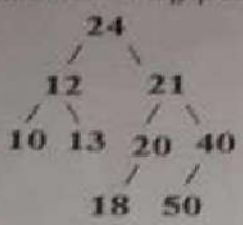
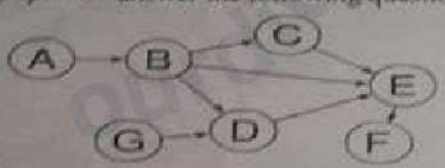
ourdiu.com | Shared by Nahid

# Daffodil International University

**Department of Computer Science and Engineering**
**Faculty of Science & Information Technology**
**Final Examination, Spring-2022**
**Course Code: CSE134 (Day), Course Title: Data Structure**
**Sections, Teachers: All**

**Time: 2:00 Hrs.** **Marks: 40**

## Answer ALL Questions:

| | | | | |
|---|---|---|---|---|
| 1. | a) | For the following binary tree, answer the following questions:<br><br><br>Now, for the above tree, write the order of nodes visited: (i) In-order Traversal, (ii) Pre-order Traversal and (iii) Post-order Traversal. | 3 | CO3 |
| | b) | Construct a Max Heap from the Tree shown and insert nodes 14, and 19. | 2.5 | |
| | c) | Construct a Min Heap from the Tree shown and delete nodes 40, and 10. | 2.5 | |
| | d) | Write the differences between Max Heap and Min Heap | 2 | |
| 2. | a) | Construct a Binary Search Tree (BST) and write properties of it. | 3 | CO3 |
| | b) | Show the BST after adding new nodes with the data value 16, 26. | 2.5 | |
| | c) | Show the BST after deleting the nodes having the data value 21, 24. | 2.5 | |
| | d) | Write, why all the binary trees are not BST. | 2 | |
| 3. | a) | Consider the following graph and answer the following questions:<br><br><br>Now, Determine the sorted sequence of the nodes for the above graph. | 3 | CO4 |
| | b) | Determine the strongly connected components of the above Graph. | 4 | |
| | c) | Conclude the differences between directed graph and undirected graph. | 3 | |
| 4. | a) | For the Graph processing, answer the following questions: | | CO1 |

| | A | B | C | K | E | F | G | Z |
|---|---|---|---|---|---|---|---|---|
| A | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| B | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| C | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| K | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| E | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| F | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| G | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Z | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |

| | | | |
|---|---|---|---|
| | | Use the above adjacency matrix and draw the graph. | 2 |
| | b) | Apply BFS to find the path from A to Z. | 5 |
| | c) | Illustrate your idea about DAG. | 3 |