the effect of temperature on it?

b) What is meant by critical thickness of insulation? How it is calculated in case of sphere?

c) Define Lambert's cosine law of radiation.

d) What is the significance of fin efficiency and fin effectiveness?

e) Draw temperature profile of a parallel-flow heat exchanger.

f) What is reciprocity theorem?

g) Differentiate Nusset number and Biot number.

h) Define Overall heat transfer co-efficient.

i) Enlist different types of condensation.

j) Define black body.

SECTION-B

2. Derive 3-dimensional momentum equation for the hydrodynamic boundary layer on a flat plate.

3. Set up expression for three dimensional equation of temperature distribution during steady state heat conduction in a solid cylinder with internal heat generation.

4. Derive relation of emissive power for small body in large enclosure.

5. Heat transfer coefficient depends upon the parameters such as fluid viscosity, thermal conductivity, specific heat, length/diameter and ($\beta g \Delta t$). By using dimensional analysis establish the correlation.

6. Derive the expression for LMTD of counter flow heat exchanger.

SECTION-C

7. If a fin is thin and long and tip loss is negligible, show that the heat transfer from the fin is given by $Q_{fin} = \sqrt{hPkA_c}\,(t_0 - t_f)\tanh\left(\sqrt{\frac{hP}{kA_c}}.l\right)$.

8. Air at 15°C flows at a velocity of 6.5 m/s over a flat plate. The plate surface is at a temperature of 60°C. Assuming that the transition occurs at a critical Reynolds no. of 5×10^5, find the distance from the leading edge at which the boundary layer changes from laminar to turbulent. At the location, calculate the following :

   (a) Thickness of hydrodynamic boundary layer.

   (b) Thickness of thermal boundary layer.

   (c) Local & average convective heat transfer coefficients.

   (d) Heat transfer rate from both sides per unit width of plate.

9. Write short notes on :

   (a) Heat exchanger effectiveness and number of transfer units (NTU)

   (b) Intensity of radiation and solid angle.

   (c) Different theories of nucleation.

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

Total No. of Pages : 02

Total No. of Questions : 07

B.Tech (ME) (2011 Onwards) (Sem.–6)

DESIGN OF MACHINE ELEMENTS-II

Subject Code : BTME-601

Paper ID : [A2361]

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

Q1 Answer briefly :

a) What is belt slip and creep?

b) What do you understand by simplex, duplex and triplex chains?

c) What do you understand by virtual number of teeth in the context of helical gear?

d) What is meant by hydrodynamic lubrication?

e) Name the factors on which selection of bearing for a particular application depends.

f) Why cross-section of the flywheel arms is usually elliptical?

g) What is curvature effect in helical springs?

h) What is the use of nipping of leaf spring?

i) Why it is necessary to dissipate the heat generated when clutches operate?

j) What is the condition for self-locking block brake?

SECTION-B

Q2 Select a suitable chain drive to transmit 50 kW from an electric motor to a line shaft. The motor shaft *r.p.m.* are 1200, line shaft *r.p.m.* are 250 and approximate center distance is 600 mm. Assume service is 10hr/day, 6 days per week.

Q3 A 20° full depth spur pinion is to transmit 2 kW at a speed of 950 rev/min. If the pinion has 18 teeth, determine suitable values for module and face width. The bending stress should not exceed 80 MPa.

Q4 Design a journal bearing for a centrifugal pump. The load on the bearing is 3.5kN and the journal diameter is 75mm. The shaft runs at 900 *r.p.m.* and the heat of friction is to be dissipated from the bearing housing. The ambient temperature may be taken as 25°C.

Q5 a) Discuss the various stresses induced in a flywheel rim.

b) Explain the procedure for determining the size and mass of a flywheel with the help of a turning moment diagram.

Q6 Design a leaf spring for the following specifications :

Total load is 150 kN, Number of spring supporting the load is 4, Maximum number of leaves is 10, Span of spring is lm, Permissible deflection is 85 mm. Take young's Modulus to be 200 kN/mm^2 and the allowable stress in the spring material is 600 MPa.

Q7 A centrifugal clutch is to be designed to transmit 15 kW at 900 *r.p.m.* The shoes are four in number. The speed at which the engagement begins is 3/4th of the running speed. The inside radius of the pulley rim is 150 mm. The coefficient of friction may be taken as 0.25. Determine: 1. mass of the shoes, and 2. size of the shoes.

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

Total No. of Pages : 02

Total No. of Questions : 09

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

MECHANICAL VIBRATIONS

Subject Code : BTME-803

Paper ID : [A3064]

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) Define periodic vibration.

b) What is difference between discrete system and continuous system?

c) What is the critical damping?

d) Write the equation of motion for forced vibration.

e) What are the basic requirements for vibration isolation?

f) What is the difference between a vibration absorber and vibration isolator?

g) What is influence coefficient?

h) Explain the geometric boundary conditions with example.

i) What is self-excited vibration?

j) What are undamped vibrations?

SECTION-B

Q2 A harmonic motion is given by $x(t) = 10 \sin(30t - \pi/3)$ mm where it is in seconds and phase angle in radians. Find :

a) Frequency and period of motion.

b) The maximum displacement, velocity and acceleration.

Q3 What is viscous damping? Explain the working principle of viscous damping with help of neat sketch.

Q4 Explain the principle of torsional vibration damper.

Q5 What is vibration isolation? Also explain transmissibility.

Q6 For damped free vibration system, derive the equation for amplitude for Under-damped and over-damped system.

SECTION-C

Q7 A shaft of negligible weight 6 cm diameter and 5 meter long is simply supported at the ends and carries four weight 50 kg each at equal distance over the length of the shaft. Find the frequency of vibration by dunkerley's method.

Take $E = 2 \times 10^6$ kg/cm^2

Q8 Derive the frequency equation of longitudinal vibrations for a free-free beam with zero initial displacement.

Q9 Write the short notes of **any two** of the following :

a) Holzer's method

b) Accelerometer

c) Stiffness influence coefficient

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

Total No. of Questions : 09

Total No. of Pages : 02

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

I.C.ENGINES

Subject Code : DE/ME-1.1

Paper ID : [A3065]

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) What is a Square Engine, and also explain air standard efficiency?

b) Draw Valve timing diagram for a 4-stroke diesel engine.

c) Define Volumetric efficiency, how this can be improved.

d) Differentiate between Air injection and solid injection.

e) Explain the phenomenon of Dissociation. Generally 10 to 20% rich mixture is used to prevent dissociation. Why? Explain.

f) What is excess air supplied in combustion? Why it is supplied?

g) What is volumetric efficiency, how it can be improved?

h) Draw flow chart for production of Petroleum.

i) Name various compensating devices of carburetor and their brief function.

j) Define mean effective pressure and explain its importance in I.C. Engine performance analysis.

SECTION-B

Q2 Discuss working of an engine working on Dual cycle.

Q3 Compare the air-standard cycle and fuel-air cycles based on

(i) Character of the cycle

(ii) Fuel- air ratio

(iii) Chemical composition of the fuel

Q4 The percentage analysis of gaseous fuel by volume is given as follows: CO_2= 8%, CO=22%, O_2= 4%, H_2=30% and N_2= 36%. Determine the minimum volume of air required for complete combustion of $1m^3$ of gas and calculate the percentage composition by volume of the dry products of combustion. If 1.4 m^3 of air is supplied per m^3 of gas, what will be the percentage by volume of $C0_2$ in the dry products of combustion?

Q5 Briefly, explain direct injection of fuel in Petrol engine, stating its merits over carburetor.

Q6 What do you mean by a supercharger? Discuss its effect on :

(i) Power output

(ii) Thermal efficiency

(iii) Fuel consumption.

SECTION-C

Q7 Discuss in detail the phenomenon of knocking S.I engine. Explain how it can be prevented/suppressed.

Q8 Explain working of diesel Injection system using a distributor type injection pump.

Q9 The following observations were made during a trial of 4-cylinder, four stroke gas engine having cylinder diameter of 6 cm and stroke 9 cm and rated speed=2800r.p.m. this engine is tested against a brake which has a torque arm of 0.37m. The brake load is 160N and fuel consumption is 8.986 liters/h. The sp. Gravity of petrol is 0.74 and calorific value is 44100kJ/kg. A Morse test is carried out and cylinders are cut in the order l, 2, 3 and 4 with corresponding brake load of 110, 107, 104 and 110N respectively. Calculate for this speed:

(i) Engine torque

(ii) Brake mean effective pressure

(iii) Brake thermal efficiency

(iv) Mechanical efficiency

(v) Specific fuel consumption and indicated mean effective pressure

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 : DEME-2.4

Paper ID : [A3078]

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) Applications of Magnetic NDT

b) Ultrasonic

c) Enlist basic type of transducers

d) Demagnetization

e) Measurement of hardness

f) Materials for liquid penetrant testing procedure

g) γ-ray radiographic technique

h) Acoustic emission technique (AET)

i) NDT methods for detection of surface weld defects

j) Safety procedures in radiography

SECTION-B

2. Classify nondestructive methods. Discuss the role of NDT in today's manufacturing.

3. Elaborate the disadvantages of magnetic particle inspection?

4. Investigate the procedure for detection of flaws in rails and tubes.

5. Explain the procedure for determining principal stresses in a stressed material with the help of photo elasticity.

6. Write a brief note on proof tests.

SECTION-C

7. Explain in brief the underlying principle of Radiography along with the procedure of X-Ray Radiography. Also, state the advantages and applications of various Radiography techniques.

8. Investigate in detail the ultrasonic inspection technique with the help of neat and suitable sketches.

9. Write short notes on :

   a) Photostress models

   b) Radiograph

Roll No. [redacted] 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 : DEME-228

Paper ID : [A2078]

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) [redacted]

b) [redacted]

c) [redacted]

d) [redacted]

e) [redacted]

f) [redacted]

g) [redacted]

h) [redacted]

i) [redacted]

j) [redacted]

SECTION-B

Q2 Discuss the role and importance of total technology management in detail.

Q3 Discuss in detail the benefits of Bench Marking.

Q4 Compare TQM and ISO 9000.

Q5 Explain cause and effect diagram with suitable example.

Q6 Explain seven wastes in JIT.

SECTION-C

Q7 Define TQM. Enlist the priority areas along with essential steps of implementing TQM in an organization.

Q8 a) Derive the expression for Taguchi's loss function.

b) Explain the factors affecting process management.

Q9 Write notes on :

a) Kanban system.

b) Quality circles.

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

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ME) (2011 Onwards) (Sem.–7,8)

REFRIGERATION AND AIR CONDITIONING

Subject Code : BTME-802

Paper ID : [A3063]

Max. Marks : 60

Time : 3 Hrs.

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) Explain why COP of a heat pump is different than that of a refrigerator.

(b) Define the terms: Energy efficient ratio, and EPR of a heat pump.

(c) Draw Bell Coleman cycle on PV and TS diagrams.

(d) Define the term *"Dry Air Rated Temperature (DART)"*.

(e) Show actual vapour compression refrigeration cycle on T-s diagram.

(f) Write desirable properties of absorption system refrigerants.

(g) Write various applications of cascade refrigeration systems.

(h) Define the terms: Degree of saturation, and Specific humidity.

(i) Explain briefly the significance of effective temperature in the design of air conditioning systems.

(j) What is the function of ducts, and suggest a suitable material for ducts of a refrigeration system?

SECTION-B

Q2. The 20 tonnes of fruit at a temperature of 30°C is supplied to a cold storage plant. The specific heat of fruit above freezing point is 2.93 kJ/kg K. The specific heat of fruit below freezing point is 1.26 kJ/kg K. The fruit is stored in cold storage plant which is maintained at –8°C. The freezing point of fruit is –4°C. The latent heat of fruit is 235 kJ/kg. If the plant requires 75 kW to drive it, find :

(a) The capacity of the plant, and (b) time taken to achieve cooling. Assume actual COP of the plant as 0.3 of the Carnot COP.

Q3. Explain the working of aqua-ammonia vapour absorption refrigeration system with help of a neat sketch.

Q4. Discuss various desirable thermodynamic and chemical properties of refrigerants.

Q5. What is *"effective temperature"*? What factors affect effective temperature? Explain its significance in the design of air conditioning systems.

Q6. What is the function of expansion device in a refrigeration system? Explain the working of any two expansion devices with neat sketches.

SECTION-C

Q7. A Simple air cooling system is being used to cool the cabin of an aeroplane which is flying at the speed of 333.3 m/sec. The cabin is to be maintained at 25°C and the pressure inside the cabin is 1 bar. The ambient air pressure and temperature are 0.85 bar and 30°C. The cabin load is 10 TR. Main compressor pressure raio is 4, ram efficiency is 90%, temperature of air leaving the heat exchanger and entering the cooling turbine is 60°C, pressure drop in the heat exchanger is 0.5 bar, pressure loss between the cooler turbine and. cabin is 0.2 bar. Assume the isentropic efficiencies of main compressor and cooler turbine are 80%, find the quantity of air passed through the cooling turbine and COP of the system. For air c_p=l kJ/kgK and c_p/c_v=1.4.

Q8. Find the dew point temperature of the coil and capacity of the air conditioning plant of an office having maximum seating capacity of 25 employees. The following data is given :

Outside design conditions = 34°C DBT, 28°C WBT

Office design conditions = 24°C DBT, 50% RH

Solar heat gain = 9120 W, Latent heat gain per employee = 105 W, Sensible heat gain per employee = 90 W, Lightening load = 2300 W, Sensible heat load from other sources = 11630 W, Infiltration load = 14 m^3/min.

Assume 40% of fresh air and 60% of recirculated air passing through the evaporator coil an the by-pass factor of 0.15.

Q9. (a) Explain the working of a simple vapour compression refrigeration system without liquid subooling and with superheated vapour after compression. Show the entire system on T-s and p-h planes. Why is superheating considered to be good in certain cases?

(b) Describe, with the help of schematic and p-h diagrams, the working of a two stage compression system with water intercooler, liquid intercooler and a liquid flash chamber.

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

Total No. of Questions : 09

Total No. of Pages : 02

B.Tech.(ME) (2011 Onwards) (Sem.–7,8)

INDUSTRIAL ENGINEERING AND MANAGEMENT

Subject Code : BTME-801

Paper ID : [A3062]

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 Explain briefly :

a) Production Management.

b) Taylor's scientific management.

c) Project organization.

d) Management control function.

e) Group technology.

f) Reasons for low productivity.

g) Man-machine chart.

h) Procedure for *"Time Study"* by *"Stop-watch"* Method.

i) Value Engineering.

j) Symbols of motion study.

SECTION-B

Q2 Discuss various functions of industrial engineering department.

Q3 Discuss the importance and characteristics of organizational structure.

Q4 State clearly the methods to improve productivity.

Q5 Explain the basic procedural steps in work study.

Q6 Elaborate in brief the phases and application of value engineering.

SECTION-C

Q7 Write short notes on :

a) Herzberg's two factor theory of motivation.

b) Fayol's principles of management.

Q8 What are classical types of plant layout? Discuss the advantages, limitations and applications of each type of layout.

Q9 A work sampling study was conducted for 100 hours in the machine shop in order to estimate the standard time. The total numbers of observations recorded were 2500. No working activity could be noticed for 400 observations. The ratio between manual and machine elements was 2:1. Average rating factor was estimated as 1.15 and the total number of articles produced during the study period was 6000.

Rest and personal allowances may be taken as 12 % of the normal time.

2. SECTION-B contains FIVE questions carrying ... 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 human resource management.

b. What is job analysis?

SECTION-B

2. What are various functions of HRM?
3. What are various methods of recruitment?
4. What are the benefits of psychological tests?
5. Discuss the role of interview in placement.
6. What role employment exchanges provide for the placements?

SECTION-C

7. Explain the procedure of job analysis in detail.
8. What is the role of trade unions in maintaining the cordial industrial relations?
9. Access the positions of employee safety in today's Indian industries.

B.Tech - Sem - 3

Dec 2018 ECE

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

Total No. of Questi

Total No. of Pages : 02

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
Paper ID : [A1131]

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 binary number 10000111 into equivalent gray number.

b. Write excitation tables of SR and JK flip flops.

c. Compare CMOs with ECL.

d. What are excess 3 codes? Where are they used?

e. Show that XOR gate acts as 1 bit comparator.

f. What is open collector logic?

g. What are De-Morgan theorems?

h. Compare PLA and PAL.

i. What are shift registers? What are their applications?

j. Determine conversion time of ADC for 8-bit resolution at 2 MHz.

SECTION-B

Q2. Implement the function $f(A, B, C, D, E) = \sum m(0,3,5,8,9,15,18,31)$ using QM Method.

Q3. Explain the working of weighted resistor A/D converter.

Q4. Design 4 bit Binary to Gray converter.

Q5. Convert D flip flop into JK flip flop.

Q6. Write note on accuracy and resolution of ADC.

SECTION-C

Q7. Design a Mod 6 up down counter.

Q8. Explain the following :

a. Counter type ADC

b. Memory organization

Q9. Design a BCD to seven segment decoder.

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

Total No. of Questions : 09

Total No. of Pages : 02

B.Tech.(CE)/(ECE)/(EE)/(Electrical & Electronics)/ (Electronics & Computer Engg.)/(Electronics & Electrical)/(ETE) (2011 Onwards)

B.Tech.(Electrical Engg. & Industrial Control) (2012 Onwards)

B.Tech.(Electronics Engg.) (2012 Onwards)

(Sem.–3)

ENGINEERING MATHEMATICS – III

Subject Code : BTAM-301

Paper ID : [A1128]

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. Solve the following :

(a) What is Euler's formulae for the fourier series expansion of the function $f(x)$ in the interval $\alpha < x < \alpha + 2\pi$.

(b) Find Laplace transform of the function $\frac{\sin t}{t}$.

(c) Find Taylor's series expansion of $\frac{z-1}{z+1}$, about $z = 1$.

(d) Find the value of $\int_{-1}^{1} (2x+1)\, P_3(x)\, dx$, where $P_3(x)$ is the third degree Legendre's polynomial.

(e) Solve $2\frac{\partial^2 z}{\partial x^2} - 5\frac{\partial^2 z}{\partial x \partial y} + 2\frac{\partial^2 z}{\partial y^2} = 0$.

(f) If $f(x)$ is an odd function in $(-c, c)$, then what are the values of a_0 and a_n?

(g) Write down the three possible solutions when we solve the Laplace equation in two dimensions by applying the method of separations of variables.

(h) Is the function $f(x, y) = 4xy - 3x + 2$ harmonic? Justify your answer.

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

(j) Evaluate $\int_0^{1+i}(x^2-iy)\,dz$ along the path $y=x^2$.

SECTION-B

2. Obtain the half range cosine series for $f(x) = (x-1)^2$ in the interval $0 < x < 1$. Hence show that $\pi^2 = 8\left(\frac{1}{1^2}+\frac{1}{3^2}+\frac{1}{5^2}+\ldots\right)$.

3. Solve $y'' + y' - 2y = 1 - 2x$, where $y(0) = 0$ and $y'(0) = 4$, using Laplace Transforms.

4. Find the transformation which maps the points 1, i, -1 of the z-plane onto i ,$0 - i$ of the w-plane respectively.

5. Solve the partial differential equation $(y+z)\,p - (z+x)\,q = x - y$.

6. Show that $J_n(x) = \frac{x}{2n}(J_{n-1}(x) + J_{n+1}(x))$? Where the letters have their usual meanings?

SECTION-C

7. Solve the wave equation $= \frac{\partial^2 u}{\partial t^2} = a^2\frac{\partial^2 u}{\partial x^2}$, under the condition : $u = 0$ when $x = 0$ and $x = \pi$, $\frac{\partial u}{\partial t} = 0$ when $t = 0$ and $u(x, 0) = x$,$0 < x < \pi$.

8. State and prove Cauchy's integral formula. Use it to evaluate $\int_C \frac{z^2-z+1}{z-1}dz$ where C is the circle (i) $|z| = 1$ (ii) $|z| = \frac{1}{2}$.

9. Solve in series the differential equation $2x(1-x)\frac{d^2y}{dx^2} + (5-7x)\frac{dy}{dx} - 3y = 0$.

Roll No. ☐☐☐☐☐☐☐☐☐☐☐ Total No. of Pages : 03

Total No. of Questio

B.Tech.(Electronics Engg.)/(Electrical Engineering & Industrial Control)
(2012 Onwards)

B.Tech.(ECE/EE/Electrical & Electronics/Electronics & Computer Engg./
Electronics & Electrical/ETE) (2011 Onwards)

(Sem.–4)

LINEAR CONTROL SYSTEMS

Subject Code : BTEE-402

Paper ID : [A1188]

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) What is the need of a control system? Explain.

(b) Define transfer function.

(c) What is the significance of time constant in first order systems?

(d) Why Bode plot is drawn on semi log paper?

(e) How Nyquist criterion is different from Routh-Hurwitz criterion?

(f) Define gain and phase margin.

(g) What do you mean by steady state error? Explain.

(h) List the various characteristics of servo motors.

(i) Discuss in brief applications of lead and lag compensation.

(j) Why compensation is required? Explain.

SECTION–B

2. Determine the ratio $\frac{Y(s)}{X(s)}$ of the system whose block diagram is shown in the figure 1.

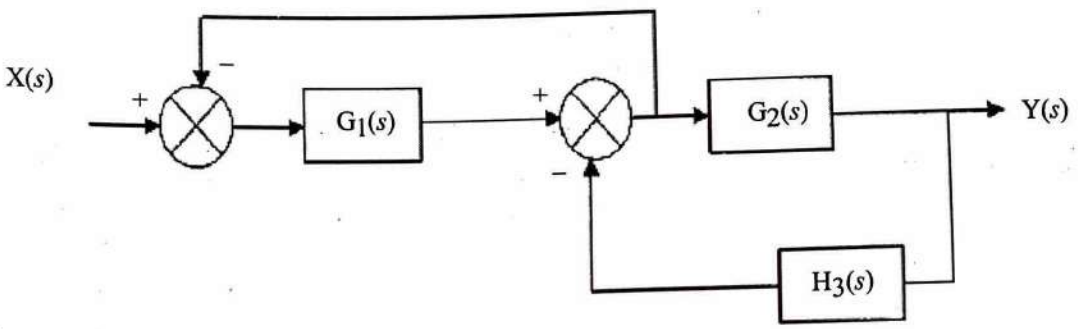


Figure - 1

3. Discuss in detail the (by considering examples) open loop and closed loop systems. Which out of these controls is preferred and why?

4. Determine the stability of the system using Routh-Hurwitz criteria whose characteristics equation is given by

$$s^5 + 13\,s^4 + 54\,s^3 + 82\,s^2 + 170\,s + 330 = 0$$

5. For a unity feedback control system the forward path transfer function is given by

$$G(s) = \frac{20}{s(s+2)(s^2+2s+20)}$$

Determine the steady state error of the system when the input is 2t.

6. For the root locus of a system having open loop transfer function

$$G(s)H(s) = \frac{K}{s(s+1)(s+3)}$$

Determine the Asymptotes to the loci and breakaway points.

SECTION C

7. Draw the time response of a underdamped second order system when subjected to unit step input and define the following :

   (a) Rise time

   (b) Peak time

   (c) Maximum overshoot

   (d) Settling time

8. Construct the Bode plot of the system whose open loop transfer function is given by

$$G(s)H(s)=\frac{4}{s(1+0.5s)(1+0.08s)}$$

9. **Write short notes on the following :**

   (a) Series and parallel compensation

   (b) Magnetic Amplifier

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

Total No. of Pages : 02

Total No. of Questions : 09

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

(Sem.–4)

ELECTRONIC MEASUREMENT & INSTRUMENTATION

Subject Code : BTEC-404

Paper ID : [A1192]

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 briefy :

a. List the advantages of electronic instruments over mechanical instruments.

b. Differentiate between primary and secondary type of measurements.

c. What do you mean by accuracy and precision?

d. What is loading effect?

e. Define the terms in context of normal frequency distribution of data 1. Average Deviation 2. Standard Deviation.

f. What is the purpose of using Ohm meter?

g. Elaborate instrumental error, environmental error and observational error.

h. Briefly explain speed of response and measuring lag.

i. What is Strain gauge?

j. What is working principle of PMMC?

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

Total No. of Questions : 09

Total No. of Pages : 02

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

SIGNAL AND SYSTEMS

Subject Code : BTEC-402
Paper ID : [A1190]

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

Q.1 Answer briefly :

a) State properties of linear convolution.

b) What is sampling theorem?

c) Define Convolution theorem.

d) What is mean and variance of Gaussian pdf?

e) What is central Limit Theorem?

f) What is noise figure?

g) Define power spectral density.

h) Give the Dirichlet Condition.

i) What is the difference between causal and non-causal system?

j) What do you mean by eygodicity?

SECTION-B

Q.2 Derive relationship between noise figure and equivalent noise temperature for a cascade system.

Q.3 Calculate SNR for Matched filter.

Q.4 Write a note on various types of Noise.

Q.5 State and prove time scaling and multiplication properties of Fourier series.

Q.6 Prove the periodicity of $y(t) = \cos(\omega t + \phi)$ and $y(t). = e^{Jwt}$, $\omega \neq 0$, also find 3 fundamental periods.

SECTION-C

Q.7 What is sampling theorem? Derive the expression for band limited & band pass signal.

Q.8 What is Complex convolution Theorem? Find convolution of linear and circular convolution.

Q.9 Discuss the properties of Laplace Transform. For a LTI system, the impulse response $h(t) = u(t)$ Find :

a) Characteristic roots of the system.

b) Stability of the system.

c) Is this BIBO stable?

d) What can this system be used?

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

Paper ID : [A1193]

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) What is the purpose of a linear wave shaping circuit?

b) Define rise time and recovery time.

c) What do you mean by delay time of a transistor?

d) Draw a neat circuit diagram of a stable multivibrator.

e) Sketch a positive series clipping circuit alongwith its input and output waveforms.

f) What do you understand by switching circuit?

g) Discuss the effect of temperature on diode.

h) Why does a resistive attenuator need to be compensated?

i) What is meant by a fractional tilt?

j) What is biased clamping?

SECTION-B

Q2. Derive the expression for gate width of a Monostable Multiviberator considering the effect of Revenues saturation current.

Q3. Draw the diode differentiator comparator circuit and explain the operation of it when ramp input signal is applied.

Q4. Explain various transistor switching times.

Q5. What is Schottky diode? How is it used for reducing storage time?

Q6. Derive an expression for the lower cut-off frequency of a high-pass circuit.

SECTION-C

Q7. a). Explain the attenuator circuit, with suitable equations and waveforms.

b) Explain fixed-bias and self-bias bistable multivibrator.

Q8. What is meant by a low-pass circuit? Derive an expression for the output of a low-pass circuit excited by a square-wave input.

Q9. a) Why a charge Compensating Capacitor is used in diode switch?

b) Draw the Circuit Diagram of double diode clipper which limits at two independent levels and explain it with its transfer characteristic.

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

Total No. of Questions : 09

Total No. of Pages : 02

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

ANALOG COMMUNICATION SYSTEMS

Subject Code : BTEC-401
Paper ID : [A1189]

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. In a Broadcast system, the maximum audio frequency transmitted from a radio station is of the order of 5 KHz. Calculate the size of the antenna, if signal is transmitted without modulation.

b. What are the frequency components of an AM wave? Plot the frequency spectrum of single tone AM system.

c. Why there is need of modulation in communication system?

d. Write the differences between baseband transmission and bandpass transmission.

e. Write the role of limiter in FM.

f. What is vestigial side band transmission?

g. Define the terms selectivity and sensitivity of a receiver.

h. Derive the power relation of AM system.

i. Draw pre-emphasis circuit and discuss why we pre-emphasis the signal before transmission in FM.

j. What is pulse time modulation?

SECTION-B

Q2. How can you reject image frequency in super heterodyne receiver? Why double spotting is harmful? Also draw selectivity curve at 750 KHz.

Q3. Draw circuit diagram and waveforms of Square law modulator.

Q4. With the help of block diagram, explain Armstrong method of FM generation.

Q5. Give comparison of SSB transmission and conventional AM system .

Q6. What do you mean by synchronization in PAM system?

SECTION-C

Q7. In tabular form, give comparison of PAM, PWM and PPM systems.

Q8. Explain the following :

a. Two way FM radio transmitter and receiver.

b. AM receiver using phase locked loop.

Q9. With derivation, explain DSB-SC system. Draw power spectrum and explain why we prefer SSB instead of DSB-SC system.

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

Total No. of Questions : 09

Total No. of Pages : 02

B.Tech.(ECE)/(ETE) (2011 Onwards)
B.Tech.(Automation & Robotics) (2011 & Onwards)
B.Tech.(Electronics Engg.) (2012 Onwards)
(Sem.–5)

MICRO PROCESSORS & MICROCONTROLLERS

Subject Code : BTEC-504
Paper ID : [A2106]

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 basic difference between microprocessor and microcontroller?

b. Give examples of embedded products using microcontroller.

c. What is the function of accumulator in 8085?

d. What is the function of program counter?

e. What does an ALU do?

f. How does instructions differ from a directive?

g. What are the advantages of SRAM as compare to DRAM?

h. Write the instruction to add the values 16H and CDH. Place result in register R2.

i. What are the advantages of serial communication over parallel communication?

j. Why must the data bus be bidirectional?

SECTION-B

Q2 Discuss address bus and data bus in 8085.

Q3 Draw and explain 8085 microprocessor pin configuration.

Q4 Differentiate ACALL and LCALL instruction.

Q5 What is the difference between EPROM and EEPROM?

Q6 Explain functional block diagram of 8085.

SECTION-C

Q7 Explain in detail :

a. TCON register.

b. RS 232 Pins.

Q8 Explain how writing, assembling and executing of a program done in 8085.

Q9 Write a short note on :

a. Stepper motor interfacing in 8051.

b. Data transfer operations in 8085.

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

Paper ID : [A2104]

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) $x(n) = (0.4)^n u(n)$. State whether it is an energy or power signal. Justify.

b) What do you mean by causality and stability of a system?

c) State the differentiation property of Z-transform.

d) State the sampling theorem of signals. What will be the sampling rate if the maximum frequency component in an analog signal is 8 KHz?

e) Give the relation between linear and circular convolution.

f) What is meant by frequency warping? What is the cause of this effect?

g) Give the computational efficiency of FFT over DFT.

h) In the implementation of a digital system what are the effects of quantization of coefficients?

i) Give the advantages and disadvantages of FIR digital filter over IIR digital filter.

j) Explain the concept of pipelining in DSP processor.

SECTION-B

2. Determine the Z-transform of the signal

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

3. Compute the linear convolution $y(n)$ using circular convolution of the signals

$$x(n) = \begin{cases} \frac{1}{4}n, & -1 \le n \le 5 \\ 0, & \text{elsewhere} \end{cases}$$

$$h(n) = \begin{cases} 1, & -2 \le n \le 3 \\ 0, & \text{elsewhere} \end{cases}$$

4. Explain the Goertzel Algorithm to compute the DFT using linear filtering approach.

5. The transfer function of analog filter is given as:

$$H_a(s) = \frac{1}{(s+1)(s+2)}$$

find the corresponding $H(z)$ using impulse invariance method for sampling frequency of 6 samples/sec.

6. Obtain the direct form – I & 2, cascade form realization for the following system

$$y(n) - \frac{3}{4}y(n-1) + \frac{1}{8}y(n-2) = x(n) + \frac{1}{2}x(n-1)$$

SECTION-C

7. Draw the 8-point: radix-2 decimation-in-time (DIT) FFT algorithm flow diagram and compute the DFT of the following sequence $x(n) = (1, 0, -2, 1, -1, 2, 0, 1)$.

8. Discuss various steps for the design of linear phase FIR filters using window method. Design the symmetric FIR low pass filter using rectangular window, whose desired frequency response is given as,

$$H_d(\omega) = \begin{cases} e^{-j\omega\tau} & \text{for } |\omega| \le \omega_c \\ 0 & \text{otherwise} \end{cases}$$

The length of the filter should be 9 and $\omega_c = 1$ radian/sample.

9. Write short notes on the following :

   a) Effect of round off noise in digital filters

   b) Architecture of TMS series of digital signal processors.

B-Tech - Sem - 6

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

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(EE / Electrical & ...s) (2011 Onwards E-I) (Sem.–6)

FLEXIBLE AC TRANSMISSION SYSTEMS

Subject Code : BTEE-605B

Paper ID : [A2340]

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 the following in short :**

a) What are the limitations of conventional compensating devices?

b) How is TSC different from TCR?

c) Differentiate between: SSSC and TCSC.

d) How are DC filters different from AC filters?

e) A 200 MVA load with power factor of 0.8 is connected to the power system network. What is the rating of capacitor required to improve its power factor to 0.92?

f) What are non-characteristic harmonics?

g) What do you understand by the term 'Congestion Management'?

h) What are the various energy storage devices that can be used in STATCOM?

i) Enumerate the various operating modes of TCSC.

j) What are the sources of RI noise?

SECTION-B

2) Prove that steady state power limit gets doubled if the magnitude of receiving end voltage is maintained constant. Also, state the assumptions made.

3) What are SVC systems? Describe the SVC schemes commonly used in EHV/UHV transmission. Also, write their applications.

4) Explain the design procedure of DC filters.

5) Discuss the working and applications of SSSC. Explain, with the help of block diagram.

6) Draw the block diagram of UPFC. Discuss its principle of operation. Explain the working, characteristics and applications of UPFC.

SECTION-C

7) Explain the objectives of Phase shifter. How is SPS superior compared to conventional phase shifter? Discuss the operating characteristics of SPS and also derive its steady state model. Also, explain the power current configuration of SPS.

8) a) How are FACTS devices useful for congestion management?

   b) Discuss the classification of compensation devices that can be used in a power system network.

9) Write short notes on the following :

   a) STATCOM

   b) Static VAR Systems

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

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

Paper ID : [A2395]

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 mathematical concept of information and its units.

b) Give the basic idea behind variable length source coding. Give example.

c) For a running data stream, which kind of the coding technique is used?

d) What do you mean by Prefix coding? Give its properties.

e) Define entropy, average length and coding efficiency.

f) Mention structural properties and applications of Convolutional Coding.

g) Briefly explain Hamming Sphere.

h) Distinguish Source Coding from Channel Coding and its requirement.

i) How do we use Parity Matrix in Block Coding?

j) Briefly comment about Selective Repeat ARQ strategies.

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

Paper ID : [A2318]

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 are main feature of structural modelling in VHDL language?

   b. What is the function of bus hold logic?

   c. What do you mean by operator overloading in VHDL?

   d. Define the term entity and architecture.

   e. How simulation of sequential circuit is done?

   f. What is noise margin in CMOS?

   g. Differentiate between NMOS and PMOS.

   h. What is sub threshold voltage?

   i. Write VHDL code for NAND gate.

   j. Differentiate between signal and variable.

SECTION-B

2. Describe package body with an example.

3. With an example, differentiate between data flow, behavioural circuit modelling.

4. Write the VHDL code for encoder.

5. Write VHDL code for full subtractor using half subtractor.

6. What is NMOS inverter? Discuss the transfer characteristics of it.

SECTION-C

7. Design and write VHDL code for 3- bit asynchronous up counter using D flip flop.

8. What is body effect? Discuss the MOS device equations.

9. Realize the following expression using NAND gate and Write VHDL code for it.

   $F(A,B,C) = A'C' + AB'C' + ABC + AB'C$

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

Paper ID : [A2317]

Max. Marks : 60

Time : 3 Hrs.

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 economy.

b) What is inventory?

c) Define industrial management.

d) What is the importance of cost estimation for the new project?

e) What is an annual cost?

f) What is labour cost?

g) Explain two functions of management.

h) What is informal organization?

i) What is delegation of authority?

j) Define breakeven point.

SECTION-B

Q2) Explain the factors to be considered in replacement studies.

Q3) Explain the importance and characteristics of organizational structure.

Q4) Explain the difference between cost estimation and cost accounting.

Q5) Discuss discounted cash flow analysis.

Q6) Explain the difference between continuous inventory review system and periodical review system.

SECTION-C

Q7) Explain the Taylor's 14 principles of scientific management.

Q8) Discuss the nature, scope, importance and applications of industrial management.

Q9) Define Motivation. How effective motivation theory helps in improving quality of work life? Explain with the help of example.

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

Paper ID : [A2316]

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. Compare flat fading and frequency selective fading.

b. What is power delay profile?

c. What is co-channel reuse ratio?

d. Draw a cell cluster having a size of seven.

e. What is Forward Channel?

f. What is cellular system?

g. Define TDMA.

h. What is Paging system?

i. What is LTE-Advance system?

j. What is uplink frequency of GSM?

SECTION-B

2. Explain the following packet radio protocols:

   a. Pure ALOHA

   b. Slotted ALOHA

3. Explain with diagram the dependence between cell cluster size and interference.

4. Explain in detail Maximal Ratio Combining Diversity method.

5. Write short note on Cordless telephone system.

6. How cell splitting is used to increase the system capacity of cellular system? Explain.

SECTION-C

7. Briefly explain about the Features of 4G and the challenges to be faced by it along with possible solutions to overcome those challenges.

8. Write in detail about

   a. AMPs

   b. GSM

   c. IS_95 (CDMA)

9. Compare TDMA, FDMA and CDMA multiple access techniques in detail.

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

Total No. of Questions : 09

Total No. of Pages : 02

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

MICROWAVE AND RADAR ENGINEERING

Subject Code : BTEC-601

Paper ID : [A2315]

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) Define the term VSWR.

b) What is transit angle effect?

c) Write the full forms of IMPATT and MASER diodes.

d) Draw V-I characteristic of GUNN diode.

e) Compare two cavity klystron with Traveling wave tube.

f) Write the two equations for maximum radar range.

g) Define frequency pushing and pulling in magnetron.

h) Define PRF.

i) Compare the pulsed radar and CW radar.

j) What is the range of microwave frequencies?

SECTION-B

Q2 Explain the pulsed RADAR system with the help of block diagram.

Q3 What is Impedance matching? Explain single stub matching and double stub matching.

Q4 Explain the negative resistance principle for TRAPATT diode.

Q5 Derive the relationship between SWR and reflection co-efficient.

Q6 Describe the operation of two hole directional coupler.

SECTION-C

Q7 a) Discuss difference between MTI and Doppler radar.

b) Describe high power measurement method.

Q8 With a neat sketch, explain the operation of magic tee. Also obtain the S matrix representation of the magic tee.

Q9 Write a short note on :

a) Scanning and Tracking Techniques.

b) Phase shifter.

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

Total No. of Pages : 02

Total No. of Questions : 09

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

OPERATING SYSTEMS

Subject Code : BTCS-401

Paper ID : [A2314]

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) Write at least two functions of Operating System.

b) Explain the term Process Synchronization.

c) Explain the term Thrashing.

d) Explain the term deadlock.

e) Differentiate between Logical and Physical address space.

f) Why page size is always power of 2?

g) Write at least two differences between UNIX and Windows based operating systems.

h) Differentiate between seek time and rotational latency.

i) Define the term File. List various attributes of a File.

j) Define the term Distributed Operating Systems.

SECTION-B

Q2 What is the need of an Operating System? Explain in brief the different views of an operating system.

Q3 Explain in detail the following CPU scheduling algorithms :

a) Shortest Job First.

b) Multilevel feedback Queue scheduling.

Q4 Explain with an example the concept of shared pages in detail.

Q5 Write a detailed note on Device Management policies.

Q6 Write a brief note on Physical File System.

SECTION-C

Q7 Explain in detail the concept of Multiprocessor Operating Systems.

Q8 a) Explain any five LINUX Operating System commands with example.

b) Explain in brief the functions of Kernel and shell.

Q9 What is the need of Page replacement? Explain any three methods of Page Replacement with example.

Roll No. [ ] Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(Automation & Robotics)/(ECE) (2011 Batch Elective-II)

(Sem.–7,8)

HUMAN RESOURCE MANAGEMENT

Subject Code : BTEC-913

Paper ID : [A2925]

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 briefly :**

   (a) Give any two examples of the changing role of HR managers in the light of globalization.

   (b) What is meant by Organization Structure?

   (c) Discuss any two limitations of human resources planning.

   (d) Why is outsourcing of personnel gaining importance?

   (e) Give any two limitations of employment tests.

   (f) Define training.

   (g) Can only financial incentives motivate the employees? Discuss.

   (h) Describe any two determinants of job satisfaction.

   (i) Give any two objectives of Worker's participation in management.

   (j) What is a Trade Union?

SECTION–B

2. Describe the scope of human resource management. Is it only the responsibility of Personnel department?

3. Explain the techniques of manpower forecasting used in industry.

4. What is meant by recruitment? Why is it called a positive process? How does it differ from selection?

5. Discuss the need for training in an industrial enterprise. What are the methods of operative training?

6. What is Career development? Briefly describe the various steps involved in the career development process.

SECTION–C

7. What is Job Analysis? Discuss the objectives and uses of job analysis. Describe the various techniques of collecting data for job analysis.

8. Define Collective Bargaining. Describe the various types of collective bargaining. Discuss the essentials of successful collective bargaining and the obstacles to it in the Indian context.

9. Write short notes on :

   (a) Maslow's theory of need hierarchy

   (b) Internal sources of recruitment

   (c) Performance appraisal systems

   (d) Quality of work life.

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

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

Paper ID : [A2999]

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 LAN, MAN and WAN.

b) Differentiate between Connection-Oriented and Connectionless services.

c) What is the need of Protocols?

d) Explain the term Framing.

e) Explain the term RARP.

f) Explain in brief the concept of Flooding Routing Algorithm.

g) Explain briefly the effects of Congestion.

h) Differentiate between Distance vector and Link State routing algorithms.

i) Explain the term Jitter Control.

j) How many bits are consumed by IPv4 and IPv6 addresses respectively?

SECTION-B

Q2 Differentiate between Bridges, Hubs and Switches.

Q3 Write a detailed note on Protocol using Go Back N.

Q4 Write a detailed note on Congestion control in Packet-Switching Networks.

Q5 Explain the concept of Hierarchical Routing with an example.

Q6 Explain in detail about Principles of Internetworking.

SECTION-C

Q7 Write a detailed note on the TCP/IP reference model. Also compare TCP/IP reference model with OSI reference model.

Q8 Explain the Congestion Prevention Policies. Also explain in detail about congestion control in Datagram Subnets.

Q9 Explain the Optimality Principle for routing. Also explain in detail the Shortest Path Routing Algorithm with an example.

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

Paper ID : [A3014]

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. Mention any four challenges of mobile computing.

   b. What do you mean by location management in cellular systems?

   c. What is encapsulation mechanism in Mobile IP?

   d. What are the advantages of Mobile TCP?

   e. How Mobile Internet protocol (Mobile IP) works?

   f. Mention salient features of WAP.

   g. What are limitations of Bluetooth technology?

   h. What is mobile agent computing?

   i. Enlist the important characteristics of MANETs.

   j. Name various routing protocols used in MANETs.

SECTION-B

2. Explain the channel structure in GSM.
3. Discuss the concept of packet delivery in Mobile IP.
4. What is Bluetooth? What are the advantages and disadvantages of Bluetooth?
5. Explain the architecture of Wireless Application Protocol.
6. Explain the role of mobile agents in computing.

SECTION-C

7. What is Mobile computing? What are various issues in Mobile computing? Explain in detail.
8. What is Traditional TCP? What are the improvements made in Indirect TCP and Snooping TOP? Explain their mechanisms and features.
9. How routing is performed in MANETs? Discuss in detail various routing algorithms used in MANETs.

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

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ECE) (2011 Batch) (Sem.–7,8)

EMBEDDED SYSTEMS

Subject Code : BTEC-701

Paper ID : [A3000]

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) Vector Table

b) Instruction Set

c) Difference between ADI 0lh, INR

d) Pointer

e) Register

f) Memory

g) Structure

h) Compiler

i) Sensors

j) ANA and ORA Instructions

SECTION-B

Q2. How to add two 8-bit numbers in assembly language?

Q3. Write a note on Biometric & RFID.

Q4. Write a program to generate factorial of a number using functions.

Q5. Discuss about instruction scheduling.

Q6. Differentiate between ADC and DAC.

SECTION-C

Q7. Describe the working of LCD Display.

Q8. Define Addressing Modes. Explain all in detail.

Q9. What are various debugging tools? Explain.

B.Tech Sem-
Dec 2018 IT

Roll No. [ ] Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(IT) (2011 Onwards) (Sem.–5)

CYBER LAWS & IPR

Subject Code : BTIT-504

Paper ID : [A2126]

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 process of digital signature?

b. Where is the cyberspace?

c. What are components of Cyber Law?

d. What is taxation in E-commerce?

e. Define Patent.

f. What is cyber theft?

g. What is meaning of Intellectual property rights?

h. Discuss goals of digital society.

i. Which is latest IT Act?

j. Write about E-marketing.

SECTION-B

Q2 Why there is need for Encryption techniques? Explain any one Encryption Algorithm.

Q3 Discuss the protection of software copyright. Explain the concept of domain name with the reference to cyber law.

Q4 Explain the domain name disputes in cyber laws and what is its resolution.

Q5 Discuss the role of Certification Authority. Name some trusted root certification authority.

Q6 What are the applications and scope of IT Act 2000?

SECTION-C

Q7 Discuss the importance of E-commerce models. What are the four main types of E-business models?

Q8 Discuss the role of international treaties and conventions in development of cyber technology.

Q9 Explain the documentation of cyber crimes offences written in IT ACT 2000.

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

Total No. of Pages : 02

Total No. of Questions : 09

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

LINEAR INTEGRATED CIRCUIT

Subject Code : BTEC-503
Paper ID : [A2105]

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 differential amplifier and give its significance.

b) Why level translator is used with the cascaded differential amplifier?

c) What is an op-amp? List the basic building blocks of op-amp.

d) Define the input offset voltage and CMRR of an op-amp.

e) How does negative feedback affect the performance of an inverting amplifier?

f) Define break frequency and bandwidth.

g) Briefly explain the difference between dc and ac amplifiers.

h) What are the advantages and disadvantages of monolithic PLL's over discrete PLL's?

i) List the important characteristics of the comparator.

j) What is VCO? Give two applications that require VCO.

SECTION-B

2. An emitter based dual input, balanced output differential amplifier has the following specifications :

$|V_{CC}|=|-V_{EE}|=10V, R_{C1}=R_{C2}=2.7K\Omega$ and $R_E=3.9K\Omega, \beta_{ac}=\beta_{dc}=100, V_{BE}=0.715V$

Calculate :

a) Operating current and voltage for each transistor.

b) Voltage gain.

3. List the characteristics of an ideal op-amp. How op-amp can be used as an integrator?

4. Define the CMRR of an op-amp and explain the significance of relatively large value of CMRR.

5. The 741C configured as a inverting amplifier and following parameters are given $A=4 \times 10^5$, $R_1=470\Omega$, $R_i= 33M\Omega$, $R_f = 3.9K\Omega$, $R_0 = 60\Omega$, supply voltage = ± 15V, maximum output voltage swing= ± 13V, unity gain bandwidth= 0.6 MHz? Compute the closed loop parameters A_f, R_{if}, R_{of}, f_f and V_{ooT}.

6. What are active filters? Give the response characteristics of an active filter. Derive the transfer function of low pass filter.

SECTION-C

7. Explain the operation of a digital to analog converter and compare the converter with binary weighted register to that with R-2R registers.

8. a) Design a frequency divider and a pulse stretcher circuit using a 555 timer.

   b) What are the advantages of adjustable voltage regulator over the fixed voltage regulator?

9. Write short notes on **any two** :

   a) Level Translator

   b) Op-Amp as an integrator

   c) Logarithmic amplifier

Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐ Total No. of Pages : 02

Total No. of Questions : 07

B.Tech. (ME) (2011 Onwards) (Sem.–5)

DESIGN OF MACHINE ELEMENTS-I

Code : BTME-501

Paper ID : [A2128]

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

Q1 Answer briefly :

a) Define the term *"Adaptive Design"*.

b) Differentiate between crushing and bearing stress.

c) Give the composition of 45C8 plain carbon steel.

d) What is stress concentration? What are the methods of reducing stress concentration?

e) What do you understand by term *'efficiency of a riveted joint'*?

f) Is hollow shaft stronger or weaker than a solid shaft of same diameter?

g) Differentiate between a cotter and key.

h) Explain the difference between rigid and flexible coupling.

i) Why a boss is generally needed at the fulcrum of the levers?

j) Enumerate the functions of seals and gaskets.

SECTION-B

Q2 a) Explain the procedure used to design a machine element.

b) Explain the factors which are considered in the selection of a material for a machine component.

Q3 Design and sketch the assembly of a knuckle joint to connect two mild steel rods subjected to an axial pull of l00kN. The allowable stresses for material are 100 MPa, 130 MPa and 60 MPa in tension, crushing and shear respectively.

Q4 A shaft made of mild steel is required to transmit 100 kW at 300 *r.p.m*. The supported length of the shaft is 3 metres. It carries two pulleys each weighing 1500 N supported at a distance of 1 metre from the ends respectively. Determine the diameter of the shaft, assuming allowable stress for shaft material 60 MPa. Use shock and fatigue factors for bending and torsion as 2 and 1.5 respectively.

Q5 Design the shaft, flange and bolt for a protected type flange coupling used to transmit 31.25 kW at 500 *r.p.m* from an engine to a machine. Assume following permissible stresses for the components of a coupling.

Shear stress for shaft	35 MPa
Shear stress for bolt	28 Mpa
Shear stress for cast iron	12 MPa

Q6 Design a right angled bell crank lever. The horizontal arm is 650 mm long and a load of 5000N acts vertically downward through a pin in the forked end of this arm. At the end of the 450 mm long arm which is perpendicular to the 650 mm long arm, a force P act at right angles to the axis of 450 mm arm through a pin into a forked end. Design the lever using the following permissible stresses: Tensile stress = 80 MPa; Shear stress = 45 MPa; Bearing pressure intensity = $10N/mm^2$.

Q7 Explain the procedure for design of a square flanged pipe joint.

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

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (IT) (2011 Onwards) (Sem.–5)

PROGRAMMING IN JAVA

Subject Code : BTIT-502

Paper ID : [A2123]

Max. Marks : 60

Time : 3 Hrs.

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. Give complete meaning of statement *"public static void main(String arg[])"*.

b. What is a byte code?

c. What is the difference between final and finally?

d. What is dynamic method dispatch?

e. Define socket.

f. What is the functionality of using is alive ()?

g. What are unchecked exceptions?

h. Why do we need socket programming?

i. What is difference between thread and a process?

j. What is use of keyword throws?

SECTION-B

2. Write programs to demonstrate the difference between method overloading and method overriding in Java.

3. Briefly explain the procedure of connecting front end application with any database using JDBC.

4. Explain about the applet and its life cycle.

5. Explain about interfaces. How they are different from the abstract classes?

6. Demonstrate the creation and handling of our own exception using any program.

SECTION-C

7. Explain different string handling functions and their syntax in java language

8. Write a program in java to do the following :

   a. To swap the two numbers without using the third variable.

   b. Factorial of a number using recursion.

9. Write a short note on :

   a. Finalize

   b. I/O streams

   c. Socket programming

   d. Multiple catch with single try statement

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

Total No. of Questions: 09

Total No. of Pages: 02

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

CYBER LAWS & IPR

M Code: 70597

Subject Code: BTIT-504

Paper ID: [A2126]

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) Cyberspace

   b) Definition of 'Computer' in terms of IT Act 2000

   c) Copyright

   d) Decryption

   e) Software Patent

   f) Internet Service Provider

   g) Certifying Authority

   h) Taxation in E-Commerce

   i) Domain Name

   j) Secure Electronic Signature

SECTION B

2. What is the need and applicability of copyrights and patents?
3. Write short note on:
   a) Cyber Crime Offences
   b) Certifying Authority
4. Explain importance of cyber laws. List and explain different components of cyber laws.
5. Do digital signatures help in network security? How can we register for them?
6. What are the different E-Commerce Models? Explain.

SECTION C

7. Discuss the history, aim, scope and commencement of IT Act 2000.
8. How do Encryption techniques help in securing data on Network? Explain any two techniques.
9. Why Patents are considered so important in digital era of products? What is the process of patent filing?

oll No. | | | | | | | | | | | |

Total No. of Pages : 02

otal No. of Questions : 09

B.Tech.(IT) (2011 Onwards) (Sem.–5)

SYSTEM ANALYSIS AND DESIGN

Subject Code : BTIT-501

Paper ID : [A2122]

ime : 3 Hrs.

Max. Marks : 60

NSTRUCTION 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) Differentiate between Manual and Automated systems.

b) Explain the term Real time systems.

c) What do you mean by ERD diagrams? Explain.

d) What do you mean by Feasibility study? Explain.

e) Differentiate between module coupling and Cohesion.

f) Define the term User-interface design.

g) What do you mean by Audit of computer system usage?

h) What is the need of system analyst?

i) Explain the term state diagram.

j) List two important features of DFD.

SECTION-B

Q2: Explain in detail the basic principles of successful systems.

Q3: Explain in detail about Maintenance activities and issues.

Q4: Explain in brief various threats to computer system and control measures.

Q5: Explain various Input and Output forms design.

Q6: Explain in detail about Dynamic modeling.

SECTION-C

Q7: What is systems development life cycle? Also discuss its various phases.

Q8: Discuss in detail the various data and fact gathering techniques.

Q9: Discuss the case study for developing prototype for Hospital management system.

Roll No. [ ]

Total No. of Questions : 09

Total No. of Pages : 02

B.Tech.(nwards) (Sem.–6)

WEB TECHNOLOGIES

Subject Code : BTIT-603

Paper ID : [A2353]

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 do you understand by terms Internet and World Wide Web?

   b. What is HTTP?

   c. Differentiate between forms and frames.

   d. What are Style sheets?

   e. What are advantages of Java Script?

   f. What are cookies?

   g. What are the protocols used by AJAX?

   h. List various data types of PHP.

   i. What are basic features of ASP.NET?

   j. What is POJO class in Java?

SECTION-B

2. Discuss various Tools for web site creation.

3. Write the basic structure of a HTML document.

4. Discuss briefly about the working principles of AJAX.

5. Describe the ASP.Net framework with necessary diagram.

6. What is the difference between JSP and PHP?

SECTION-C

7. a) Explain the different types of Internet connections. 6

   b) What is a web browser? List some popular web browsers. 4

8. a) What is Java Script and how it works? How will you insert Java Script code into HTML document? 5

   b) How conditional checking is performed in Java Script? 5

9. a) How is MySQL database connected to PHP? 5

   b) What is the use of Ajax in PHP? 5

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

Total No. of Questions : 09

Total No. of Pages : 02

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

CLOUD COMPUTING

Subject Code : BTCS-912

Paper ID : [A2359]

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) BIG Data.

b) What is Cloud?

c) Define Data Corruption.

d) What is API?

e) Difference between Security and Risk.

f) What are Digital signatures?

g) Define SSL.

h) Explain the term Hijacking.

i) What do we mean by Encryption?

j) List Differences between Grid and Cloud.

SECTION-B

Q2) Define cloud computing deployment scenario in public clouds, hybrid clouds and virtual private clouds.

Q3) List down the relative differences between symmetric key encryption and asymmetric key encryption in detail.

Q4) Explain the principle behind cloud security with respect to the cloud security reference model.

Q5) What is virtualization? Explain its characteristics and benefits in cloud computing.

Q6) Explain briefly the concept of cloud computing with respect to its various workload patterns used in IT industry.

SECTION-C

Q7) Give detailed overview of cloud service delivery with respect to its service model architecture used in IaaS and PaaS.

Q8) Write short-note on :

a) Public clouds.

b) Virtual private clouds.

Q9) a) How can encryption be defined as best tool for providing security? Explain.

b) List down various security breaches encountered in cloud computing.

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

Total No. of Questions : 09

Total No. of Pages : 02

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

MOBILE COMPUTING

Subject Code : BTIT-903

Paper ID : [A2357]

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 brief about :

a) Blue Tooth.

b) Explain Memory Management.

c) What is Web view overlay?

d) What do you mean by Data management security?

e) Explain the features of CDMA systems.

f) Explain TCP and UDP.

g) List the difference between analog and digital signal.

h) What is DHCP?

i) Explain mobile operating system.

j) What do you mean by encryption?

SECTION-B

Q2) Explain TCP IP model in detail.

Q3) Write brief about :

a) fork()

b) wait()

c) exec()

d) getpid()

e) get()

Q4) Explain the term deployment in Apple IOS, android and window phones.

Q5) What is file system? Explain in detail along with its characteristics.

Q6) List the relevant differences between authentication and authorization in detail.

SECTION-C

Q7) a) Write Shell script to identify that the given string is palindrome or not.

b) Explain Folder, File in Mobile OS hence give the detailed description of Android applications.

Q8) Explain how the Data Management is going to prove a major issue with the advancement in mobile computing? Explain.

Q9) What do you mean by Memory? Explain how memory allocation is enabled in multi-tasking environment. List down its various merits and demerits along with.

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

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(IT) (2011 Onwards) (Sem.–6)

INFORMATION SECURITY AND RISK MANAGEMENT

Subject Code : BTIT-602

Paper ID : [A2352]

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 a worm?

b) Explain different vulnerabilities.

c) What are cookies?

d) What is Cryptography?

e) What is watermarking?

f) Explain the use of firewall.

g) What is message confidentiality?

h) Explain the cost benefit analysis in security planning.

i) Explain digital signature.

j) Explain SHA-2 algorithm.

SECTION-B

Q2 Write about different Cryptographic algorithms.

Q3 Explain RSA Algorithm with an example.

Q4 What is the benefit of Pretty Good Privacy?

Q5 How threat assessment is done?

Q6 Explain Merkle- Hellman Knapsacks.

SECTION-C

Q7 Explain various security threats and write their solution.

Q8 How can we know that our system is compromised? Write about Risk Assessment.

Q9 Explain the Hash Algorithms. Also explain the message digest and its use.

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

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(IT) (2011 Onwards) (Sem.–6)

NETWORKING PROGRAMMING

Subject Code : BTIT-601

Paper ID : [A2351]

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 layers in the Internet model are the network support layers?

b. What is a peer-to-peer process?

c. Compare POSIX message queues and system V message queues.

d. Define datagram distribution service.

e. Describe the format of TCP segment.

f. What is secure shell?

g. Explain external data representation.

h. Describe the behaviour of TCP client under abnormal conditions.

i. How are shared memory segments created in UNIX?

j. Define various socket options available under UNIX.

SECTION-B

Q2. Explain the components and technologies used in SNA.

Q3. Write an introduction to socket addressing.

Q4. Write a note on differences between IPv4 and IPv6.

Q5. Describe the piping process in IPC.

Q6. What are reliable and unreliable signals?

SECTION-C

Q7. Explain the TCP/IP protocols in detail.

Q8. Explain various communication protocols and compare the characteristics.

Q9. Write a detailed note on the I/O models available under UNIX.

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

Total No. of Questions : 09

Total No. of Pages : 02

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

OBJECT ORIENTED ANALYSIS AND DESIGN

Subject Code : BTCS-906

Paper ID : [A3052]

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) What is cluster testing?

b) What is meta model?

c) What is abstraction?

d) What is collaboration?

e) Define object diagram.

f) Define requirements validation.

g) What are package diagrams?

h) What are the components of state diagrams?

i) What is usability testing?

j) Define abstract class and method.

SECTION-B

Q2 What is the difference between object oriented and analysis and object oriented design?

Q3 Differentiate between aggregation and association.

Q4 How use case modeling helps in inception phase of any software project? Justify with example.

Q5 How is sequence diagram different from activity diagram?

Q6 What is a transition? Discuss its parts.

SECTION-C

Q7 a) Explain system level testing.

b) Elaborate aspect oriented software.

Q8 Explain Unified Process in detail. What are its steps?

Q9 Write about object oriented metrics.

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

Total No. of Questions : 18

Total No. of Pages : 02

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

BUSINESS INTELLIGENCE

Subject Code : BTCS-908

Paper ID : [A2990]

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. Association Rule Mining
2. Role of Business Intelligence
3. Cubes
4. Clustering
5. OLAP
6. Framework
7. Snowflake
8. Data Integration
9. Business Metrics
10. Business Intelligence Process

SECTION-B

11. What are the roles and responsibilities of Business Intelligence?
12. Explain Business Intelligence Infrastructure components.
13. Describe Association Rule Mining in detail.
14. Explain the concept of dashboards and balanced scorecard.
15. Write a note on ETL.

SECTION-C

16. What is Data Mining? Explain decision tree in detail.
17. What are Business metrics and KPIs in multi-dimensional data modeling?
18. Explain the concept of Data Integration in detail.

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

Total No. of Pages : 02

Total No. of Questions : 09

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

ENTERPRISE RESOURCE PLANNING

Subject Code : BTCS-916

Paper ID : [A3060]

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) Enterprise

   b) Explosive growth of ERP market

   c) Material Management

   d) ERP & E-Business

   e) Quality Management

   f) Resource planner

   g) Challenges of ERP

   h) Venoors

   i) OLAP

   j) KDD

SECTION-B

Q2. Explain Data Mining and its techniques.

Q3. Discuss the future trends in ERP.

Q4. What are various models of ERP? Also write the benefits of ERP system.

Q5. Differentiate conventional application packages with ERP packages.

Q6. Describe business modules. What are the resources of business?

SECTION-C

Q7. What are various subsystems in HR module? Describe plant maintenance module.

Q8. Define categories of Oracle software applications.

Q9. What is SAP and SAP AG? What SAP skills are demanded today?

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

Total No. of Pages : 02

Total No. of Questions : 09

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

MULTIMEDIA AND APPLICATIONS

Subject Code : BTCS-910

Paper ID : [A3059]

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 short notes on :

a What is the need of Multimedia?

b Write a short note on Multimedia software tools.

c What is the use of SGMLA in multimedia?

d Name any two types of multimedia servers.

e Define psychoacoustics.

f Differentiate Entropy and Run Length encoding.

g How QOS is used in multimedia communication?

h Define sample rate.

i Write a short note on BMP image format.

j What is Intra-frame coding?

SECTION-B

Q2 What are various multimedia standards for document architecture?

Q3 Write a short note on RAID and its levels.

Q4 Discuss Huffman coding by taking suitable example.

Q5 Write a short note on source coding techniques.

Q6 Define following :

a. Distributed Multimedia System

b. MHEG

SECTION-C

Q7 Explain Applications and latest trends of Multimedia.

Q8 a. Write a short note on MPEG compression.

b. Discuss the components of MIDI.

Q9 Write in detail the application of Multimedia in resource management with technical specification including hardware and software.

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

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(IT) (2011 Onwards) (Sem.–7,8)

BUILDING ENTERPRISE APPLICATIONS

Subject Code : BTIT-701

Paper ID : [A3049]

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. Explain the life cycle of building enterprise application.

b. Differentiate between integration testing and globalization testing.

c. What do you mean by requirements elicitation?

d. What methods are used for estimating development effort of enterprise application?

e. What are the elements of configuration management plan?

f. What are the advantages of prototyping?

g. What is user acceptance testing?

h. List the primary components of an enterprise technology.

i. What is role of modeling in enterprise application development?

j. Write a short note on dynamic code analysis.

SECTION-B

Q2. What is the role of documentation in application development?

Q3. What methods are used to measure success of enterprise applications?

Q4. Explain the process of planning the construction of an enterprise application.

Q5. What are the main error types for requirements?

Q6. Explain various methods of enterprise application testing.

SECTION-C

Q7. Explain various types of enterprise applications and the methodologies used to develop them.

Q8. Explain how use cases are used for functional specification. Give example.

Q9. Write a short note on infrastructure architecture.

Dec 2018 CSE

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

Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(CSE/IT) (Sem.–3)

DISCRETE STRUCTURES

Subject Code : BTCS-302

Paper ID : [A1124]

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. How many subset can be formed from a set of n elements? How many of these will be proper?
2. Give an example of a relation which is both symmetric and antisymmetric.
3. How many words can be obtained by arranging the letter of the word 'DISCRETE'? In how many of them D, I, S occur together?
4. List all the elements and draw Hasse diagram of D_{36}.
5. Define Ideal of a Ring and Quotient Ring.
6. Give an example of finite abelian group.
7. State Lagrange's Theorem. Is its converse true?
8. Show that identity element of a group is unique.
9. Define bipartite graph with example.
10. Differentiate between path and circuit.

SECTION-B

11. Use Karnaugh map to find the minimal sum for $f(x, y, z, t) = xy' + xyz + x'y'z' + x'yzt'$.

12. Show that $X = \{0,1,2,3,4,5\}$ is a commutative ring with unity under addition and multiplication modulo 6.

13. Is the relation of perpendicularity between two lines is an equivalence relation, Justify.

14. Show that $K_{3,3}$ is not a planer graph.

15. Prove that every subgroup of Cyclic group is cyclic.

SECTION-C

16. Solve recurrence relation $S(K+2) - 5\,S(K+1) + 6S(K) = 5^r$.

17. Show that set of even integer is a commutative ring without unity.

18. State and prove Eulerian theorem on graph to show that Koinigsberg's graph is not proved to a solution.

SECTION-B

11. What is object oriented programming? Explain any five characteristics of object oriented programming languages.

12. Explain public, private and protected access specifiers and show the ambiguity in multiple and multipath inheritance.

13. What do you mean by type conversion? Give an example of basic to object conversion.

14. What is the difference between early binding and late binding in C++?

15. Define Virtual Function. Explain the mechanism of Virtual function.

SECTION-C

16. Define Operator Overloading. Explain how to overload unary operator and binary operator.

17. Write a program in C++ that display entered string into reverse order.

18. What are function templates of C++? Discuss the concept of error handling functions supported in C++.

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

Total No. of Pages :02

Total No. of Questions : 18

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

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

(Sem.–3)

DATA STRUCTURES

Subject Code : BTCS-304

Paper ID : [A1126]

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. Give the use of NULL pointer in C.
2. What is memory leak and dangling pointer?
3. Write the definition of Big O notation.
4. What are applications of double Linked List?
5. Discuss dequeue and priority queue.
6. What is B Tree and its properties?
7. What is adjacency Matrix?
8. Compare direct address tables with hash tables.
9. What are advantages of insertion sort?
10. What is complexity of Binary Search?

SECTION-B

11. Give the syntax of copy an array into another array.

12. Write the operation to delete last occurrence of an item from linked list.

13. Explain the process of traversing a binary tree using non- recursive procedures.

14. Why is threaded binary tree required? Give the brief introduction to threaded Binary trees.

15. Illustrate the concept of breadth-first search traversing of graph by taking a suitable example.

SECTION-C

16. Discuss various operations that can be performed on data structure with their applications.

17. How a linear array is represented in memory? Explain the program which reads two matrixes.

18. Write an algorithm to sort an array of integers in the descending order using selection sort.

Roll No. [| | | | | | | | | | |]

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

Paper ID : [A2143]

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 unit step function?

2. Find fourier cosine series of $f(x) = 1, 0 \leq x \leq 2$.

3. What does the constant term a_0 represent in fourier series?

4. Eliminate h, k from $(x - h)^2 + (y - k)^2 + z^2 = a^2$.

5. Discuss analyticity of function $f(z) = z\overline{z}$.

6. A bag contains 2 white and 3 red balls and bag Y contains 4 white and 5 red balls. One ball is drawn from bag and found red. Find the probability that it drawn from bag Y.

7. Define critical region.

8. Define alternate hypothesis.

9. In normal distribution, 31% of items are under 45 and 8% are over 64. Find the mean and standard deviation of distribution.

10. Six dice are drawn 729 times. How many times do you expect atleast three dice to show 5 or 6?

SECTION-B

11. Find the laplace transform of $\left(\frac{1-cost}{t^2}\right)$.

12. Solve $(D^2 - D'^2 - 3D + 3D')z = xy + e^{x+2y}$

13. The theory predicts the proportion of beans in four groups should be in ratio 9:3:3:1.In an experiment with 1600 beans the numbers in the four groups were 882, 313, 287 and 118. Does the experimental result support the theory?

14. Using gauss elimination method solve :

$3x + y - z = 3$

$2x - 8y + z = -5$

$x - 2y + 9z = 8.$

15. Using Euler method solve for y at x=0.1for $\frac{dy}{dx} = x + y + xy$, $y(0) = 1$. Take step size h=0.025.

SECTION-C

16. Find the moment generating function of Normal distribution.

17. Find fourier series expansion of periodic function of period 4

$$f(x) = \begin{cases} 2+x & -2 \le x \le 0 \\ 2-x & 0 < x \le 2. \end{cases}$$

18. If $f(z) = u + iv$ is analytic function of $z = x + iy$ and $u - v = e^{-x}[(x - y)siny - (x + y)cosy]$. Find u, v and the analytic function $f(z)$.

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

Total No. of Pages : 02

Total No. of Questions : 18

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

DIGITAL CIRCUITS & LOGIC DESIGN

Subject Code : BTCS-303

Paper ID : [A1125]

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. Define 1's and 2's compliment?
2. Differentiate combinational and sequential circuits.
3. What are the advantages of CMOS memory chips over BIPOLAR memory chips?
4. What is Flip-Flop?
5. Convert $(10110111)_2$ to octal number?
6. Realize OR gate using only NAND gates.
7. What is EEPROM?
8. Define the terms decoder and de-multiplexer.
9. Give the logic diagram and characteristics table of a clocked D flip flop.
10. What is a ring counter?

SECTION-B

11. Simplify the following function using K Map.

    $F(A,B,C) = \sum(0,2,3,4,6)$

12. Design full subtracter using NAND gates only.

13. Explain the working of Master Slave JK Flip Flop.

14. Write a short note on the following.

    a) RTL

    b) CMOS

15. Explain the working of Successive Approximation A/D Converter.

SECTION-C

16. a) Write the expression for Boolean function

    $F(A,B,C): \sum m(1,4,5,6,7)$ in standard POS form.

    b) Write short note on VLSI design.

17. a) Design a 3 bit Gray to Binary code convertor.

    b) Distinguish between half and full adder using logic diagram and truth table.

18. Explain different types of ROM along with their advantages and disadvantages.

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

Paper ID : [A1123]

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 register transfer language.
2. Define Micro-operation with example.
3. Explain in brief about computer registers.
4. Define the term microinstruction and microprogram.
5. Explain in brief about the term Peripheral devices.
6. What is a Priority Interrupt?
7. Explain in brief about Data manipulation instructions.
8. Explain in brief about main memory.
9. Explain in brief about the concept of pipeline.
10. Explain in brief about arithmetic pipeline.

SECTION-B

11. Write a detailed note on Logic microoperations.

12. Explain in detail about memory reference instructions.

13. Write a detailed note on I/O Interface.

14. Difference between hardwired control unit and microprogrammed control unit.

15. Explain in brief about following :

    a) Design of Accumulator Logic.

    b) Serial communication.

SECTION-C

16. Write a detailed note on RISC and CISC architecture.

17. Explain the vector processor and array processors in detail.

18. Explain the following terms in detail :

    a) Main memory

    b) Associative memory

    c) Virtual memory

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

Total No. of Pages : 02

Total No. of Questions : 09

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++

M Code: 56595

Subject Code: BTCS-305

Paper ID: [A1129]

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. a) Differentiate between a local and a static object.

   b) What is the purpose of defining a Destructor function?

   c) Explain briefly what is Exception Handling?

   d) What are the properties of a static data member?

   e) What is the use of Scope resolution operator in C++?

   f) What is an Abstract class?

   g) What is Visibility mode? What are the different inheritance Visibility modes supported by C++?

   h) What is the use of this keyword?

   i) What are C++ streams?

   j) Explain nested class with the help of an example.

SECTION B

2. What is a class? What is the relation between an object and a class? Write a program which shows how to define a class, how to access member functions and how to create and access objects in C++.

3. Explain with examples the different (Variable) storage classes used in C++.

4. Write a program to get character input from the user and store those characters in a file.

5. With the help of a suitable example, show how to access records randomly in a file.

6. Explain the concept of Virtual and Pure Virtual Functions with the help of examples.

SECTION C

7. a) What is inheritance? Explain with example how to inherit a class in C++.

   b) What is Dynamic Memory Allocation? Explain with the help of an example how to create and destroy objects dynamically.

8. Create a class whose object represents a complex number (A complex number contains a real part and an imaginary part). Write a program so that it is possible to add two objects of this class and store the result in third object.

9. What is a Template? Explain with the help of an example how to create a Function Template and a Class Template.

SECTION-B

11. What do you understand by subroutine? Explain.

12. Describe serial and parallel data transfer techniques.

13. Explain any 5 addressing modes.

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 how stepper motor can be interfaced with 8085.

18. Write a detailed note on DMA.

Roll No. | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(CSE/IT) (2011 onwards) (Sem.–4)

SYSTEM PROGRAMMING

Subject Code : BTCS-405

Paper ID : [A1187]

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. Define the term system programs. List any four system programs.
2. Explain in brief about OPTAB.
3. Write the advantages of two pass assembler over one pass assembler.
4. Explain the term macros in brief.
5. Explain in brief about code generation phase of compiler.
6. Explain the concept of linking in brief.
7. Explain in brief about DOS Editor.
8. What is code optimization?
9. Explain the role of Loaders.
10. What is the need of Debuggers? Explain.

SECTION-B

11. Explain in brief about following :

    a) Linkers

    b) Assemblers

12. Explain the concept of recursive macro expansion with an example.

13. Write a detailed note on the lexical Phase of compiler.

14. Explain in detail about Line editor.

15. Describe in brief about various debugging techniques.

SECTION-C

16. Write a detailed note on Single Pass assembler.

17. Explain in detail about various loading schemes.

18. Write a detailed note on full screen editor.

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

Paper ID : [A1185]

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 terms WAN and MAN.
2. What is Time division multiplexing?
3. What is Circuit switching?
4. What is the function of Medium Access Layer?
5. What are the issues of Data Link Layer?
6. Define Bandwidth.
7. What is the difference between MAC address and IP address?
8. What is Datagram?
9. What is WWW?
10. Define subnetting.

SECTION-B

11. Discuss in detail about different Network Topologies.

12. What are Transmission Impairments?

13. Write short note on Twisted Pair cable and Coaxial cable.

14. Explain how token Bucket protocol is used for congestion control.

15. Compare UDP and Transmission Control protocol in brief.

SECTION-C

16. Explain the difference between TCP and OSI Model.

17. a) Discuss about Go-Back-N ARQ Sliding Window protocol.

    b) Explain IP addressing.

18. Write short notes on following :

    a) FTP

    b) DNS

    c) Distance Vector Routing algorithm.

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

Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(CSE) (2011 Batch) (Sem.–4)

MATHEMATICS – III

Subject Code : BTCS-402

Paper ID : [A1184]

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

Answer briefly :

1. Define periodic functions.
2. Find Laplace transform of $te^{-t}\sin 3t$.
3. Examine whether $f(x) = \sin \frac{1}{x}$ can be expanded in Fourier series in $[-\pi, \pi]$.
4. Solve $(D^2 + 4DD' - 5D'^2)z = \sin(2x + 3y)$
5. Define conjugate functions.
6. What is null hypothesis?
7. What do you mean by degree of freedom?
8. A coin is tossed 400 times and head turned up 216 times. Test the hypothesis that coin is unbiased.
9. What is the mean and variance of poisson distribution?
10. What do you mean by critical region?

SECTION-B

11. Obtain fourier series for the function

$$f(x)=\begin{cases} x, & -\pi<x<0 \\ -x, & 0<x<\pi \end{cases}$$

and show that $\frac{1}{1^2}+\frac{1}{3^2}+\frac{1}{5^2}+\cdots=\frac{\pi^2}{8}$.

12. Define second shifting theorem and find the laplace transform of sintu$(t-\pi)$.

13. Solve $r-4s+At+p-2q=e^{x+y}$.

14. Solve by using guass Jordan method

$$x+2y+z-w=-2,$$

$$2x+3y-z+2w=7,$$

$$x+y+3z-2w=-6,$$

$$x+y+z+w=2.$$

15. Given $y'=x^2+y^2$, $y(0)=1$. Determine $y(0.1)$, $y(0.2)$ by using modified Euler Method.

SECTION-C

16. Find the mean and variance of Normal distribution.

17. Show that the function $u=e^{-2xy}\sin(x^2-y^2)$ is harmonic. Find conjugate function v and express $u+iv$ as analytic function of z.

18. Solve

a) $z(x+y)p+z(x-y)q=x^2+y^2$

b) $4r-4s+t=16\log(x+2y)$

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

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(CE) (2011 onwards) (Sem.–4)

DESIGN OF CONCRETE STRUCTURES-I

Subject Code : BTCE-403

Paper ID : [A1173]

Max. Marks : 60

Time : 3 Hrs.

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.**
4. **Assume any data suitably. Use of IS 456:2000 is allowed.**

SECTION-A

Q1. Answer briefly :

a) What are the components responsible for setting of cement?

b) Define bulking of sand and its importance.

c) What are Gap graded aggregates?

d) Differentiate between segregation and Bleeding of concrete.

e) What is reinforced concrete? Give its advantages over plain cement concrete.

f) Define limit state of serviceability.

g) Why compaction of concrete is required?

h) Briefly write the terms 'Balanced', 'Over Reinforced' and 'Under Reinforced' sections in : bending.

i) What do you understand by durability of concrete?

j) Distinguish between one way and two way slabs?

SECTION-B

Q2. List various test conducted on cement. Briefly explain consistency of cement.

Q3. Discuss how aggregate shape and texture affects strength of concrete.

Q4. Explain various steps to design concrete mix by BIS method.

Q5. A reinforced concrete beam has a support section with a width of 250 mm and effective depth of 500 mm. The support section is reinforced with 3 bars of 20 mm diameter on the tension side. 8 mm diameter 2 legged stirrups are provided at a spacing of 200 nm centers. Using M-20 grade concrete and Fe-415 HYSD bars, calculate the shear strength of the support section

Q6. Design a floor slab of size 4.5 m × 5.2 m simply supported on all the four edges by brick walls of width 230mm, subjected to a live load of 2.5 kN/m^2. M-20 concrete and Fe-415 grade steel are used.

SECTION-C

Q7. a) Differentiate between Limit state and working stress method philosophy. (5)

b) Explain creep and shrinkage of concrete. (5)

Q8. A singly reinforced concrete beam is of width 400 mm and effective depth 615 mm. It is reinforced with 8 Nos. 20 mm mild steel bars. Assuming M-25 concrete, and Fe-250 grade of steel. Determine its moment of, resistance according to the working stress method. Calculate also the stress in steel when the beam is subjected to the above moment. (10)

Q9. a) A tee beam has an effective flange width of 2500 mm and depth of flange is 150 mm, width of rib: 300 mm, effective depth: 800 mm. Using M-20 grade concrete and Fe-415 HYSD bars, estimate the area of tension reinforcement required if the section has to resist a design ultimate moment of 1200 kN/m. (7)

b) What is limit state of collapse? (3)

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

Paper ID : [A1183]

Max. Marks : 60

Time : 3 Hrs.

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. What is the Kernel in operating system?
2. Define operating system as resource manager.
3. What is CPU Scheduling Criteria?
4. What is meant by the state of the process?
5. What is the difference between preemptive and non preemptive scheduling?
6. How context switching is used in multiprogramming?
7. What is device management in operating system?
8. Define Starvation in deadlock.
9. What are the advantages of distributed systems?
10. Explain the Linux **'cd'** command options along with the description.

SECTION-B

11. Explain the Distributed Processing in Operating Systems. What are the necessary conditions for deadlock?

12. Consider the following four processes, with the length of the CPU burst time given in milliseconds.

Process	Arrival Time(ms)	Burst Time (ms)
P1	1	6
P2	1	5
P3	2	5
P4	2	3

Find Average Waiting Time and Turnaround time for given Process using FCFS and SCF Algorithms?

13. What is role of scheduler? What requirement is to be satisfied for a solution of a critical section problem?

14. Explain the use of I/O traffic controller in operating system.

15. Explain any two solutions of recovery from deadlock.

SECTION–C

16. Explain the security attacks on operating system. Write the steps to protect the computer system from various attacks.

17. What are device management policies for storing data in operating System?

18. a. What are the advantages and disadvantages of multiprocessor systems?

    b. What are the basic components of Linux?

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

Total No. of Pages : 02

Total No. of Questions : 15

MBA (2014 to 2017) (Sem.–4)

ENTREPRENEURSHIP & MANAGING SMALL MEDIUM BUSINESS

Subject Code : MBA-402

Paper ID : [A2525]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A contains SIX questions carrying FIVE marks each and students has to attempt ANY FOUR questions.**
2. **SECTIONS-B consists of FOUR Subsections : Units-I, II, III & IV. Each Subsection contains TWO questions each carrying EIGHT marks each and student has to attempt ANY ONE question from each Subsection.**
3. **SECTION-C is COMPULSORY and consist of ONE Case Study carrying EIGHT marks.**

SECTION-A

Q1. What do you mean by entrepreneurs?

Q2. Innovation is one of the most important functions of an entrepreneur. Discuss.

Q3. Distinguish between entrepreneur and intrapreneur.

Q4. Write a short note on venture capital funding.

Q5. Discuss various obstacle faced by women entrepreneur.

Q6. What are the main sources of innovation?

SECTION-B

Unit-I

Q7. Explain in detail the contribution of entrepreneurship in economic development of a country.

Q8. What are the qualities of a successful entrepreneur?

Unit-II

Q9. Define women entrepreneur. Describe reasons for slow progress of women entrepreneurs in India.

Q10. Discuss the role and contribution of women entrepreneurs in India.

Unit-III

Q11. Discuss the role and importance of small scale industries.

Q12. Write a short notes on :

(a) Nature and components of SME environment

(b) Sources of finance for SME's

Unit-IV

Q13. Write a short note on :

(a) Technical study

(b) Management feasibility

Q14. Discuss the various activities and schemes of commercial banks.

SECTION-C

Q15. Case Study :

Reliance engineering is a manufacturing firm with about 160 employees. The founder of the business, Manoj, is not active now, and his son, Amit, is the person responsible for the business now. One of Amit's sisters, Ashwini, runs a small branch distributin office. Her husband, Arun works out of that office as a salesperson. There are two other people in the office.

Amit is reorganizing the business and planning to eliminate the two other office functions by moving them to the home office. Ashwini wants to hire her 21-year-old daughter, who has a degree, to fill the soon-to-be-created position of office assistant. From everything Amit understands, this is not the right thing to do. However, Ashwini cannot understand why. Amit has two sons about to leave college. His other sister, Veena, has one son, now out of college, and three daughters still in school.

Amit is not yet sure who else might want to join the business, but one of his sons, who will graduate with an industrial engineering degree next year, has expressed some interest.

Case Questions :

(a) Is there a list of do's and don'ts regarding employment of family members in a family business?

(b) Amit has not got down to documenting a family employment policy yet. Help him frame one.

B.Tech Sem

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

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

Paper ID : [A2097]

Max. Marks : 60

Time : 3 Hrs.

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

Write briefly :

1. What is the need of security in network communication?
2. List the advantages of IPv6 over IPv4?
3. What do you understand by SKIP?
4. What are the factors that affect the performance of Ad-hoc networks?
5. What are characteristics of a 2G cellular network?
6. List examples of wireless communication system.
7. What is Wireless LAN (WLANs) technology?
8. What are limitations of Bluetooth technology?
9. Why shape of cell is hexagonal in cellular networks?
10. What are soft hands offs?

SECTION-B

11. Draw a neat diagram of Encapsulating Security Payload (ESP) format and explain.

12. What is Internet Key Exchange (IKE) protocol?

13. Explain the features and advantages of TDMA.

14. What are advantages of a wireless LAN (WLANs) as compared to traditional LAN?

15. Is 3G cellular wireless technology superior to 2G technology? Justify.

SECTION-C

16. Explain the architecture of Ad-hoc network, with a neat schematic diagram. Also discuss routing in ad-hoc networks.

17. Write short notes on:

    a) IPsec

    b) WLL

18. What are the different techniques used for increasing the capacity and improving the coverage in cellular system?

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

Paper ID : [A2101]

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. What is DMA and its advantages?
2. How I/O port Addresses allows the software drivers to communicate with hardware devices on computer?
3. Discuss the features of ATA standards.
4. Compare SCI *vs.* IDE.
5. What does a video adapter do?
6. What are device drivers?
7. Write steps of troubleshooting of drivers.
8. How the serial port is tested?
9. What is IEEE 1394?
10. Write the types of graphics cards.

SECTION-B

11. Give general information on PCI, PCI-X and PCI Express Local Bus.

12. Explain the use of advanced 3D Technologies in CPI.

13. What are different types of Video cards and drivers?

14. What are ports? Explain steps of testing serial ports.

15. Write some aspects cost performance analysis while designing the system.

SECTION-C

16. Discuss the concept of Integrated Video/ Motherboard chipset with examples.

17. Which hardware devices are used for Designing and Integration of Peripheral device to a computer system?

18. What are device drivers? Discuss the role of drivers in UNIX operating System.

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

Paper ID : [A2098]

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. What is encryption? What is its importance?
2. What is discretionary access control?
3. What are functional dependencies?
4. What is query optimization?
5. What is a view?
6. What are weak entities? Explain.
7. What is the need of normalization?
8. What is role based security?
9. What do you mean by serializability?
10. What is inconsistent read problem?

SECTION-B

11. Explain with the help of examples ACID properties in DBMS.

12. Explain two phase locking protocols. Explain with example.

13. Consider the following relations :

    Hotel {hotelNo, name, address}

    Room {roomNo, hotelNo, type, price}

    Booking {hotelNo, guestNo, dateFrom, dateTo, roomNo}

    Guest {guestNo, name, address}

    Write the SQL statements for the following :

    a) List the names and addresses of all guests in Chandigarh, alphabetically ordered by name.

    b) List all family rooms with a price below Rs. 400 per night, in ascending order of price.

    c) How many hotels are there?

14. What are the primary and foreign keys? Explain with example.

15. What is database modeling? How is E-R model different from other data models? What are the main advantages of the E-R model?

SECTION-C

16. Discuss the following with examples :

    a) Lost update problem.

    b) Dirty reads.

    c) Incorrect analysis problem.

17. Explain the deferred and immediate modification versions of log based recovery scheme in terms of ease of implementation and overhead cost.

18. Explain various types of normalization with examples. Distinguish between 3NF and BCNF.

Total No. of Pages : 02

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

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

Paper ID : [A2102]

Max. Marks : 60

Time : 3 Hrs.

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 NULL pointer in C?

b) What is dangling pointer and how to avoid it?

c) What is the definition of Big O notation?

d) Give the syntax of conversion from infix to postfix?

e) How does priority queue work?

f) Difference between array and linked list.

g) Why B-tree is a self-balancing tree data structure?

h) Write a short note on adjacency list.

i) Define double hashing.

j) What is complexity of Binary Search?

SECTION-B

Q2 Give the syntax of searching a specific element in an array.

Q3 Write an operation to delete n nodes after m nodes of a linked list.

Q4 How Trees provide an efficient insertion and searching? Show with example.

Q5 Give the brief introduction to concept of collision and its resolution using open addressing.

Q6 Illustrate the concept of breadth-first search traversing of graph by taking a suitable example.

SECTION-C

Q7 Explain various data types used in data structure with their syntax and applications.

Q8 How a linear array is represented in memory? Explain the program which reads two matrixes.

Q9 Write an algorithm to sort an array of integers in the descending order using insertion sort.

Total No. of Pages: 02

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

Total No. of Questions: 09

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

COMPUTER NETWORKS-II

M Code: 70534

Subject Code: BTCS-501

Paper ID: [A2097]

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 is 2.5G?

   b) What is WLL?

   c) What is IPSec used for?

   d) What is a network?

   e) State different types of networks.

   f) What is the difference between MAN and WAN?

   g) What is the need of defining a topology? What factors need to be considered before making choice for the topology?

   h) What is the limitation of star topology?

   i) What is LMDS?

   j) State the difference between 2.5G and 3G.

SECTION B

2. Why is the difference between circuit switching and packet switching? Which one of them is faster and why? Which is more resource intensive and why?

3. What is IPSec Protocol? Discuss its header.

4. How is TDMA based network different from CDMA based networks?

5. What is the mechanism used to secure traffic communication over http protocol? What are digital signatures and how are they implemented?

6. Explain the network architecture of a cellular network.

SECTION C

7. What is the need of IKE? Explain in detail various IKE phases and SKIP protocol.

8. What are the essentials of a Wireless System Design? Why is frequency reuse important and how can it be attained in a cellular network.

9. Explain the different types of Routing Protocols. Specifically discuss in details 03 routing protocols used in adhoc networks.

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. – 5)

LINEAR INTEGRATED CIRCUIT

M Code: 70547

Subject Code: BTEC-503

Paper ID: [A2105]

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. a) What are the four differential amplifier configurations? Which one is commonly used and why?

   b) What is level translator circuit?

   c) Differentiate constant current bias and current mirror circuit.

   d) List four parameters considered for ac and dc applications.

   e) Define input offset voltage and CMMR.

   f) Draw the circuit diagram of third-order low pass Butterworth filter and also its frequency response.

   g) What is the effect of negative feedback in a non-inverting amplifier on input impedance and bandwidth?

   h) The output voltage of an op-amp changes by 20V in 4μs. Calculate the slew rate of op-amp.

   i) Draw the circuit diagram of Schmitt trigger? What are its applications?

   j) What are the advantages of adjustable voltage regulator over fixed voltage regulator?

SECTION B

2. Discuss current mirror circuit. How is it helpful in improving the CMRR?
3. Derive the expression for voltage gain of differential amplifier with two op-amps.
4. Design a low pass filter at a cutoff frequency of 1 kHz with a passband gain of 2. Plot the frequency response of this filter.
5. What is the effect of variation in power supply voltages on offset voltage?
6. Explain the operation of saw tooth wave generator with circuit diagram.

SECTION C

7. Explain the operating principle of PLL with the help of block diagram. Discuss its two applications.
8. Write a note on
   a) Voltage to frequency converter
   b) Wien bridge oscillator
9. a) Design an astable multi vibrator using 555 timer to generate a clock of 5 kHz with a duty cycle of 70%.
   b) Describe the working of R-2R ladder D/A converter.

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

Total No. of Pages: 02

Total No. of Questions: 09

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

COMPUTER PERIPHERALS & INTERFACES

M Code: 70538

Subject Code: BTCS-505

Paper ID: [A2101]

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. a) Give the advantage of DMA channel?

   b) How I/O port addresses conflicts can be resolved?

   c) Discuss the need of ATA standards?

   d) Write advantages and limitations of IDE?

   e) Write Video adapter types?

   f) What are advanced 3D Technologies?

   g) Write steps of troubleshooting of drivers?

   h) How the serial port is tested?

   i) What is IEEE 1394?

   j) Write the types of graphics cards?

SECTION B

2. Discuss the need of PCI (Peripheral Component Interconnect) Bus?
3. Explain the use SCSI Interface with its pin outs?
4. What is need for video RAM in video hardware?
5. Write types of mouse and their interfaces?
6. List some aspects cost performance analysis while designing the system?

SECTION C

7. What is chipset? Discuss the concept of Integrated Video/ Motherboard chipset?
8. What are steps for Designing and Integration of Peripheral device to a computer system?
9. What are device drivers? Discuss the drivers for UNIX operating System?

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

Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(CSE) ...ards) (Sem.–6)

SIMULATION AND MODELING

Subject Code : BTCS-601

Paper ID : [A2306]

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. What is calling population model?
2. Poisson process.
3. How the sample size is decided in simulation?
4. Mean and variance of binomial distribution.
5. Define face validity.
6. Cumulative distribution function.
7. Write any two Properties of pseudo random numbers.
8. Dynamic physical model.
9. Relationship between L, W, L_q, w_q.
10. Name any two simulation languages.

SECTION-B

11. Discuss the applications of network queuing model.

12. What do you mean by time advance mechanisms in simulation? Discuss next-event time advance approach with flowchart.

13. Differentiate between analytical and computational simulation.

14. What is poker test? Explain with suitable example.

15. Discuss the steady state behaviour of infinite calling Population Model.

SECTION-C

16. What do you mean by statistical model in simulation? Discuss any one in detail.

17. Write an algorithm to generate non-uniformly distributed random numbers from the given Weibull distribution.

18. Discuss two application areas each of the following :

    a. Chi-square with equal probabilities.

    b. Convolution methods.

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

Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(CSE) (2011 Onwards) (Sem.–6)

RELATIONAL DATABASE MANAGEMENT SYSTEM-II (RDBMS-II)

Subject Code : BTCS-602

Paper ID : [A2307]

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. Discuss the concept of Data Independence.
2. What is a query tree?
3. What are the objectives of Normalisation?
4. What is consistent Database state and how it is achieved?
5. What is object identity (OID)?
6. What is the purpose of data replication?
7. What is deferred update?
8. What is time variant data?
9. Name two commercial and two freeware relational database management systems.
10. What is a Time Stamp?

SECTION-B

11. What do you mean by query processing? What are its objectives?

12. Describe the wait-die and wound-wait techniques for deadlock prevention.

13. What query language is used in ORDBMS? What are its standard parts?

14. What are the goals of data mining?

15. Discuss the features of oracle.

SECTION-C

16. Discuss the main cost components for a cost estimation function that is used to estimate query execution cost.

17. Discuss one method of recovery without log file.

18. Discuss different types of architecture of distributed database.

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

Paper ID : [A2309]

Max. Marks : 60

Time : 3 Hrs.

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 term ISP.
2. Explain the term Web Servers.
3. What is DHTML? Explain.
4. What is XML? Write any two characteristics of XML.
5. Explain in brief about HTTP Request.
6. Briefly explain the term Java object.
7. Which java script operator calculates the remainder by dividing two integers? Explain with example.
8. What are the advantages of JavaScript?
9. What is AJAX? Explain
10. List different types of operators available in PHP.

SECTION-B

11. Write a brief note on Web Applications.

12. Write a short note on HTML Lists.

13. Write a short note on AJAX server Script.

14. How can a cookie be created using Java script? Explain.

15. State the advantages of XML. Write a detailed note on XML syntax rules.

SECTION-C

16. Write a detailed note on different types of operators available in JavaScript.

17. Explain different types of statements available in PHP.

18. Explain the concept of Polymorphism, Inheritance and exception handling in Java with suitable example.

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

Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(CSE/Electronics & Computer Engg./IT) (2011 Onwards) (Sem.–6)

SOFTWARE ENGINEERING

Subject Code : BTCS-603

Paper ID : [A2308]

Max. Marks : 60

Time : 3 Hrs.

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. What is client server environment?
2. What is white box testing?
3. What is a formal method system?
4. What do you mean by metrics?
5. What is cyclomatic complexity?
6. Define software engineering as defined in IEEE 610.12.1990 standard.
7. Write four advantages of using software engineering for development of software.
8. What do you mean by SEI-Capability Maturity Model?
9. Which software fails?
10. What are disadvantages of using library routines?

SECTION-B

11. What are size metrics? How is function point metric advantageous over LOC metric?

12. How do you access the quality of software design? Discuss SQA plan.

13. What is meant by modular design? When and how should a modular design be implemented?

14. Discuss White Box techniques in detail.

15. Discuss Mutation testing technique in detail.

SECTION-C

16. What are the five levels of CMM? List important features of each of these levels.

17. Explain the following :

    a) Use-Case diagrams

    b) Software metrics

    c) CASE

18. a) What is the difference between decision table and decision tree?

    b) What is difference among formal, semiformal and informal methods of software development?

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

Paper ID : [A2644]

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. Define wage.
2. What is bonus?
3. Define job satisfaction.
4. Explain two retirement terminal benefits.
5. What is seniority performance appraisal?
6. What is induction program?
7. Define motivation.
8. What is industrial dispute?
9. What is employee grievance?
10. Explain the importance of human resource management in industry.

SECTION-B

11. Define human resource management. Discuss functions and objectives of HRM.

12. What is the difference between training and development?

13. What is motivation? Explain factors affecting motivation.

14. Explain the importance of collective bargaining in the industry.

15. State and explain different safety previsions under the factories act 1948.

SECTION-C

16. a) Discuss the concept of quality of work life.

    b) Explain the payment of wages Act-1936.

17. Explain the importance of employee employer relationship in the industry and explain different causes and effects of industrial disputes.

18. Explain the need and importance of contract labour (Regulation and Abolition) Act 1970.

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

Total No. of Pages : 02

Total No. of Questions : 18

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

OPTIMIZATION TECHNIQUES

Subject Code : CH-304

Paper ID : [A2643]

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. What is discontinuous function? How can one check the continuity of a function?
2. Give the classification of optimization problems.
3. Consider the objective function : $f(x_1, x_2) = 6x_1^2 + 6x_1x_2 + x_2^3 + 3x_2^2$. Is it convex?
4. State the Kuhn-Tucker conditions.
5. Find the volume of the largest right circular cylinder that can be inscribed inside a Sphere of radius R.
6. What is difference between local optimal point and global optimal point?
7. State disadvantages of Newton's method for one-dimensional search.
8. What is basic feasible solution in simplex method?
9. Define the property of continuity.
10. What are the characteristics of direct search methods?

SECTION-B

11. 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.

12 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.

13. Minimize $f(x) = x^4 - x + 1$ using Newton's method, starting point $x = 0.3$.

14. Locate the minimum value of a function $f = (x - 30)^2$ to within an accuracy of 1% if the initial range of search is $0 \le x \le 100$ by using golden section method.

15. Apply golden section 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% of its original size.

SECTION-C

16. Find the minimum of $f = x\,(x - 1.5)$ in the interval (0,1) to within 5% of the exact value, using interval halving method.

17. Estimate the minimum of $f(x) = 3x^2 + \frac{12}{x^3} - 5$ in the interval $\frac{1}{2} \le x \le \frac{5}{2}$.

by using Powell's Method, with initial point $x1 = 0.5$ and step size $\Delta = 0.5$. For convergence parameters use

$$\left|\frac{\textit{Difference in } x}{x}\right| \le 3 \times 10^{-2} \textit{ and } \left|\frac{\textit{Difference in } F}{F}\right| \le 3 \times 10^{-3}$$

18. The function $f(x) = \left(1 + 8x_1 - 7x_1^2 + \frac{7}{3}x_1^3 - \frac{1}{4}x_1^4\right)(x_2^2 e^{-x_2})F(x_3)$

Has two maxima and one saddle point. For

(*a*) $F(x_3) = 1$ *and* (*b*) $F(x_3) = x_3 e^{-(x_3+1)}$

Locate the global optimum by a search technique.

Total No. of Pages : 02

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

Total No. of Questions : 18

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

TOTAL QUALITY MANAGEMENT

Subject Code : ME-251

Paper ID : [A2641]

Max. Marks : 60

Time : 3 Hrs.

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. Define Total Quality Management.
2. Enumerate various factors which affect quality.
3. Define MRP.
4. How do suggestion schemes improve workplace performance?
5. Enumerate various models of TQM implementation.
6. How does TQM promote team building in an organization?
7. How employee empowerment is realized through TQM?
8. Differentiate between ISO 9001 and 9002.
9. List down the different types of FMEA
10. Enumerate basic elements of Total Quality Management.

SECTION-B

11. Enumerate the criteria for Deming Prize.

12. Describe the JIT implementation for equipment layout giving its benefits and applications.

13. What do you mean by quality circles? How do quality circles operate in organizations to improve quality?

14. Explain various types of benchmarking techniques deployed in organizations, giving their applications, advantages and limitations.

15. Explain the steps involved in application of QFD technique in organizations.

SECTION-C

16. a) Discuss the Malcolm Baldrige Criteria for Performance Excellence.

    b) Explain seven new QC tools for problem solving.

17. a) How do organizations adopt various redressal mechanisms at workplace?

    b) Write short note on any one of the following :

    i) Taguchi Methods

    ii) Failure mode effect analysis

18. a) Differentiate between push and pull kanbans used in JIT manufacturing giving their advantage and limitations.

    b) Explain the procedure of ISO-9001, ISO 9002 certifications.

B. Tech - CSE
Sem - 7th & 8th

Roll No. [ ][ ][ ][ ][ ][ ][ ]

Total No. of Pages : 02

Total No. of Questions : 18

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

OBJECT ORIENTED ANALYSIS AND DESIGN

Subject Code : BTCS-906

Paper ID : [A2988]

Max. Marks : 60

Time : 3 Hrs.

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. What is the purpose of sequence diagram?
2. What is difference between a node and a component?
3. Define Aggregation and Generalization.
4. What is fork and join condition?
5. What is the use of component?
6. What is the difference between state diagram and activity diagram?
7. Differentiate between static and dynamic behavior.
8. What is the role of interfaces?
9. Which OOAD artifact is the MOST useful in situations where asynchronous events occur?
10. What is Qualifier?

SECTION-B

11. Explain in detail the concept of Event state diagram with help of example.

12. Explain in detail the concept of Association and its types with suitable example.

13. Explain in detail the concept of Collaboration diagram with help of example.

14. What is the purpose of deployment diagram? Give one example. How are these different from collaboration diagrams?

15. a) Illustrate the relationship between sequence diagram and use case diagram.

    b) Differentiate between layered architecture and partitioned architecture with example.

SECTION-C

16. a) What is object oriented modeling? What are its benefits?

    b) What is the difference between structured design and object oriented design methodology?

17. What is the purpose of Use-Case Model? Discuss various relationships used in Use-case diagram with example.

18. Write short notes on :

    a) Rational Unified Approach.

    b) Building Blocks of UML

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

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

Paper ID : [A2989]

Max. Marks : 60

Time : 3 Hrs.

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. Software Configuration Management
2. Risk Management
3. Test Automation
4. Cash flow forecasting
5. Change control
6. Software Reliability
7. Earned Value
8. PERT
9. CMMI
10. Project Scheduling

SECTION-B

11. What is cost estimation? What are different factors that affect the cost?

12. Explain Oldman-Hackman job characteristic model. Elaborate with example.

13. What are different processes involved in software configuration management? Explain.

14. How Risk Management is important in software project management? Explain its nature and types.

15. What is the role of organization and team structures in quality assurance of software? Explain.

SECTION-C

16. What are various parameters in Earned Value Analysis? How it helps in monitoring and control of any software project?

17. a) What are the various activities involved in software project management? Explain.

    b) What are different types of contract? Explain contract management.

18. Compare CMMI and ISO models for software quality in detail. How can they control quality of the software?

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

Total No. of Pages : 02

Total No. of Questions : 18

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

COMPILER DESIGN

Subject Code : BTCS-913

Paper ID : [A2995]

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. Write at least two differences between compiler and an interpreter.
2. What are different types of errors during compilation?
3. Define regular expression.
4. Define bootstrapping.
5. Differentiate between pass and phase of compiler.
6. Define LR(0) and LR(1) grammar.
7. What is advantage of removing left recursion from a grammar?
8. What is the advantage of Triples over Quadruples in intermediate code storage?
9. What is the purpose of code optimization phase of compiler?
10. What is the use of symbol table?

SECTION-B

11. Construct action and goto table for LR(0) parser : (5)

    (0) S→EE (1) E → eE (2) E → f (2.5)

12. a) Loop Optimization

    b) What is the significance of quadruples, triples? Write quadruples and triples for the expression : (2.5)

$$(A + B) * (C + D) - (A + B + C)$$

13. What are three representations of IR (Intermediate Code)? Discuss SDT for three address code generation with example. (5)

14. Discuss stack allocation of space and Activation Records. (5)

15. What is Context Free Grammar (CFG)? Discuss Shift-Reduce Parser with example. (5)

SECTION-C

16. Write a note on LEX and YACC compilers.

17. a) Discuss predictive parsing and Recursive descent parsing.

    b) What is Handle Pruning? Write with an example, how handle is removed while parsing a string?

18. a) Discuss various issues covered in code generation phase.

    b) Discuss ambiguous and non-ambiguous parse trees. How ambiguity is removed from a parse tree?

Total No. of Pages : 02

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

Total No. of Questions : 09

B.Tech.(IT) (2011 Onwards) (Sem.–7,8)

SOFTWARE PROJECT MANAGEMENT

Subject Code : BTIT-702

Paper ID : [A3050]

Max. Marks : 60

Time : 3 Hrs.

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) Define software engineering.

b) Define three P's in Software Project Management.

c) What are technical reviews?

d) What is ISO?

e) What is validation?

f) What is COCOMO?

g) What is Software Configuration Management?

h) What is total quality management?

i) What is Verification?

j) What is Risk Identification?

SECTION-B

Q2) Explain how a software development effort is initiated and finally terminated in the spiral model.

Q3) Explain change management in software configuration management.

Q4) What are different types of risks that a project might suffer from?

Q5) Discuss the principles of Total Quality Management.

Q6) What is project planning? When does the project planning start and end in the software life cycle?

SECTION-C

Q7) What are the different categories software development projects according to the COCOMO estimation model? Give examples of software product development projects belonging to each of these categories.

Q8) Compare various SDLC models. Why spiral model is known as meta model?

Q9) What are the major phases of the waterfall model of software development? Which phase consumes the maximum effort for developing a typical software product?

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

Total No. of Pages : 02

Total No. of Questions : 09

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

OPTICAL COMMUNICATION

Subject Code : BTEC-702

Paper ID : [A3001]

Max. Marks : 60

Time : 3 Hrs.

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 numerical aperture.

b. Discuss briefly chromatic dispersion.

c. Give the importance of V number or normalized frequency of fiber.

d. What is meant by indirect band gap semiconductor material?

e. Define modulation bandwidth of an LED.

f. How do we achieve *'population inversion'*?

g. Explain briefly Responsivity.

h. What are the drawbacks of Avalanche photo diode?

i. Define frequency chirping.

j. Define Optical TDM systems.

SECTION-B

Q2. Discuss the following for optical fibers :

a. Absorption

b. Rayleigh Scattering

Q3. A single-mode fiber is measured to have $\lambda^2(d^2n = d\lambda^2) = 0.02$ at 0.8 μm. Calculate the dispersion parameters β_2 and D.

Q4. Explain the operation of DFB and DBR lasers.

Q5. a. Explain in brief need of fiber optic Communication and Evolution of Light Wave Systems.

b. A multimode fiber with a 50 μm core diameter is designed to limit the intermodal dispersion to 10 ns/km. What is the numerical aperture of this fiber?

Q6. Explain the concept of Dispersion in Single mode fibers.

SECTION-C

Q7. a. Explain the p-i-n diode and the concept of receiver noise for p-i-n receivers.

b. Photons at a rate of 10^{10} /s are incident on an APD with responsivity of 6 A/W. Calculate the quantum efficiency and the photocurrent at the operating wavelength of 1.5 μm for an APD gain of 10.

Q8. Explain the Loss limited Lightwave systems and Dispersion Limited lightwave systems.

Q9. a. Derive an expression for the CNR of analog SCM lightwave systems by including thermal noise, shot noise, and intensity noise.

b. Explain Time division multiplexing in brief.

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

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

Paper ID : [A2986]

Max. Marks : 60

Time : 3 Hrs.

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. Differentiate between NFA and DFA.
2. State Pumping Lemma for Context Free Languages.
3. What is Chomsky Classification of formal languages?
4. Differentiate between Moore and Mealy Machine.
5. What is the difference between acceptance of string in PDA with null stack or with final state?
6. Explain briefly Lex and Yacc.
7. Explain the concept of Unit Production.
8. Explain the acceptance of the string over NFA and DFA over the same alphabet.
9. Define terminal and non-terminal symbol.
10. Define leftmost and rightmost derivation.

SECTION-B

11. Explain in brief the properties of LL (k) grammars.

12. Explain in brief various types of languages. Also name the automata accepting those languages.

13. Find the grammar generating $L = \{a^n|b^nc^i\ |n\geq 1,\ i\geq 0\}$.

14. Design a Turing Machine which recognizes the set of all even length palindromes over {0,1}.

15. Consider the following productions.

    $S \rightarrow aB|bA \quad A \rightarrow aS|bAA|a \quad B \rightarrow bS|aBB|b$

    For the string aaabbabbba, find the

    a) Leftmost derivation

    b) Rightmost derivation

    c) Parse Tree

SECTION-C

16. Write short notes on :

    (a) Griebach Normal Form.

    (b) Push Down Automata.

    (c) Cellular Automata

17. Describe *"equivalent states"* in finite state automaton and prove that the relation *"equivalent"* among states is an 'equivalence' relation. How this equivalence relation can be used to minimize the number of states in FA?

18. Design a PDA which recognizes the set of all even length palindromes over {a,b}.

Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 18

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

ARTIFICIAL INTELLIGENCE

Subject Code : BTCS-701

Paper ID : [A2985]

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

Explain the following in brief :

1. Need of formulating the problems in AI.
2. Alpha-beta pruning.
3. Advantages of logical reasoning.
4. Implementation challenges in temporal constraints.
5. Characteristics of bayes rule.
6. Role of reinforcement learning in AI.
7. Major reasons for growth of intelligent agents.
8. Features of utility functions in decision making.
9. Significance of planning in the blocks world.
10. Future scope of artificial intelligence.

SECTION-B

11. Give details of the year-wise development of AI. How AI is being used in the area of medical research?

12. Describe any four informed searching techniques with suitable examples.

13. Differentiate between forward chaining and backward chaining.

14. Discuss the various in-built functions used in LISP.

15. Explain the process of inductive learning using decision trees.

SECTION-C

16. Write an algorithm for A* searching technique. Explain with the help of suitable example.

17. Discuss the role of uncertainty in AI. Explain decision theoretic expert systems in brief.

18. Differentiate between the various learning methods: neural networks, reinforcement learning and genetic algorithms.