(3 Hours) [Marks: 80]

N.B.: 1) Question No. 1 is compulsory.
2) Answer any three out of remaining questions.
3) Assume suitable data if necessary.
4) Figures to the right indicate full marks.

Q1. (a) Define height, depth and degree of Binary Tree with the help of an example (5)

(b) What is recursion? State its advantages and disadvantages. (5)

(c) Convert given infix expression to equivalent postfix expression A+(B*(C-D)/E)) (5)

(d) Explain asymptotic notation. (5)

Q2. (a) What is singly linked list? Write an algorithm to perform following operation of singlylinked list
(a) Insertion Operation (From Beginning and From Specific Position of Linked List)
(b) Deletion Operation (From Beginning and From End of Linked List)
(c) Traversal (10)

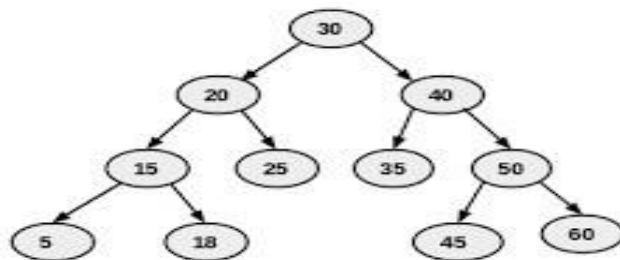Q2.(b) Write an algorithm for implementation of stack using an array.
(10

)Q3.(a) Explain Binary Search Tree. Construct Binary Search Tree from given numbers
45,15,8,56,64,65,47,12,59,10,73,50,16,61 (10)

Q3.(b) Write an algorithm for implementation of queue using an array. (10)

Q4.(a) Write an algorithm for Inorder, Preorder and Postorder traversal of tree data structure.
Find the Inorder, Preorder and Postorder traversal for the given Tree
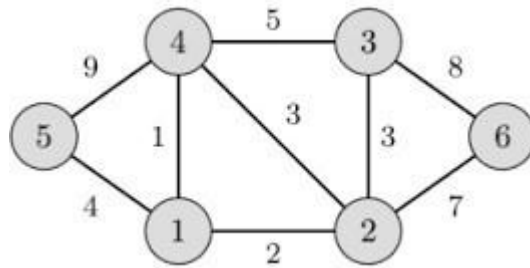

(10)

Q4.(b) Write an algorithm for implementation of merge sort. Comment on its time complexity. (10)

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Q5.(a) What is Collision? What are the methods to resolve collision? Explain LinearProbing with example.

(10)

Q5.(b) What is Minimum Spanning Tree? Draw the MST using Prim's and Kruskal'sAlgorithm. (Find out cost of all intermediate steps)

(10)

Q6. Solve any Four: (20)

a) Doubly Linked List
b) DFS and BFS
c) Quick Sort
d) Double Ended Queue
e) Dijkstra's Algorithm
f) Expression Tree

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