

Registration No.:

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Total Number of Pages: 02

Course: B.Tech
Sub_Code: RCS3C002

3rd Semester Back Examination: 2025-26

SUBJECT: Data Structure

BRANCH(S): CSE, CSEAIML, CSEDS, CSIT, CST, ELECTRICAL & C.E., IT

Time: 3 Hours

Max Marks: 100

Q.Code: U672

Answer Q1 (Part-I) which is compulsory, any eight from Part-II, and any two from Part-III.
The figures in the right-hand margin indicate marks.

Part-I

Q1 Answer the following questions:

(2 x 10)

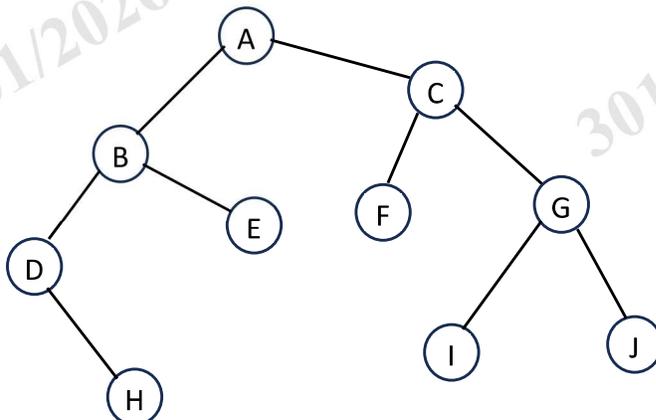
- Convert the following postfix notation into infix notation:
12,7,3, -, /,2,1,5, +, *, +
- What is sparse matrix? How is it represented?
- Write an algorithm to traverse a single linked list.
- Write the syntax for creating a node in a double linked list.
- Define AVL Trees. Give an example.
- Differentiate between a complete binary tree and almost complete binary tree.
- What do you mean by a minimum spanning tree?
- "All trees are graphs but all graphs are not trees". Why? Give an example.
- What are the types of Collision Resolution techniques and the methods used in each type?
- Classify the Hashing Functions based on the various methods by which the key value is found.

Part-II

Q2 Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)

(6 x 8)

- Write a C program for implementing a stack using an array.
- Perform selection sort on the following sequence: 20, 35, 40, 100, 3, 10, 15.
- Write a C program for implementing binary search.
- Write a C program to display a single linked list in reverse order.
- Traverse the given tree using Inorder, Preorder, and Postorder traversals:

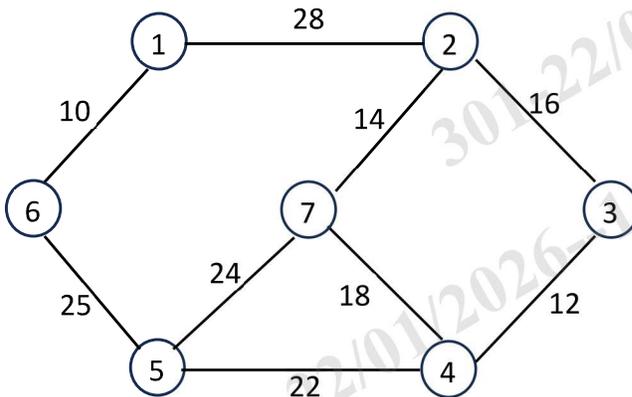


- f) Perform Bubble sort on the following sequence:
65, 70, 75, 80, 85, 60, 55, 50, 45
- g) Write the pseudo-code for inserting an element to the end of an array.
- h) Explain different kinds of graphs with an example from each.
- i) Consider a hash table with size = 11. Using linear probing, insert the keys:
113, 117, 97, 100, 114, 108, 116, 105, 99
- j) Draw the B-Tree of order 3 by inserting the following data:
92, 24, 6, 7, 11, 8, 22, 4, 5, 16, 19, 20, 78
- k) Write a C program to insert a node at the end of a double linked list.
- l) Write a C program to merge two stacks, Stack1 and Stack2 with each stack containing 10 elements each.

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

- Q3** Write a C program to display a 4*4 matrix in the reverse order. (16)
- Q4** Write a C program to add a new node at any position in a circular linked list. (16)
- Q5** Construct the minimum spanning tree from the following graph using Kruskal's algorithm: (16)



- Q6** Apply Breadth First Search algorithm on the following graph: (16)

