

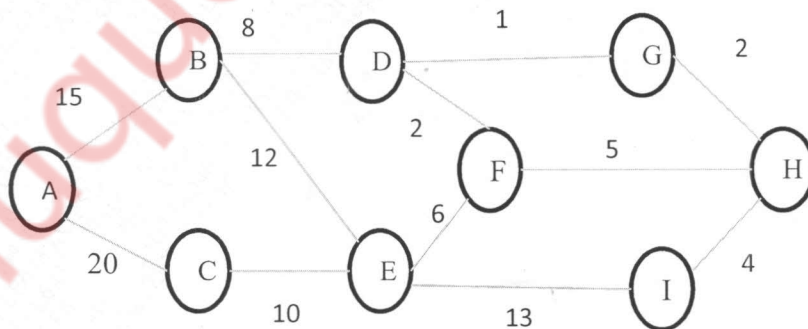


(3 hours)

80 Marks

- N.B
- 1) Question no. 1 is compulsory
 - 2) Attempt any three questions out of remaining questions
 - 3) Assume suitable data if necessary
 - 4) Figure to Right indicates full marks.

- Q.1
- a) What is ADT? Write ADT for Stack. 3
 - b) Explain Asymptotic notations 3
 - c) Explain Complete Binary Tree with example 3
 - d) Define Minimum spanning tree. 3
 - e) Write an algorithm to count the number of nodes in singly linked list. 3
 - f) Write properties of Red-Black tree. 3
 - g) Define algorithm and state its properties 2
- Q.2
- a) Write an algorithm for insertion and deletion from doubly linked list. 10
 - b) Write a program to implement QUEUE as an array. 10
- Q.3
- a) Construct Binary Tree from Inorder and postorder traversal given and write an algorithm to traverse a tree in inorder and postorder traversal. 10
 Inorder: I N F O R M A T I O N
 Postorder: I N O F M A I N O T R
 - b) Write properties of Heap. Also build Max-Heap from given data: 56 , 12, 45, 33, 8, 63, 74, 25, 18, 36 10
- Q.4
- a) What is Binary Search Tree? Construct BST for following data set : 35, 13, 45, 8, 11, 39, 60, 55, 58, 5, 9, 18 10
 - b) Find shortest path from A to H using Dijkjstra's algorithm 10



- Q.5 a) Write an algorithm to implement STACK ADT using linked list. 10
b) Write an algorithm to implement merge sort. Explain it's time complexity. 10
- Q.6 Write short note on (any four) 20
- a) BFS algorithm
 - b) Selection sort
 - c) Circular Queue
 - d) Types of graphs
 - e) Linear and Non-linear data structures

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