FACULTY OF TECHNOLOGY
B. Tech. 4/4 (Chem. Engg.) I-Semester (Backlog) Examination, June 2018

Subject : Transport Phenomena

Time : 3 Hours   Max. Marks: 70

Note: Answer all questions. All questions carry equal marks.

1 (a) (i) Explain briefly how the viscosities of low density gases depend on pressure and temperature as per the chapman Enskog theory.

   (ii) Two immiscible fluids with viscosities μ_1 & μ_2 flow between two parallel & horizontal plats spaced at a distance 2b apart. Each of this fluid occupies half the space between the fluids. The length of the plate is L and width W. The fluids flow under a pressure gradient. Derive the equations for velocity distribution and momentum flex distribution for each of the fluids by shell momentum balance.

OR

   (b) (i) State the differences and similarities among the three operations.

   (ii) Derive the expressions for velocity and momentum flux distribution for the upward flow in a cylindrical annulus.

   (iii) Give any two equivalent forms of fick's Ist law of binary diffusion explaining the notation employed.

2 (a) (i) What is Lorenz number and mention its use in Heat conduction with electrical heat source.

   (ii) Heat is flowing through annular wall of inside radius r_1 and outside radius r_2. The thermal conductivity varies linearly with temperature from K_1 at T_1 to K_2 at T_2. Develop an expression for the heat flow through the wall. What simplification results when $(r_2-r_1)/r_1$ is very small.

OR

   (b) (i) An incompressible fluid is flowing between two coaxial cylinders with the outer cylinder moving with a velocity   R and the inner cylinder stationary and surfaces of them are maintained at temperature T_a and T_b respectively. Assuming that T will be a function of radius and that the volume source of heat from viscous dissipation as S_v obtain the expressions for heat flows and temperature distributions. It may be assumed that the slit width 'b' in small w.r.t the radius R of the outer cylinder.

   (ii) Explain the procedure step wise to determine the temperature & heat flux distributions by shell energy balances state clearly all the Boundary conditions.

3 (a) (i) Gas A dissolves in liquid B in a beaker and during the isothermal diffusion A undergoes an irreversible first order homogeneous reaction A+B   AB. By making a shell mass balance on species A obtain the expression for concentration profile and indicate the profile graphically.

   (ii) Diffusion occurs from a spherical particle of diameter D to surrounding stagnant fluid B. D_{AB} is the diffusion coefficient of the particle from the surface to the fluid. Prove that the limiting Sherwood number is 2.

OR

(b) (i) In solving shell mass balance equations. What are the commonly employed boundary conditions.

(ii) Liquid 'B' is flowing in laminar flow down a vertical plate. Assume short contact time and that the velocity distributions in the liquid as linear with the distance 'y' normal to the plate. By making the shell mass balances obtain the equation for mass flux and the expression for concentration distribution of gas A which gets absorbed (slightly) soluble in B.

4 (a) (i) Derive the Navier-stokes equation from Ist principles of momentum balance over a volume element of dimensions Δx, Δy and Δz.

(ii) Consider an isothermal, incompressible fluid flowing radically between two concentric porous spherical shells. Assuming steady state, show from equation of continuity that $r^2 V_r$ = constant.

OR

(b) (i) A system consists of two concentric porous spherical shells of radii KR & R. The inner surface of the outer shell is at T_1 and the outer surface of the inner shell is at a lower temperature T_k. Dry air at T_k is blown outward radically from the inner shell into the intervening space and their through the shell prove that the differential equation for temperature distribution T (r) in the gas between two shells is given by:

$$\frac{dT}{dr} = \frac{4 T K}{W r \, Cp} \frac{d}{dr}\left(r^2 \frac{dT}{dr}\right)$$

Where w_r is the radial mass flow rate of gas. Use equations of continuity and energy.

(ii) Obtain the equation of continuity for a multi component mixture in a fixed volume element of sides of Δx, Δy and Δz Indicate how this continuity equation simplifies for the binary systems with constant density & diffusivity.

5 (a) (i) Explain the significance of the following (A) Reynolds stresses (B) Eddy properties.

(ii) Obtain the time smoothed form of the following equations in mass transfer in turbulent flow.

$$\frac{\partial C A}{\partial t} + Vx \frac{\partial C A}{\partial x} = DAB \frac{\partial^2 C A}{\partial X^2} + KCA$$

(iii) A large cast iron ingot at 600^0 C is taken out from the furnace and its one surface is suddenly exposed and maintained at 40^0 C. Find A) the time required to reach the temperature at 400^0 C at a depth of 5 cm from the surface & B) instantaneous heat flow rate at the bottom surface itself after one hour. Assume erf (n) = n.

OR

(b) (i) Discuss the various semi-empirical expressions proposed to find concentration gradients and mass flux in turbulent flow.

(ii) Prove that the time smoothed velocity for turbulent flow in a long tube using the prandtl mixing length relation for the turbulent core as. $v^+ = \frac{1}{0.36}$ ln S$^+$ + 3.8

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FACULTY OF ENGINEERING

B.E. 3/4 (Civil) II – Semester (Old) Examination, May / June 2018

Subject: Water & Waste Water Engineering

Time: 3 Hours   **Max.Marks: 75**

Note: Answer all questions from Part A & any five questions from Part B.

PART – A (25 Marks)

1   What is a confined aquifer?   2

2   What is peak factor?   2

3   Determine settling velocity for a particle of diameter 0.1 mm in water having kinematic viscosity 1 mm^2/Sec, specific gravity of the particle is 2.6.   3

4   Determine hydraulic radius for a sewer pipe of diameter 50 cm flowing half full.   3

5   The BOD of sewage is 250 ppm in the constant reaction rate is 0.15 per day. Find ultimate BOD.   3

6   State the significance of skimming tank in the treatment process.   2

7   Define the term: Recirculation ratio in trickling filter.   2

8   What is the oxygen transfer capacity of aerator?   3

9   State the functions of grid channel.   3

10 Highlight the sources of solid waste.   2

PART – B (5x10 = 50 Marks)

11 a) Predict the population of a town by Geometric increase method for following data for the years 2001, 2021.   5

Year	1921	1931	1941	1951	1961
Population x 1000	65	74	81	93	104

   b) Explain in detail network analysis by Hardy-cross method.   5

12 a) Explain with the help of neat sketch various components of a tower head intake. 5

   b) What are various standards for portable water supply plant?   5

13 a) Explain in detail the methods available for removal of hardness in a water treatment plant.   5

   b) Determine the dimensions and number of rapid sand filters for a population of 8 lakhs and average demand of 150 LPCD and peak factor of 2.0. Assume L = 1.4B and filtration rate of 4m^3/day/m^2.   5

14 a) Differentiate between temporary and permanent hardness. 5

   b) Mention any three methods of softening water. Describe Zeolite process of water softening. 5

15 Explain the design and working principle of trickling filter. 10

16 a) Describe with the help of neat sketch components of septic tanks along with their functions. 5

   b) Explain any two methods of sludge thickening. 5

17 Write short note on any two of the following: 10
   i) Infiltration galleries
   ii) Flocculation
   iii) Storm water quantity estimation.

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FACULTY OF ENGINEERING

B.E. 3/4 (Civil) II – Semester (Main & Backlog) Examination, May / June 2018

Subject: Environmental Engineering

Time: 3 Hours   Max.Marks: 75

Note: Answer all questions from Part – A & any five questions from Part – B .

PART – A (25 Marks)

1. Define per capita demand of water. (2)

2. List the various types of pipes based on construction materials (3)

3. What is super chlorination? (2)

4. List the commonly used coagulants used in sedimentation with coagulation process. (2)

5. For a city, the catchment area is 200 hectares, density of population is 300 persons/ hectare and water supply is 250 litres /capita/ day. Calculate the quantity of sanitary sewage for a separate system. (3)

6. Define Biological Oxygen Demand. (2)

7. What are the points to be considered in sewage treatment design? (3)

8. What is the purpose of screening in sewage? What are the various types of screens? (3)

9. What is sludge lagooning? (3)

10. Compare the function and performance of septic tank with the inhoff tank. (2)

PART – B (Marks: 50)

11 a) Name the different types of pumps used generally in water supply scheme. Explain the factors on which their selection depends. (5)

b) The population of three decades i.e. 1990, 2000 and 2010 is 2 lakhs, 3.8 lakhs and 4.5 lakhs. Find the population after 1, 2 and 3 decades from the last known decade, using geometrical increase method. (5)

12 a). Design set of three rapid gravity filters for treating the water, to be supplied to a population of 1,00,000. Per capita demand is 270 litres/day. The rate of filtration of the rapid gravity filters may be taken as 4500 litres/hr/Sq.m. (5)

b) Write short notes on rectangular and hooper bottom sedimentation tanks. (5)

13 a) Determine the velocity of flow in a circular sewer of diameter 150 cm, laid on a slope of 1 in 750 while flowing full, using Chezy's and Bazin's formula. Take Kutter's constant as 0.013 and Bazin's constant as 0.3. (5)

b) Explain the rational methods of storm water estimation. (5)

14. Design a circular sewage sedimentation tank for a town having population of 40,000. The average water demand is 140 litres/ capita /day. Assume that 70% water reaches at the treatment unit and the maximum demand is 2.7 times the average demand. (10)

15 a) Explain the working of inhoff tanks with a neat sketch. (5)

b) Explain the process of anerobic sludge digestion. (5)

16 a) Write short notes on properties and quantity of sludge. (5)

b) Explain the process of sedimentation in treatment of water. Discuss the differences between plain sedimentation and coagulation. (5)

17. Write short notes on (10)

a) Water Softening.

b) Rapid Sand Filters.

c) Method of determination of B.O.D.

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FACULTY OF ENGINEERING & INFORMATICS

B.E. 3/4(IT) II- Semester(Main & Backlog) Examination, May / June 2018

Subject : Computer Graphics (Elective-I)

Time : 3 hours   Max. Marks : 75

Note : Answer all questions from Part-A and any Five Questions from part-B

PART – A (25 Marks)

1. Define Frame Buffer and Refresh Rate.   [2]
2. What are the disadvantages and DDA algorithm?   [2]
3. Briefly describe about the line type attribute.   [3]
4. Write about rigid- body transformations.   [3]
5. Define a point clipping.   [2]
6. Write about different types of coordinates in 2D view.   [2]
7. Write about PHIGS.   [3]
8. Briefly describe about rubber-band method for positioning straight line. [3]
9. Write about geometric tables used in 3D object representation.   [2]
10. State the properties of Bezier curve.   [3]

PART – B (50 Marks)

11. a) What are the differences between raster-scan system and random –scan
       system?   [4]
    b) Write an algorithm to draw circle using mid-point method.   [6]

12. a) Explain about Homogeneous Coordinates and its uses.   [4]
    b) Show that two successive rotations about origin 2D are additive and
       commutative.   [6]

13. a) Explain Sutherland-Hodgeman algorithm with an example.   [6]
    b) Write Sutherland-Hodgeman algorithm advantages and disadvantages.   [4]

14. Explain interactive picture construction techniques with examples.   [10]

15. Write a short notes on i) Depth Buffer method   ii) Depth sorting method.   [10]

16. a) Describe about the flood –fill algorithm.   [5]
    b) Show that rotation and translation is commutative.   [5]

17. Write short notes on
    a) 3D viewing coordinates   [3]
    b) Liang-Barsky line clipping   [4]
    c) Raster-Scan system   [3]

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FACULTY OF ENGINEERING

B.E. 3/4 (Inst.) II-Semester (Main & Backlog) Examination, May / June 2018

Subject : Biomedical Instrumentation

Time : 3 hours   Max. Marks : 75

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

1	Mention the general characteristics of biomedical instrument devices.	3
2	Define and explain Korotkoff sound.	2
3	Define Plethysmograph.	2
4	Explain briefly finger plethysmograph.	3
5	Mention principle of EEG.	2
6	Draw the block diagram of basic electronic recording system.	3
7	Why endoscope is called fluoroscope? Define otoscope.	3
8	Define microshock and macroshock.	3
9	Write the principle of colorimeter.	2
10	Define fluoroscopy.	2

PART – B (50 Marks)

11 a)	Explain the need of carrier amplifier in biomedical recording system.	5
b)	Draw and explain the block diagram used for recording EMG.	5
12 a)	Explain Ink jet recorder in detail.	5
b)	Explain resting rhythms of EEG.	5
13 a)	Differentiate between direct and indirect BP measurement techniques.	5
b)	Discuss the generation and characteristics of the first two heart sounds.	5
14	Distinguish between ECG and EEG. Explain 10-20 electrode system in EEG.	3+7
15 a)	Write a short note on collimators and grids.	5
b)	Describe the principle and operation of electrophoresis.	5
16 a)	Write the advantages and disadvantages of laser surgery.	5
b)	Explain Holter Monitoring.	5
17	Write short notes on :	
a)	MRI	5
b)	Phono cardiography	5

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FACULTY OF INFORMATICS

B.E. 3/4 (IT) II-Semester (New) Examination, May / June 2018

Subject : Software Testing (Elective-I)

Time : 3 hours   **Max. Marks : 75**

Note: Answer all questions from Part-A & any FIVE questions from Part-B.

PART – A (25 Marks)

1 What is Testing? What is the difference between error and fault.	3
2 Define test plan and test script.	2
3 What is web engineering? Is it same as software engineering?	2
4 What is the difference between inspections, walkthrough reviews?	3
5 Distinguish between decision node and junction node.	2
6 What are the guidelines for selecting a testing tool?	3
7 What is the difference between static testing and dynamic testing?	2
8 What are the states of data object in data flow testing?	3
9 What are various uses of load runner?	3
10 What is the psychology behind testing by an independent team?	2

PART – B (50 Marks)

11 a) Find out some myths related software testing.   5
   b) Explain briefly, what are the notations used in cause effect graphing.   5

12 Write short notes on :
   a) System testing   3
   b) Regression testing   3
   c) Acceptance testing   2
   d) Integration testing   2

13 What is the difference between quality management and project management?
   List the various activities under both.   10

14 What is the importance of debugging process?   Discuss various types of
   debugging.   10

15 Write short notes on :
   a) Describe table based testing   5
   b) Uses of load runner and win runner   5

16 Discuss the type of test metrics used in software testing, in detail.   10

17 Write short notes on :
   a) Boundary Value Analysis (BVA)   5
   b) Equivalence partitioning   5

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FACULTY OF ENGINEERING

B.E. 3/4 (Mech.) II– Semester(Main &Backlog) Examination, May/June 2018

Subject: Control Systems Theory

Time : 3 Hours **Max. Marks: 75**

Note: Answer all questions from Part-A Answer any five questions from Part B

PART – A (25 Marks)

1. Define transfer function. What are its properties? (2)

2. What is meant by LTI system? (2)

3. Derive the transfer function of R-L-C series circuits and determine its natural frequency. (3)

4. Determine the static error constants of the system given by (2)

$$G(s)H(s) = \frac{K}{s\left(s^2 + as + b\right)}$$

5. The characteristic equation of a system is given by $s^3 + 3ks^2 + (k + 2)s + 4 = 0$ Determine the range of k for which the system is stable. (3)

6. Sketch the Polar plot of the system given by $G(s) = \dfrac{10}{s^2}$ (2)

7. Write short notes on Lead compensator. (2)

8. Linearise the equation $v = \sqrt{2gh}$ about the point $\bar{h} = 5$ where g = 10 units (3)

9. If $A = \begin{bmatrix} 0 & 1 \\ -2 & 0 \end{bmatrix}$, determine the state transition matrix. (3)

10. Develop the state space model for spring-mass-dashpot system. (3)

PART – B (50 Marks)

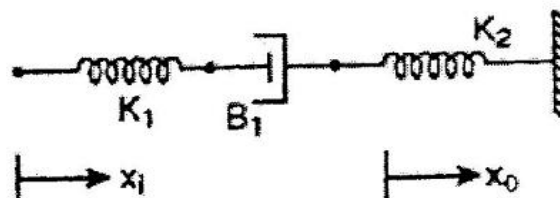11. Derive the transfer function $X_0(s)/X_i(s)$ for the model shown in figure I. (10)

Fig.1

12. a) Find the overall transfer function for the SFG given in the figure 2. 5+5
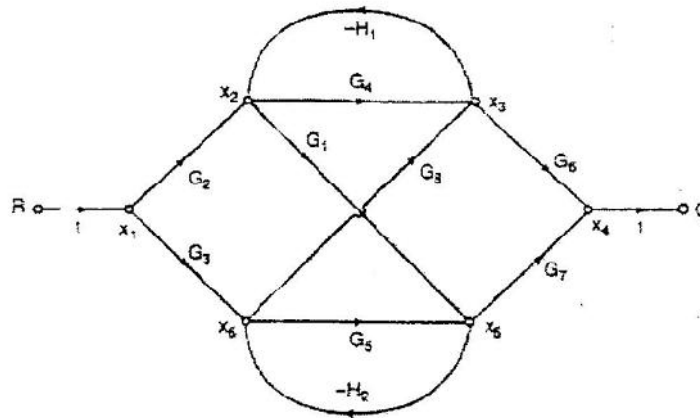

Fig. 2

b) Derive the transfer function for D.C. servo motor.

13. Sketch the Bode plot and comment on the stability of a control system whose transfer function is given by 10

$$G(s)H(s) = \frac{10(s+10)}{s(s+2)(s+5)}$$

14. Determine the closed loop stability of the system given below by using the Nyquist Stability criterion. 10

$$G(s)H(s) = \frac{(3s+1)}{s^2(s+1)(2s+1)}$$

15. Find the total response of the system given by 10

$$\begin{bmatrix} x^{\cdot}_1 \\ x^{\cdot}_2 \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ -2 & -1 \end{bmatrix}\begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix}U \qquad \text{and} \qquad \begin{bmatrix} x_1(0) \\ x_{2(0)} \end{bmatrix} = \begin{bmatrix} 1 \\ 0 \end{bmatrix} \quad , u(t) = 1$$

16. Sketch the root locus of the system for a system given by 10

$$G(s)H(s) = \frac{K}{s((s^2 + 8s + 17))}$$

Find the value of 'K' to yield a damping ratio of 0.55

17. A system given by $\frac{d^2y}{dt^2} + \frac{dy}{dt} + y(t) = 0.4\frac{dx}{dt} + x(t)$ where x(t) and y(t) are input

and output respectively. Determine (i) unit step response (ii) time domain specifications. 10

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FACULTY OF ENGINEERING

B. E. 3/4 (AE) II-Semester (Main & Backlog) Examination, May / June 2018

Subject: Automotive Air Conditioning

Time: 3 Hours   Max. Marks: 75

Note: Answer all questions from Part-A, & any FIVE Questions from Part-B.

Use Psychrometric Chart and steam tables.

PART-A (25 Marks)

1 Define air conditioning. What are the factors affecting comfort air conditioning?
2 Explain thermodynamic wet bulb temperature.
3 Define Specific humidity and relative humidity.
4   What is meant by one ton of refrigeration?
5 Write the chemical formula for R-12 and R-134.
6 Define Bypass factor of cooling coil.
7 Why ducts are used in air-Conditioning system?
8 List out the equipment used in automotive air conditioning?
9 Classify air conditioning systems.
10 Define the following terms: Room sensible heat factor and Grand sensible heat factor.

PART-B (50 Marks)

11 On a particular day, the atmospheric air was found to have a dry bulb temperature of 30^0C and a wet bulb temperature of 18^0C. The barometric pressure was observed to be 756mm of Hg. Using the tables of psychrometric properties of air, determine the relative humidity, the specific humidity, the dew point temperature, the enthalpy of air per kg of dry air and volume of mixture per kg of dry air.

12 The following data refer to air conditioning of a public hall:

   Outdoor Condition $= 40^0$C DBT, 20^0C WBT

   Required comfort conditions $= 20^0$C DBT, 50% RH

   Seating capacity of hall   = 1000

   Amount of outdoor air supplied = 0.3 m^3/min/person

13 If the required condition is achieved first by adiabatic humidifying and then cooling, find: The capacity of the cooling coil and surface temperature of the coil if the bypass factor is 0.25 and the capacity of the humidifier and its efficiency.

14 (a) How the refrigerants are classified and list the desirable properties of refrigerants.
   (b) With neat sketch Explain Ford automatically controlled air-condition system.

..2

15 Discuss in brief testing, diagnosis and trouble shooting of air conditioning system. Write short notes on: (a) Adiabatic mixing of air streams (b) Thermostatic expansion valve

16 Describe the step-wise procedure to calculate cooling load for an automobile.

17 Explain the following with help of sketches:
    (a) Flame type leak detector
    (b) Hermetic compressor

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FACULTY OF ENGINEERING
B.E. 3/4 (ECE) II-Sem. (Old) Examination, May / June 2018
Subject: Electronic Instrumentation

Time: 3 Hours   Max. Marks: 75

Note: **Answer all questions From Part-A, & any Five Questions from Part-B.**
Part-A (25 Marks)

1. Define 'Precision' and explain with an example.   [3]

2. List the salient features of "Quality Management Standards".   [2]

3. What are the factors required for the selection of a transducer.   [3]

4. Compare Photo voltaic and Photo emissive transducer.   [2]

5. Explain about 'Loudness Measurement'   [3]

6. Compare passive and active transducers   [3]

7. List out the special features of 'Mixed signal Oscilloscope'   [3]

8. Compare DVM and LCR meter.   [2]

9. What is the need of Ultrasonic Imaging System?   [2]

10. What are Human Physiological systems.   [2]

PART-B (50 Marks)

11. Explain the terms 'Accuracy', 'Resolution' and 'Sensitivity' with examples. Also discuss in detail about IEEE standards and Elements of ISO 9001.   [10]

12. Draw and explain the construction of LVDT. Also, discuss the operation of LVDT.   [10]

13. What is the function of Hygrometer. Explain about different types of Hygrometers. [10]

14. With a neat block diagram, explain the operation of Digital storage oscilloscope. [10]

15. Explain in detail the Operation of X-ray machine and list the properties of X-rays. [10]

16. a) Discuss in detail about spectrum analyzer.   [5]
    b) Explain about GPIB Interface and Protocol.   [5]

17. Write any Two of the following
    a) Piezoelectric transducer   [5]
    b) Delayed time base Oscilloscope   [5]

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FACULTY OF INFORMATICS

B.E. 3/4 (IT) Semester – II (Main & Backlog) Examination May/June 2018

Subject: Natural Language Processing (Elective – I)

Time: 3 Hours   **Max. Marks: 75**

Note: Answer all questions from Part – A & any five questions from Part – B.
Part – A (25 Marks)

1. Write applications for Dialogue based and Text based Natural Language Processing (3)
2. Compare Syntactic knowledge and Semantic Knowledge in language understanding (2)
3. Give inflectional forms and Derivational forms of words with examples (2)
4. Construct a transition network for the sentences: John plays flute (3)
5. Give an example of feature and feature structure (2)
6. Briefly discuss passing as a search procedure (3)
7. Explain Semantic Interpretation. (2)
8. Describe 'Word senses' with an example. (3)
9. Define Forward probability and briefly explain its use. (3)
10. Compare context-dependent Best-First Parser with probabilistic context free Grammar with respect to Accuracy. (2)

PART – B (50 Marks)

11. (a) Discuss computational linguistic approach to NL? (5)

   (b) Explain why NLP needs to attend different forms of knowledge. (5)

12. (a) Present an outline of English syntax with a focus on open class words. (6)

   (b) Explain the significance of conditional probability in NLP. (4)

13. State and Explain 'The are-extension algorithm' and 'Bottom-up chart parsing algorithm'. (10)

14. a) Describe methods for linking logical forms with syntactic structures. (4)

   b) Introduce elements of Lambda calculus and explain the significance of Lambda Reduction. (6)

15. Write Viterbi Algorithm. Compare viterbi with Frute-Force (exhaustive search) algorithms for computational complexity in terms of T wards and N lexical categories. Show how most likely sequence of categories for a sequence of words is found using viterbi algorithm. 10

16. (a) Present an extended parse tree to view a feature structure. 4

   (b) Present a parse tree with feature value for the sentence: The man cries with a brief explanation. 6

17. Write short notes on any two from the following:

   (a) Best –First context-dependent parsing 10

   (b) n-gram probability model

   (c) Augmented Transition Networks.

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FACULTY OF ENGINEERING

BE 3 / 4 (CSE) II Sem.(Old) EXAMINATION, May/June 2018

Subject: Principles of Programming Languages

Time: 3 Hours   **Max. Marks: 75**

Note: Answer All questions from Part-A & any Five questions from Part-B.

PART – A (25 Marks)

1. List the design principles of imperative programming languages.   (3)
2. Define Context Free Grammar.   (2)
3. Describe the difference between static and dynamic binding.   (2)
4. Explain the need of Non-determinacy in programming languages.   (3)
5. What is Type Equivalence?   (2)
6. List the differences between logically and enumerated controlled loops. (3)
7. Describe how to maintain static chain during a subroutine call.   (3)
8. What is Dynamic method binding?   (2)
9. What is busy waiting?   (2)
10. Discuss about fact and rules in logic programming languages.   (3)

PART – B (50 Marks)

11. List and explain different phases of Compilation process.   (10)

12. a) Explain static scoping and dynamic scoping with example.   (5)
    b) What is internal and external fragmentation? Discuss merits and demerits
       of both.   (5)

13. a) Discuss call-by-value and call-by-reference with example.   (5)
    b) Explain iteration based control structures.   (5)

14. a) What is exceptional handling? How exceptions are handled in C++. (5)
    b) Discuss the Recursive types.   (5)

15 Define monitor? Explain how Co-operative and Competitive synchronizations are
   implemented by using monitors.   (10)

16 a) Discuss about basic elements of prolog.   (5)
   b) Explain how functions are defined in Scheme.   (5)

17 Write short notes on:
   a) Generic Subroutines   (5)
   b) Polymorphism   (5)

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FACULTY OF INFORMATICS

B.E. 3/4 (IT) II – Semester (Old) (Main) Examination, M a y / J u n e 2 0 1 8

Subject: Software Testing   (Elective – I)

Time : 3 hours   **Max. Marks: 75**

Note: Answer All questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

1. Define a) Error b) Failure c) Text oracle	(3)
2. Differentiate verification and validation.	(2)
3. Write short notes on BVA.	(3)
4. Discuss about the stages of an inspection process.	(3)
5. Explain testing defect backlog.	(2)
6. How system test plan is different from acceptance test plan?	(2)
7. List the issues in testing a class.	(2)
8. Describe the importance of debugging.	(2)
9. Explain briefly about test script.	(3)
10. List various features of Win runner.	(3)

PART – B (50 Marks)

11 a) Illustrate the software testing life cycle stages with working example.   (5)
   b) List and explain activities performed by a tester during project development.   (5)

12 Explain in detail about
   a) State table-based testing   b) Equivalence class testing   (10)

13 Describe about various phases of test plan in detail.   (10)

14. a) What is the role of invariants in class testing? Discuss with example.   (5)
    b) Discuss various quality aspects to be considered in web testing?   (5)

15. a) Explain various types of applications that can be tested using JMeter. What
       are its uses?   (5)
     b) Demonstrate the process of testing an application using load runner.   (5)

16. a) What are the different parameters for evaluating regression test selection
        technique?   (5)
    b) Discuss various types of software metrics.   (5)

17. Write short notes on the following:
    a) Source Code Testing utilities in Unix   (4)
    b) Cyclomatic Complexity   (3)
    c) Stress Testing   (3)

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FACULTY OF INFORMATICS

B.E. 3/4 (I.T) II – Semester (Old) Examination, May/June 2018

Subject: Digital Instrumentation and Control

Time: 3 Hours   **Max. Marks: 75**

Note: Answer all questions from Part A & any Five questions from Part B.

PART – A (25 Marks)

1) Find the successive approximation ADC output for a 4-bit converter to a 3217 volts input if the reference is 5 volts.   3
2) Define the operation of Silicon Controlled Rectifier.   2
3) Give the basic operation of a capacitive sensor using proper equations.   3
4) A process temperature is found to change by 33.4^0F. Calculate the change in ^{0}C.   2
5) List the characteristics of light as a source of energy.   2
6) A stepper motor has 7.5^0 per step. Find the rpm produced by a pulse rate of 2000 pps on the input.   3
7) Define control lag and dead time.   2
8) Distinguish between the nature of variables in a discrete state system and continuous state system.   3
9) What are the multivariable alarms?   2
10) Describe the control loop stability criteria with respect to the bode plot.   3

PART – B (50 Marks)

11. Draw block diagram of a process control loop and explain in detail all its elements.   10

12. Describe the types of accelerometers and the characteristics of each.   10

13. Describe in detail the operating principles of ac, dc and stepping motors. Use diagrams for explanation.   10

14. Develop a ladder diagram for the following narrative event sequence description for a motor: 10
No start button
Nc stop button
Thermal overload switch opens on high temperature.
Green light when running
Red light for thermal overload.

15. a. Describe the implementation of Proportional integral controller using opamp.   6
     b. List the advantages and disadvantages of using computers for control function.   4

16. a) Describe the process reaction method of finding controller settings.   6
     b) Compare and contrast the PI and PD control modes.   4

17. a) Explain how control value regulates the flow rate in fluid delivery system and also give expression for the same.   6
     b) Explain the principle of accelerometer using the spring-mass system.   4

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FACULTY OF INFORMATICS

B.E. 3/4 (I.T) II – Semester (Old) Examination, May/June 2018

Subject: Dataware Housing & Data Mining (Elective – I)

Time: 3 Hours　　　　　　　　　　　　　　　　　　**Max. Marks: 75**

Note: Answer all questions from Part A & any Five questions from Part B.

PART – A (25 Marks)

1) What is data mining?　2
2) Describe the steps involved in data mining when viewed as a process of knowledge discovery.　3
3) Differentiate between ROLAP with MOLAP.　3
4) Give a brief account of data mining techniques.　2
5) Mention the techniques to improve classification accuracy.　3
6) Define decision tree induction.　2
7) What is the measure to determine how well the cluster are separated and how compact are the clusters?　3
8) List the most common methods for constructing hidden Markov models.　2
9) What are the different tasks of time series methods.　2
10) Discuss the essential features of temporal data and temporal inferences.　3

PART – B (50 Marks)

11. a) Discuss the application of data mining in the banking industry.　5
　　b) In real world data, tuples with missing values for sum attributes are a common occurance. Describe various methods for handling this problem.　5

12. a) Briefly compare snowflake schema, fact concellation, starnet query model.　6
　　b) Prove that all non empty subsets of a frequent itemset must also be frequent.　4

13. Why is tree pruning useful in decision tree induction? What is a drawback of using a separate set of tuples to evaluate pruning?　10

14. Write a short note with examples.
　a) Density based method. b)DBSCAN　5+5

15. Why is concept hierarchy important for spatial data? Identify certain cases of occurancy of such hierarchies in spatial data.　10

16. a) What are advantages and disadvantages of decision tree approach over other approaches of data mining?　6
　　b) Discuss A priori algorithm with an example　4

17. a) Elaborate on principal component analysis.　6
　　b) Discuss chameleon- a hierarchical clustering based on k-nearest neighbors.　4

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FACULTY OF INFORMATICS

B.E. 3/4 (IT) Semester – II (NEW)(Main & Backlog) Examination May / June 2018

Subject: Digital Signal Processing (Elective – I)

Time: 3 Hours   **Max. Marks: 75**

Note: Answer all questions from Part – A & any five questions from Part -B.

Part – A (25 Marks)

1. Find the DFT of a sequence x(h) = {1,1,0,0}   (3)

2. Calculate the number of multiplication's needed in the calculation of DFT and FFT with 64 point sequence.   (2)

3. What is linear phase?   (2)

4. Why FIR filters are always stable?   (3)

5. What are the advantages of IIR filters   (3)

6. Mention any two techniques used for digitizing the transfer function of an analog filter.   (3)

7. What is the function of Barrel shifter in DSP processor?   (2)

8. List status register bits of 5X and their functions.   (3)

9. What are the different buses of TMS320C54X processor?   (2)

10. How interrupts are handled by C54x DSP processor?   (2)

PART – B (50 Marks)

11. (a) Compute the IDFT of the sequence
X(K) = {7,-0.707-j0.707, -j ,0.707-j 0.j707, 1,0.707+j0.707, j, -0.707+j0.707} using DIT-FFT algorithm.   (6)
(b) State and prove any two properties of DFT.   (4)

12. (a) Design a band pass filter which approximates the ideal filter with cut-off frequencies at 0.2 rad/sec and 0.3 rad/sec. The filter order is M=7. Use the Hamming window function.   (6)
(b) Explain Gibb's phenomenon.   (4)

13. Design a digital Chebyshev filter to meet the following specifications: (6)

$$0.8 \le \left| H\left(e^{j\check{S}}\right) \right| \le 1, \ 0 \le \left| \check{S} \le 0.2f \right|$$

$$\left| H\left(e^{j\check{S}}\right) \right| \le 0.2, \ 0.6f \le \left| \check{S} \le f \right|$$

Using impulse invariant technique. Assume T = 1 sec.

b) Apply the bilinear transformation to H(s) = $\dfrac{2}{(S+1)(S+2)}$ with T = 1 sec. Find H(z).　(4)

14. a) Explain with a block diagram a basic DSP system? What are the
advantages and disadvantages of programmable DSP processors.　(6)

b) Compare General purpose processor with DSP processors.　(4)

15. a) What are the architectural features of 54XX processor? Explain with a
block diagram.　(6)

b) Assume that the current contents of ARO to be 400h, what will be the　(4)
contents after each of the following TMS 320 C 54 xx addressing mode
are used? Assume that the contents of AR0 are 40 h. 1)*AR3+0 ; 2) AR3+;
3)*AR3+OB

16. (a) Explain overlapping save method of convolution with an example.　(6)

(b) Write the steps involved in the design of FIR filters.　(4)

17. Write short notes on

(a) JPEG algorithm　5

(b) DSP based Bio-telemetry receiver　5

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FACULTY OF INFORMATICS

B.E. 3/4 (I.T) II – Semester (Old) Examination, May/June 2018

Subject: Computer Graphics (Elective – I)

Time: 3 Hours   **Max. Marks: 75**

Note: Answer all questions from Part A & Five questions from Part B.

PART – A (25 Marks)

1) Define Picking in OpenGL?
2) What are the different types of parallel projections?
3) Distinguish between global and local lighting.
4) Write about Back-Face detection methods.
5) Derive viewing transformation relation.
6) Write program for drawing point, line segment and polygon in OpenGL.
7) Draw the architecture for scene graph.
8) The end points of a given line are (0,0) and (6,18). Compute each value of y as X steps from 0 to 6 using DDA and Bresenhams algorithms and plot the resultant line.
9) Distinguish between Bezier Curves and B-spline Curves.
10) A workstation display can have a resolution of 1280X1024 pixels. If it is refreshed 72 times per second, how fast must the memory be? How much time can we take to read one pixel from memory? What is the number for a 480X640 display that operates at 60 Hz but it interlaced?

PART – B (50 Marks)

11. a) Illustrate Raster Scan Display and Random scan displays and outline major differences.
    b) What are the major application areas of Computer Graphics?

12. Show that the following sequence commute.
    a) A rotation and a uniform scaling.
    b) Two rotations about the same axis.
    c) Two translations

13. Suppose a rectangular window ABCD is defined such that A(-1,-2) and C(3,1). Using Cohen-Sutherland algorithm, clip the line segment joining the points P(-20,0) and Q(20,30). Discuss limitations of Cohen-Sutherland algorithm.

14. A line AB has end points (1,1) and (6,7). Determine the points on line AB traced by DDA and Bresenhams algorithm.

15. a) Distinguish between Ambient Light and Spot Light. Give an example.
    b) Explain the Phong Lighting Model.

16. Write short notes on
    a) CSG trees
    b) BSP Trees

17. a) Distinguish between Quadtrees and Octtrees.
    b) Write a program for torus?

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