

E. Sem - TE - Winter 2025 C-Scheme R-19C(EXTC)

Duration: 3hrs

21/11/25 [Max Marks:80]

- N.B. : (1) Question No 1 is Compulsory.
 (2) Attempt any three questions out of the remaining five.
 (3) All questions carry equal marks.
 (4) Assume suitable data, if required and state it clearly.

1 Attempt FOUR

[20]

- a Define Abstract Data Type (ADT) with examples.
- b Differentiate between Stack and Queue with suitable diagrams.
- c Explain the representation of a trees and its types.
- d Apply Linear search algorithm with the following example. 63, 82, 94, 77, 53, 87, 23, 55, 10, 44. key=44

2 a Write an algorithm/pseudo code for implementing queues using array. [10]

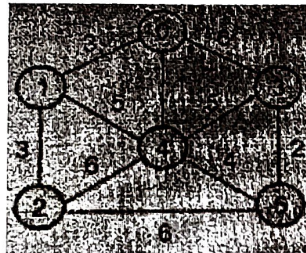
b Construct a Binary Search Tree (BST) from the following elements: [10]
50, 30, 70, 20, 40, 60, 80 and perform in order traversal.

3 a Write the algorithm to traverse a linked list, with below operation in a singly linked list. A) add new node B) Delete a node [10]

b Demonstrate DFS with example. [10]

4 a Apply Huffman Coding on "UNIVERSITY OF MUMBAI". [10]

b Apply Prim's and Kruskal's Algorithm on the following graph: [10]



5 a Convert the following infix expression to postfix and evaluate it: [10]

$A = (3 + 4) * (5 - 2) / (6 - 3)$

Show all intermediate steps.

b Construct a binary tree using the following traversals: [10]

- Inorder: D B E A F C
- Preorder: A B D E C F

Draw the tree and perform post order traversal.

6 a Given the hash function $h(k) = k \text{ mod } 10$, insert the keys [10]
25, 36, 20, 33, 12, 26 using linear probing. Show the final hash table.

b Given the stack operations: PUSH(5), PUSH(8), POP(), PUSH(2), PUSH(9), POP(), POP(). Show the stack contents after each operation and draw the final stack. [10]