(10 EC 23)

FOUR YEAR B.Tech. DEGREE EXAMINATION, APRIL 2015

THIRD YEAR/SECOND SEMESTER

Branch – EEE & ECE

MICROPROCESSOR AND APPLICATIONS

Time : 3 Hours *Max. Marks : 60*

Answer ONE question from each Unit.

UNIT – I

1. (a) What is minimum mode? List out the joins operated in minimum mode of 8086.

   (b) What is maximum mode? How it can be operated?

Or

2. What are different types of instructions supported by 8086? Explain with examples.

UNIT – II

3. Write a program to sort given numbers.

Or

4. Write a program to print n^{th} fibisocci number.

UNIT – III

5. What is an interrupt? Why interrupt is caused? What are different types of interrupt?

Or

6. What is DMA? Explain how DMA improves the efficiency of processor.

UNIT – IV

7. Explain memory interfacing of 8086 in detail.

Or

8. Explain interfacing details of ADC with 8086.

[P.T.O]

UNIT – V

9. Explain interrupt structure of 8051.

Or

10. Explain different modes of 8051.

FOUR YEAR B.Tech. DEGREE EXAMINATION, APRIL 2015

THIRD YEAR – SECOND SEMESTER

Branch – CSE

PRINCIPLES OF PROGRAMMING LANGUAGES

Time : 3 Hours *Max. Marks : 60*

Answer any ONE question from each unit.

UNIT – I

1. (a) Explain the advantages and disadvantages of some programming environment you have used.

   (b) Describe the language features that have significant effect on the reliability of programs.

Or

2. (a) What is the primary use of attribute grommal? Explain in detail.

   (b) Explain the basic concepts of denotational semantics.

UNIT – II

3. (a) Discuss about the array types.

   (b) Explain union types in –detail.

Or

4. (a) Write about the arithmetic expressions in detail.

   (b) What is mixed-mode assignment? Explain in detail?

UNIT – III

5. (a) What are the general characteristics of sub programs?

   (b) List and explain the semantic models of parameter passing.

Or

6. (a) Write about implementing simple program in detail.

   (b) What is recursion? Explain in detail with example.

UNIT – IV

7. (a) What is abstract datatype? Explain the advantages.

   (b) Explain naming an encapsulations in detail.

Or

8. (a) Discuss about type checking and polymorphism in detail.

   (b) How does ruby implement primitive datatypes such as integer and floating point data?

UNIT – V

9. (a) What are the differences between checked and unchecked exception in Java?

   (b) Explain the Java event model in detail.

Or

10. (a) Explain mathematical functions in detail.

    (b) List and explain the applications of functional languages.

FOUR YEAR B.TECH. DEGREE EXAMINATION, APRIL 2015

THIRD YEAR — SECOND SEMESTER

Branch – Mechanical Engineering

DYNAMICS OF MACHINERY

Time : 3 Hours *Max. Marks : 60*

Answer ONE question from each Unit.

UNIT – I

1. A cone clutch with cone angle 20° is to transmit 7.5 kw at 750 rpm. The normal intensity of pressure between the contact faces is not to exceed 0.12 N/mm^2. The coffcient of friction of 0.2 if face width is $\frac{1}{5}^{th}$ of mean diameter, find

   (a) Main dimensions of clutch

   (b) Axial force required while running.

Or

2. An electric motor driven power screw moves a nut in a horizontal plane against a force of 75 KN at a speed of 300 mm/min. The screw has a square thread of 6 mm pitch on a major diameter of 40 mm. The coefficient of friction at screw threads is 0.1. Estimate power of motor.

UNIT – II

3. A band brake acts on $\frac{3}{4}^{th}$ of circumference of a drum of 450 mm diameter which is a keyed to shaft. The band brake provides a braking torque of 225 N-m. One end of band is attached to a Fulcrum pin of lever and the other end to a pin 100 mm from Fulcrum. If the operating force is applied at 500 mm from Fulcrum and coefficient of friction is 0.25, Find the operating force when the drum rotates in

   (a) Anti clock

   (b) Clock wise directions.

Or

4. Explain with neat sketches types of transmission dynamometers.

UNIT – III

5. In a porter governor, length each arm is 300 mm and all arms are pivoted on axis of rotation. the mass of each ball is 7.5 kg and mass of sleeve is 45 kg. The extreme radii of rotation are 150 mm and 225 mm. Draw controlling force curve and set off a speed scale along the ordinate corresponding to a radius.

Or

6. In a spring loaded hart Nell type governor, the extreme radii of rotation of balls are 80 mm and 120 mm. The ball arm and the sleeve arm to bell crank lever are equal in length. The mass of each ball is 2 kg if the speeds at 2 extreme positions are 400 mm and 420 rpm. Find

   (a) Initial compression of central spring.

   (b) Spring constant.

UNIT – IV

7. The turning moment diagram for a multi cylinder engine has been drawn to a scale 1 mm = 600 N-m vertically and 1 mm = 3° horizontally. The intercepted areas between the output torque curve and the mean resistance line, taken in order from one end, are as follows :

   +52, –124, +92, –140, +85, – 72 and +107 mm^2. When the engine is running at a speed of 600 rpm . If total fluctuation of speed is not to exceed ± 1.5% of mean. Find the necessary mass of flywheel of radius 0.5 m.

Or

8. A punching press is required to punch 40 mm diameter holes in a palte of 15 mm thickness at a rate of 30 holes per minute. It requires 6 N-m of energy per mm^2 of sheared area. If punching takes 1/10 of a second and the rpm of fly wheel varies from 160 to 140, determine the mass of flywheel having radius of gyration of 1 metre.

UNIT – V

9. Explain the effect of Gyroscopic couple of an Aeroplane.

Or

10. Explain about stability of a 2 wheel vehicle while taking a turn.

FOUR YEAR B.Tech. DEGREE EXAMINATION, APRIL 2015

THIRD YEAR/SECOND SEMESTER

Branch – Civil Engineering

Paper V — R.C.C. STRUCTURAL DESIGN – II

Time : 3 Hours *Max. Marks : 60*

Answer ONE question from each Unit.

UNIT – I

1. Two reinforced concrete columns 800 mm × 800 mm and 600 mm × 600 mm in size carry axial loads of 1500 kN and 1000 kN. These columns arc placed 4 m apart centre to centre. The SBC of soil is 200 kN/m². Design the combined slab type rectangular footing. The cantilever projection available from centre line to column 1 upto property line is 1.72 m.

Or

2. Two reinforced columns 800 mm × 800 mm and 700 mm × 700 mm in size carry an axial loads of 2250 kN and 1800 kN. The columns are placed 3 m apart. The available space by the side of 1800 kN column is only 1.4 m from centre line. The safe bearing capacity of soil is 200 kN/m². Design a combined trapezoidal slab type footing.

UNIT – II

3. A cantilever-retaining wall is required retain earth 4.0 m high above-ground level. The back fill surface is level but subject to a surcharge of 40 kN/m² and the backfill granual soil is having a unit weight of 16 kN/m³, with angle of internal friction as 30°. The SBC of soil is 160 kN/m² and the co-efficient of friction between soil and concrete is 0.5. Design the RC retaining wall.

Or

4. Design a counter fort type retaining wall to retain a filling of 7.5 mht above the ground level. The unit weight and SBC of the soil are 15 kN/m³, and 150 kN/m². The angle of internal friction of soil and co-efficient of friction are 30° and 0.5.

UNIT – III

5. Explain with sketches "Hoyers" long line system of pretensioning.

Or

6. (a) Distinguish between concentric and eccentric tendons indicating their practical applications.

   (b) Explain the concept of load balancing in prestressed concrete members.

UNIT – IV

7. The inside diameter of a circular room is 9 m. Design a spherical dome to carry a live load of 1.5 kN/m^2.

Or

8. Design a rectangular tank 5 m × 5 m × 3 m high. The tank is open at top and the walls are rigidly fixed to the base which rests on firm ground. Use approximate method.

(10 CE 23)

FOUR YEAR B.Tech. DEGREE EXAMINATION, APRIL 2015

THIRD YEAR/SECOND SEMESTER

Branch - EEE, ECE & EICE

ECONOMICS AND ACCOUNTANCY

Time : 3 Hours *Max. Marks : 60*

Answer ONE question from each Unit.

UNIT – I

1. (a) Define elasticity of demand. Explain its significance and illustrate.

   (b) Briefly discuss about consumer's equilibrium.

Or

2. What is demand? State and explain law of demand. Are there any exceptions to the law?

UNIT – II

3. (a) State the assumption in BEA. Explain how BEA is used by the manager's in their day to day operations.

   (b) Explain the applications of BEA.

Or

4. (a) Define cost. Explain the different cost concepts used in the process of cost analysis.

   (b) Explain Cobb's and Douglas production system.

UNIT – III

5. Define markets. Elaborate how differently markets are classified?

Or

6. (a) Differentiate between monopoly and perfect competition.

   (b) Briefly discuss about price discrimination.

UNIT – IV

7. Explain the features of partnership company. What are its advantages and disadvantages?

Or

8. (a) Differentiate between partnership and joint stock company.

   (b) Discuss briefly about shares and debentures with examples.

UNIT – V

9. Discuss briefly about :
   (a) Trading account
   (b) Profit, loss account
   (c) Balance sheet.

Or

10. (a) Explain affecting the requirements of capital.
   (b) Explain sources of capital and their implications to the business.

(10 SH 15)

FOUR YEAR B.Tech. DEGREE EXAMINATION, APRIL 2015

THIRD YEAR / SECOND SEMESTER

Branch – CSE

ECONOMICS AND ACCOUNTANCY

Time : 3 Hours *Max. Marks : 70*

Answer ONE question from each unit.

UNIT I

1. Define management accounting. Discuss the scope and functions of management accounting.

Or

2. Discuss briefly about trading account, profit and loss account.

UNIT II

3. (a) What is ratio? How to select a ratio? Objectives of ratio analysis.

   (b) Briefly explain profitability ratio's.

Or

4. (a) Discuss about the limitations of cash flows statement.

   (b) Discuss about the limitations of funds flow statement.

UNIT III

5. Define managerial economics. Explain its nature and scope of managerial economics.

Or

6. Explain about the roles and responsibilities of managerial economist.

UNIT IV

7. What do you understand by demand forecasting? Explain different methods of demand forecasting.

Or

8. Short notes on :

   (a) Cost control

   (b) Cost reduction.

UNIT V

9. (a) Explain price discrimination. Advantages of price discrimination.

   (b) What are the causes of Oligopoly? Discuss.

Or

10. Short notes on :

   (a) Monopoly

   (b) Monopsony

   (c) Oligopsony.

(10 SH 15 T)

FOUR YEAR B.Tech. DEGREE EXAMINATION, APRIL 2015

THIRD YEAR/SECOND SEMESTER

Branch - Mechanical Engineering

ENGINEERING METROLOGY

Time : 3 Hours *Max. Marks : 60*

Answer ONE question from each Unit.

UNIT – I

1. (a) Explain about tolerance. What are the design considerations in selection of engineering tolerances?

   (b) What is interchangeability and selective assembly in detail?

Or

2. (a) Explain Taylor's principle as applied to limit gauging.

   (b) Determine the dimensions and tolerances of shaft and hole having size of 30 H_7/h_9 fit. Also determine the allowances.

UNIT – II

3. (a) Explain how a pneumatic comparator works and briefly enumerate the advantags of differential pneumatic comparators.

   (b) What is clinometer and explain briefly types?

Or

4. (a) A 200 mm sine bar is to be set to an angle of $32° -5' - 6''$. Find the height of gauge blocks required using and appropriate set of gauge blocks.

   (b) Explain with neat sketches us of sine bar limitations and precautions.

UNIT – III

5. (a) What are the light sources for interferometry? Explain.

   (b) Explain with neat sketch N.P.L flatness interferometer.

Or

6. (a) With the help of neat sketch describe the construction and working of

   (i) profilometer

   (ii) tomils on sufc meter.

   (b) Describe the principle and operation of Taylor-Hobson taly surf surface roughness instrument.

UNIT – IV

7. (a) Name and describe various methods of measuring the minor diameter of thread.

   (b) Describe the effects of pitch errors on the effective diameter of a screw thread.

Or

8. (a) Describe briefly the constant Chrod method and base tangent method for tooth thickness measurement.

   (b) Describe the following alignment on test on milling machine

   (i) Squareness of centre T-slot of work table with main spindle

   (ii) Parallelism of failstock sleeve to saddle movement.

UNIT – V

9. (a) Explain briefly about natural tolerance limit and control limit.

   (b) Objectives of statistical quality control and control charts.

Or

10. (a) Explain about acceptance sampling plans for attributes.

    (b) What is OC curves and characteristics of OC curve?

FOUR YEAR B.Tech. DEGREE EXAMINATION, APRIL 2015

THIRD YEAR/SECOND SEMESTER

Branch – Civil Engineering

Paper IV — HYDROLOGY

Time : 3 Hours *Max. Marks : 60*

Answer ONE question from each Unit.

UNIT – I

1. (a) With a neat sketch comment on hydrologic cycle. (6)

   (b) Discuss about non-recording rain gauges. (6)

Or

2. (a) Explain about Recording type rain gauges. (6)

   (b) How to estimate missing Rainfall Data. (6)

UNIT – II

3. (a) Discuss about Pen Man method. (6)

   (b) Define potential Evapo-transpiration and factors affecting consumptive use of Outer. (6)

Or

4. (a) Comment on Energy budget method. (6)

   (b) Factors affecting infiltration. (6)

UNIT – III

5. What are the factors affection runoff? (12)

Or

6. Explain infiltration method to compute runoff. (12)

UNIT – IV

7. Discuss briefly about unit-hydrograph. (12)

Or

8. Comment on S-hydrograph. (12)

[P.T.O]

UNIT – V

9. (a) Explain modified Pul's method. (6)

(b) Discuss about Darcy's law. (6)

Or

10. Explain unconfined aquifer for steady Radial Flow to a well. (12)

FOUR YEAR B.Tech. DEGREE EXAMINATION, APRIL 2015

THIRD YEAR/SECOND SEMESTER

Branch - Civil Engineering

Paper III – ENVIRONMENTAL ENGINEERING – I

Time : 3 Hours *Max. Marks : 60*

Answer ONE question from each Unit.

UNIT – I

1. (a) What are the factors affecting rate of demand? (6)

   (b) Explain water requirements in the case of

   (i) Institutional case

   (ii) Industrial case. (6)

Or

2. Explain in brief various factors affect population growth. (12)

UNIT – II

3. (a) Important requirements of water for domestic use.

   (b) Show that aeration by rising bubbles is far move efficient than aeration by falling droplets.

Or

4. With neat sketches neatly describe about types of aerators. (12)

UNIT – III

5. Explain briefly about forms of chlorination. (12)

Or

6. (a) Advantages of chloramine – ammonia treatment. (6)

   (b) What are the methods of disinfection? (6)

UNIT – IV

7. Explain briefly about Ion exchange process. (12)

Or

8. Discuss briefly about removal of Iron and Manganese. (12)

[P.T.O]

UNIT – V

9. (a) Advantage and disadvantages of concrete pipes. (6)

(b) Write short note on equivalent pipe method. (6)

Or

10. (a) Advantages and disadvantages of Asbestos cement pipes. (6)

(b) Write short note on surface reservoirs and elevated reservoirs. (6)

FOUR YEAR B.Tech. DEGREE EXAMINATION, APRIL 2015

THIRD YEAR/SECOND SEMESTER

Branch - Mechanical Engineering

HEAT TRANSFER

Time : 3 Hours *Max. Marks : 60*

Answer ONE question from each Unit.

UNIT – I

1. (a) Describe different types of boundary conditions applied to heat conduction problems.

   (b) Explain the different types of extended surfaces.

Or

2. (a) Explain the importance of insulated tip solution for the fins used in practice.

   (b) A stainless steel tube (K = 19 w/mk) 2 cm ID and 4 cm OD is covered with a 4 cm layer of asbestos insulation (K = 0.21 w/mk). If the steady state heat loss permetre length of the tube is 750 w/m and the outside surface temp is limited to 50° C. What is the temperature of the inside wall of the tube?

UNIT – II

3. (a) What is meant by lumped capacity? What are the physical assumptions?

   (b) Describe the relation between fluid friction and heat transfer.

Or

4. (a) Derive Reynols Colbourn's Analogy for laminar flow over a plate.

   (b) Water at 20° C was flowing over a plate of uniform heat flux of 9000 w/m^2. The flow velocity was 200 m/sec. The length of the plate was 1.3 m. Determine the temperature of the plate.

UNIT – III

5. (a) What are the characteristics of a boundary layer?

   (b) Explain the physical mechanism of free convection with suitable example.

Or

6. (a) What are Fourier and Biot numbers? What is the physical significance of these numbers?

   (b) A flat plate 1.0m wide and 1.5 m long is to be maintained at 90° C in air with a free stream temperature of 10° C. Estimate the velocity at which air must flow over the flat plate so that the rate of heat from the plate is 3.75 kw.

UNIT – IV

7. (a) What is the Stefan-Boltzmann law?

   (b) Define radiation intensity. Prove that the intensity of radiation is given by $I_b = \bar{t}b / \pi$.

Or

8. (a) What are radiation shield, derive a general expression for ratio of heat exchange with and without radiation shield?

   (b) What is Stefan Boltzman law, derive an expression to prove Stefon Bolzman constant?

UNIT – V

9. (a) Show that $\in = \frac{NTU}{(HNTU)}$ for counter flow.

   (b) Explain the concept of mean temperature difference.

Or

10. (a) A H.E is required to cool 55,000 kg/hr of alcohol from 66° C to 40° C using water 40,000 kg/m of water entering at 5° C. Calculate the surface are required for

    (i) Parallel flow

    (ii) Counter flow mode

    U = 580 w/m² K

    Cp water 4180 J/Kg.K

    Cp alcohol = 3760 J/Kg.k.

   (b) Classification of heat exchangers.

FOUR YEAR B.Tech. DEGREE EXAMINATION, APRIL 2015

THIRD YEAR/SECOND SEMESTER

Branch - CSE

MICROPROCESSORS

Time : 3 Hours *Max. Marks : 60*

Answer ONE question from each Unit.

UNIT – I

1. (a) Explain the architecture of 8086 with neat diagram.
   (b) Discuss the signal descriptions of 8086 in detail.

Or

2. (a) Explain the advertising modes of 8086 in detail.
   (b) Explain the stack structure and operations of 8086.

UNIT – II

3. (a) Explain the 8288 bus controller in detail.
   (b) Discuss about the letches and transceivers.

Or

4. (a) Explain in detail about A/D and D/A converters.
   (b) Write about simple I/O interfacing.

UNIT – III

5. (a) Explain about the programmable DMA interface 8237.
   (b) Draw and discuss about the internal architecture of 8253.

Or

6. (a) Explain the different commands of 8279 in detail.
   (b) Discuss the need of dedicated key board of display controller.

UNIT – IV

7. (a) Draw and explain the block diagram of hardware in detail.
   (b) Draw and discuss the architecture of 8087.

Or

8. (a) Draw and explain the architecture of 8089.
   (b) Explain the features of Intel pentium.

[P.T.O]

UNIT – V

9. (a) Draw and explain the architecture of 8051 micro controller.

(b) Explain the signal description of 8051.

Or

10. (a) Write the important features of 80196.

(b) Explain the instruction set of 8051.

(10 EC 24)

FOUR YEAR B.TECH. DEGREE EXAMINATION, APRIL 2015

THIRD YEAR — SECOND SEMESTER

Branch – ECE

MICROWAVE TECHNIQUES

Time : 3 Hours *Max. Marks : 60*

Answer ONE question from each Unit.

UNIT – I

1. (a) With suitable diagram explain the working of magnetron.
   (b) Explain the working of BWO in detail.

Or

2. Draw and explain the construction and principles of Reflex Klystron.

UNIT – II

3. (a) Discuss the operation and construction of a PIN diode.
   (b) Explain the characteristics of varactor diode at microwave frequencies.

Or

4. (a) Explain the construction and principles of operation of a "TRAPATT" diode.
   (b) Explain the principles and characteristics of microwave transistors and FET'S.

UNIT – III

5. (a) Draw the neat sketch of E-plane Tee-Derive the S-matrix for it.
   (b) Explain the working principle of 2-hole directional coupler with a neat diagram.

Or

6. (a) What are S-parameters? What are the properties of s-matrix? what are the use of S-matrix.
   (b) Draw typical magic the junction and the sum and difference of signals.

UNIT – IV

7. (a) Using network analyzer, describe the procedure for measuring scattering parameters.
   (b) Describe with necessary block diagram, power measurement using bolometer.

Or

8. (a) Explain the bench setup used for the measurement of impedance.
   (b) What the relation between $\lambda_g, \lambda_o, \lambda_c$ in a wave guide?

[P.T.O]

UNIT – V

9. (a) Explain Horn and lens antennas.

   (b) Discuss strip lines.

Or

10. (a) Explain helical antennas in detail.

    (b) Explain passive reflector antennas in detail.

FOUR YEAR B.Tech. DEGREE EXAMINATION, APRIL 2015

THIRD YEAR / SECOND SEMESTER

Branch – EEE

POWER SYSTEMS – II

Time : 3 Hours *Max. Marks : 60*

Answer ONE question from each unit.

UNIT – I

1. (a) Briefly explain the series compensation of a transmission line.

   (b) Explain the Ferranti effect with phasor diagram.

Or

2. (a) Derive the ABCD parameters of a nominal II representation of medium lines.

   (b) Determine the efficiency and regulation of a 3-phase, 100 km, 50Hz transmission line delivering 20mw at a pf of 0.8 logging and 66 kv to a balanced load. The conductors are of copper, each having resistance 0.1 Ω per km, 1.5 cm out side diameter, spaced symmetrically 2 meters between centers use nominal T-method.

UNIT – II

3. Explain Beweleyss lattice diagram.

Or

4. (a) Derive the expression for surge impedance and velocity of a travelling wave.

   (b) Find the reflection and refraction of a line terminating with

   (i) Short circuit

   (ii) Open circuit.

UNIT – III

5. (a) Define

   (i) Soil resistivity

   (ii) Earth resistance.

   (b) Discuss the advantages of grounding the neutral of the system.

Or

6. (a) A 132 kv, 3Q, 50 Hz over head line of 100 km length has a capacitance to earth of each line of 0.01 μf per km. Determine the inductance and KVA rating of the arc suppression suitable for this line.

(b) Explain the phenomenon of "arcing grounds".

UNIT – IV

7. Explain the different bus bar arrangements in sub-stchomy.

Or

8. (a) What are the advantages of HVDC transmission over HVAC transmission?

(b) What are the different types of HVDC links?

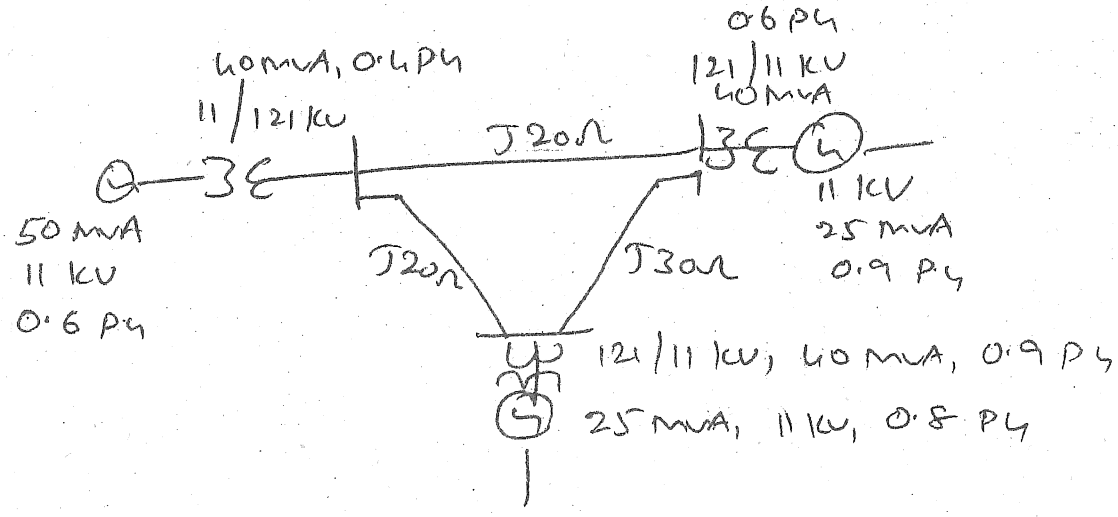
UNIT – V

9. (a) What is a 3-winding transformer and explain its modeling?

(b) What are the advantages of pu system?

Or

10. Draw the reactance diagram on a base of 100 mvA, 11 kv.



(10 EE 16)

FOUR YEAR B.Tech. DEGREE EXAMINATION, APRIL 2015

THIRD YEAR — SECOND SEMESTER

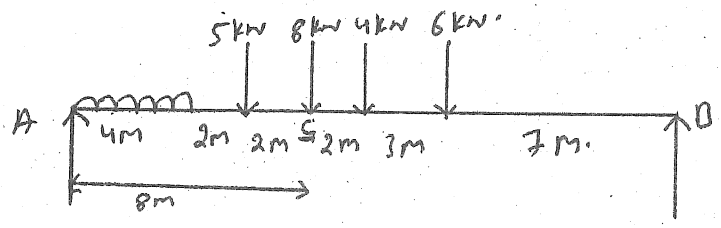
Branch – Civil Engineering

STRUCTURAL ANALYSIS – II

Time : 3 Hours *Max. Marks : 60*

Answer ONE question from each Unit.

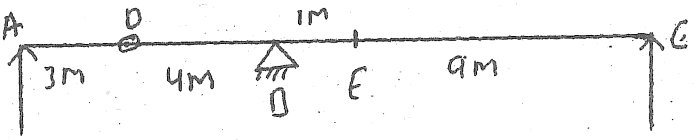
UNIT – I

1. 

(12)

Using I. Lines. Calculate S.F, B.M at a section 8 m from left support when 4 kN load is at centre of span.

Or

2. 

(12)

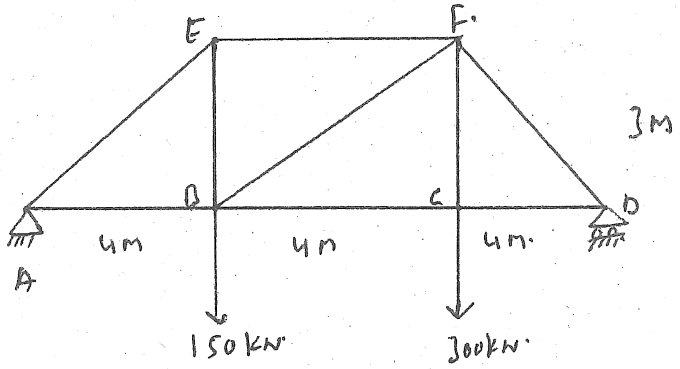
Draw I.L.D. for

(a) Reactions A, B, C

(b) S.F. at right of B

(c) B.M. at section 1 m to right of B.

UNIT – II

3. 

(12)

C/S area for horizontal members = 2000 mm²

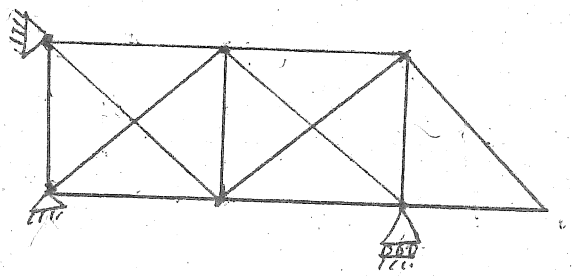
C/S area for inclined members = 3000 mm²

Using Castiglianu's theorem find displacement at joint E. E = 200 kN/mm².

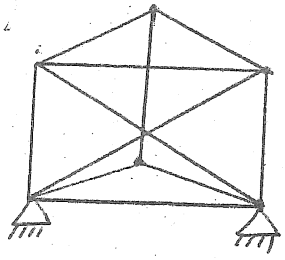
Or

4. Determine degree of indeterminacy for following. (12)

(a)

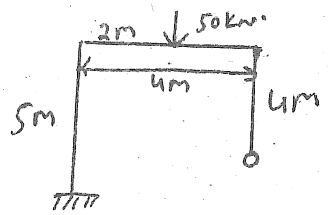


(b)



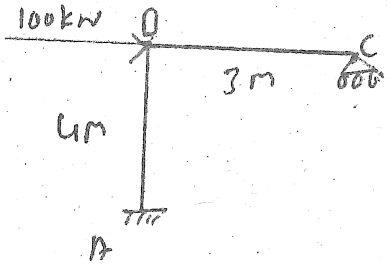
UNIT – III

5. Analyse using slope deflection method. (12)



Or

6. Analyse using moment distribution method. (12)

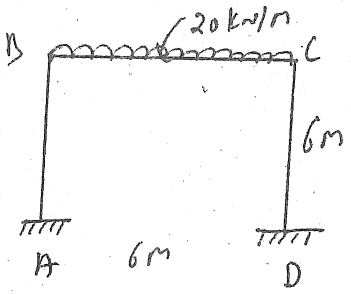


UNIT – IV

7. Using example explain about portal method. (12)

Or

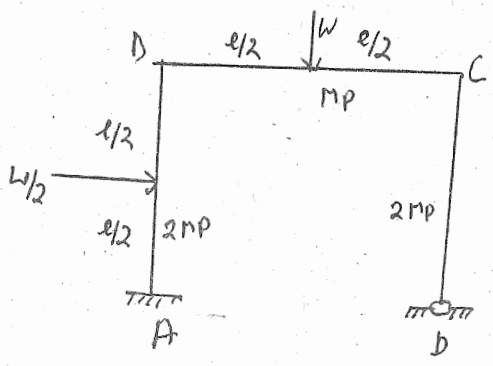
8. Analyse using Kanni's method. (12)



(10 CE 26)

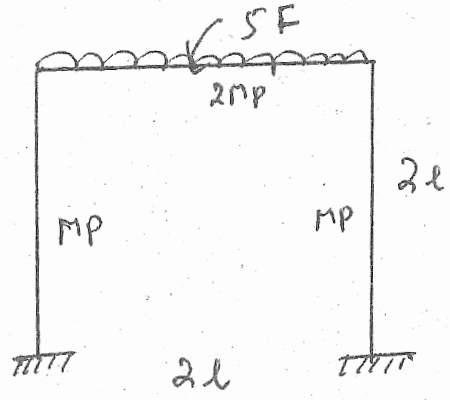
UNIT – V

9. Find collapse load for following. (12)



Or

10. Find collapse load for following. (12)



(10 CE 26)

FOUR YEAR B.Tech. DEGREE EXAMINATION, APRIL 2015

THIRD YEAR/SECOND SEMESTER

Branch - ECE

DIGITAL SIGNAL PROCESSING

Time : 3 Hours *Max. Marks : 60*

Answer any ONE question from each Unit.

UNIT – I

1. (a) A casual LIT system is described by the difference equation $y(n) - y(n-1) + y(n-2) = x(n-1)$. Where $x(n)$ is the i/p and $y(n)$ is the o/p? Find the system function also plot the poles and zeros.

   (b) Give some properties of z transforms.

Or

2. (a) Find the inverse z transform of $x(t) = \dfrac{z}{3z^2 - 4z + 1}$ for the ROC $\frac{1}{3} < |z| < 1$.

   (b) Find convolution of the signal $u(n) * u(n-3)$.

UNIT – II

3. (a) State and prove Parsevel's theorem.

   (b) Find the DFT of a sequence $x(n) = \{1,1,1,1,0,0,0,0\}$ using DIT-FFT algorithm.

Or

4. (a) Derive 8 point D/F FFT algorithm and draw the butterfly diagram.

   (b) Let $x(k)$ denote the N-point DFT of an N-point sequence $x(n)$. If the DFT of $x(k)$ is computed to obtain a sequence $x_1(n)$. Determine $x_1(n)$ in terms of $x(n)$.

UNIT – III

5. (a) Compare different windowing techniques.

   (b) Realize the following system by cascade and parallel form given $H(z') = \dfrac{z + 8z^{-1} + 6z^2}{1 + 8z^{-1} + 12z^{-2}}$.

Or

6. (a) Realize the following casual linear phase FIR filter $H(z) = \dfrac{2}{3} + z^{-1} + \dfrac{2}{3}z^{-2}$.

   (b) What are the important properties of linear phase filters?

[P.T.O]

UNIT – IV

7. (a) Convert the given analog band pass filter with the system function $H(s) = \dfrac{1}{CS + 0.1D^2 + 9}$ into a digital IIR filter by using bilinear transformation.

   (b) Compare different analog to digital transformations.

Or

8. (a) Using impulse invariance method design a LP digital filter with the following specifications :

   (i) $\alpha_{max} = -3\,db$ for $0 \le w \le \dfrac{2\pi}{10}$ within pass band

   (ii) $\alpha_{min} = -15\,db$ for $\dfrac{3\pi}{10} \le w \le \pi$ with stop band.

   (b) Compare FIR filter with IIR filter.

UNIT – V

9. (a) Give some applications of DSP.

   (b) Explain design of FIR filter using Fourier series method.

Or

10. (a) Explain design of FIR filters with frequency sampling.

    (b) Explain filter design using windowing method.

FOUR YEAR B.Tech. DEGREE EXAMINATION, APRIL 2015

THIRD YEAR/SECOND SEMESTER

Branch - Mechanical Engineering

OPERATIONS RESEARCH

Time : 3 Hours *Max. Marks : 60*

Answer ONE question from each Unit.

UNIT – I

1. Use the graphical method to solve following LP problem. (12)

   Mazimize $z = 15x_1 + 10x_2$:

   Subject to constraints :

   $4x_1 + 6x_2 \leq 360$;

   $3x_1 \leq 180$;

   $5x_2 \leq 200$ and

   $x_1, x_2 \geq 0$.

Or

2. Solve the following LPP : (12)

   Maximize $Z = 3x_1 + 9x_2$;

   Subject to the constraints :

   $x_1 + 4x_2 \leq 8$

   $x_1 + 2x_2 \leq 4$

   $x_1 x_2 \geq 0$

UNIT – II

3. A company has four machines that are to be used for three jobs. Each job can be assigned to one machine. Determine the optimal job assignment pairs shall minimize the cost.

Machine

Jobs	W	X	Y	Z
A	18	24	28	32
B	8	13	17	18
C	10	15	19	22

Or

4. A travelling salesman has to visit five cities. He wishes to start from a particular city visit each city once and then return to his starting point. What should be the sequence of visit of the sales man so that the cost is minimum? (12)

	A	B	C	D	E
A	–	2	5	7	2
B	6	–	3	8	2
C	8	7	–	4	7
D	12	4	6	–	5
E	1	3	2	8	–

UNIT – III

5. (a) What is replacement? Describe some important replacement situations. (6)

(b) Explain with examples, the failure mechanism of items. (6)

Or

6. These are seven jobs, each of which has to go through the machines A and B in the order AB processing time in hour are as follows :

Job :	1	2	3	4	5	6	7
M/C A :	3	12	15	6	10	11	9
M/C B :	8	10	10	6	12	1	3

Determine a sequence of these jobs that will minimize the total clapsed time T. Also find idle time of machines A and B.

UNIT – IV

7. (a) What are inventory models? Describe them briefly. (8)

(b) What are various assumptions of Eod formula? (4)

Or

8. A purchase manager places order for a lot of 500 units of a particular item. From the available data the following result are obtained. Inventory carrying cost = 40% ordering cost per order = Rs. 600. Cost per unit = Rs. 50; Annual demand = 1,000 units. Find out the loss to the organization due to his ordering policy. (12)

UNIT – V

9. At what average rate must a clerk at a super market work in order to ensure a probability of 0.90? So that the customer will not have to wait longer than 12 minutes. It is assumed that there is only one customer at which customers arrive in a pass on fashion at an average rate of 15/hour. The length of service by the clerk has an exponential distribution. (12)

Or

10. Consider the game with the following pay off table :

Play A	Play B	
	B_1	B_2
A_1	2	6
A_2	−1	λ

(a) Show that the game is strictly determinable, whatever λ may be?

(b) Determine the value of game. (12)

FOUR YEAR B.Tech. DEGREE EXAMINATION, APRIL 2015

THIRD YEAR/SECOND SEMESTER

Branch – CSE

SOFTWARE ENGINEERING

Time : 3 Hours *Max. Marks : 60*

Answer ONE question from each Unit.

UNIT – I

1. (a) Explain about software myths? (6)
   (b) Write about software process framework? (6)

Or

2. (a) What is the purpose of process assessment? Write the approaches to software process assessment? (6)
   (b) Explain about incremental process models. (6)

UNIT – II

3. (a) Explain the core principles of software engineering practice. (6)
   (b) What is testing? Write the testing principles. (6)

Or

4. (a) Write about W^5HH principle of planning activity. (6)
   (b) Explain about scenario-based elements and behavioural elements of analysis model. (6)

UNIT – III

5. (a) Define scenario? How to write use-cases for scenario-based modeling. (6)
   (b) What is a design pattern? How to use patterns in design? (6)

Or

6. (a) Explain about Domain Analysis? (6)
   (b) Explain about guidelines and attributes of a design quality. (6)

UNIT – IV

7. (a) Define architecture? Explain about different architectural style. (6)
   (b) What is component? Explain object-oriented view of component level design. (6)

Or

8. (a) Explain about Transaction mapping in architectural design? (6)
   (b) Explain about the design principles of component development? (6)

[P.T.O]

UNIT – V

9. (a) Define debugging? Explain about the debugging process? (6)

   (b) Explain about basis path testing. (6)

Or

10. (a) Explain about integration testing. (6)

    (b) Explain about testing of client/server architectures. (6)

FOUR YEAR B.Tech. DEGREE EXAMINATION, APRIL 2015

THIRD YEAR – SECOND SEMESTER

Branch – CSE

NETWORK SECURITY AND COMPUTER ETHICS

Time : 3 Hours *Max. Marks : 60*

Answer ONE question from each unit.

UNIT – I

1. (a) What are the principal differences between version 4 and version 5 of kerberos? (6)

   (b) Explain about mutual authentication protocols. (6)

Or

2. (a) Write and explain the digital signature algorithm. (6)

   (b) What is the use of public-Key certificate? Explain how to obtaining a user's certificate? (6)

UNIT – II

3. (a) What are the 5 principal services provided by PGP? (6)

   (b) What are the limitations of SMTP/822 scheme? How to resolve these problems by MIME? (6)

Or

4. (a) What are the differences between transport mode and tunnel mode of encapsulating security payload? (6)

   (b) Explain about Anti-replay service and integrity check value. (6)

UNIT – III

5. (a) Explain about payment processing of secure electronic transaction. (6)

   (b) Explain about hand shake protocol of secure socket layer. (6)

Or

6. (a) Write about moral and legal issues in computer ethics. (6)

   (b) Explain about traditionalist account. (6)

[P.T.O]

UNIT – IV

7. (a) Explain about employer-employee relationship. (6)

   (b) Explain about ethical significance. (6)

Or

8. (a) Explain about collective responsibility. (6)

   (b) What are the four arguments that can be given in defense of hacking? (6)

UNIT – V

9. (a) What is privacy in computer ethics? Explain with examples. (6)

   (b) Explain about legislative background. (6)

Or

10. (a) What do you mean by embedden, enhanced and impeded values? Explain. (6)

    (b) "Is Technology Good or Bad". Justify your answer. (6)

FOUR YEAR B.Tech. DEGREE EXAMINATION, APRIL 2015

THIRD YEAR/SECOND SEMESTER

Branch – Mechanical Engineering

PRINCIPLES OF MACHINE DESIGN

Time : 3 Hours *Max. Marks : 60*

Answer ONE question from each Unit.

UNIT – I

1. (a) Explain the basic procedure for Mechanical Engineering Design. (6)

   (b) Explain the advantages of preferred numbers. (6)

Or

2. The principal stresses induced at a point in a machine component made of steel 50 C_4 (Syt = 460 N/mm^2) are as follows : σ_1 = 200 N/mm^2; σ_2 = 150 N/mm^2, $\sigma_3 = 0$.

   Calculate the factor of safety by

   (a) Maximum shear stress theory

   (b) Distortion energy theory. (12)

UNIT – II

3. A 25 mm diameter shaft is made of forged steel 30 C 8 (δ_{ut} = 600 N/mm^2). These is a step in the shaft and the theoretical stress concentration factor at the steps is 2.1 the notch sensitivity factor is 0.84. Determine the endurance strength of the shaft if it is subjected to a reversed bending moment. (12)

Or

4. A rotating beam specimen made of steel 45 C_8 (δ_{ut} = 630 N/mm^2) is subjected to a completely reversed bending stress. Calculate the endurance strength of the specimen for a life of 90,000 cycles. (12)

UNIT – III

5. (a) Discuss on bolt of uniform strength. (6)

   (b) Find the size of the bolts required for a C.I. steam Engine cylinder head. The diameter of the cylinder head is 400 mm and the steam pressure is 0.12 N/mm^2. Assume the permissible tensile stress as 35 MPa. (6)

Or

6. A bracket is bolted to a column by 6 bolts of equal size as shown in Figure 1. It carries a load of 50 kN at a distance of 150 mm from the centre of column. If the maximum stress in the bolt is to be limited to 150 MPa. Determine the diameter of the bolt. (12)

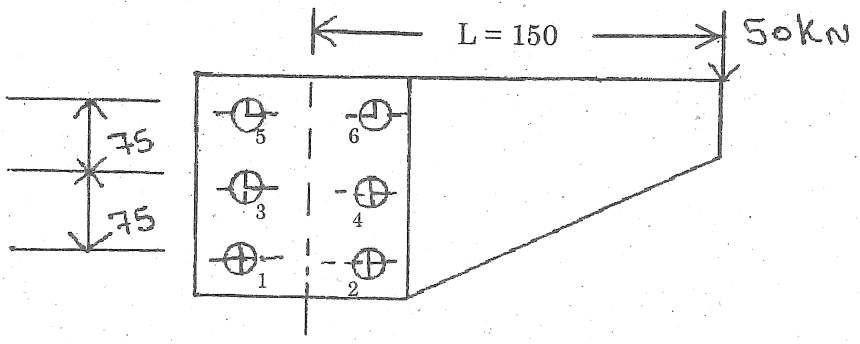


Figure 1

UNIT – IV

7. A 125 × 95 × 10 mm angle is joined to a frame by two parallel fillet welds along the edges of 150 mm leg. The angle is subjected to a tensile load of 180 kN. Find the lengths of the weld if the permissible static load per mm welf length is 430 N. (12)

Or

8. Explain procedure for designing an axially loaded unsymmetrical welded section. (12)

UNIT – V

9. A semi-elliptical dominated spring 900 mm long and 55 mm wide is held together at the centre by a band 50 mm width. Thickness of cach leaf is 5 mm. Find the number of leaves required to carry a load of 4500 N. Assume working stress of 490 Mpas. Find the deflection of the spring. (Assume E = 26 KH/mm^2 for spring). (12)

Or

10. (a) What is nipping in a leaf spring? Discuss its role. (4)

(b) A helical spring is made from a wire of 6 mm diameter and has outside diameter of 75 mm. If the permissible shear stress is 350 MPa and modulus of rigidity 84 kN/mm^2. Find the axial load which the spring can carry and the deflection per active turn. (8)

FOUR YEAR B.Tech. DEGREE EXAMINATION, APRIL 2015

THIRD YEAR – SECOND SEMESTER

Branch – ECE

DIGITAL IC APPLICATIONS

Time : 3 Hours *Max. Marks : 60*

Answer ONE question from each unit.

UNIT – I

1. (a) Explain weighted resistor DAC in detail.

   (b) Explain successive approximation ADC in detail.

Or

2. (a) Explain dual slope integrating type ADC.

   (b) Give specifications of ADC's and DAC's.

UNIT – II

3. (a) Explain VHDL steps in digital system design.

   (b) Briefly discuss libraries and packages.

Or

4. (a) Briefly discuss entity declarations and statements.

   (b) Give different assignment statements and operators used in VHDL.

UNIT – III

5. (a) Explain 4×1 multiplexer in detail.

   (b) Write VHDL propragram to convert 4 bit BCD to binary.

Or

6. (a) Explain decoders in detail.

   (b) Write a VHDL program to design 8×3 encoder.

UNIT – IV

7. (a) Explain ring counter briefly.

   (b) Discuss latches.

Or

8. (a) Explain different shift registers.

   (b) Explain any one counter using CAD tools.

UNIT – V

9. (a) Explain testing of PCB's in detail.

   (b) Discuss fault model.

Or

10. (a) Explain briefly built in self test.

    (b) Explain path sensitizing random test.

FOUR YEAR B.Tech. DEGREE EXAMINATION, APRIL 2015

THIRD YEAR/SECOND SEMESTER

Branch – EEE

POWER ELECTRONICS

Time : 3 Hours *Max. Marks : 60*

Answer ONE question from each Unit.

UNIT – I

1. (a) Sketch switching characteristics of a thyristor during its turn-on and turn-off process.

   (b) What are the necessary conditions for turning on of an SCR.

Or

2. (a) Discuss the two transistor model of a thyristor. Derive an expression for the anode current.

   (b) Snubber circuit for an SCR should primarily consist of capacitor only. But in actual practice, a resistor is used in series with the capacitor. Explain.

UNIT – II

3. (a) A 3-ϕ full converter thyristor bridge feeds a resistive load R. Sketch the waveforms of the output current i_0 for a firing angle of 30°.

   (b) Describe the working of a single-phase dual converter with appropriate waveforms.

Or

4. (a) Discuss the effect of source inductance on the performance of a single-phase full converter indicating clearly the conduction of various thyristors during one cycle.

   (b) An RL load, energised from single-phase, 230 V, 50 Hz source through a single thyristor, has $R = 10\ \Omega$ and L = 0.08 H. If thyristor is triggered in every positive half cycle at $\alpha = 75°$. Find current expression as a function of time.

UNIT – III

5. (a) Explain the operation of two quadrant chopper.

   (b) Explain speed control of DC shunt motor using choppers.

Or

6. (a) What is a multi phase chopper? With appropriate waveforms, the difference between the in-phase operation and phase-shifted operations of this chopper.

   (b) Enumerate the merits and demerits of multiphase chopper.

UNIT – IV

7. (a) Explain the working of $1-\phi$ full bridge inverter.

   (b) Write short notes on current source inverters.

Or

8. Describe the working of a single-phase parallel inverter with relevant waveforms.

UNIT – V

9. (a) What is a cyclo converter? Enumerate some of its industrial applications.

   (b) Explain the operations of $1-\phi$ step up and step down cycloconverter with waveforms.

Or

10. (a) Write a short notes on load commutated cyclo converter

    (b) A-3-pulse cyclo converter, fed from $3-\phi$, 400 V, 50 Hz supply is delivering a load current of 30 A to a 1-phase resistive load. The supply has an inductance of 1 mH per phase. Calculate the rms value of load voltage for a firing angle of

    (i) 0° and (ii) 45°.

FOUR YEAR B.TECH. DEGREE EXAMINATION, APRIL 2015

THIRD YEAR — SECOND SEMESTER

Branch – Civil Engineering

Paper I — FOUNDATION ENGINEERING

Time : 3 Hours *Max. Marks : 60*

Answer ONE question from each Unit.

UNIT – I

1. Write note on Rankine Earth pressure theory and culumbs earth pressure theory.

Or

2. (a) Derive the expression for active earth pressure of cohesionless soils.

   (b) Determine the active and passive earth pressure given the following data. Height of Retaining wall = 10 m, $\phi = 25°$, $\gamma_d = 17\,KN/m^3$. Ground water table is the top of the wall.

UNIT – II

3. Explain the types of retaining walls with neat sketches.

Or

4. A retaining wall 5 m high, retains a soil with c = 2 N/cm^2 $\phi = 30°$ and g = 20 kN/cm^3 with horizontal surface level with the top of the wall. The backfill carries a surcharge of 20 kN/m^2. Compute the total passive earth resistance on the wall and its point of application.

UNIT – III

5. Explain the steps involved in the site investigation.

Or

6. Describe with a neat sketch how will you carry the wash boring method of soil exploration what are its merits and demerits.

UNIT – IV

7. (a) Describe Terzaghis theory of bearing capacity of shollow strip foundation.

   (b) Explain general shear failure and local shear failure.

Or

8. Compute the ultimate load which an eccentrically loaded square footing of 2 m size with an eccentricity of 0.40 m can take at a depth of 0.6 m in a soil with $\gamma = 20\,KN/m^3$ c = 12 kN/m^2 and $\phi = 30°$ Nc = 30 Nq = 18 and N_γ = 15.

UNIT – V

9. Write short note on negative skin friction.

Or

10. A precast concrete pile is driven with a 30 KN drop hammer with a free fall of 1.5 m. The average penetration recorded in the last fewblows is 5 mm per blow. Estimate the allowable load on the pile using engineering New's formula.

FOUR YEAR B.Tech. DEGREE EXAMINATION, APRIL 2015

THIRD YEAR / SECOND SEMESTER

Branch – Civil Engineering

RAILWAY, AIRPORT AND HARBOR ENGINEERING

Time : 3 Hours *Max. Marks : 60*

Answer ONE question from each unit.

UNIT – I

1. (a) What are the characteristics of transportation modes? (6)

   (b) Economic and social advantages of railways. (6)

Or

2. Compare railway and highway transports. (12)

UNIT – II

3. (a) What are the functions of sleepers? (6)

   (b) Write short notes on plate sleepers. (6)

Or

4. (a) Requirements of a good Ballast. (6)

   (b) Write short note on minimum depth of Ballast section. (6)

UNIT – III

5. (a) A railway station should satisfy some basic requirements. Discuss. (6)

   (b) Write short notes on Marshalling yards. (6)

Or

6. (a) Discuss about goods plat forms. (6)

   (b) Write about Locomotive yards. (6)

UNIT – IV

7. Define Airport master plan and ICAO recommendation for master plan. (12)

Or

8. What are the factors should be considered for the selection of site for a major airport? Explain in detail. (12)

UNIT – V

9. Explain briefly about classification of ports. (12)

Or

10. (a) Write short notes on (6)

    (i) Dolphins

    (ii) Aprons.

    (b) Comment on ware houses. (6)

FOUR YEAR B.Tech. DEGREE EXAMINATION, APRIL 2015

THIRD YEAR/SECOND SEMESTER

Branch – ECE

COMPUTER NETWORKS

Time : 3 Hours *Max. Marks : 60*

Answer ONE question from each Unit.

UNIT – I

1. (a) Explain clearly about circuit switching and packet switching.

   (b) Discuss some satellite networks.

Or

2. (a) What are assumptions made for dynamic channel allocations in LAN's and MAN's.

   (b) Explain in detail about multiple access protocols.

UNIT – II

3. (a) What is a three way hand share? How it is used in establishing and releasing a connection?

   (b) Explain about leaky bucket algorithm.

Or

4. (a) How can you control congestion in virtual circuit subnets?

   (b) Explain networks layer design issues in detail.

UNIT – III

5. (a) Write about elements of transport protocols.

   (b) Differentiate between TCP and UDP.

Or

6. (a) Explain the transport layer performance issues.

   (b) Explain ATM in detail.

UNIT – IV

7. (a) Explain briefly about domain name spacing.

   (b) Explain about message formats in E-mail.

Or

8. (a) Discuss electronic mail.

   (b) Explain WWW and multimedia in detail.

UNIT – V

9. (a) Discuss public key algorithms.

   (b) Explain digital signatures.

Or

10. (a) Differentiate E-mail security and web security.

    (b) Explain briefly cryptography.

FOUR YEAR B.Tech. DEGREE EXAMINATION, APRIL 2015

THIRD YEAR/SECOND SEMESTER

Branch – CSE

WIRELESS NETWORKS

Time : 3 Hours *Max. Marks : 60*

Answer ONE question from each Unit.

UNIT – I

1. (a) Explain about floor acquisition multiple access protocols. (6)

   (b) Explain about deployment considerations of Adhoc wireless networks. (6)

Or

2. (a) Explain about distributed wireless ordering protocol. (6)

   (b) Explain about power control MAC protocol for Ad Hoc networks. (6)

UNIT – II

3. (a) Explain the characteristics of an ideal routing protocol for Ad Hoc wireless networks. (6)

   (b) Explain about Feedback – Based TCP. (6)

Or

4. (a) Explain about power – Aware Routing protocol. (6)

   (b) What are the issues in designing a transport layer protocol for Ad Hoc wireless networks? (6)

UNIT – III

5. (a) Explain about Layered sensor Network Architecture. (6)

   (b) Explain about chain-based three-level scheme. (6)

Or

6. (a) Explain about flooding and Rumor routing. (6)

   (b) Explain about different MAC protocols for sensor networks. (6)

[P.T.O]

UNIT – IV

7. (a) Explain about location discovery. (6)

   (b) Write the issues in WSN routing. (6)

Or

8. (a) Explain about optimized Link State Routing. (6)

   (b) Explain about Ad Hoc On-Demand Distance – Vector Routing protocol. (6)

UNIT – V

9. (a) Explain about 802.11 mesh architecture. (6)

   (b) Explain about Heterogeneous Mesh Networks. (6)

Or

10. (a) Explain about opportunistic routing. (6)

    (b) Write about the necessity of mesh networks. (6)

FOUR YEAR B.TECH, DEGREE EXAMINATION, APRIL 2015

THIRD YEAR — SECOND SEMESTER

Branch – EEE

UTILIZATION OF ELECTRIC POWER

Time : 3 Hours *Max. Marks : 60*

Answer ONE question from each Unit.

UNIT – I

1. (a) Explain the laws of illumination.

   (b) With neat sketch explain the operation of sodium vapour lamp.

Or

2. Write brief note on

   (a) Factory lighting

   (b) Street lighting

   (c) Flood lighting.

UNIT – II

3. (a) Briefly explain the different methods of electric heating.

   (b) What is Di-electric heating? Write the applications of it.

Or

4. Write short note on :

   (a) Electric heating equipment

   (b) arc welding.

UNIT – III

5. (a) What is load equalization. Explain in detail.

   (b) Explain the characteristics of D.C. series motor.

Or

6. (a) Write the factors that influence the choice of motor.

   (b) Explain the block diagram of Electric drive.

UNIT – IV

7. (a) What are the different systems of traction?

   (b) Write the special features of traction motors.

Or

8. Explain the different methods of electric braking.

UNIT – V

9. (a) Explain the speed-time characteristics for different services.

   (b) Define :

   (i) Adhesive weight.

   (ii) Coefficient of adhesion

   (iii) Tractive effort.

Or

10. (a) Explain the mechanics of train movement.

    (b) Write short note on traction system in India.

FOUR YEAR B.Tech. DEGREE EXAMINATION, APRIL 2015

THIRD YEAR — SECOND SEMESTER

Branch – Mechanical Engineering

ANALYSIS OF PRODUCTION SYSTEMS AND RELIABILITY ENGINEERING

Time : 3 Hours *Max. Marks : 60*

Answer any ONE question from each Unit.

UNIT – I

1. What is group technology? Explain stages in group technology manufacture and benefits of group technology.

Or

2. (a) What is lean manufacturing and explain principles of lean manufacturing.

   (b) Comparison of mass production and Agile production.

UNIT – II

3. (a) Explain factors influencing facility location.

   (b) When to use process, product and fixed position layout?

Or

4. (a) What are the computer packages for layout analysis and explain them?

   (b) Define plant layout. What are the objectives of good plant layout?

UNIT – III

5. (a) Discuss briefly about aggregate planning with example.

   (b) Define MRP. Explain structure of MRP and how MRP works.

Or

6. Define forecasting and explain moving average and exponential smoothing method.

UNIT – IV

7. (a) What is sequencing? Explain sequencing rules.

   (b) Sequencing for n-jobs through two machines and n jobs through three machines.

Or

8. Discuss briefly about PERT and CPM with examples.

UNIT – V

9. (a) Explain method for improving reliability during design.

   (b) Describe a mixed configuration systems. What is its probability of failures?

Or

10. (a) Describe a system connected in series. What is the system reliability in terms of probability of failures?

    (b) Describe a system connected in parallel. What is the system reliability in terms of probability of failures?
