Code No: R201218 **R20** SET - 1

I B. Tech II Semester Supplementary Examinations, March- 2022

DATA STRUCTURES

(Com. to CSE, IT, CSE-AI&ML, CSE-AI, CSE-DS, CSE-AI&DS, AI&DS)

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) Give an algorithm for Quick Sort and trace the steps for sorting the following list, and derive the time complexity. (7M)
65, 70, 75, 80, 85, 60, 55, 50, 45

b) Illustrate the differences between insertion sort and selection sort with an example. (7M)

Or

2 a) Describe the Radix Sort algorithm and trace the steps for sorting the following list 136, 487, 358, 469, 570, 247, 598, 639, 205, 609 (7M)

b) Illustrate the difference between bubble sort and merge sort with an example. (7M)

UNIT-II

3 a) Write an algorithm to reverse a Single linked list (7M)

b) Explain the implementation of a double-linked list with an example. (7M)

Or

4 a) Outline the applications of Single Linked List and write algorithms to merge two single linked lists into one list. (7M)

b) Explain the procedure to insert elements into circular linked lists. (7M)

UNIT-III

5 a) Explain the working of Circular Queues with an example. (7M)

b) Write the algorithm for the Converting an expression from Infix notion to Postfix notation (7M)

Or

6 a) Explain the implementation of Deqeues with a suitable example. (7M)

b) Describe Infix, Prefix, and Postfix of an expression. Convert the given Infix expression to postfix expression using the stack algorithm and show the stack details at each conversion step. $((A + B)\text{^}C\ - (D * E)/F)$ (7M)

UNIT-IV

7 a) Outline the Binary Search Tree concept and write an algorithm to search an element in the Binary Search Tree. (7M)

b) Define Binary Search Tree and create a Binary Search Tree using following data: 45, 39, 56, 12, 34, 78, 32, 10, 89, 54, 67, 81 (7M)
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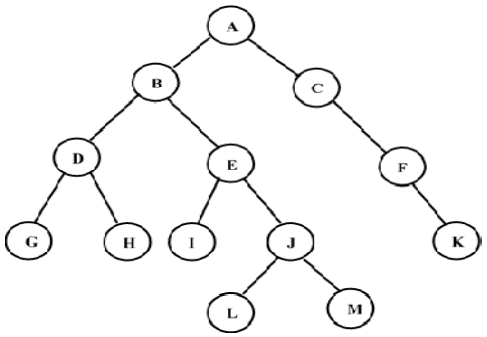
Or

8 a) What is a Binary Heap? Explain the different types of Heaps. (7M)

b) (7M)

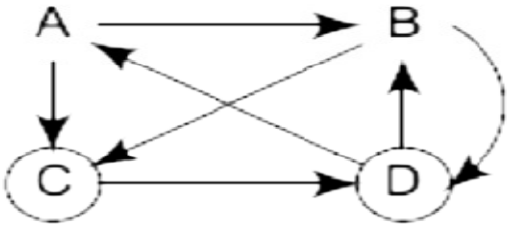


Write down the Inorder, Preorder, and Postorder traversals for the given Tree?

UNIT-V

9 a) What is a Graph? Illustrate the different memory representations with an example. (7M)

b) Identify which data structure is suitable for representing the following diagram and explain which techniques are used to represent memory. (7M)



Or

10 a) Write an algorithm to traverse a Graph using Depth First Search (7M)

b) Define the graph and Consider the graph given below. Create the adjacency matrix for the given graph. (7M)