B.TECH. DEGREE EXAMINATION, MAY 2017

III B.Tech. II Semester

RCC STRUCTURAL DESIGN - II
(Civil Engineering)

Time : 3 hours   Max. Marks : 60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks
* * *

SECTION - I

1   Design a combined trapezoidal footing for two columns A and B, spaced 5 m c/c. Column A is 300 x 300 mm in size and transmits a load of 650 kN. Column B is 400 x 400 mm in size and transmits a load of 950 kN. The maximum length of the footing is restricted to 7 m only. The SBC of the soil may be taken as 120 kN/m^2. Use M 25 mix and Fe 415 grade steel.

2   Design a combined footing for two RC columns A and B, separated by a distance of 4 m c/c. Column A is 500 mm square and carries a load of 1200 kN and Column B is 600 mm square and carries a load of 1600 kN. The property line is located 400 mm from centre of column A measured outwards along the centre line of columns and runs at right angles to the column line. No encroachment beyond the property line is permissible. The SBC of the soil may be taken as 200 kN/m^2. Use M 20 mix and Fe 415 grade steel.

SECTION - II

3   A T-shaped cantilever retaining wall has to retain earth embankment 3.5 m. high above ground level. The unit weight of earth is 18 kN/m^3 and its angle of repose is 30^0. The embankment is horizontal at its top. The SBC of the soil may be taken as 100 kN/m^2 and the coefficient of friction between soil and concrete is 0.5. Use M 20 mix and Fe 415 grade steel.

   (a) Check the stability of retaining wall

   (b) Design the Toe slab

   (c) Design the heel slab

4   A cantilever retaining wall is proposed for a road for the following requirements.

Height of wall from the bottom of base to top of stem = 5.5 m

Super imposed load due to road traffic   = 20 kN/m^2

Unit weight of fill   = 18 kN/m^2

Angle of internal friction for fill material   = 30^0

Allowable bearing pressure on ground   = 160 kN/m^2

Coefficient of friction between concrete and ground = 0.4

Provide a parapet wall 1 m high on the top of stem.

Use M 20 mix and Fe 415 grade steel.

  (a) Check the stability of retaining wall

  (b) Design the Toe slab

  (c) Design the heel slab

SECTION - III

5   A circular tank has an internal diameter of 10 m and has maximum height of water as 4.5 m. The walls of the tank are restrained at the base. Determine the values of maximum hoop tension and its location, moment at the base, shear at the base using I.S. code tables. The thickness of the wall is 180 mm. Use M 25 mix and Fe 415 grade steel.

6   Design a rectangular water tank 4 m x 6 m x 3 m. deep. The tank is open at top and the walls are rigidly fixed to the base which rests on firm ground. Use M 20 mix and Fe 415 grade steel.

SECTION - IV

7   Sketch the yield line pattern for an isotropically reinforced rectangular slab. Derive an expression for the yield moment using virtual work method.

8   (a) What are the guidelines for predicting yield line pattern ?

    (b) Briefly explain the Virtual work method in yield line theory.

SECTION - V

9   A PSC beam of 6m having a c/s of 400 mm x 600 mm carries a central concentrated load of 160 kN in addition to the self weight. The beam is prestressed with a force of 1000 kN using a bent tendon having an eccentricity of 50 mm at the ends (Top) and central dip of 100 mm. Determine the stress distribution for the

  (a) end section and

  (b) mid section of the beam.

10   A pre stressed concrete beam 250 mm wide and 360 mm deep has a span of 12 m. The beam is pre stressed by steel wires of area 350 mm^2 provided at a uniform eccentricity of 60 mm with an initial prestress of 1250 N/mm^2. Determine the percentage loss of stress in the wires

(a) if the beam is pre tensioned beam

(b) if the beam is post tensioned beam

Take, $E_s = 210$ kN/mm^2, $E_c = 35$ kN/mm^2

Creep strain $= 45 \times 10^{-6}$ mm/mm per N/mm^2 for pre tensioned beam

and 22×10^{-6} mm/mm per N/mm^2 for post tensioned beam

Shrinkage of concrete $= 300 \times 10^{-6}$ for pre tensioned beam

and 215×10^{-6} for post tensioned beam

Relaxation of steel stress $= 5\%$ of the initial stress

Anchorage slip $= 1.25$ mm

Friction coefficient for wave effect, K $= 0.0015$ / m

B.TECH. DEGREE EXAMINATION, MAY 2017

III B.Tech. II Semester

DYNAMICS OF MACHINERY
(Mechanical Engineering)

Time : 3 hours   Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks
* * *

SECTION - I

1 (a) Explain the terms friction axis, friction couple and friction circle

   (b) The mean diameter of Whitworth bolt having V-Threads is 25 mm. The pitch of the thread is 5 mm and angle of V is 55^0. The bolt is tightened by a nut whose mean radius of bearing surface is 25 mm. If the coefficient of friction between nut and bolt is 0.1 and nut with bearing surface is 0.16. Find the force required at the end of the spanner 0.5 m long when the load on the bolt is 20 kN.

2 (a) What is a clutch? Describe the working of a multi plate clutch with a neat sketch.

   (b) A single disc clutch internal and external diameter as 200 and 300 mm. maximum intensity pressure as 0.06 N/mm².the coefficient of frictional surface shaft and plate surfaces as 0.03 N/mm².Determine the power lost in to the shaft. Assuming uniform wear and the shaft rotating with a speed of 1200 rpm.

SECTION - II

3 (a) Distinguish between brakes and dynamometers?

   (b) A band and brake having 12 blocks, each of which subtends an angle of 160 at the center, is applied to a rotating drum of diameter 600 mm. The blocks are 75 mm thick. The drum and the flywheel mounted on the dame shaft have a mass of 1800 kg and have a combined radius of gyration of 600 mm. The two ends of the band are attached to pins on the opposite sides of the brake fulcrum at a distance of 40 mm and 150 mm from the fulcrum. If the force of 250 N is applied at a distance of 900 mm from the fulcrum find (i) Maximum braking torque (i) angular retardation of the drum. Consider the coefficient of friction between the blocks and the drum as 0.3.

4 (a) What is meant by self-locking and self-energized brake?

   (b) What is the function of transmission type dynamometer and explain in detail about the calculations involved in finding the power transmitted in it.

SECTION - III

5   (a)   Explain the terms sensitiveness, hunting and stability relating to governors .

    (b)   A hartnell governor having a central sleeve spring and two right angled bell crank lever operates between 290rpm and 310rpm for a sleeve lift of 15mm. The sleeve and ball arms are 80mm and 120mm respectively. The levers are pivoted at 120mm from the governor axis and mass of the ball is 2.5kg.The ball arms are parallel at lowest equilibrium speed. Determine.
    (i) load on the spring at maximum and minimum speeds   (ii) Stiffness of the spring.

6   (a)   Derive an expression for the determination of equilibrium speed of a Proell Governor.

    (b)   Calculate the minimum speed of a proell governor, which has equal arms each of 200mm and are provided on the axis of rotation. The mass of each ball is 4kg and the central mass on the sleeve is 20kg.The extension arms of the lower links are each 60mm long and parallel to the axis when the minimum radius of the ball is 100mm.of load.

SECTION - IV

7   (a)   Describe the turning moment diagram for a single cylinder double acting steam engine

    (b)   The length and connecting rod of a horizontal reciprocating engine are 200mm and1meter respectively. The crank is rotating at 400rpm.When the crank has turned 30° from the inner dead center, the difference of pressure between cover end and piston rod is 0.4 N/mm2.If the mass of the reciprocating parts is 100Kg and a cylinder bore is 0.4meters. Calculate(i)Inertia force (ii) Force on piston (iii) Piston effort (iv) Thrust on the side of the cylinder walls(v) Thrust in the connecting rod (vi)Crank effort.

8   (a)   Describe the graphical method of determining the torque considering the inertia of the connecting rod of the reciprocating engine

    (b)   A horizontal gas engine running at 210rpm has a bore of 220mm and a stroke of 440mm. The connecting rod is 924mm long the reciprocating parts weight 20kg.When the crank has turned through an angle of 30° from IDC, the gas pressure on the cover and the crank sides are 500KN/m2 and 60KN/m2 respectively. Diameter of the piston rod is 40mm.Determine,1. Turning moment on the crank shaft 2.Thrust on bearing3. Acceleration of the flywheel which has a mass of 8kg and radius of gyration of 600mm while the power of the engine is 22KW.

SECTION - V

9   (a)   Define precession axis and spin axis by neat sketches

    (b)   An aero-plane makes a complete half circle of 50 m radius towards left in a time of 20 sec when flying at 200 kmph. The rotary engine and the propeller of the plane has a mass of 400 kg and a radius of gyration of 0.3m. The engine rotor rotates at 2400 rpm clockwise when seen from the rear. Find the gyroscopic couple on the air craft and state its effect on the aero plane.

10   (a)   Derive an equation for gyroscopic couple for a rotating disc.

    (b)   A uniform disc having a mass of 8 kg and radius of gyration 150 mm is mounted on one end of a horizontal arm of length 200 mm. The other end rotates freely in a bearing. The disc is given a clockwise spin of 240 rpm. Determine the motion of the disc if its arm remains horizontal.

B.TECH. DEGREE EXAMINATION, MAY 2017
III B.Tech. II Semester
MICROPROCESSOR & INTERFACING
(Common for EEE, ECE, & CSE)

Time : 3 hours   Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks
* * *

SECTION - I

1 (a) Explain the following with respect to 8085 microprocessor.
       i)SOD   ii)SID   iii)TRAP
   (b) Explain the architectural difference between 8085 and 8086?
2 (a) Draw the Timing diagrams of RD, WR, address and data lines with respect to clock signal in 8085.
   (b) Explain the functionality of various registers used by 8085.

SECTION - II

3 (a) Explain various addressing modes of 8085 with the help of examples.
   (b) Write an ALP in 8085 to perform square of any given data. (Assume suitable input data.)

4 (a) Explain different types of interrupts supported by 8085.
   (b) What is the difference between Memory mapped and I/O mapped interfacing? Explain.

SECTION - III

5 (a) Explain with a neat timing diagram, the minimum mode 8086 based system.
   (b) Why interrupt is needed in software based design? Explain in detail.

6 (a) Write an ALP in 8086 to perform sorting operation of data. (Assume suitable input data.)
   (b) Write an ALP in 8086 to reverse a given string of characters. (Assume suitable input data.)

SECTION - IV

7 (a) Differentiate interrupt driven data transfer scheme and DMA data transfer scheme.
   (b) What are the registers supported by 8259? Explain in brief.

8   What are the various modes of operation of 8253? Explain in detail.

SECTION - V

9   Discuss the interface of two 16x4 EPROM's and two 16x4 RAM's with 8086. Select suitable mapping.

10   Design a 4-phase stepper motor with 8086 and write an ALP to rotate the shaft of stepper motor 2 rotations in anti-clockwise direction.

Code: 13EE3210

B.TECH. DEGREE EXAMINATION, MAY 2017

III-B.Tech., II Semester

ELECTRONIC MEASUREMENTS
(Electrical & Electronics Engineering)

Time: 3 hours   Max. Marks: 60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks
* * *

SECTION - I

1 a Explain the basic digital storage oscilloscope with neat block diagram.
   b Explain with neat block diagram of digital oscilloscope which uses analogue storage to eliminate the need for a very fast analogue to digital converter.

2 a How frequency can be measured with the help of Lissajous patterns?
   b Draw the Lissajous patterns for 2:1, 3:1, 3:2 and 5:2.

SECTION - II

3 a How the superimposed noise can be reduced by using dual scope integrating type digital voltmeter.
   b Explain the dual scope integrating type digital voltmeter with it block diagram and associated equation.

4   Explain briefly about the following digital multimeter circuits:
   a DC voltage attenuation
   b Current to Voltage converter
   c AC/DC converter
   d Resistance to Voltage converter
   e High frequency to Low frequency converter

SECTION - III

5   Explain the following applications for Q-Meter:
   a Correction for shunt resistance & distributed capacitance
   b Measurement of inductance
   c Measurement of effective resistance
   d Measurement of self-capacitance
   e Measurement of capacitance

6 a Explain about half wave type Rectifier type instrument with neat circuit and waveforms
   b Explain about full wave type Rectifier type instrument with neat circuit and waveforms
   c Mention the applications of rectifier type instruments

SECTION - IV

7   a   Explain in detail about thermocouple and thermopile.

      b   Draw the thermocouple output voltage as a function of temperature for various thermocouple materials.

      c   What are the advantages and limitations of thermocouples?

8   a   Explain the concept of Magnetostrictive Transducers.

      b   Give the applications of Magnetostrictive Transducers.

SECTION - V

9   Explain the flowing resistive transducers with neat diagrams.

      a   Resistance pressure transducers

      b   Resistance position transducers

10 a   What is the principle of liquid level capacitance method? Derive the necessary expressions.

      b   Explain the parallel plate capacitance method for liquid level measurement.

B.TECH. DEGREE EXAMINATION, MAY 2017

III B.Tech. II Semester

HEAT TRANSFER
(Mechanical Engineering)

Time : 3 hours   Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks
* * *

SECTION - I

1 (a) Draw the temperature gradient through a plane wall when thermal conductivity
   I.   Remains constant with increasing temperature
   II.   increasing with increasing temperature
   III.   decreasing with increasing temperature

   (b) Starting from fundamentals derive the general heat conduction equation in Cartesian coordinate system.

2 (a) Obtain an expression for heat transfer rate under steady state conditions in a hollow cylinder of inner and outer radii r_i and r_o maintained at temperatures T_i and T_o respectively.

   (b) A 3mm diameter and 5 m long electric wire is tightly wrapped with a 2 mm thick plastic cover whose thermal conductivity is k = 0.15 W/m °C. Electrical measurements indicate that a current of 10 A passes through the wire and there is a voltage drop of 8 V along the wire. If the insulated wire is exposed to a medium at T_∞= 30°C with a heat transfer coefficient of h = 12 W/m^2 °C, determine the temperature at the interface of the wire and the plastic cover in steady operation. Also determine whether doubling the thickness of the plastic cover will increase or decrease this interface temperature.

SECTION - II

3 (a) What is an infinitely long cylinder? When is it proper to treat an actual cylinder as being infinitely long, and when is it not?

   (b) Annular aluminum (k = 200 W/m-K) fins are attached to a tube of OD 5 cm with a thickness of 2 mm. The fins have a thickness of 2 mm and a radial length of 15 mm. The base surface temperature is maintained at 200°C. The temperature and the heat transfer coefficient of the adjoining fluid are 30°C and 50 W/m^2-K respectively. Find the fin efficiency, the heat loss per metre length of the tube and the effectiveness of the fin.

4 (a) Define fin efficiency and effectiveness and derive the corresponding expressions for an infinite long fin.

   (b) Stainless steel ball of diameter 3 cm is uniformly heated to a temperature of 800°C. It is to be hardened by first cooling in an oil bath to a temperature of 100°C and The heat transfer coefficient and the oil bath temperature are 700 W/m^{2}K and 40°C respectively. What is the time required for this process? If 100 balls are to be quenched per minute, determine the heat removal rate from the oil bath per minute so that its temperature remains constant at 40°C. Properties of Stainless steel are: k = 61 W/m-K, ρ = 7865 kg/m^3, c_p = 0.46 kJ/kg-K

SECTION - III

5   (a)   What is dimensional analysis? What are dimensionless numbers?
    (b)   Air at a temperature of 27 °C is moving at a velocity of 0.3 m/s past a 40W incandescent bulb. The bulb may be treated as a sphere of 50mm diameter with its surface temperature of 127 °C. Estimate heat transfer coefficient and compute the percentage of power lost due to convection.

6   (a)   Define Grashof number and explain its significance in natural convection heat transfer.
    (b)   Water enters a 3.5 cm internal diameter thin copper tube of a heat exchanger at a rate of 0.3 kg/s, and is heated by steam condensing outside at a temperature of 110° C. If the average heat transfer coefficient is 900 W/m².K, determine the length of the tube required in order to heat the water to 105 ° C

SECTION - IV

7   (a)   How is the intensity of emitted radiation defined? For a diffusely emitting surface, how is the emissive power related to the intensity of emitted radiation?
    (b)   Determine the view factors F_{13} and F_{23} between the rectangular surfaces shown in Figure
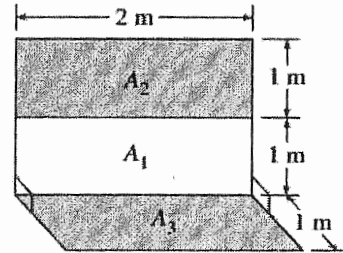
8   (a)   Define the properties emissivity and absorptivity. When are these two properties equal to each other?
    (b)   Two very long concentric cylinders of diameters $D_1 = 0.2$ m and $D_2 = 0.5$ m are maintained at uniform temperatures of $T1 = 950$ K and $T2 = 500$ K and have emissivities $\varepsilon_1 = 1$ and $\varepsilon_2 = 0.7$, respectively. Determine the net rate of radiation heat transfer between the two cylinders per unit length of the cylinders.

SECTION - V

9   (a)   Can the outlet temperature of the cold fluid in a heat exchanger be higher than the outlet temperature of the hot fluid in a parallel-flow heat exchanger? How about in a counter-flow heat exchanger? Explain.
    (b)   What is the difference between film and dropwise condensation? Which is a more effective mechanism of heat transfer?

10 (a)   Draw the boiling curve and identify the different boiling regimes. Also, explain the characteristics of each regime
    (b)   Cold water enters a counter-flow heat exchanger at 10°C at a rate of 8 kg/s, where it is heated by a hot water stream that enters the heat exchanger at 70°C at a rate of 2 kg/s. Assuming the specific heat of water to remain constant at Cp = 4.18 kJ/kg °C, determine the maximum heat transfer rate and the outlet temperatures of the cold and the hot water streams for this limiting case.

B.TECH. DEGREE EXAMINATION, MAY 2017

III B.Tech. II Semester
COMPUTER GRAPHICS
(Computer Science & Engineering)

Time : 3 hours
Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section

All Questions carry equal marks
* * *

SECTION – I

1 (a) Explain about Architecture of a raster display.

  (b) Briefly discuss the Anti aliasing approaches.

2 Explain in detail about the edge coherence and the scan-line algorithm for filling polygons?

SECTION – II

3 (a) Make a comparison between random scan and raster scan display systems.
  (b) Explain any two hardcopy technologies in graphics.

4 (a) Reduce the triangle with vertices A (0, 0), B (1, 1) and C (0, 1) to half of its size while keeping B (1, 1) fixed.

  (b) Discuss about the following translations.
  (i)Scaling
  (ii)Rotations.

SECTION – III

5 (a) Difference between parallel and perspective projections.

  (b) Briefly explain the coordinate systems in 3D viewing.

6 (a) Briefly explain the Bezier and B-spline surfaces.
  (b) What is meant by spline? Explain its representation in computer graphics.

SECTION – IV

7 (a) What is meant by solid modeling?

(b) Discuss about the regularized Boolean set operations in solid modeling.

8   Explain about the following two visual surface algorithms in detail.
(i)The depth-sort algorithm
(ii)Binary space partitioning trees

SECTION – V

9   Discuss in detail about 'gouraud shading', 'phong shading' along with their advantages.

10   Discuss various computer animation languages along with their advantages and disadvantages.

B.TECH. DEGREE EXAMINATION, MAY 2017
III B.Tech. II Semester
HYDROLOGY
(Civil Engineering)

Time: 3 hours

Max. Marks: 60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks
* * *

SECTION – I

1. a) Explain briefly the types and forms of precipitation

   b) A catchment area is in the form of an equilateral triangle ABC of side 10 km. Four rain gauge stations are located at A, B, C and D. Station D is at the centroid of the triangle. The average annual precipitations observed at these stations are 1145, 1252, 1184, and 1056 mm respectively. Find the average annual precipitation of the catchment area by Thiessen polygon method.

2. a) Describe the principle of working of a float type recording raingauge with a neat sketch.

   b) How is the double mass curve technique used to check the consistency and adjust the rainfall record at a suspicious station?

SECTION – II

3. a) Discuss the factors affecting evaporation.

   b) Define pan coefficient. Discuss the relative merits and demerits of sunken, floating and land pans

4. a) Describe how infiltration capacity rate can be measured using a double ring infiltrometer

   b) A six hour storm produced rainfall intensities of 5, 16,25,10,12 and 3mm/hr in successive one hour intervals over a basin of 800km^2. The resulting runoff is observed to be 2640 hectare-meters. Determine ϕ –index for the basin

SECTION – III

5. a) Distinguish between
      i) Surface runoff and sub surface runoff
      ii) Direct runoff and base flow
      iii) Overland flow and interflow

   b) Explain the factors to be considered in locating a stream gauging site

6. Explain in detail, the various factors affecting runoff

7. a) Explain the method of design flood estimation using the rational method.

   b) Describe the method of estimating a T_r-year flood using Gumbel's distribution.

8. a) What is a hydrograph? Draw a single peaked hydrograph and explain its components.

   b) A six hours storm produced a flood hydrograph as given below.

Time (h)	: 0	06	12	18	24	30	36	42	48	54	60
Discharge (m^3/s)	: 8	10	15	18	12	25	28	14	10	09	08

   Assuming a constant base flow of 8 m^3/s, determine the ordinates of unit hydrograph. The basin area is 100 km^2.

SECTION – V

9. a) Define flood routing. What are the uses of flood routing?

   b) Derive the Muskingum routing equation and the expressions for the routing coefficients C_0, C_1 and C_2

10. a) Distinguish between
        i) Aquifer and Aquifuge
        ii) Aquiclude and Aquitard
        iii) Confined Aquifer and Unconfined Aquifer

    b) During a recuperation test, the water level in an open well was depressed by pumping by 2 m and it is recuperated by 1.5 m in 1 hour. Determine the yield from a well 2 m in diameter under a depression head of 2 m situated in the same area

B.TECH. DEGREE EXAMINATION, MAY 2017

III B.Tech. II Semester

MICROWAVE TECHNIQUES
(Electronics & Communication Engineering)

Time : 3 hours   Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks
* * *

SECTION - I

1 (a) A two cavity klystron amplifier has the following parameters.
Beam voltage = 1000 V, Beam current=25 mA, frequency=3 G Hz, gap spacing in either cavity = 1mm, spacing between center of cavities = 4 cm, effective shunt impedance = 30 k Ω. Determine
   (i)   The electron velocity
   (ii) The DC transit time of electron
   (iii) The input voltage for maximum output voltage
   (iv) The voltage gain in decibels

  (b) Explain the conditions for sustained oscillations in a Reflex klystron with the help of spiral diagram.

2 (a) Describe the structure of an O-type travelling wave tube and explain its characteristics.
  (b) With suitable diagrams explain the working of cavity Magnetron.

SECTION - II

3 (a) Explain the operation of a Tunnel diode with the help of Energy Band diagrams.
  (b) Describe the construction and operation and applications of PIN diode.

4 (a) Explain the operation of MASER and mention its applications.
  (b) Discuss the difference between transferred electron devices and avalanche transit time devices.

SECTION - III

5   (a)   A TE_{11} mode is propagating through a circular waveguide. The radius of the guide is 5cm, and the guide contain an air dielectric.

Determine the Cutoff frequency and wavelength λ_g in the guide for an operating frequency of 3 G Hz.

      (b)   Write short notes on the following.
- (i)   Windows
- (ii)   Bends
- (iii)   Corners

6   (a)   Explain about Faraday rotation Isolator.

      (b)   Derive the S-matrix of a directional coupler.

SECTION - IV

7   (a)   Describe the method of high VSWR measurement.

      (b)   Explain the method of reflection coefficient measurement.

8   (a)   With an experimental setup, briefly explain how scattering coefficients can be measured.

      (b)   Explain the reflectometer method of measurement of unknown impedance.

SECTION - V

9   (a)   Write short notes on technology of hybrid MIC's

      (b)   Explain the principle features of strip line.

10   (a)   Write short notes on Lens antennas.

      (b)   Discuss about the feed mechanisms of a parabolic reflectors.

Code : 13EC3203

B.TECH. DEGREE EXAMINATION, MAY 2017
III B.Tech. II Semester
OPTICAL COMMUNICATION
(Electronics & Communication Engineering)

Time : 3 hours   Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks
* * *

SECTION – I

1 (a) Distinguish between step index and graded index fibers
   (b) Differentiate between intermodal and intermodal dispersion
2 (a) Discuss material and waveguide dispersion mechanisms
   (b) Explain with suitable diagrams the different mechanisms that contribute to attenuation in optical fibers

SECTION – II

3 (a) Write a brief note on fiber connectors
   (b) Give a brief account of quantum efficiency of an LED
4 (a) Discuss the principle of operation of LASER diodes. What are the effects of temperature on the performance of a LASER diode?
   (b) Describe for a fabryperot resonator laser diode.

SECTION – III

5. (a) Explain the operation of APD with neat diagram
   (b) Briefly explain the concept of carrier to noise ratio in analog systems
6 (a) Write a short notes on Photo Darlington Receiver transistor operation
   (b) Explain receiver performance and calculation

SECTION – IV

7 (a) Explain the principles of WDM
   (b) Write short notes on semi conductor optical amplifiers
8 (a) Explain the concept of WDM couplers
   (b) Explain basic noise networks

SECTION – V

9   (a) Explain general optical system with neat diagram

    (b) Explain applications of fiber communications and list its advantages

10 (a) Distinguish between passive and active sensing

    (b) Explain the various components of optical communication system and explain each in detail

B.TECH. DEGREE EXAMINATION, MAY 2017

III B.Tech. II Semester

CRYPTOGRAPHY & NETWORK SECURITY
(Computer Science & Engineering)

Time : 3 hours   Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks
* * *

SECTION - I

1 (a). What is a security attack? Explain different security mechanism.

   (b). Explain the characteristics of block and stream ciphers.

2 Explain in detail the sub key generation and round function of DES algorithm in detail.

SECTION - II

3 Explain the RSA algorithm. Compute cipher text for M=88, p=17 and q=11.

4 Explain in detail Elliptic Curve Cryptography (ECC).

SECTION - III

5 (a). What is importance Chinese Remainder Theorem in cryptography? Explain.

   (b). Explain various logarithms used for modular arithmetic operations with example.

6 What is Hash function? Explain MACs based hash function with its design objectives and structure of the algorithm.

SECTION - IV

7 Explain Message Digest Algorithm in detail

8 (a). Describe HMAC algorithm in detail.
   (b). Explain the classification of authentication function in detail.

SECTION - V

9 (a). Explain ESP Header of IP Sec.

   (b). Explain different Web security requirement.

10 Write short notes on the following

   (a). Viruses (b). Trusted Systems (c). Worms (d). Intruders

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B.TECH. DEGREE EXAMINATION, MAY 2017

III B.Tech. II Semester
INDUSTRIAL ENGINEERING & MANAGEMENT
(Mechanical Engineering)

Time : 3 hours   Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks
* * *

SECTION - I

1   Describe Functions of Management in detail

2   What are different types of sales forecasting techniques? Explain any one technique with a suitable example

SECTION - II

3   (a)   Discuss on the factors influencing plant location

     (b)   Compare and contrast the suitability for different types of layouts to the different types of production

4   (a)   What are different types of maintenance strategies? Briefly explain

     (b)   Elaborate on merits and limitations of break-down maintenance

SECTION - III

5   (a)   Define Method study? What are the objectives of method study

     (b)   What are the objectives of work measurement? Explain in detail

6   Describe the steps involved in Method study by selecting a suitable work

SECTION - IV

7   (a)   Differentiate Job evaluation and merit rating?

     (b)   What are the merit rating methods? Explain any one in detail

8   Briefly explain incentive plans with suitable examples

SECTION - V

9   (a)   What is inspection and quality control? Discuss its significance

     (b)   Explain acceptance sampling for attributes with a suitable example

10   (a)   Elaborate on Qualify function deployment

     (b)   Briefly outline tools for continuous quality improvement

Code : 13EE3211

B.TECH. DEGREE EXAMINATION, MAY 2017

III B.Tech. II Semester

MODERN CONTROL THEORY
(Electrical & Electronics Engineering)

Time : 3 hours   Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks
* * *

SECTION - I

1   Explain the effects of a PI controller on the static and dynamic response of a system.

2   (a) Design a PD controller so that the closed loop has damping ratio of 0.4 and natural frequency of as 4 rad/sec for a unity feedback system with open loop transfer function G(s)=10/s(s+2)(s+4).

     (b) Explain frequency response of lag compensator and determine ω_m, $\emptyset_m$, β.

SECTION - II

3   (a) Determine the canonical state model of the system whose transfer function
          T(s)=s(s+7)/(s+4)(s+6)(s+8)
     (b) Construct the state model characterized by the differential equation.
     $$\frac{d^3y}{dt^3}+\frac{3}{dt^2}\frac{d^2y}{}+\frac{12}{dt}\frac{dy}{}+9y+u=0$$

4   (a) Describe controllability and observability for continous time systems.

     (b) A Linear dynamical time invariant system represented by x& =Cx+Du
          where $C = \begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 0 & -4 & -6 \end{bmatrix}$ $D = \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix}$
          Find if the system is completely controllable.

SECTION - III

5   (a) Derive the solution of homogeneous state equations.
     (b) Explain about Block diagram approach to Resolvant matrix of a linear system.

6   Consider the system defined by
          $\dot{x} = Ax$, $Y = CX$
          where $A = \begin{bmatrix} -2 & 0 \\ 1 & -1 \end{bmatrix}$ $C = \begin{bmatrix} 0 & 1 \end{bmatrix}$

     Design a full order state observer. The desired Eigen values for the observer matrix are $\mu_1 = -3$, $\mu_2 = -7$.

SECTION - IV

7   (a)   Write about common physical non linearities of a non-linear system.

     (b)   Derive the describing function of Dead-zone and saturation Non linearity.

8   Construct a phase trajectory by Delta method for a nonlinear system represented by the differential equation choose the initial conditions as x(0)=1.0 and

$$\ddot{X} + 8|\dot{X}|\dot{X} + 6X = 0 \qquad X(0) = 2.0 \ \& \ \dot{X}(0) = 0$$

SECTION - V

9   (a)   State and explain the Liapunov stability problem.

     (b)   Consider a nonlinear system described by the equation Investigate the stability of equilibrium state.

$$\dot{x}_1 = -5x_1 + 3x_2 \qquad\qquad \dot{x}_2 = 5x_1 - 2x_2 - x_2^2$$

10 (a)   Write about Krasovskii's method and Variable gradient method.

     (b)   Use Krasovskii's method to determine the stability of the system described by

$$\dot{x}_1 = -3x_1 + 2x_2 \qquad\qquad \dot{x}_2 = x_1 - x_2 - x_2^3$$

B.TECH. DEGREE EXAMINATION, MAY 2017

III B.Tech. II Semester

STRUCTURAL ANALYSIS - II

(Civil Engineering)

Time: 3 hours   Max. Marks: 60

*Answer FIVE Questions, Choosing ONE Question from each section*

All Questions carry equal marks

SECTION- I

1. Two point loads of 100 kN and 50 kN spaced 3 m apart , crosses a girder of 10 meters span, the smaller load leading from left to right. Construct the maximum S.F.D and B.M.D, stating the position and the amount of maximum bending moment.

2. A uniform load of 40 kN/ m run, 6 metres long crosses a girder of 30 m span, calculate the maximum S.F and B.M at sections 5, 10, 15 meters from the left \hand support. Construct the maximum S.F.D and B.M.D.

SECTION- II

3. a) Define clearly perfect, deficient and redundant frames with neat sketches.

   b) Using the principle of virtual work, determine the vertical and horizon deflection components of Joint 'C' of the truss in figure shown below. E = 200 x10^6 k N/m^2 and cross sectional area of each bar = 150x10^{-6} m^2
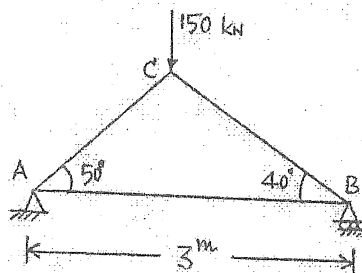
4. a) State the assumptions made in the analysis of framed structures.

   b) Determine the vertical displacement of joint' C' of the steel truss shown in the figure below. The cross sectional area of each member is A = 400 mm^2 and E= 2x10^5 N/ mm^2
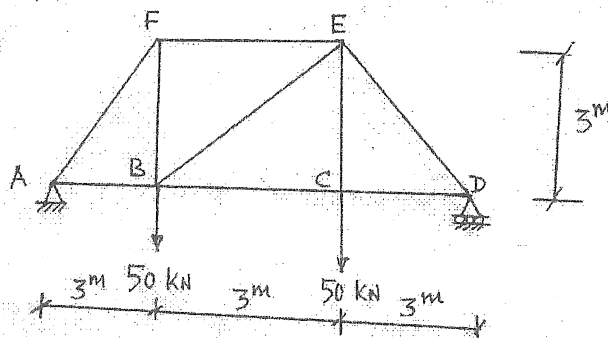
SECTION- III

5. a) Explain briefly about the steps in moment distribution method.

    b) Determine the end moments and draw S.F.D and B.M.D of the continuous beam as shown in the figure. Consider EI constant throughout. Adopt moment distribution method.
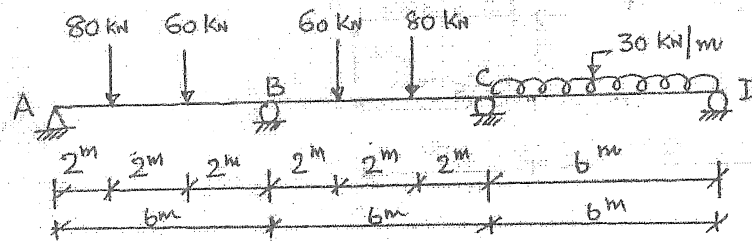

Fig. 3

6. Analyze the two span continuous beam loaded as shown in the figure below, by the slope deflection method. Sketch the B.M.D and S.F.D to suitable scale.
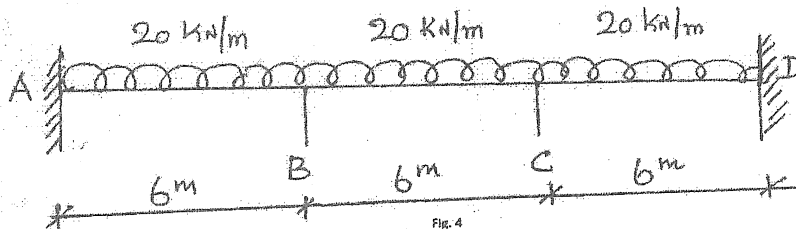

Fig. 4

SECTION- IV

7. A beam ABCD is fixed at A and D and continuous over B and C. Beam AB is of 3 m span and carries a u.d.l of 40 kN /m over whole span. Beam BC is 2m span and carries a central point load of 100 kN. Beam CD is 3 m span and carries a u.d.l of 50 kN /m over whole span. Determine the final moments at supports using Kani's method. Take EI as constant throughout.

8. A two - span continuous beam ABC is fixed at supports A and C and is continuous over support B. Span AB and BC are 5 m each. A u.d.l of 20 k N/m and 30 k N/m are acting over whole spans of AB and BC. Determine the final moments at A, B and C and draw S.F.D and B.M.D. Mark the salient values. Adopt Kani's method. Take EI as constant throughout beam and as one unit.

SECTION- V

9. a) State upper and lower bound theorems in plastic analysis.

    b) Find the shape factors for the following sections.

    i) A diamond section with unequal diagonals, the shorter leg 'b' and the longer leg 'd' and the shorter diagonal placed parallel to the z-z axis.

    ii) Hollow tube section of external diameter 'D' and internal diameter 'd'

10. A continuous beam ABC is subjected to service loads as shown in the figure below. Determine the fully plastic moment of the beam. Take the load factor as 1.70
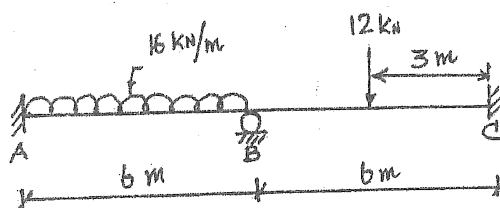
B.TECH. DEGREE EXAMINATION, MAY 2017
III B.Tech II Semester

POWER SYSTEMS – II
(Electrical & Electronics Engineering)

Time : 3 hours

Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks
* * *

SECTION - I

1 (a) Define regulation of a short 3 – phase transmission system and develop an expression for approximate voltage regulation?

(b) A three phase, 400kV, 100km transmission line is supplying a load of 100Mw at 0.8 p.f lagging. The resistance, inductance and capacitance of a line are 0.01Ω per km/phase; 2mH per km/phase and 10µF per km/phase respectively. Calculate efficiency and regulation of the line using T-model of a transmission line.

2 (a) With a neat sketch derive the nominal – π representation of a medium line?

(b) Find the A,B,C and D parameters of a 3-phase, 80km, 50Hz transmission line with series impedance of (0.15+j0.78) ohm per km and a shunt admittance of j5.0×10^{-6} ohm per km.

SECTION - II

3 (a) With a neat sketch derive the expression for reflection and refraction coefficient of transmission line when receiving End is open circuited.

(b) An overload transmission line operates at 210 kV between phases at 50 Hz. The conductors are arranged in a 3.5 meter delta formation. What is the Maximum diameter of conductor that can be used for no corona loss under Fair weather conditions? Assume an air density factor of 0.9 and irregularity Factor of 0.82. The critical voltage is 230 kV. Find also the power loss under Storm conditions

4 (a) Draw equivalent circuit for finding the transmitted voltage and current surges on a forked line. Derive expressions for transmitted voltage and current?

(b) A Step wave of 100 KV travels on a line having a surge impedance of 400. The line is terminated by an inductance of 4000mH. Find the voltage across the inductance and the reflected voltage wave?

SECTION - III

5 (a) Explain the phenomenon of ' Arcing grounds" and suggest the method to minimize the effect of this phenomenon?

(b) In a 50Hz, overhead line, the capacitance of one line to earth was 1.5µF. It was decided to use an earth fault neutralizer. Calculate the reactance to neutralize the capacitance of (i). 100% of the length of line. (ii) 90% of the length of the line. (iii). 95% of length of the line.

6   (a) What are factor affecting the grounding the neutral of the system in detail? What are the advantages?

     (b) A 132kV, 50Hz, three phase, 100km long transmission line has a capacitance of 0.012µF per km per phase. Determine the inductive reactance and KVA rating of the arc suppression coil for the line to eliminate arcing ground phenomenon.

SECTION - IV

7   (a) Explain reasons for variation of voltage in a power system and suggest methods to improve voltage profile?

     (b) Show mathematically that under certain operating condition, the power angle characteristics could be a straight line?

8   (a) With a suitable diagram explain the DC transmission incorporating HVDC in to AC systems in case of INDIA?

     (b) With a neat sketch explain the bus bar arrangements of 66/11KV substation for number, size and location?

SECTION - V

9   (a) Prove that the approximate per unit change in voltage equals the ratio of change in reactive power to the short circuit capacity of the bus?

     (b) Explain in detail with a suitable example of power system network into single diagram having transmission line, synchronous machines, transformers and induction motor in detail?

10   (a) Draw a per-phase, per-unit equivalent circuit of this power system using a base apparent power of 100 MVA and a base line voltage of the generator G1 of 13.8 kV. Given that: G1 ratings: 100 MVA, 13.8 kV, $R = 0.1$ pu, $Xs = 0.9$ pu; T1 ratings: 100 MVA, 13.8/110 kV, $R = 0.01$ pu, $Xs = 0.05$ pu; T2 ratings: 50 MVA, 120/14.4 kV, $R = 0.01$ pu, $Xs = 0.05$ pu; M ratings: 50 MVA, 13.8 kV, $R = 0.1$ pu, $Xs = 1.1$ pu; L1 impedance: $R = 15$ ohms, $X = 75$ ohms

     (b) List out various advantages of PU unit representation of system incase of forming single line diagram?

B.TECH. DEGREE EXAMINATION, MAY 2017
III B.Tech. II Semester

CONCRETE TECHNOLOGY
(Civil Engineering)

Time:3 hours　　　　　　　　　　　　　　　　　　　　　　　　Max. Marks: 60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks
***

SECTION – I

1. (a) Discuss the difference between the wet and dry process of manufacturing of Portland cement.

　(b) Draw the flow diagrams for wet and dry process of manufacture of cement and explain the same.

2. (a) Distinguish between pozzolanic and cementitious admixtures.

　(b) What are the different chemicals used to obtain the desired colours on a concrete surface?

SECTION – II

3. (a) Write short notes on (i) uniform grading (ii) gap grading and (c) continuous grading.

　(b) Describe the importance of sieve analysis in determining particle size distribution.

4. (a) Define the term workability? Explain its significance.

　(b) How the workability of concrete is to be adjusted according to the size of the aggregate and reinforcement particulars in RCC work?

SECTION – III

5. (a) Describe the importance of curing? For how long should it be continued?

　(b) What is re-vibration? Is it detrimental to concrete? Where is it practiced?

6. (a) Explain in detail how the flexural strength of concrete is determined with a help of neat sketch.

　(b) Write the importance of Ultrasonic pulse velocity test and explain its procedure with the help of neat sketch.

SECTION – IV

7. (a) Explain how static modulus of elasticity can be determined experimentally.

　(b) Discuss about the relation between modulus of elasticity and strength of concrete.

8. (a) How impermeable is concrete? What parameters affect the permeability of concrete?

　(b) What are the various types of chemical attacks encountered by concrete?

SECTION – V

9. 　　List out various steps involved in the ACI method of mix design of concrete.

10. (a) What are the recommendations given in IS:456-2000 to produce good quality concrete?

　(b) What are the various analyses techniques used in quality management system? And explain any two techniques.

B.TECH. DEGREE EXAMINATION, MAY 2017
III B.Tech. II Semester

DIGITAL DESIGN
(Electronics & Communication Engineering)

Time : 3 hours   Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks
* * *

SECTION - I

1 (a) Find the voltage gain expression for common source stage with resistive load.

   (b) Explain cascade current mirrors .What is the role of channel length modulation in this circuit?

2 (a) Explain common drain amplifier with neat sketches.

   (b) Compare cascode and active current mirrors.

SECTION - II

3 (a) Discuss about classification of ICS.

   (b) How does CMOS internal circuitry differ from NMOS? Explain CMOS NOR gate.

4 (a) Explain HTL NAND gate.

   (b) Explain open collector TTL NAND gate with neat sketches.

SECTION - III

5 Explain the structural, data flow and behavioral models each with an example.

6 (a) Discuss various steps used in VHDL design flow.

   (b) What is behavioral description for a 4-bit binary counter in VHDL?

SECTION - IV

7   (a)   Construct 4 to 1 multiplexer using logic gates. Implement 4 to 1 multiplexer using 2 to 1multiplexer.

       (b)   Write VHDL program for 2 to 4 decoder.

8   (a)   Design a logic circuit to convert the 8421 BCD to Excess-3 code.

       (b)   Develop a VHDL program for a priority encoder.

SECTION - V

9   (a)   Explain the conversion of J-K flip to D flipflop.

       (b)   Explain and write a VHDL program for ring counter.

10   (a)   Develop a Modulo-6 synchronous counter using JK-flipflops.

       (b)   What is IC 74X74? Write a VHDL program for 74X74.

B.TECH. DEGREE EXAMINATION, MAY 2017
III B.Tech. II Semester

MECHANICAL MEASUREMENTS & CONTROL
(Mechanical Engineering)

Time : 3 hours

Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks
* * *

SECTION - I

1 (a) Define the terms (i) Range (ii) Sensitivity (iii) Hysteresis (iv) Reliability
   (b) Explain the dynamic measurement system with a sketch?

2   Discuss the analysis of experimental data and types of errors in detail?

SECTION - II

3   With a neat sketch explain the constructional feature and working of (i) piezoelectric transducer, and (ii) photoelectric transducer?

4   Describe any pressure and vacuum measurement systems with neat sketches

SECTION - III

5 (a) Explain how turbine flow meter and magnetic flow meters work?
   (b) State the principle of operation and working principle of electrical thermometers for temperature measurement?

6 (a) What are torsion meters and dynamometers?
   (b) Explain the construction details and measurements by hydraulic and pneumatic load cells?

SECTION - IV

7 (a) Explain the working of strain measurement in bending using electrical resistance strain gauge?
   (b) How compressive and tensile strains are measured using strain gauges? Explain

8 (a) Explain the principle of seismic instruments? How are they used in measuring velocity and acceleration response?

SECTION - V

9   Figure 1 shows the unit step response of a second order system. Determine the following from the plot
        i) Gain , ii) Damping ratio,   iii) Natural Frequency and iv) Transfer function
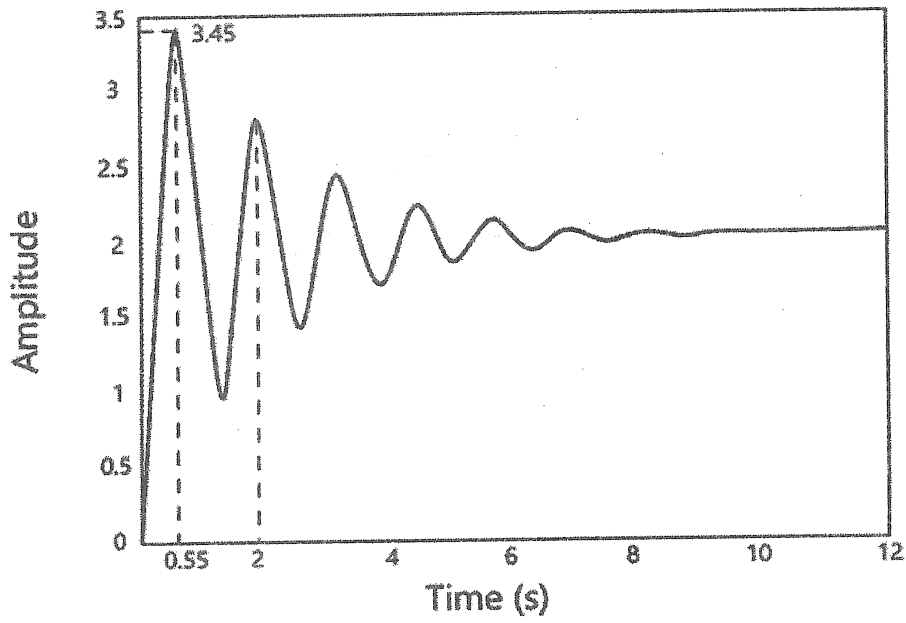
Fig.1

10   (a) Explain the process control and signal flow graphs

            (b) Sketch and explain hydraulic control systems?

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks
* * *

SECTION - I

1 (a) What is free and open source software?

   (b) Discuss about open source mature product dilemma.

   (c) What are some of the common myths about open source software?

2 (a) What are the risks involved with open source software?

   (b) Write about the business models of OSS.

SECTION - II

3 (a) Elaborate the modes of operations in vi editor.

   (b) Discuss the redirection operators in detail.

4   Explain the following unix commands with examples :
         a) Wc   (b) mv   (c) find   (d) diff   (e) ls   (f) chomd

SECTION - III

5   Explain the following file filter commands with examples :
         a) uniq   (b) grep   (c) join   (d) sed

6 (a) What is pipe? Explain the "tee" command with an example.

   (b) Explain all backup commands with suitable examples.

SECTION - IV

7   Write about the following FOSS applications.
         a) LAMP   (b) Moodle   (c) Virtual box   (d) Gimp

8 (a) Discuss the following FOSS applications :
         d) Network simulator   (b) Wordpress   (c) LaTeX   (d) Android

SECTION - V

9   Explain the open source software development in detail.

10 (a) Explain the engagement of community in creating open source software.

    (b) Write a note on version control and bug tracker in detail.

B.TECH. DEGREE EXAMINATION, MAY 2017

III B.Tech. II Semester

COMPILER DESIGN
(Computer Science & Engineering)

Time : 3 hours   Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks
* * *

SECTION - I

1 a) Explain different phases of compiler by considering the following example statement:
$x = y + z * 10$

   b) Differentiate between compiler and interpreter.

2 a) Explain input buffering scheme used in lexical analysis phase.

   b) What is regular expression? Write regular expressions for the following patterns: identifier, integer constant, and float constant.

SECTION - II

3 a) What is a parser? Distinguish between top down parsing and bottom up parsing.

   b) Write short notes on parser generator, YACC.

4 Construct CLR parsing table for the following augmented grammar.

$S^1 \rightarrow S$
$S \rightarrow CC$
$C \rightarrow cC \mid d$

SECTION - III

5 a) Define synthesized attribute and inherited attributes. Give suitable examples.

   b) What is syntax directed definition? Write syntax directed definition for simple desk calculator.

6 a) What is type checker? Write translation scheme for type checking of expressions and statements.

   b) Write short notes on type conversions.

SECTION - IV

7   List and explain different storage allocation strategies with examples.

8   Convert the assignment statement $a := b * - c + b * - c$ into the following:
        (i) Syntax tree   (ii) postfix notation   (iii) three address code
        (ii) Quadruple   (iv) triple   (vi) indirect triple

SECTION - V

9   a)   List and explain the various issues involved in the design of code generator.
    b)   Explain the next use information in code generation phase.

10   Explain the following code optimization techniques.
        (i) Common sub expression elimination
        (ii) Copy propagation
        (iii) Dead code elimination
        (iv) Code motion

Code : 13ME3205

B.TECH. DEGREE EXAMINATION, MAY 2017

III B.Tech. II Semester

PRINCIPLES OF MACHINE DESIGN
(Mechanical Engineering)

Time : 3 hours

Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks
*Assume suitable data wherever necessary.*

* * *

SECTION - I

1   (a)   What are Fe 360 and FeE250 designations of steels?

    (b)   Explain various steps in machine design process.

2   (a)   A hypothetical engineering stress- strain curve for typical specimen shown in the figure. Q is the yield point, R is the UTS and S is fracture point. Determine the Yong's modulus, resilience and toughness of the specimen.
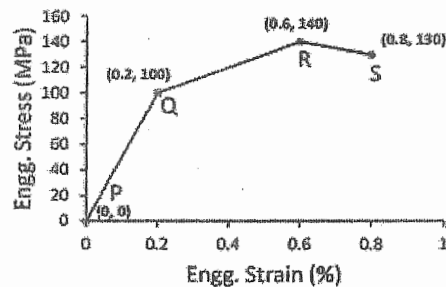
    (b)   Two circular shafts of ratio of radii :2:1 are subjected to same amount of torque. What is the ratio of shear stresses developed in them? Also calculate ratio of angle of twists that they undergo.

SECTION - II

3   (a)   For the given fluctuating fatigue load, Determine the values of stress amplitude and stress ratio.
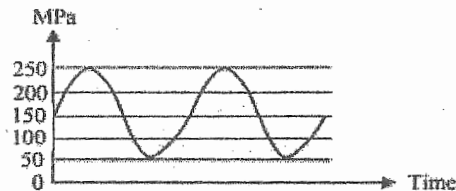
    (b)   Plot all fatigue theories of failure on plane where y axis is variable stress and x axis is mean stress . Indicate all salient pints.

4   (a)   A carbon bar is subjected to fluctuating tensile load from 20kN to 100kN. The material yield strength of 240MPa and endurance limit is 160MPa. Take factor of safety: 2 and determine the area of cross section according to Soderberg principle.

    (b)   Define endurance limit? On what factors it depends?

SECTION - III

5   A bolted joint with four bolts is shown below. The cross sectional area of each bolt is 25mm^2. A torque T=200N.m is acting on the joint. Calculate the shear stresses developed in each bolt.
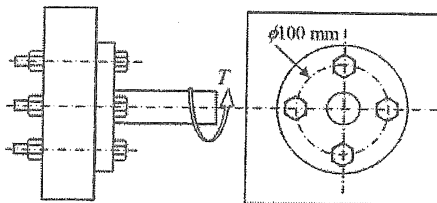

6 a.   What do you mean by uniform strength bolt?

  b.   Two threaded bolts of same material and length are subjected to identical tensile load. Find the ratio of diameters of bolts if their ratio of elastic strain energy is 4:1.
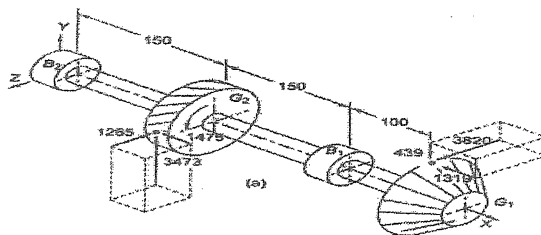
SECTION - IV

7.   Determine the thickness of the continuous weld required for connecting a horizontal square bar of 150mm side and length of 500mm to a vertical plate as a cantilever beam. A vertical load of 25kN acting on the outer tip of square bar. Take the permissible shear stress as 20MPa.

8.   Derive expression for stresses developed in fillet weld when a circular shaft attached to a frame through its base. Let the shaft is subjected to a torque **T**. Diameter of shaft is **D**.

SECTION - V

9.   Explain various sequential steps followed to design the joint shown below with line diagrams of each part.:
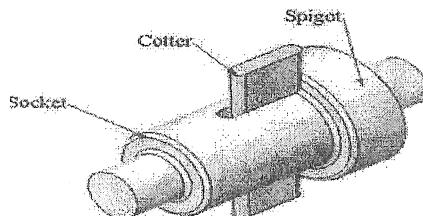
10.   A circular shaft is supported on bearings B1 and B2. Two gears G1 and G2 are mounted as shown in the figure. Arrows in the diagrams indicate Gear forces in the unit of Newton. Distances are specified in mm. Find the diameter of shaft with ASME Code taking maximum permissible shear stress: 160MPa.

------ END OF QUESTION PAPER ---

B.TECH. DEGREE EXAMINATION, MAY 2017

III B.Tech. II Semester

COMPUTER ORGANIZATION
(Electronics & Communication Engineering)

Time : 3 hours   Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks
* * *

SECTION - I

1 (a) Provide the basic set of arithmetic microoperations.

   (b) Tabulate the details of the logic microoperations for two variables.

2 Briefly explain about all the Memory-Reference Instructions.

SECTION - II

3 What is the function of an assembler and explain the stages of its operation.

4 With the help of a block diagram, explain the role of microprogram sequencer.

SECTION - III

5 Explain the different instruction formats.

6 How are floating point addition and subtraction implemented using pipeline arithmetic units?

SECTION - IV

7 (a) Describe the source initiated transfer using handshaking.

   (b) Describe the destination initiated transfer using handshaking.

8 Explain the CPU-IOP communication in detail.

SECTION - V

9 What are the different mapping procedures associated with cache memory?

10 Discuss about the conditions for cache incoherence and its solutions.

B.TECH. DEGREE EXAMINATION, MAY 2017
III B.Tech. II Semester
POWER ELECTRONICS
(Electrical & Electronics Engineering)

Time : 3 hours   Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks
* * *

SECTION - I

1 a   Sketch the V-I Characteristics of Thyristors and explain features of SCR.

   b   What is snubber circuit and How is it useful in SCR.

2 a. Two SCRs are connected back-to-back have a load resistance of 400 ohms and a supply of 110V ac. If firing angle is, 60^0 find
       (a) the rms output voltage
       (b) average power.
   b   Explain the necessity of series and parallel connection of SCRs and write different problems arising in series parallel connections.

SECTION - II

3 a   Explicate the operation of a single phase half wave converter for R-load with neat circuit diagram and necessary waveforms.
   b   A single phase fully controlled bridge is used for obtaining a regulated converter dc output voltage. The rms value of ac input voltage is 230V and firing angle is maintained at 60^0, so that the load current is 4A.
       (a) Calculate the d.c. output voltage and active and reactive power input.
       (b) Assuming load resistance remains same and if free-wheeling diode is used at the output, calculate dc output voltage. The firing angle is maintained at 60^0

4 a   Describe the operation of a single phase three pulse mid point converter with relevant waveforms. Derive an expression for average output voltage.
   b   Show that the effect of source inductance on the performance of single phase fully controlled converter is to present an equivalent resistance of $\omega Ls / \pi$ ohms in series with the internal rectifier voltage.

SECTION - III

5 a. Derive an expression for the output voltage of a step-up chopper.
   b. Compare the control techniques used in choppers.

6   Explain the operation of Jone's Chopper and load commutated chopper with neat circuit diagram and draw output voltage and current waveforms.

SECTION - IV

7   a.   Explain different pulse width modulation techniques used for inverters.

       b.   A 1 phase half bridge inverter has a resistive load of 2Ω. The dc supply voltage is 24V. Calculate a) rms output voltage at fundamental frequency b) output power c) Average and peak current.

8   a.   Explain the operation of Mc Murray Bedford bridge inverter with relevant voltage and current waveforms.

       b.   Write Differences between voltage source inverter and current source inverter.

SECTION - V

9   Explain performance of AC Series voltage controllers.
An ac voltage controller uses a triac for phase angle control of a resistive load of 100Ω. Calculate the value of delay angle for having an rms load voltage of 220 volts. Also calculate the rms value of triac current . Assume the rms supply voltage to be 230V.

10   Explain Single phase midpoint and bridge configuration cyclo converters with R and RL loads

B.TECH. DEGREE EXAMINATION, MAY 2017

III B.Tech. II Semester

ENVIRONMENTAL ENGINEERING - I
(Civil Engineering)

Time : 3 hours   Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks
* * *

SECTION - I

1 a) List out the factors affecting per capita water demand.
   b) Identify the daily water demand of the city in 2031 by Arithmetic Increase Method and Geometric Increase Method, if the per capita water demand is 200 lpcd and the city population records is as given below.

Census Year	1961	1971	1981	1991	2001
Population	25000	52000	94000	164000	247000

2 a) Draw a neat sketch of River Intake and explain the working principle.
   b) Explain Geometric Increase method of forecasting population.

SECTION - II

3 a) Describe the different characteristics of water with respect to Turbidity, Hardness, Chloride and Microbiology.
   b) What should be the size of a rectangular sedimentation tank to treat 1.0 MLD with 2 hours detention and overflow rate less than 40,000 litres per day per sq.m. of the surface areas.

4   Sketch the general outline of conventional water treatment units and explain their functions in detail.

SECTION - III

5   Give details about Slow Sand filtration process with neat Sketch.

6 a) Explain the theory of filtration in detail.
   b) What is disinfection? What are the factors affecting disinfection?

SECTION - IV

7 a) Explain any one of the Desalination method.
   b) Give in detail about the RO process.

8 a) What is Adsorption? Which type of impurities removed from this process?
   b) How fluoride can be removed from the water and explain it.

9   Identify the flow in each pipe in the loop shown in figure 1. use Hardy cross method for analyzing the loop. Consider CH as 110 for all pipes.
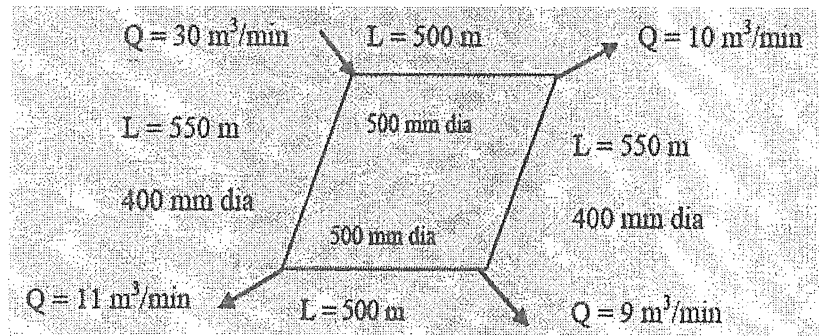

Figure 1.

10   a) Sketch the Grid-Iron Layout of distribution networks and explain it.
     b) Give the details about Reflux pipe joint and their applications.

B.TECH. DEGREE EXAMINATION, MAY 2017

III B.Tech. II Semester

UTILIZATION OF ELECTRIC POWER
(Electrical & Electronics Engineering)

Time : 3 hours   Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks
* * *

SECTION - I

1   State the laws of illumination and explain with the help of suitable diagrams,and
     derive an equation of the same.

2   Define and explain the following :
     (i) Solid angle   (ii) Luminous efficiency   iii) Illumination

     ((iv) Refraction factor   (v) Coefficient of utilization

SECTION - II

3   What is electric heating? What are the advantages over heating?

4   Explain the theory of dielectric heating and state its applications. what are
        the advantages of dielectric heating?

SECTION - III

5   What is an electric drive? What are its advantages? Compare a group drive and an
     individual   drive.

6   Explain about Load Equalization and how it is accomplished?

SECTION - IV

7   a) What are the requirements of good electric braking?
       b) What are the various electric traction systems in India? Compare them.

8   Describe how plugging, rheostat braking, and regenerative braking are employed with DC   series motor.

SECTION - V

9   Derive the expression for speed-time characteristics of   urban service traction systems

10   Draw the speed-time curves for different services and explain them in detail

B.TECH. DEGREE EXAMINATION, MAY 2017

III B.Tech. II Semester

COMPOSITE MATERIALS
(Mechanical Engineering)

Time : 3 hours   Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks
* * *

SECTION - I

1 (a) Define composite material? What is the different fiber reinforced composites? Explain them with suitable applications?

   (b) Explain in detail about polymer matrix composites? Mention the advantageous and drawbacks of the metal matrix composites?

2 (a) Explain in detail about ceramic matrix composites? Mention the advantageous and drawbacks of the ceramic matrix composites?

   (b) Explain in detail about carbo-carbon composites? Mention the applications of the ceramic matrix composites?

SECTION – II

3 (a) What is the purpose of reinforcement in composite? Explain in detail about polymer composites?

   (b) What do you understand by ceramic composites? Explain?

4 (a) What is the importance of fibers in composite? Explain with suitable examples?

   (b) Explain the importance of metal matrix composite? Explain?

SECTION – III

5 (a) What are the basic requirements while selecting the constituents for metal matrix composites? Explain?

   (b) Explain rapid solidification process used for making of metal matrix composites with neat diagram?

6 (a) Explain vapour deposition technique used for making of ceramic matrix composites with neat diagram?

   (b) What are the basic requirements while selecting the constituents for polymer matrix composites? Explain?

7   (a)   What are the different techniques used to control particle content in composite? Explain?

     (b)   How porosity in composite is determined? Explain with suitable example?

8   (a)   How will be uniform distribution of fiber in composite? Explain?

     (b)   How strength of a composite is analyzed? Explain?

SECTION - V

9   Write a note on applications of composite in the following areas
   a. Aerospace industries   b. House hold components

10   Write a note on applications of composite in the following areas
   a. Packaging industries   b. Automobile applications

B.TECH. DEGREE EXAMINATION, MAY 2017
III B.Tech II Semester

TRANSPORTATION PLANNING
(Civil Engineering)

Time : 3 hours   Max. Marks: 60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks
* * *

SECTION - I

1. a) Assume that in your city it has been stated that the objective of the government is to reduce the congestion on the city streets. Go through the steps of the rational transportation planning process in order to develop as workable solution
    b) Explain in detail the relevance of transport planning process to less developed countries

2. a) Explain the inventory to be adopted for exiting travel patterns and transport facilities.
    b) Explain how transportation planning process gets affected to large extent by political considerations. Cite a few examples of this w.r.t. out country.

SECTION - II

3. a) What are the factors to be considered for selection of external cordon line for an urban transportation study?
    b) What for mean zoning. Explain the points to be considered while dividing the area in number of zones for carrying a transportation planning survey.

4. a) Explain the basic movements in a transportation survey while collection of survey data.
    b) Elaborate the significance and process involved in commercial vehicle; taxi and post card questionnaire survey for providing transportation planning.

SECTION - III

5   a) Given that a zone has 245 household with car and 245 household without car and the average trip generation rates for each groups is respectively 5.0 and 2.5 trips per day. Assuming that in the future, all household will have a car, find the growth factor and future trips from that zone, assuming that the population and income remains constant.
    b) Explain the factors governing trip generation and attraction rates

6 a) The base year trip matrix for a study area consisting of three zones is given below

	1	2	3	O_i
1	34	31	29	94
2	14	22	34	70
3	25	36	27	88
d_j	73	89	90	252

The productions from the zone 1,2 and 3 for the horizon year is expected to grow to 91, 96, and 110 respectively. The attractions from these zones are expected to increase to 98, 108, 102 respectively. Compute the trip matrix for the horizon year using doubly constrained growth factor model using Furness method.

b) Explain how calibration of gravity model is processed for determination of travel time factor.

SECTION - IV

7. a) The total number of trips from zone i to zone j is 4200. Currently all trips are made by car. Government has two alternatives- to introduce a train or a bus. The travel characteristics and respective coefficients are given in table below. Decide the best alternative in terms of trips carried.

	t^v_{ij}	t^{walk}_{ij}	t^t_{ij}	F_{ij}	Φ_{ij}
Coefficient	0.05	0.04	0.07	0.2	0.2
Car	25	-	-	22	6
Bus	35	8	6	8	-
Train	17	14	5	6	-

b) In order to relieve congestion on an urban street network a motorway is proposed to be constructed. The travel time from one zone centroid to another via the proposed motorway is estimated to be 12 minutes whereas the time for the same travel via the existing streets is 21 minutes. The flow between the two zone centroids is 1200 vehicles per hour. Assign the flow between the new motorway and existing streets.

8 The network shown in figure below and the trip – distribution matrix given in table below. Determine the link flows using the incremental – assignment technique. The link travel times $\tau_a (x_a)$ are given by : $\tau_a (x_a) = k_a[1+ 0.15 (x_a / b_a)^4]$. The link number, the k_a value and the b_a Value for a particular link mentioned as (α, β, γ) on the links. Divide the trip distribution matrix into four parts in the ratio 40:30:20:10

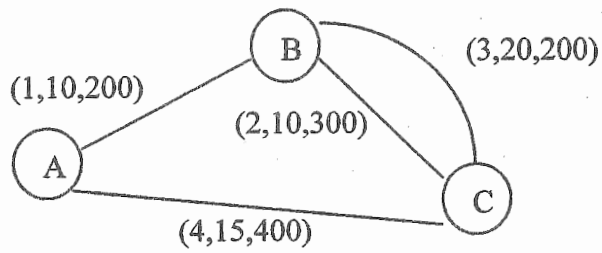| Origin zone	Destination Zone		
	A	B	C
A	0	250	150
B	250	0	400
C	150	400	0

Figure : Network for incremental – assignment technique

SECTION - V

9. a) Explain the difficulties in Transport Planning for Small Cities
   b) What are the elements in transportation planning

10. a) Explain the need for evaluation in transportation plans
    b) Explain the selection of land use transport models.

B.TECH. DEGREE EXAMINATION, MAY 2017

III B.Tech. II Semester

MOBILE COMPUTING

(Computer Science & Engineering)

Time : 3 hours   Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks
* * *

SECTION - I

1   List various Spectrum Allocation frequencies and its significance

2   Discuss Digital modulation and Analog Modulation with example

SECTION - II

3   a. Discuss pros and cons of Global System for Mobile communication (GSM)
     b. List GSM Mobile Services and explain any one of them in detail

4   Explain in detail Architecture of the Global System for Mobile communication (GSM) system

SECTION - III

5   Write about Agent Advertisement Discovery, Registration in network integration

6   List different types of Encapsulation and explain each one of them briefly

SECTION - IV

7   Discuss indirect TCP and Snooping TCP in-detail

8   Explain Mobile TCP and also its advantages and disadvantages

SECTION - V

9   Discuss WDP - Wireless Datagram Protocol in-detail

10   What is significance of Wireless Markup Language (WML) and discuss in-detail with focus on current mobile application development

B.TECH. DEGREE EXAMINATION, MAY 2017

III B.Tech. II Semester

NEURAL NETWORKS & FUZZY LOGIC

(Electronics & Communication Engineering)

Time : 3 hours   Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks
* * *

SECTION - I

1 (a) Describe the neuron modeling for artificial neural systems

   (b) Summarize the characteristics of artificial neural network.

2 (a) Define Feed forward network of neuron model.

   (b) Describe the Hebbian learning rule.

SECTION - II

3 (a) Define XOR problem and analyze the architectural graph of network for solving the XOR problem.

   (b) Describe the typical application of the error back-propagation algorithm for handwritten character recognition.

4 (a) Describe the training errors

   (b) Describe the Multilayer Feed forward Networks as Universal Approximators.

SECTION - III

5 Describe the Winner take all learning trained by " *Kohonen network*"

6 Describe the Counter propagation network with functional diagram, feed forward part and full counter propagation network.

SECTION - IV

7 (a) Explain the operations and properties of classical set (crisp) relations.

(b)   Compare and contrast classical set theory and fuzzy set theory

8   (a)   Describe the basic non dynamic learning Control architecture.

(b)   Memorize the cardinality of a fuzzy set

SECTION - V

9   (a)   Describe the Mean of Maxima method of de-fuzzification

(b)   Summarize the Functions of Fuzzification

10   Analyze the design of Fuzzy systems for temperature setting of storage water heater.