

B.Tech. III Semester
Examination: Nov-Dec, 2017
Data Structure and Algorithms
Paper No. CSE-201

Time : 2:30 Hours

Max Marks: 90

Note *: Question No. 1 is compulsory. Attempt remaining four question from all section, selecting atleast one question from each section.

Q1. Attempt any three questions from the following:

3x6= (18)

- (a) What are the goals of data structure? Describe it.
- (b) Explain the terms Front and Rear for queue.
- (c) What is an array? Differentiate between one- dimensional and two Dimensional arrays.
- (d) What is trees? Write down the application of trees.
- (e) What is the purpose of memory compaction?
- (f) List some of the applications of graph.

Section-A

- Q2. (a) Write short notes on DFS and BFS with suitable example and Write down the Algorithm of DFS. (09)
- (b) What are common operations that can be performed on a data-structure? (09)
- Q3. Give an algorithm for Quick Sort and explain its time complexity. Trace the algorithm for the Following data ? (18)

65 70 75 80 85 60 55 50 45

Section-B

- Q4. Define Deque and Write an algorithm for inserting an element into a Dequeue and deleting an element from a Dequeue. (18)
- Q5. (a) What are the application of linked list? Explain them. (09)
- (b) What do you mean by Stack? Define with the help of algorithm for its operations e.g., PUSH and POP. (09)

Section-C

- Q6. (a) What is threaded binary tree? Mention its advantages and disadvantages. (09)
- (b) List the operation to be performed on a binary tree. (09)
- Q7. (a) Write short notes on Tree Traversal. Explain them briefly with example. (09)
- (b) Write down the difference between complete binary trees and extended binary tree. (09)

Section-D

- Q8. Give briefly explanation on AVL search Tree and construct an AVL search tree by inserting the following element in the order of their occurrence: (18)
- 64, 1, 44, 26, 13, 110, 98, 85
- Q9. (a) What are the ways in which files can be organized? (09)
- (b) List the various file operations. Explain them. (09)

B.Tech III Semester (Exam May-June-2017)
Advanced Engineering Mathematics
Paper No. MAT-201

Time: 2 Hours

Max. Marks: 90

Note: Question No. 1 is compulsory and attempt only one question from each section

1(a) The graph of an odd function is symmetrical about (2)

- (i) Origin (ii) y-axis (iii) x-axis (iv) None of these

(b) The sufficient condition for the Dirichlet's condition is (2)

- (i) $f(x)$ is periodic, single valued and finite.
 (ii) $f(x)$ has a finite number of discontinuities in any one period.
 (iii) $f(x)$ has a finite number of maxima and minima.
 (iv) All of the above.

(c) f' is (2)

- (i) Real (ii) Complex (iii) Periodic (iv) None of these

(d) The singularity in the function $f(z) = \frac{\sin(z-a)}{(z-a)}$ is (2)

- (i) a removable singularity
 (ii) an essential singularity
 (iii) a pole
 (iv) all of the above

(e) The value of the integral $\oint_C \frac{z^2+5}{z-3} dz$, where C is the circle $|Z| = 1$, is (2)

- (i) $2\pi i$ (ii) $-2\pi i$ (iii) 0 (iv) πi

(f) If the coin is tossed three times. The number of elements in the sample space are (2)

- (i) 6 (ii) 8 (iii) 12 (iv) None of these

(g) A box contains 4 white and 2 black marbles, another box containing 3 white and 5 black marbles. If 1 marble is drawn from each box. Then the probability that both are white is (2)

- (i) $\frac{1}{4}$ (ii) $\frac{1}{2}$ (iii) $\frac{3}{4}$ (iv) 1

(h) A variable which is added to the L.H.S. of $\leq$ inequality to make it into equality is called (2)

- (i) Artificial variable
 (ii) Slack variable
 (iii) Surplus variable
 (iv) None of the above

(i) The LPP problem

$$\text{Maximize } Z = 2x_1 + x_2 - x_3$$

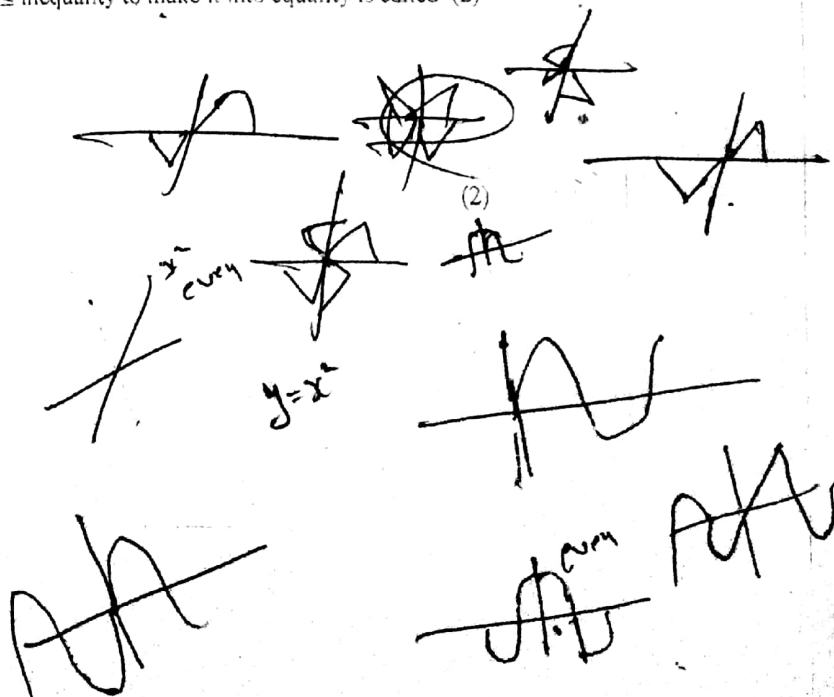
$$x_1 + x_2 \leq 1$$

$$x_1 - 2x_2 - x_3 \geq 2$$

$$x_1, x_2, x_3 \geq 0$$

can be solved by

- (i) Graphical method
 (ii) Simplex method
 (iii) Both of the above
 (iv) None of these



Section-A

- 2(a) Obtain the Fourier series for the function $f(x) = x^2, -\pi \leq x \leq \pi$. (9)
- 2(b) Find the half-range cosine series for the function $f(x) = x$ in the interval $0 < x < 2$. (9)
- 3 Find the Fourier cosine transform of $f(x) = \frac{1}{1+x^2}$. Hence derive Fourier sine transform of $\phi(x) = \frac{1}{x(1+x^2)}$. (18)

Section-B

- 4(a) Prove that $\lim_{z \rightarrow 0} \frac{z}{|z|}$ does not exist. (9)
- 4(b) Prove the Cauchy-Riemann equations in polar coordinates. (9)
- 5(a) Evaluate $\oint \frac{\cos \pi z^2}{(z-1)(z-2)} dz$, where C is the circle $|z| = 3$. (9)
- 5(b) Expand the function $\frac{1}{(z+1)(z+3)}$ in Laurent's series for
(i) $|z| < 1$ (ii) $1 < |z| < 3$. (9)

Section-C

- 6(a) In a bolt factory, machines A, B and C manufacture respectively 25%, 35% and 40% of the total. Of their output 5%, 4% and 2% percent are defective bolts. A bolt is drawn at random from the product and is found to be defective. What is the probability that it was manufactured by machine B? (9)

- 6(b) A random variable X has the following probability function:

x	0	1	2	3	4	5	6	7
p(x)	0	k	2k	2k	3k	k ²	2k ²	7k ² +k

- (i) Find k (ii) Evaluate $P(X < 6), P(X \geq 6), P(3 < X \leq 6)$. (9)

- 7(a) Six dice are thrown 729 times. How many times do you expect at least three dice to show a five or six? (9)

- 7(b) A coin was tossed 400 times and the head turned up 216 times. Test the hypothesis that the coin is unbiased. (9)

Section-D

- 8(a) Define the following: (4)

- (i) Feasible solution
(ii) Basic solution

- 8(b) Solve the following LPP by graphical method (14)

$$\begin{aligned} \text{Minimize } Z &= 20x_1 + 10x_2 \\ \text{s.t. } x_1 + 2x_2 &\leq 40 \\ 3x_1 + x_2 &\geq 30 \\ 4x_1 + 3x_2 &\geq 60 \\ \text{and } x_1, x_2 &\geq 0 \end{aligned}$$

- 9 Using Simplex algorithm solve the following LPP (18)

$$\begin{aligned} \text{Minimize } Z &= x_1 - 3x_2 + 3x_3 \\ \text{Subject to } 3x_1 - x_2 + 2x_3 &\leq 7 \\ x_1 + 4x_2 &\geq -12 \\ -4x_1 + 3x_2 + 8x_3 &\leq 10 \\ \text{and } x_1, x_2, x_3 &\geq 0 \end{aligned}$$

B.Tech. III Semester, Exam November-2017

DISCRETE STRUCTURES

Paper No. CSE-203

Time: 2 Hours 30 Minutes

Max. Marks: 90

Note: Attempt five questions in all, selecting only one question from each section. Question No. 1 is compulsory.

1. Attempt any three questions from the following:

(3x6)

- Define Power Sets & Multisets?
- Define AP & GP. Also write the formula for sum of n terms in AP and GP.
- If $f(x) = 3x^4 - 5x^2 + 9$, find $f(x-1)$.
- How many variable names of 8 letters can be formed from the letters a, b, c, d, e, f, g, h, i if no letter is repeated.

Section-A

2. a. Prove that:

(9)

- The statement $(p \rightarrow q) \leftrightarrow (\sim q \rightarrow \sim p)$ is a tautology.
- $p \leftrightarrow q$ is equivalent to $(p \rightarrow q) \wedge (q \rightarrow p)$.

b.

(9)

- Let $f(x) = x^2 + 3x + 1$, $g(x) = 2x - 3$. Find $f \circ f$, $f \circ g$ & $g \circ f$.
- Prove: $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$; $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$

3. a. Let $A = \{1, 2, 3, 4\}$ and $R = \{(1, 1), (1, 3), (2, 2), (2, 4), (3, 1), (3, 3), (4, 2), (4, 4)\}$. (9)

Show R is an Equivalence relation.

b. (a) Let $A = \{1, 2\}$ and $B = \{2, 3\}$. Write down the following sets:

(9)

- $P(A)$; (ii) $P(B)$; (iii) $P(A) \times P(B)$

Section-B

4. a. In how many ways can we select a software development group of 1 project leader, 5 programmers and 6 data entry operators from a group of 5 project leaders, 20 programmers 25 data operators? (9)

b. Devise a formula to obtain the number of diagonals in a polygon of 'n' number of sides. Using that formula find the number of diagonals in a Dodecagon (12 sides). (9)

5. Consider following sets, $E = [-2, 1) \cup (3, 4)$, $F = (-5, -3] \cup [0, 3]$, $G = (0, 8]$, $H = [0, 2) \cup (4, 10]$. Describe the following using either tabular form ($\{\}$) and set builder notation. (18)

- $(E \cap F) \cup (G - F)$
- $(G \cup H) - F$
- $(G - H) \cup (F \cap (E \cup G))$

Section-C

6. Define the following with suitable examples:

(18)

- (i) Rings,
- (ii) Field,
- (iii) Integral Domain,
- (iv) Normal Subgroup
- (v) Homomorphism

7. (a) State and Prove Lagrange's Theorem.

(9)

(b) Define the following with suitable examples:

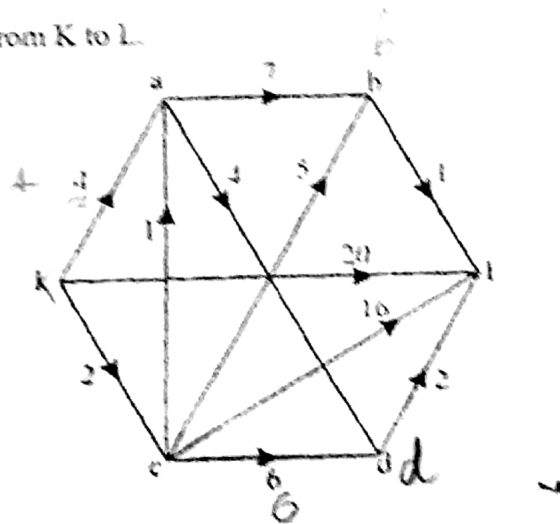
(9)

- (i) Automorphism; (ii) Cyclic Group; (iii) Cosets

Section-D

8. Find the shortest path from K to L.

(18)

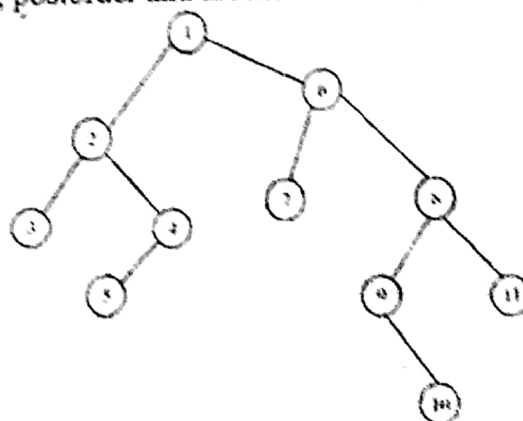


9. (a) Define Hamiltonian path and circuit with a proper example.

(9)

(b) Determine the preorder, postorder and inorder traversal of the binary tree.

(9)



DATA COMMUNICATION AND NETWORKS

Paper Code: CSE-205

Time : 2:30 Hours

Max Marks: 90

Note *: Question No. 1 is compulsory. Attempt remaining four question from all section, selecting atleast one question from each section.

Q1. Attempt all questions:

(6x3=18)

- a) Explain broadcast and point to point communication.
- b) Explain the electronic mail in detail.
- c) What is bit rate and baud rate?

Section-A

- Q2. (a) Write a detail note on Parallel and Serial Transmission. (09)
- (b) What is Network Topologies? Explain Bus and tree topology in detail. (09)
- Q3. (a) Write down the future application of data communication. (09)
- (b) What is Data transmission and differentiate between simplex, half and full duplex with suitable examples. (09)

Section-B

- Q4. (a) What is the role of media in transmission? How optical fiber is beneficial for this? (09)
- (b) What is noise and its types? How noise affect the information signal. (9)
- Q5. (a) Explain the function of modem with its standards (09)
- (b) What do you mean by baseband and broadband transmission? Discuss it briefly. (09)

Section-C

- Q6. (a) Write down about the methods of Data compression. (09)
(b) What do you mean by protocol and how it is important in networking. (09)
- Q7. Explain media access control protocol with its frame format. (18)

Section-D

- Q8. (a) Write a short note (Public Switched telephone Network) PSTN. (09)
(b) Explain packet switching and circuit switching. (09)
- Q9. (a) Explain about ISDN in detail with its neat diagram. (12)
(b) What is the function of router in network? (06)

B.Tech IIIrd Semester Examination, Nov -2017
Information Security and Cyber Laws
 Paper No:-CSE207

Time: 2:30 hours

Max. Marks: 90

Note - Attempt Five question in all selecting at least one question from each section. Question-1 is compulsory.*

Q1. Write Short notes on any two followings: -

2X10

- a. Confidentiality
- b. Data integrity.
- c. Non repudiation.
- d. Access control.

Section-A

Q2. What do you understand by electronic cash? How does a cash based transaction differ from credit based transaction? 18

Q3. a. Discuss the security issues in mobile computing environment. 09

b. Differentiate between private key cryptosystem and public key cryptosystems. 09

Section-B

Q4. a. What is physical security? What are the needs of physical security in an information system? 09

b. What are disasters and controls for an information system? Explain the basic tenets of physical security. 09

Q5. What is electronic data interchange (EDI)? What are the benefits of EDI? How it is help in E-governance? 18

Section-C

Q6. a. What are the basic concepts of network security? Why is security parameter an important concept? 09

b. Explain with suitable examples. What considerations should be made in the design of physical security? 09

Q7. What are firewalls? Why do organizations need firewalls. Explain the different types of firewall with implementation model and configuration. 18

Section-D

Q8. What do you mean by biometric data? What are the criteria used while selecting a biometrics Characteristics to design a biometrics system? 18

Q9. a. What do you understand by intellectual Property right (IPR)? Explain different types of IPR. 09

b. Discuss Ethical and legal issues in software piracy. 09