FACULTY OF ENGINEERING

B.E. 3/4 (Civil) II-Semester (OLD) Examination, October 2020

Subject : Water Resources Engineering and Management - I

Time: 2 Hours   **Max. Marks: 75**

PART –A

Note : Answer any Seven Questions.   **(7x3=21 Marks)**

1. Define φ index?
2. What is consumptive use of water
3. State the purpose of fish ladder
4. Define sensitivity of module?
5. Write two functional requirements of multi purpose project
6. What is Confined aquifer
7. Define initial regime
8. What is creep length
9. Write two functions of head regulator
10. What is done in project evaluation.

PART-B

Note : Answer any Three Questions   **(3 x 18 = 54 Marks)**

11 a) Explain the various factors affecting runoff
   b) In a 160 minute storm the following rates of rainfall were observed in a 20 minute intervals
   4, 3, 10.6, 7.5, 2.3, 2.3, 5 and 6.5mm/hour. Assuming the ϕ index value as 3mm/ hour,
   determine the total rainfall, runoff and W index for the storm

12 a) Derive the relation between duty, delta and base period
   b) Design an alluvial channel to Carry 35 comes of water. Take f=1.1 Also find longitudinal slope,
   use lacey's theory

13 a) With a neat sketch briefly explain the components of diversion head works
   b) Write a note on Blighs creep theory

14 a) What is the purpose of cross drainage works and classify them
   b) What is a canal fall and mention the Criteria for location of canal fall

15 a) Explain how water resources project is formulated
   b) Mention the functional requirements of a water resources project

16 a) Explain recuperation test method for finding yield of an open well
   b) Explain kennedy's method of unlined channel design

17. Write short notes on two of the following
   a) Permeability
   b) Balancing depth
   c) Functions of cross regulator.

****

FACULTY OF ENGINEERING

B.E.3/4 (Civil) II - Semester (Backlog) Examination, October 2020

Subject : Water Resources Engineering-I

Time: 2 Hours   **Max. Marks: 75**

PART –A

Note : Answer any Seven Questions   **(7x3=21 Marks)**

1. What are the advantages of recording rain – gauges

2. What are the factors effecting runoff?

3. Define Wilting point

4. What do you understand by balancing Depth of cutting?

5. What is divide wall? What is its use in the construction of diversion headwork

6. Write the differences between weir and Barrage

7. Write the functions of cross regulator

8. Define Canal outlet

9. What do you understand by C-D works?

10. With a neat sketch show all the elements of level crossing?

PART-B

Note : Answer any Three Questions   **(3 x 18 = 54 Marks)**

11 a) Explain the various forms of precipitation. And also write down the methods to minimize the loss due to evaporation.

b) An experimental rectangular has 5 rain guage stations. Compute the missing rainfall of station E

Station	Station coordinate	Normal annual Rainfall (cm)	Storm rainfall (cm)
A	(1,3)	128	12
B	(8,11)	114	11.4
C	(3,10)	136	13.2
D	(5,8)	144	14.6
E	(7,5)	109	?

12 a) What are the different methods used for canal lining?

b) Design an irrigation channel by Kennedy's theory to carry a discharge of 25 cusec N=0. 225, m=1, s=1/5000.

13 Design a vertical drop weir using Bligh's theory and check the thickness of floor of flood Discharge = 3000m³/s, HFL before constriction = 200mts. Full supply level = 100m, Bed level of river= 193 mts, Lareys' silt factor=1 coefficient of crap=10, min. downstream water level=193m, Afflux=1mt.

14 a) Explain about various types of canal falls.

b) Write the design procedure of trapezoidal notch fall

…2

15 Distinguish between the following:
   a) Aqueduct, siphon aqueduct
   b) Super passage, syphon.

16 a) Derive the equation of yield of an open well by recuperation test

   b) A well with radius of 0.5m completely penetrates an unconfined aquifer of thickness 50 mts and k=30 m/day the well is pumped so that the water level in
   the well remains at 40m above the bottom. Assume the pumping has no effect on water table at r=500m. What is the steady state discharge

17 Write short notes on the following:
   a) Flexibility, sensitivity, proportionality of outlet

   b) Selection of cross drainage works

****

FACULTY OF ENGINEERING

B.E. 3/4 (EEE/Inst./ECE) II-Semester (Backlog) Examination, October 2020

Subject : Managerial Economics and Accountancy

Time: 2 Hours   **Max. Marks: 75**

PART –A

Note : Answer any Seven Questions   **(7x3=21 Marks)**

1. What is the scarcity definition of economics?

2. What are production decisions?

3. Show the concept of equilibrium with the help of a diagram.

4. Define Cross elasticity of demand.

5. Outline the law of Returns to scale.

6. Differentiate between out of pocket cost and imputed cost.

7. Compare fixed working capital and variable working capital.

8. Recall the profitability index method.

9. Rephrase the ledger posting.

10. Outline petty cash book.

PART-B

Note : Answer any Three Questions   **(3 x 18 = 54 Marks)**

11. Why Managerial economics is highly significant theoretically and practically. Discuss.

12. Explain the Law of Demand and also its exceptions.

13. Why Demand curve in a Monopoly market slopes downward?

14. There are two projects A & B. The cost of the project is Rs. 30,000 in each case. The cash inflows are as follows.

Year	CFAT of project A (Rs)	CFAT of project B (Rs)
1	10,000	2,000
2	10,000	4,000
3	10,000	24,000

Calculate Payback and NPV and suggest which project to be accepted under each method.

15.   Enlist any five concepts of cost and explain them.

16. Calculate the profit – volume ratio and break – even point from the following details.
Fixed cost = Rs. 3,00,000
Variable cost = Rs. 20
Selling price per unit = Rs. 30

17. Prepare a profit and loss account from the following balances as on 31st march, 2000

Particulars	Amount (Rs.)	Particulars	Amount (Rs.)
Gross profit	50,000	Rates and Taxes	500
Bad debts	2,000	Travelling Expenses	500
Fire Insurance Premium	1,000	Trade expenses	400
Carriage outward	2,500	Discounts (Dr.)	1,000
Salaries	5,000	Apprentice premium (Cr.)	2,000
Rent	5,500	Printing and stationery	400

****

FACULTY OF ENGINEERING
BE 3/4 (Mech./Prod.) II-Semester (Backlog) Examination, October 2020

Subject: Refrigeration and Air Conditioning

Time: 2 Hours   **Max. Marks: 75**

PART – A

Note: Answer any seven questions.   **(7x3 = 21 Marks)**

1 Sketch P-V graph of reversed Carnot cycle.
2 Classify refrigerants.
3 Define an expansion device. What are different types of expansion devices?
4 Define sub-cooling in vapour compression system.
5 What are the advantages and limitations of Electrolux refrigeration system?
6 Define Peltier effect.
7 Name few components used in ducting systems.
8 Define (a) Dew point temperature   (b) Relative humidity.
9 Mention few applications of refrigeration.
10 Define Grand Sensible Heat Factor (GSHF).

PART – B

Note: Answer any three questions.   **(3x18 = 54 Marks)**

11 (a) Mention few alternate refrigerants to reduce ozone depletion and global
       warming with justification.
   (b) A 5 ton refrigerating machine operating on bell coleman cycle has pressure
       limits of 10 bar and 1 bar. The temperature of air before compression is
       10°C. The compressed air is cooled to 40°C before it enters an expander.
       Assuming both compression and expansion to be adiabatic with γ =1.4.
       Determine - (i) COP (ii) Mass of air circulated per min   (iii) Power rating of
       motor assuming 90% mechanical efficiency Assume C_p=1.0 kJ/kgK.

12 (a) Explain the working of simple vapour compression refrigeration system with
       the help of P-H and T-S diagram. Also derive its COP.
   (b) Explain the working of compound compression system with flash
       intercooling.

13 (a) Explain the working of steam jet refrigeration system. What are its advantages
       and limitations?
   (b) Explain the working of practical NH_3-H_2O absorption system.

14 (a) Represent the following on psychrometric chart (i) Cooling and dehumidification
       (ii) Heating and humidification.
   (b) Atmospheric air at 0.965 bar enters the adiabatic saturator. The wet bulb
       temperature is 20°C and dry bulb temperature is 31°C during adiabatic
       saturation process. Determine: (i) Humidity ratio of the entering air (ii) Vapour
       pressure and relative humidity at 31°C and   (iii) Dew point temperature.   [5]

..2

15 (a) Explain year round air conditioning system.
   (b) The following data refer to an air conditioned hall, provided with summer
       air conditioning system.
       Outdoor conditions = 35°C DBT and 27°C WBT
       Inside conditions   =   23°C DBT and 55%RH
       Volume of air supplied = 10.5m^3/min
       Sensible heat load in room   =33.75kW
       Latent heat load in room   = 11.47kW
       Find the sensible heat factor of the plant.

16 (a) Define apparatus dew point.
   (b) Explain the principle and operation of thermo electric refrigeration system.

17 (a) What are the desirable properties of refrigerants?
   (b) What is the function of accumulator in vapour compression refrigeration
       system?

*****

FACULTY OF ENGINEERING

B.E. 3/4 (AE) II-Semester (Old) Examination, October 2020

Subject : Finite Element Analysis

Time: 2 hours   Max. Marks: 75

PART –A

Note : Answer any Seven Questions.   **(7x3=21 Marks)**

1 Recall compatibility equations and constitutive equations for equilibrium conditions

2 Formulate the finite element equilibrium equation using Minimum potential energy approach

3 Distinguish between Essential Boundary conditions and Natural boundary conditions in beam analysis. Remember the equations.

4 Distinguish between a beam, truss and frame element with respect to FE analysis

5 Identify the method for conduct of FE analysis to determine the displacement of srishailam water dam. Reproduce the corresponding material property relation matrix.

6 Rephrase Jacobian matrix. Explain its use in FEA

7 Explain the importance of Gauss Quadrature in FEA. Explain how Gaussian points are selected.

8 Distinguish between local, global and intrinsic coordinates.

9 Distinguish between consistent mass matrix and lumped mass matrix in dynamic analysis of FEA

10 Enlist any five analysis packages with their unique applications.

PART – B

Note: Answer any three questions.   **(3x18 = 54 Marks)**

11 a) Recall minimum potential energy principle and Formulate the Finite element

   equation from the basic principles of minimum potential energy.

   b) Enlist and briefly describe the general steps of finite element method.

12 Determine the nodal displacements, and element stress for the 1D axial bar element shown in Figure.1. $A_1 = 15$ cm^2; $A_2 = 24$ cm^2; $P = 10$ kN; $l_1 = 100$cm; $l_2 = 75$ cm; $E = 200$ GPa; Coefficient of Thermal expansion $\alpha = 10 \times 10^{-6}$ per ^{0}C; $\Delta T = 50$ ^{0}C
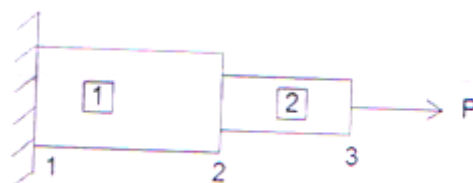

Fig.1

……2

13 Determine the nodal displacements and element stresses for the planar truss shown in Fig.2. E = 200 GPa; P = 50 kN; α = 10 x 10^{-6} per ^{0}C; Δ T = 50^{0}C; A = 500 mm^2 for all members.
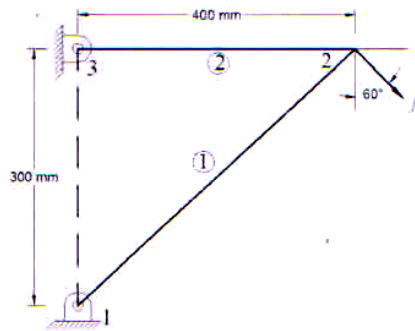

Fig.2

14 Formulate the element stiffness matrix for a 3 noded triangular element, from the first principles.

15 a) Formulate the FE Equilibrium equation for 1D Torsion element.

   b) The nodal coordinates of an axisymmetric element are (3,2); (7,4) and (6,3). Determine the [B] matrix at its centroid.

16 Calculate the temperature distribution in the compound slab shown in Fig.3.
   K$_1$ = 50 W/mk; K$_2$ = 75 W/mk; K$_3$ = 25 W/mk; L$_1$ = 0.15 m; L$_2$ = 0.2 m;
   L$_3$ = 0.25 m; h = 50 W/m^{2}k; Q = 5x10^6 W/m^3 (Second element, Internal
   Heat generation); Q = 5 x 10^4 W/m^2 (Third element, Heat flux); T$_\infty$ = 30^{0}C;

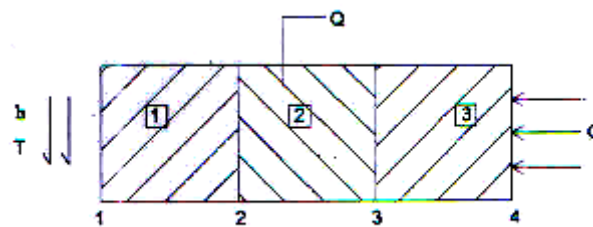

Fig.3

17 Determine the natural frequencies of a simply supported beam shown in Fig.3.
   having parameters as L = 2 m; A = 30 cm^2; I = 400 mm^4; E = 200 GPa;
   Density = 7800 kg/m^3. Use two elements.

Fig.3

********

FACULTY OF ENGINEERING

B. E. 3/4 (A.E) II – Semester (Backlog) Examination, October 2020

Subject: Finite Element Methods

Time: 2 hours   **Max. Marks: 75**

PART –A

Note : Answer any Seven Questions.   **(7x3=21 Marks)**

1. Distinguish between Initial value problems and boundary value problems.
2. Define Node. In FE problems, where nodes are to be placed?
3. Derive the equilibrium equation for finite element method from first principles.
4. What are the various methods by which Boundary conditions are treated in FEM.
5. Distinguish between sub parametric, super parametric and iso parametric elements schematically.
6. Define Jacobian. Write the capacitance matrix of 1D heat rod element.
7. Distinguish between shape function and hermite shape function.
8. Sketch the shape functions of a plane truss element.
9. Distinguish between consistent mass matrix and lumped mass matrix.
10. Enlist convergence requirements. Sketch pascal's triangle.

PART – B

Note: Answer any three questions.   **(3x18 = 54 Marks)**

11. For the differential equation $\frac{d^2 y}{dx^2} + 300\, x^2 = 0, \; 0 \le x \le 1$ with boundary condition y

    (0) = y (1) =) find the solution of the problem using a two term trial function by Galerkin's method.

12. A steel plate having thickness of 5 mm is subjected to a loading of P = 500 N as shown in Fig.1. E=200 GPa; ρ = 7800 kg/m^3, P = 500 N; g = 10 m/sec^2. Find the nodal displacements and stresses.

Fig.1
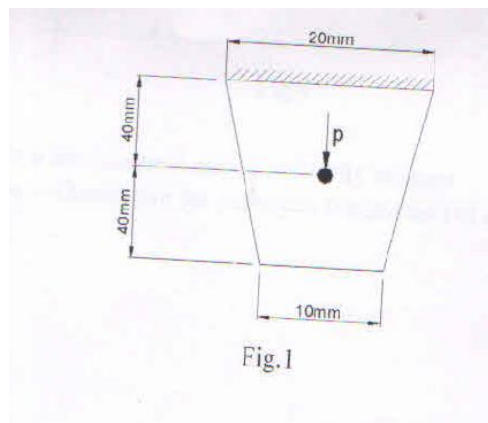
 2

13. Formulate the system equations for the shaft shown in Fig.2 Consider the shaft to be simply supported at bearing A and B. E=200 GPa; $I_1 = 6 \times 10^4$ mm^4; $I_2 = 3 \times 10^4$mm^4.
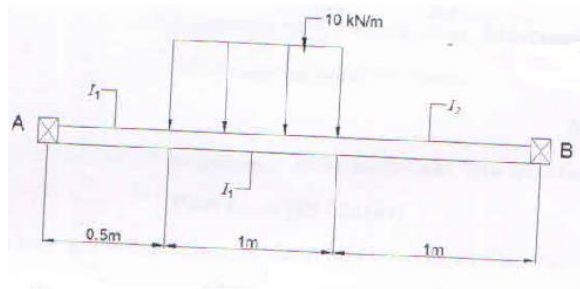
14. Formulate the finite element equations for constant strain triangle element shown in Fig.3, Plane stress E=200 GPa; $\upsilon=0.25$; Thickness = 5mm. Nodal coordinates in mm are x1 = 1; $x_j = 5$; $x_k = 3$; $y_i = 2$; $y_j = 4$; $y_k = 6$; Pressure p = 5 N/mm^2 on side ij.

Fig.3
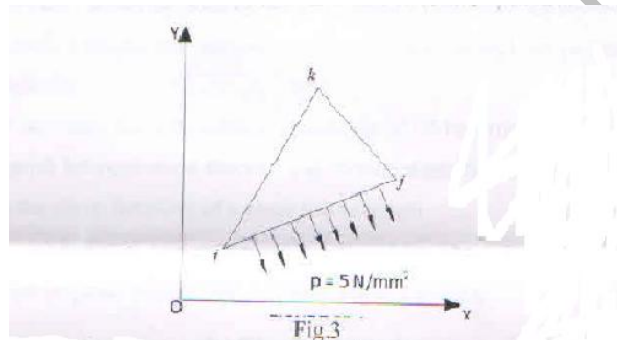
15. A stepped bar is shown in Fig.4. Find (i) Natural frequencies in axial vibration (ii) Corresponding eigenvectors. E = 200 GPa; A = 600 mm2; L = 30mm; ρ= 7500 kg/m3.

Fig.4
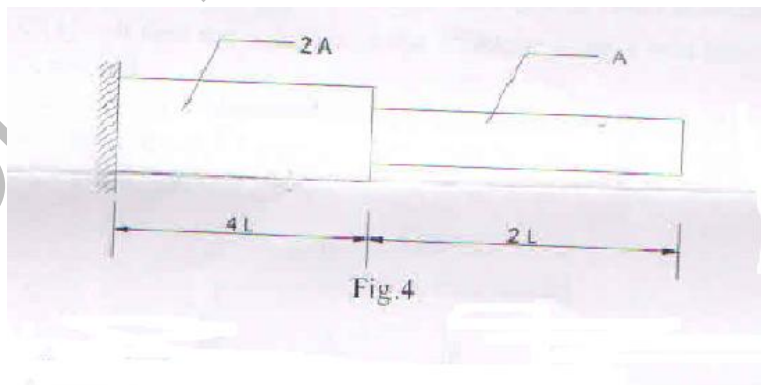
16. Derive the strain displacement matrix for a CST element.

17. Explain (i) Gauss Quadrature for numerical Integration (ii) Axisymmetric elements.

* * *

FACULTY OF ENGINEERING

B.E. 3/4 (CSE) II-Semester (Backlog) Examination, October 2020

Subject : Web Programming and Services

Time : 2 hours   Max. Marks :75

PART –A

Note : Answer any Seven Questions.   **(7x3=21 Marks)**
1. Mention the MIME format for audio and video files.
2. Differences between DIV and SPAN tag.
3. Write java script function to validate the date with the format DD-MM-YY
4. What is MVC architecture? Explain.
5. What is the purpose of deployment descriptor?
6. Write briefly on XML document structures.
7. Draw and briefly explain Servlet life Cycle.
8. Differentiate JSP include and JSP forward action tags
9. What is API? List the interfaces in JAVA mail API.
10. Give the architecture of CLR.

PART – B

Note: Answer any three questions.   **(3x18 = 54 Marks)**

11. a) Explain a XHTML program to create student registration form.
    b) Explain in detail different phases of HTTP.

12. a) Explain XML schema with suitable example for DTD and XSD
    b) What is J2EE platform? Explain J2EE container architecture

13. a) Explain Events and Event handling in done in java script with
       suitable example
    b) What is session tracking? Write a program to track session using
    HTTP session object

14. a) Explain different statement objects in JDBC with suitable examples
    b) Create JSP page which will print "welcome, username!" Accept
       username from the textbox.

15. a) Define Common Language Runtime. Illustrate the roles of CLR in
       .NET framework   .
    b) What is code behind file? Explain different controls in ASP
       .NET with example.

16. a) Explain in detail different JSP elements.
    b) What is connection pooling? Explain how it is dealt

17. Write short notes on
    a) Java Mail API
    b) Discuss FRAME, FORM, and TABLE tags of XHTML.
          c) XML parsers

****

FACULTY OF ENGINEERING

B.E. 3/4 (I.T.) II - Semester (Backlog) Examination, October 2020

Subject : Artificial Intelligence

Time : 2 Hours   **Max. Marks: 75**

PART –A

Note : Answer any Seven Questions.   **(7x3=21 Marks)**

1 List the advantages of DFS?
2 Differentiate supervised and unsupervised learning.
3 Define a Neural network? Explain the different types of layers.
4 Write short notes on semantic networks.
5 Define ANN and list few applications.
6 Explain an expert system?
7 Explain semantic tableau.
8 State and explain logical entailment in predicate calculus.
9 Why is A* admissible?
10 State plausibility?

PART – B

Note: Answer any three questions.   **(3x18 = 54 Marks)**

11 a) Describe A* algorithm. Support your answer with an example.
    b) Write short notes on Hill climbing.

12 a) Write the steps to convert the formula in proportional logic into CNF. Convert
        the formula $(\neg A \rightarrow B) \wedge (C \wedge \neg A)$ into its equivalent CNF representation.
    b) Write the following predicate statement to clause form.

    $\forall x$ [Roman(x) $\rightarrow$ LoyalTo (x, Caesar) v Hate(x ,Caesar)]

13 a) Explain the phases in building an expert system.
    b) Explain Dempster – Shafer theory.

14 a) Write about Decision trees.
    b) Define perceptron and design a perceptron for the Boolean function OR.

15 a) Explain Case Grammars.
    b) Explain the phases in sentence analysis.

16 Draw and explain the architecture of expert system.

17 Write short notes on

    a) Semantic Web
    b) Knowledge representation using Frames.

****

FACULTY OF ENGINEERING
BE (Civil) VI-Semester (Main & Backlog) Examination, October 2020

Subject: Waste Water Treatment (Elective-II)

Time: 2 Hours   **Max .Marks: 70**

PART – A

Note: Answer any five questions.   **(5x2 = 10 Marks)**

1 What is composite sampling?
2 State the different forms of nitrogen.
3 How power requirements are estimated in facultative aerated lagoons?
4 Mention the expression for the calculation of effluent BOD.
5 State the effluent water quality standards as per CPCB.
6 How surface BOD loading is computed for facultative ponds?
7 List the important factors to be considered in the site selection of rapid infiltration systems.
8 Mention the important characteristics of sludge.
9 Distinguish between convection and advection.
10 State the basic characteristic of a plug flow reactor model.

PART – B

Note: Answer any four questions.   **(4x15 = 60 Marks)**

11 (a) Determine the capacity of an equalization tank for the given flow variation.

Time (h)	0	2	4	6	8	10	12	14	16	18	20	22	24
Cumulative flow (m³)	0	25	50	75	100	120	130	140	150	160	170	198	225

   (b) List the principal constituents of wastewater and the importance for its removal / reduction.

12 (a) Determine the aerated lagoon size and power requirements to serve 50,000 people. Assume sewage generation at a rate of 250 lpcd, influent 5 day BOD as 300 mg/l, and effluent BOD as 20 mg/l.
   (b) List the important characteristics of different types of aerated lagoons.

13 (a) Design the facultative pond in a waste stabilization pond to treat 3.5 Mld of wastewater which has a design loading of 440 kg BOD/ha-d. The design temperature is 30°C.
   (b) Design a maturation pond of a waste stabilization pond to treat 3600 cu.m/day of sewage having a BOD of 260 mg/l. Assume that the wastewater contains 5×10^7 faecal coliforms per 100 ml in the influent and 1000 per 100 ml in the effluent. The first order rate constant for faecal coliforms removal at 25°C is 6.2 per day. Assume the depth of anaerobic and facultative ponds as 1.5m, area of facultative pond as 15641 sq.m., and net evaporation rate as 50 mm per day.

14 (a) Write a brief note on earthworm technology adopted in wastewater processing.
   (b) Determine the capacity of the anaerobic sludge digester based on mean cell residence time and volatile solids loading factor. Capacity of the plant is 3 Mld; SS removal efficiency in the primary clarifier is 65%; influent SS concentration is 200 mg/l; moisture content in sludge is 90%; volatile solids destroyed is 65%; digested sludge solids concentration is 8% ; specific gravity of primary sludge is 1.02 while that of digested is 1.04; density of water is 1000 kg per cu.m. and mean cell residence time is 12 days.

15 (a) Prove from first principle that the outflow tracer concentration in a continuous flow stirred tank reactor model is a function of inflow tracer concentration and detention time.

(b) A 2.0m diameter outfall line extends offshore to a depth of 30.0m. It discharges 6.0 cumec of sewage into receiving water having a density of 1025 kg/m^3. What is the dilution at the plume cnetre line when the effluent reaches the surface. If the outfall lien extends 2000m from the shore, and the onshore current speed is 0.2 m/s, what will be the effluent dilution at the shore.

16 A city discharges 120 cumec of wastewater into a river having rate of flow of 1600 cumec during lean period with a velocity of 0.1 m/s. The 5-day BOD of sewage at the given temperature is 250 mg/l. Find the amount of critical DO deficit, the location and time it will occur in the d/s portion of the river. Assume deoxygenation coefficient K as 0.1 day-1 and coefficient of self purification f$_s$ as 3.5. Saturation DO at given temperature is 9.2 mg/l.

17 Design the nitrification step for a complete mixing activated sludge system to treat wastewater from a community. Assume 5 day raw BOD as 260 mg/l and average sewage flow as 4300 m^3/d. Assume 30% BOD removal in primary settling and 90% in biological step. Raw TKN is 51 mg/l and 40 mg/l after settling. Winter temperature of mixed liquor is 10°C. Yield coefficient (Y) is 0.6. Endogenous decay rate constant per unit time (K$_d$) is 0.07/d (5 day BOD at 15°C). MLSS is 4700 mg/l. VSS/SS is 0.8. Assume organic nitrogen in effluent a 7 mg/l.

*****

FACULTY OF ENGINEERING

B. E. (Civil) VI – Semester (CBCS) (Backlog) Examination, October 2020

Subject: Ground Improvement Technique (Elective – II)

Time: 2 hours   Max. Marks: 70

PART – A

Note: Answer any five questions.   **(5x2 = 10 Marks)**

1. Explain the objectives of blending of aggregate in Mechanical stabilization.
2. Classify the ground modification techniques.
3. What are the characteristics of a grout material?
4. Explain the various stages of action of lime stabilization.
5. Illustrate various vibro techniques.
6. What is sand compaction pile?
7. What do you understand from the term in-site densification?
8. Compare sand drains and wick drains.
9. Define Geotextiles.
10. State the application of geosynthetics as capping in solid waste disposal sites.

PART – B

Note: Answer any four questions.   **(4x15 = 60 Marks)**

11. (a) Why ground improvement is required? And what are the solutions for ground improvement.

    (b) A residential G+4 multi storied RCC framed structure provided with nominal isolated footing without proper evaluation of bearing capacity of the ground was constructed up to G+2. At this stage, the geotechnical investigation conducted at that site in the close proximity of existing foundation, revealed that the bearing capacity of the ground for G+4 without distributing the existing footings. Analyze the site condition and suggest improvement technique that can enhance the bearing capacity of the ground for G+4 without disturbing the existing footing.

12. (a) Classify the methods and applications of grouting.
    (b) Compare the lime and cement stabilization.

13. (a) Explain the mechanism of in-site densification of cohesion less soils in the dry, partially saturated and fully saturated states, using vibration method.
    (b) Describe the vibro floatation technique including its merits and demerits.

14. (a) Explain in detail the well point system of dewatering.
    (b) Write in detail the thermal methods of soil stabilization.

15. (a) Write a note on applications of geosynthetics in "geotechnical engineering".
    (b) Describe in detail various material composites required in the construction of any reinforced soil structure. Give applications of soil reinforcement for ground improvement.
    5

16. (a) What are the applications of Bitumen stabilization? Explain them.
    (b) Explain the various methods of pre loading with the aid of neat sketches.

17. Write short notes on any TWO of the following:
    (a) Rothfutch's method.
    (b) Classification of grout material.
    (c) Compaction piles.

******

FACULTY OF ENGINEERING

B. E. VI Semester (EEE) (CBCS)(Backlog) Examination, October 2020

Subject: AI Techniques (Elective-I)

Time: 2 Hours   **Max. Marks: 70**

PART – A

Note: Answer any five questions.   **(5x2 = 10 Marks)**

1. What is called Hebbs rule of learning?
2. Differentiate between supervised and unsupervised learning.
3. What is called defuzzification?
4. The input to a single input neuron is 2 and its weight is 2-3 and its bias is -3. An activation function of sunoid is used. What is the output of neuron?
5. What is the difference between Hard and soft computing?
6. Define the terms cross over and mutation.
7. What is the difference between linguistic and fuzzy variables?
8. Given fuzzy sets

$$P = \{\frac{0.2}{verycold} + \frac{0.3}{cold} + \frac{0.2}{hot} + \frac{0.3}{veryhot}\} \quad and \quad Q = \{\frac{0.75}{very\ cold} + \frac{0.6}{cold} + \frac{0.5}{hot} + \frac{0.4}{veryhot}\} \text{ find PUB.}$$

9. What is the function of ANN in Power System?
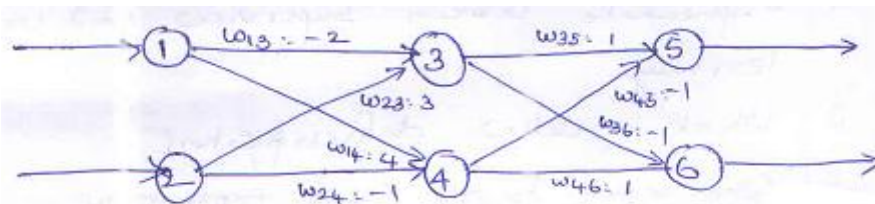10. What are Hoppfeild neural network?

PART – B

Note: Answer any four questions.   **(4x15 = 60 Marks)**

11. a) Given a feed forward neural network with one hidden layer and each neuron has an 'hardlim' transfer function f(v). Calculate the output of the network. Y5 and Y6 for each input pattern.

Pattern	P_1	P_2	P_3	P_4
X_1	0	1	0	1
X_2	0	0	1	0

b) Compare biological neuron and Artificial neural network.

12. a) Give two discrete fuzzy sets.

$$A = \{\frac{0.2}{x_1} + \frac{0.5}{x_2} + \frac{1}{x_3}\} \quad and \quad B = \{\frac{0.3}{y_1} + \frac{0.9}{y_2}\}$$

Find the fuzzy Cartesian product

b) What is called neuron learning and training and distinguish between them with examples?

......2

13. a) Given the chronosones

    P_1: 0111 0011 0011 0001, P_2: 1100 0011 1100 0010

    P_3: 0101 0100 0011 0100, P_4: 1111 0000 1100 0011

    Perform one point and 2 point cross over operation between

    (P_1 and P_2), (P_1 and P_4) and (P_2 and P_4), (P_2 and P_3)

  b) Given the membership functions

$$\mu_{cool}(x) = 1 \quad when \quad x \leq 20$$

$$= \frac{35 - x}{15} \quad when \quad 20 \leq x < 35$$

$$= 0 \quad when \quad x > 35$$

$$\mu_{hot}(x) = \frac{x - 20}{15} \quad when \quad 20 \leq x$$

$$= 1 \quad when \quad 25 \leq x \leq 45$$

$$= \frac{60 - x}{15} \quad when \quad 45 \leq x < 60$$

Obtain the graphical representation of the membership function and the membership values at 30°, 40° and 50° temperature.

14. a) What is called Routette Wheel selection in GA. Explain with example.
  b) Explain the terms Axon, dendrite and synpose and what are the equivalent components in ANN?
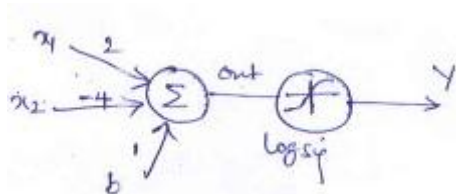
15. a) Given a fuzzy sets. R =

$$\begin{array}{c|cc} & y_1 & y_2 \\ \hline x_1 & 0.7 & 0.5 \\ x_2 & 0.8 & 0.4 \end{array}$$

and

$$S = \begin{array}{c|ccc} & x_1 & x_2 & x_3 \\ \hline y_1 & 0.9 & 0.6 & 0.2 \\ y_2 & 0.1 & 0.7 & 0.5 \end{array}$$

Find RXS using Min Max components.

  b) Given neural network

Determine the Y

16. a) Write short notes on Radial Basis function neural networks.
  b) Explain how ANN is used in hand load casting
  c) Give examples of Crisp and fuzzy variables used in any application examples.

17. a) What is the bias and activation functions in a neural network.
  b) Given the fitness function $f(x) = x^2$ where x varies between 1 to 31 and the population has 4 chromozomes. (01101), (11001), (00011),(11100). Find the most fittest chromosome to take part in cross over.

****

FACULTY OF ENGINEERING

B.E. (EEE) VI - Semester (CBCS) (Main) Examination, October 2020

Subject : Electric Distribution System (Elective – II)

Time : 2 hours   **Max. Marks : 70**

PART – A

Note: Answer any five questions.   **(5x2 = 10 Marks)**

1 Write the significance of load factor.
2 Write short note on contribution factor.
3 Write the benefits that are derived through optimal location of substations.
4 How do you fix rating of a distribution substation?
5 Define feeder and distributor.
6 Classify different types of primary feeders and give their merits and demerits.
7 What is meant by voltage drop and voltage regulation? Show the relationship between them.
8 Derive the expression for voltage drop for non-3-ϕ primary line of single phase two wire lateral with ungrounded neutral.
9 What are the causes of low power factor?
10 Explain the effect of series capacitors on control of voltage.

PART – B

Note: Answer any four questions.   **(4x15 = 60 Marks)**

11 a) Explain the characteristics of residential, industrial and commercial loads.
    b) A power supply is having the following loads :

Types of load	Maximum demand	Diversity of group	Demand factor
Domestic	1500 kW	1.2	0.80
Commercial	200 kW	1.1	0.80
Industrial	10,000 kW	1.25	1.00

If the overall system diversity factor is 1.35 determine i) Maximum demand
    ii) Connected load of each type.

12 a) How is the rating of distribution system substation is decided? Explain.
    b) Draw the single line diagram of 33KV/11KV substation and explain the purpose of each component.

13 a) Give the factors which will affect the selection of conductor size of the feeder.
    b) In a radial feeder the load is connected at the received end the impedance of feeder is (0.11 + J0.1) p.u, the sending end voltage is I.O.P.U is the real load and power factor at the receiving end are I.O.P.U. and 0.8 P.F. lagging. Determine the receiving end voltage, load angle and find the corresponding values of the receiving end and sending end currents.

..2

14 a) In terms of resistance and reactance of the circuit, derive the equation for load power factor for which voltage drop is minimum.

b) In a three phase, 4-wire system, if (5+J3) Ω, (5+J2) Ω and (8+J6) Ω are the loads connected and the supply voltage is 400V. Determine the line and phase currents as well as the current passing through the neutral wire.

15 a) Write down the procedure to determine the best capacitor location.

b) A 3-phase overhead line has resistance and reactance per phase of 5 ohm and 20 ohm respectively. The load at the receiving end is 25 MW at 33KV and a power factor of 0.8 lagging. Find the capacity of the synchronous condenser required for this load condition if it is connected at the receiving end and the line voltages at both ends are maintained at 33 KV.

16 a) Explain the different factors to be considered to decide the ideal location for substation.

b) What are the various factors that influence the voltage levels in the design and operation of the distribution system?

17 a) Derive the expression for power loss of a radial feeder with non-uniformly distributed load.

b) Consider the single phase radial distributor shown in the following figure. The magnitude of load currents, P.fs and distances are indicated in the figure. The resistance and reactance of each wire are 0.1Ω per km and 0.2 Ω per km respectively. It is required to maintain voltage at point 'B' as $230 \angle 0^0$ volts . Find voltage drop in the three sections and total voltage drop in the feeder. The P.F. angles of individual loads are w.r.t. voltage at point 'B'.
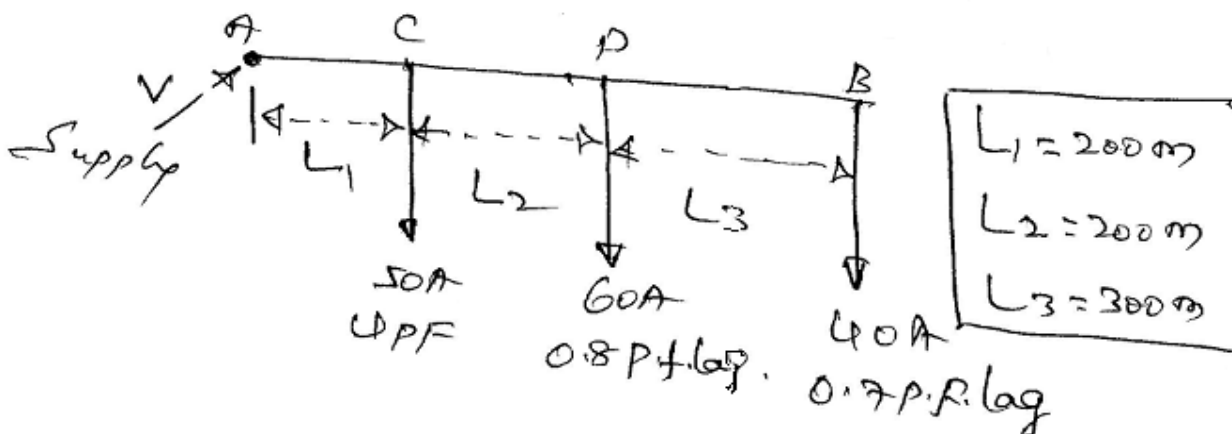
******

FACULTY OF ENGINEERING

B.E. (EEE) VI - Semester (CBCS) (Backlog) Examination, October 2020

Subject : Digital Control System (Elective-II)

Time : 2 hours   **Max. Marks : 70**

PART – A

Note: Answer any five questions.   **(5x2 = 10 Marks)**

1 Define A/D Converter with a neat sketch and mention the types of A/D converters.

2 Give the properties of state transition matrix.

3 Define the terms settling time and constant damping ration loci.

4 What are the effects of digital PD controller on discrete system?

5 What is the necessary and sufficient condition to be satisfied for design of state observer?

6 Solve the following difference equation by use of Z-transform method $x(k+2)+3x(K+1)+2x(k)=0$, $x(0) = 0$, $x(1) = 1$

7 Write state equation and output equation for discrete and continuous time control systems.

8 What are the necessary and sufficient conditions for stability using Jury stability test?

9 What are the effects of Lag compensator on the system?

10 Write the state equation and output equation for diagonal canonical form.

PART – B

Note: Answer any four questions.   **(4x15 = 60 Marks)**

11 Find x(k) for k = 0, 1, 2, 3, 4 when X(Z) is given by $X(Z) = \dfrac{10z + 5}{(z - 1)(z - 0.2)}$

12 a) Explain the duality between controllability and observability.
    b) Explain whether the discrete data system $x(k+1) = AX(k)+BU(k)$ and $y(k) - CX(k)$ where

$A = \begin{bmatrix} 0 & -2 \\ -1 & 1 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 0 \\ 0 & -1 \end{bmatrix}$, $C = \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$ is i) state controllable and ii) observable.

13 Check the stability of the sampled data control system represented by the following characteristic equation $P(Z) = Z^4 - 1.7Z^3 + 1.04Z^2 - 0.268Z + 0.024$ using Jury stability criterion and bilinear transformation.

14 Write short notes on following :
   a) Lead-Lag compensators
   b) Transient response specifications

15 Discuss the necessary conditions for design of state feedback controller through pole placement.

16 State and prove
   a) Initial value theorem
   b) Final value theorem

17 For $A = \begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix}$ compute the state transition matrix e^{At} by using cayley Hamilton theorem.

******

FACULTY OF ENGINEERING

B.E. (Inst.) VI - Semester (CBCS) (Backlog) Examination, October 2019

Subject : Piping & Instrumentation Diagrams (Elective-II)

Time : 2 hours   Max. Marks : 70

PART – A

Note: Answer any five questions.   **(5x2 = 10 Marks)**

1. What does P & ID imply? What is the need of these diagrams?
2. What does the tag TIC-103 indicate in P&I diagrams?
3. Explain about modifiers for first letter and succeeding letters in identification letters with examples.
4. Draw the representations of pneumatic binary and electric binary line symbols.
5. Draw how the behind the panel or normally inaccessible instrument symbols are depicted in instrumentation drawings.
6. Draw the process lines for unit battery limit installations.
7. What do the following symbols indicate?
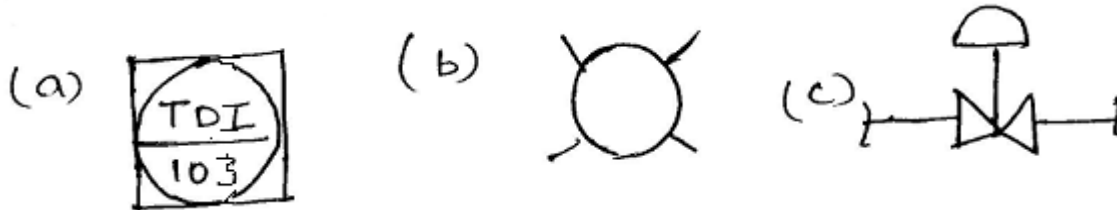
8. What is the full form of KKS numbering system? What is its significance?
9. What are the different codes and standards on which P&I diagrams are based?
10. Draw the symbols for following functions :
    i) Averaging   ii) Difference   iii) Velocity limiter
    iv) High and low limiting

PART – B

**Note: Answer any four questions.**   **(4x15 = 60 Marks)**

11. What are the suggested abbreviations to denote the types of power supply in P&I diagrams? Write the scope of P&I diagrams.

12. What are process flow diagrams and block flow diagrams? Explain with relevant examples?

13. List out the various types of contracts between Licensor and Contractor in preparing P&I diagrams.

14. What steps have been established for the purpose of minimizing the revisions and avoiding unnecessary works, in preparing the P&I diagrams? Explain in detail.

15. Describe all the instrument line symbols and general instrument function symbols used in preparing P&I diagrams.

..2

16 Write short notes on :
   i)   Criteria for utility flow diagrams
   ii) Minimum information to be shown in P&I diagrams

17 Decode the following diagram and briefly explain the operation :
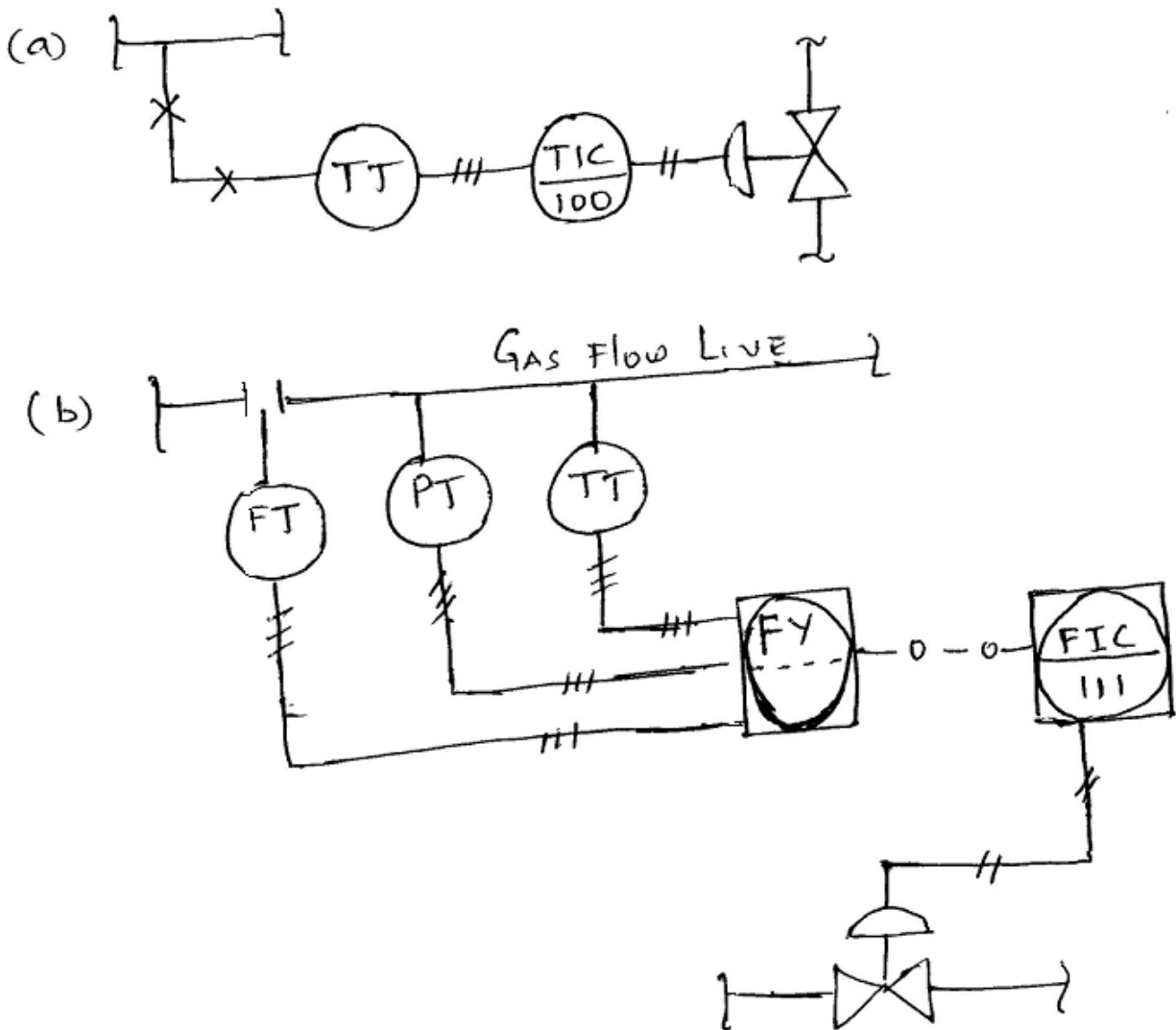
******

FACULTY OF ENGINEERING

B.E. (ECE) VI – Semester (CBCS) (Backlog) Examination, October 2020

Subject: Digital Image Processing (Elective – I)

Time: 2 Hours   **Max.Marks: 70**

PART – A

Note: Answer any five questions.   **(5x2 = 10 Marks)**

1 What is dynamic range
2 List the elements of DIP system
3 Briefly explain how cones and rods are distributed on retina
4 Define spatial averaging
5 How a degradation process if modeled?
6 Give the kernels of Hadamard Transform
7 Define Inter pixel redundancy
8 Give the block diagram of source encoder
9 Differentiate photopic and scotopic vision
10 Give a 5x5 laplacian of Gaussian mask.

PART – B

Note: Answer any four questions.   **(4x15 = 60 Marks)**

11 a) Explain the fundamental steps in Image Processing.
   b) For v = (0,1), find the length of the shortest 3, 8 and m paths between p(4,1) fourth row first column and q(1,4) first row fourth column.

3	1	2	1
2	2	0	2
1	2	1	1
1	0	1	2

12 a) Prove the periodicity and translation properties of a 2D DFT.
   b) Obtain the Walsh Kernels for N=8.

13 a) What is a histogram of an image? Sketch histograms of basic image types.
   b) Explain histogram equalization with an example.

14 a) Discuss in detail Weiner filtering.
   b) Explain inverse filtering and its limitations in image restoration.

15 a) How a point line and edge are detected? Explain with the operators.
   b) Explain frequency domain enhancement with ideal low pass and Butterworth filters.

16 a) Explain Huffman coding.
   b) A source emitts letters from an alphabet A = (a_1, a_2, a_3, a_4) with probabilities
   $P(a_1)$ = 0.9, $P(a_2)$ = 0.06, $P(a_3)$ = 0.02, and $P(a_4)$ = 0.02.
   1) Find the Huffman code
   2) Find the average length of the code and its redundancy.

17 Write short notes on:
   a) Geometric transformations
   b) Homomorphic filtering
   c) Categorization of images according to their source of EM radiation.

****

FACULTY OF ENGINEERING

B.E. (ECE) VI-Semester (CBCS) Examinations, October 2020

Subject : Data Communications and Computer Networking (Elective-I)

Time: 2 Hours   **Max. Marks: 70**

PART –A

Note : Answer any Five Questions   **(5x2=10 Marks)**

1. Describe a Data Communication network in brief.

2. Explain the importance of framing with reference to data link layer.

3. Find CRC code for P=1100011 and M=11100011(P-Divisor and M-Message).

4. Compare pure ALOHA and slotted ALOHA with reference to channel utilization.

5. List the design goals of network layer.

6. Define Congestion. What are the factors that lead to congestion?

7. Distinguish TCP and UDP protocols.

8. What is the ATM AAL layer protocol?

9. Differentiate between virtual circuit and Datagram subnet.

10. What is Digital Signature?

PART-B

Note : Answer any Four Questions   **(4x15 = 60 Marks)**

11. a) Describe OSI Model and contrast it with TCP/IP Model.
     b) Explain Flow control Protocols.

12. a) Explain the architecture of IEEE 802.11 with its frame structure.
     b) Compare Circuit switching and Packet switching.

13. a) Give the header format of TCP protocol and explain.
     b) What are the desirable properties in a routing algorithm?

14. a) Explain distance Vector routing algorithm.
     b) Explain the cell formats of ATM networks.

15. a) Explain the elements of Transport protocol?
     b) What is IP addressing? Describe IPV4 protocol.

16. a) Explain Authentication protocols in detail.
     b) Describe the architecture of E-Mail.

17. Write short notes on any two of the following:
     a) X.25
     b) HDLC
     c) IP addresses

****

FACULTY OF ENGINEERING

B.E. (ECE) VI-Semester (CBCS) (Backlog) Examinations, October 2020

Subject : Optical Communication (Elective-I)

Time: 2 Hours   **Max. Marks: 70**

PART –A

Note : Answer any Five Questions   **(5x2=10 Marks)**

1. Explain Snell's Law with diagram.

2. Draw the block diagram and explain the elements involved in Optical Communication.

3. Write on Direct and Indirect Band gap energy.

4. How is signal dispersion affect transmission capacity in Optical Communication.

5. For an Optical source, explain Internal and External optical efficiency.

6. Distinguish between Spontaneous and Stimulated emission in Optical sources with a diagram.

7. List the Characteristics of Optical Detector

8. Compare the Optical Detectors

9. Write the considerations for a point to point link in Optical Communication

10. What is Inter Symbol interference

PART-B

Note : Answer any Four Questions   **(4x15 = 60 Marks)**

11. a) Sketch and explain Step, Multimode and Graded index fiber with dimensions Explain the structure of a multi core fiber optic cable
    b) Given V=2.4, what should be the core radius of a single mode fiber that has the core index of 1.468 and the cladding index of 1.447 at the wavelength of 1.3 μ m.

12. a) Discuss Attenuation mechanism encountered in Optical Communication. Explain different types of optical power loss mechanisms
    b) What is signal distortion in fiber. Explain the material, waveguide and intermodal dispersion.

13. a) Derive the rate equation of photo carriers and charge carriers developed in an LED.
    b) Why is Double hetero Junction structure used in optical sources. Explain with a neat sketch working of Edge emitting LEDs

14. a) Discuss different types of Optical amplifier configurations used. Explain the optical signal gain concept in SOA.
    b) Explain how is the principle of Impact ionization used in Reach through APD for increased optical gain.

15. a) Draw the block diagram of an Optical Receiver and explain the working of it. Develop expression for Signal to Noise ratio in Optical receivers.
    b) What is detector response time and how is it related to signal bandwidth.

16. a) Write the considerations for a point to point link in optical communication. Explain the concept of Power and Rise time Budget in Optical links
    b) What are the noise effects on system performance.

17. Write short notes on any two of the following:
    a) Distributed feedback Laser and Distributed Bragg filter lasers.
    b) WDM requirement with block diagram
    c) Optical interfaces SONET/SDH

****

FACULTY OF ENGINEERING

B.E. VI – Semester (CBCS) (MECH.)(Backlog) Examination, October 2020

Subject: Non-Conventional Energy Sources (Elective)

Time: 2 hours   Max. Marks: 70

PART – A

Note: Answer any five questions.   **(5x2 = 10 Marks)**

1. What is the importance of non-conventional energy sources?
2. What are the limitations of wind energy?
3. How do you classify the various non-conventional energy sources?
4. Explain the basic operation principle of concentrated solar collectors.
5. What is a paraboloidal collector? Explain briefly.
6. What do you understand by angle of attack in wind energy system?
7. Differentiate between tidal and wave power generation.
8. What is pyrolysis of biomass?
9. What is a solar pond?
10. What are the features of OTES systems?

PART – B

Note: Answer any four questions.   **(4x15 = 60 Marks)**

11. (a) What is the global scenario and importance of non-conventional energy source?
    Explain in detail.
    (b) What is the criteria for assessing the potential of non-conventional energy sources?

12. (a) Explain in detail the working principles of flat plate collectors and concentric sphere collectors.
    (b) Explain in detail about the Stirling and Brayton engines.

13. Write in detail about Natural and Forced convection.

14. What do you understand by geothermal sources? Explain in detail.

15. Explain the working of OTES with suitable examples.

16. Write in detail about Biomass gasification system in power generation with a neat diagram.

17. (a) Write briefly about dry steam and wet steam geothermal energy systems.
    (b) How does composting help in energy generation.
    (c) What is the principle of photovoltaic cells?

* * *

FACULTY OF ENGINEERING

B.E. (CBCS) (Prod) VI – Semester (Backlog) Examination, October 2020

Subject : Flexible Manufacturing System (E-I)

Time: 2 Hours   **Max. Marks : 70**

PART –A

Note : Answer any Five Questions   **(5x2=10 Marks)**

1. Discuss about types of Flexibility. In mfg system

2. What are the benefits of FMS?

3. What are the functions of FMS software?

4. Discuss about simulation modeling process.

5. Explain different database systems.

6. How is graph formulation done?

7. What is the significance of scheduling in FMS?

8. What is Material Handling? Explain

9. What are the different Manufacturing Applications in FMS?

10. How is GT useful in FMS?

PART-B

Note : Answer any Four Questions   **(4x15 = 60 Marks)**

11. With neat sketches explain different types of AGV's.

12. What are Intrinsic operating Functions?

13. Explain in detail the different types of Layouts in FMS.

14. What is database? Discuss different types of database Layouts?

15. What are the five components of Knowledge based system for Group Technology?

16. Discuss various FMS applications in sheet metal fabrication and Aerospace Industries.

17. Write short notes on
    a) Algorithm of n-batch scheduling problem.
    b) FMS supervisory computer control
    c) Artificial Intelligence and expert systems in FMS

****

FACULTY OF ENGINEERING
B.E. (CSE) VI-Semester (CBCS)(Backlog) Examination, October 2020

Subject : Graph Theory and its Applications

Time : 2 Hours   **Max. Marks: 70**

PART –A
**Note : Answer any Five Questions**   **(5x2=10 Marks)**

1   Is there a graph with degree sequence (1,2,3,5,4,4)?

2   Define Walk ,Path ,Circuit in a graph?

3   Define Bipartite graph.

4   Find the chromatic number of complete graph of n vertices

5   Give examples of class 1 and class 2 graph.

6   What is Independent set and covering?

7   What is line connectivity?

8   What is Chordal graph?

9   What is in degree and out degree of a graph
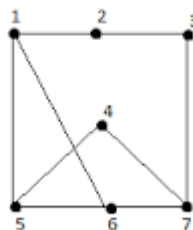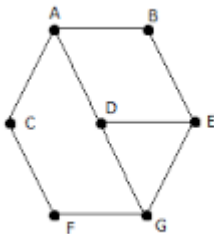
10 What is Eulerian circuit?

PART – B
Note: Answer any four questions.   **(4x15 = 60 Marks)**

11 (a) Using the algorithm of Kruskal, find a shortest spanning tree in the following
       Graph.
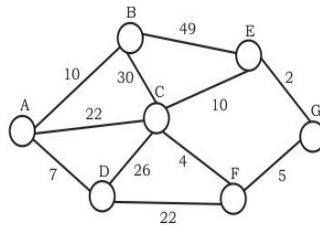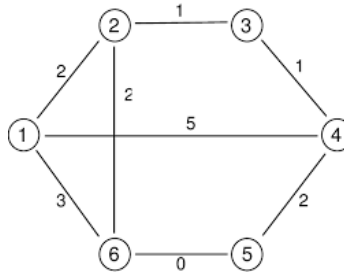

(b) For the following pair of graphs, determine whether the graphs are
   isomorphic or not? Give the justification for your answer?

12 (a) Explain Fleury's algorithm.
   (b) Find optimal tour by using Chinese postman problem.

13 (a) Write necessary and sufficient conditions for a Hamiltonian graphs.
   (b) Write a short note on matching in bipartite graphs.

14 A diagonal of an n × n matrix is a set of n entries no two of which belong to the same row or the same column. The weight of a diagonal is the sum of the entries in it. Find a minimum-weight diagonal in the following matrix:

         4 5 8 10 11
         7 6 5 7 4
         8 5 12 9 6
         6 6 13 10 7
         4 5 7 9 8

15 (a) Explain Brook's theorem with example.
   (b) A local restaurant has 8 different banquet rooms. Each banquet requires some subset of these 8 rooms. Suppose that there are 12 evening banquets that are to be scheduled in a given 7 day period. Two banquets that are scheduled the same evening must use different banquet rooms. Model and restate the scheduling problem as a graph coloring problem.

16 Write notes on.
   (a) Eulerian Directed graphs
   (b) Tournaments

17 Find spanning tree for the following graph by using BFS &DFS.

*****
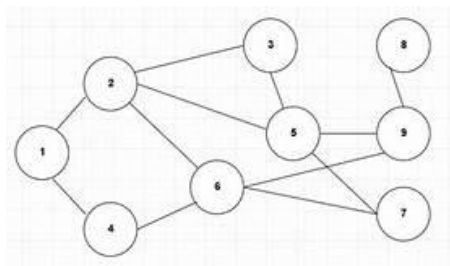
FACULTY OF ENGINEERING

B. E. (CSE) (CBCS) VI– Semester (Backlog) Examination, October 2020

Subject: Advanced Databases (Elective – II)

Time: 2 hours   Max. Marks: 70

PART – A

Note: Answer any five questions.   **(5x2 = 10 Marks)**

1. How to insert the values into structured types in SQL1999 for composite attributes?

2. List out the consistency requirements for sub tables.

3. What are the drawbacks of using ID and IDREFS for foreign key definition in DTD?

4. What are different parts of XSLT template? Explain with an example.

5. Differentiate between Outer join and aggregate operations based on their cost analysis.

6. State any four equivalent rules for transformation of relation query expressions for query optimization.

7. Distinguish the terms: Inter-query parallelism, Inter-operator parallelism.

8. What is the difference between master-slave replication & multi-master replication?

9. Give examples for some popular Cloud base data storage systems.

10. What is Admission control in the context of Multimedia databases?

PART – B

Note: Answer any four questions.   **(4x15 = 60 Marks)**

11. (a) Consider the relation schema below.
    Employee (person_name, street, city)
    Works (Person_name, company_name, salary)
    Company (Company_name, city)
    Manages (person_name, manager_name)
    Give a schema definition in SQL-2003 corresponding to the relational schema, but using references to express foreign-key relationships.

    (b) How do you store multi-valued attributes in object-relational databases using SQL? Illustrate with example.

12. (a) What are the two standard APIs for manipulation of XML document? Explain the programming model used in each of these.

    (b) What are FLWOR expressions? Explain with example.

13. How do you sort a file of 108 blocks using merge sort. Assume 5 buffer blocks are available in main memory. Also calculate the number of block transfers and seeks. Show the detailed steps.

14. (a) Discuss query opitmatization.

(b) Describe different lock based concurrency control mechanisms in distributed databases with replication data.

15. Explain how K-D tree is used to index spatial data consisting of two or more dimensions. [10]

16. (a) Explain the two-phase and three-phase commit protocols.

(b) Explain deadlock handling in distributed database transaction.

17. Write short note on the following:
    (a) Table inheritance.
    (b) Pipelined evaluation Vs Materialized Evaluation.

******

FACULTY OF ENGINEERING

B.E. VI – Semester (CBCS) (I.T.) (Backlog) Examination, October 2020

Subject: Data Mining (Elective – II)

Paper : I

Time : 2 Hours   **Max. Marks : 70**

PART – A

Note: Answer any five questions.   **(5x2 = 10 Marks)**

1. What are the steps involved in data preprocessing?
2. Give examples for discrete and continuous attributes?
3. Define support and confidence in Association rule mining?
4. List few techniques to improve the efficiency of Apriori algorithm.
5. Explain the process of classification using Neural Networks
6. List the advantages of Decision tree classification?
7. Define CLARA and CLARANS?
8. Explain briefly about outliers in clustering?
9. Define text mining?
10. Discuss briefly the latest trends in the field of data mining?

PART – B

Note: Answer any four questions.   **(4x15 = 60 Marks)**

11. a) Describe the process of KDD with a neat diagram

     b) Evaluate the Euclidean, Manhattan and Minkowski(q=3) distance between two

       objects represented by the tuples (22,1,42,10) and (20,0, 36,8).

12. a) Explain with an example the working of market basket analysis

     b) What are the things suffering the performance of Apriori candidate generation
        technique. Discuss how to improve them?

13. a) Discuss the back propagation algorithm for classification

     b) Induce a decision tree for the data given below. Use the information gain for the

       attribute selection process for generating the tree. (Table given in Page 2)

RID	age	income	student	credit rating	Class: buys computer
1	youth	high	no	fair	no
2	youth	high	no	excellent	no
3	middle aged	high	no	fair	yes
4	senior	medium	no	fair	yes
5	senior	low	yes	fair	yes
6	senior	low	yes	excellent	no
7	middle aged	low	yes	excellent	yes
8	youth	medium	no	fair	no
9	youth	low	yes	fair	yes
10	senior	medium	yes	fair	yes
11	youth	medium	yes	excellent	yes
12	middle aged	medium	no	excellent	yes
13	middle aged	high	yes	fair	yes
14	senior	medium	no	excellent	no

14. a) What is cluster analysis? List and explain the requirements of clustering in data mining?
    b) Describe Grid Based clustering methods

15. Give an overview of all the clustering methods used in data mining?

16. a) Discuss the role of data mining in financial data analysis.
    b) Explain different types of web mining techniques.

17. Write short notes on the following

    (a) Visual and Audio data mining
    (b) Data mining applications

****

FACULTY OF ENGINEERING

B.E. (IT) VI-Semester (Main)(Backlog) Examination, October 2020

Subject : Software Quality and Testing

Time : 2 hours   Max. Marks :70

PART – A

Note: Answer any five questions.   **(5x2 = 10 Marks)**

1. Give objectives of Software quality assurance
2. Mention SQA standards
3. Provide three examples of projects that would obviously benefit from application of the spiral model.
4. Differenciate classic and real CASE tools
5. State the Limitations of software metrics
6. Write the principles of CMM
7. Define Acceptance Test
8. How do you Record Test Results
9. List the Java Testing Tools
10. What is Cactus?

PART – B

Note: Answer any four questions.   **(4x15 = 60 Marks)**

1. a) Describe the environments for which SQA methods are developed
   b) List and briefly describe the nine causes of software errors

12. a) COMPARE different software development methodologies
    b) Explain the main contributions of checklists to software quality assurance.

13. a) Explain how software quality metrics are categorized?
    b) Mention the Problems in the application of cost of software quality metrics

14. a) How do you Develop Test Plan? Explain
    b) How do you Determine Your Software Testing Techniques

15. a) Write the steps for Testing a Data Warehouse
    b) What is the Methodology to Evaluate Automated Testing Tools

16. Differentiate 3 Sigma And 6 Sigma

17. a) Describe Computerized tools for project progress control
    b) What are Rational Testing Tools? Explain

****

FACULTY OF ENGINEERING

B.E. (IT) VI-Semester (CBCS) (Backlog) Examination, October 2020

Subject : Internet of Things (Elective-II)

Time : 2 hours   **Max. Marks:70**

PART – A

Note: Answer any five questions.   **(5x2 = 10 Marks)**

1   Define the term "reference architecture" with reference to IoT.
2   In what way M2M is different from IoT?
3   What does the communication model for an IoT Reference Model consist of?
4   Write short notes on Data representation
5   Define most commonly used IoT standard for MAC.
6   What is 6TiSCH?
7   Why Datagram Congestion Control Protocol (DCCP) is more secure than TCP?
8   What is the difference between AMQP and MQTT?
9   Write any 3 features of OneM2M
10 List the RPL attacks

PART – B

Note: Answer any four questions.   **(4x15 = 60 Marks)**

11. (a) Discuss the main design principles and needed capabilities of IoT.
    (b) Describe IoT architecture outline covering the functionality of all layers.

12. (a) With a suitable diagram, explain IoT domain model.
    (b) Discuss the functional and non-functional requirements IoT technical design
         constraints.

13. (a) What is DASH7? Explain the MAC features of DASH7.
    (b) Draw the header format of IPv6 and explain the capabilities of IPv6.

14. (a) Compare and contrast TCP and UDP.
    (b) Discuss the messaging modes of Constrained Application Protocol (CoAP).

15   Why security required in IoT? Explain the security aspects of IOT protocols.

16 (a) What do you mean by Everything as a Service(XaaS)?
    (b) Explain the relationship between core concepts of IoT Domain Model and IoT
         Information Model with the help of neat sketch.

17   Write short notes on the following
    a) Zigbee Smart Energy

    b) MPTCP

    c) Cognitive RPL

****