Code No: **R201208** **R20** **SET - 1**

I B. Tech II Semester Supplementary Examinations, Jan/Feb-2024
DATA STRUCTURES THROUGH C

(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 70

Answer any five Questions one Question from Each Unit
All Questions Carry Equal Marks

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UNIT-I

1. a) Define Data Structure. Explain different types of Data Structures. [7M]
   b) Write a note on Stack data structure. Explain operations of Stack ADT with example each. [7M]

(OR)

2. a) Explain various Asymptotic notations to represent time complexity of an algorithm. [7M]
   b) Describe Queue data structure. Explain Enqueue and Dequeue operations with example each. [7M]

UNIT-II

3. a) What is a Polynomial? Explain various representations of Polynomials in computer memory. [7M]
   b) Explain various operations of Single linked lists. [7M]

(OR)

4. a) Explain advantages and disadvantages of Single linked list over Double linked lists. [7M]
   b) Explain with an example to insert a node at beginning and insert a node at end in a Single linked list. Conclude which operation takes less time to complete. [7M]
   Note: Assume any single linked list that contains 3 nodes to perform operations.

UNIT-III

5. a) Discuss representation of Binary tree using arrays and linked list. [7M]
   b) Construct a Binary search tree with the following elements: [7M]
   140, 80 , 30 , 20 ,10 ,40 ,30 ,60 ,100 ,70 ,160 ,50 , 130, 110, 120

(OR)

6. a) Write in-order, pre-order and post-order traversal of a binary tree. [7M]
   b) Construct min heap for the following: [7M]
   140, 80 , 30 , 20 ,10 ,40 ,30 ,60 ,100 ,70 ,160 ,50 , 130, 110, 120

UNIT-IV

7. a) Write Depth First Traversal algorithm. Explain with an example [7M]
   b) Explain Prim's algorithm with an example. Explain its application. [7M]

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(OR)

8. a) Explain Floyd's algorithm to find transitive closure of a graph with a suitable example. [7M]

   b) Define Graph. Explain following [7M]
   i. Weighted Graph ii. Connected graph iii. Isolated vertex
   iv. Path v. Degree of the graph

UNIT-V

9. a) Explain the Bubble sort algorithm to sort the following elements: [7M]
   12, 25, 5, 9, 1, 84, 63, 7, 15, 4, 3.

   b) Write an algorithm to sort elements using Quick sort with suitable example. [7M]

(OR)

10. a) Discuss how to sort elements using merge sort with suitable example. [7M]

    b) Discuss how to search for an element in an array using Linear search with suitable example. [7M]

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