KERALA UNIVERSITY OF DIGITAL SCIENCES, INNOVATION AND TECHNOLOGY

FINAL EXAMINATION

SCHOOL OF COMPUTER SCIENCE & ENGINEERING

YEAR 2024, JANUARY

COURSE NAME:DATA STRUCTURES AND ALGORITHMS
COURSE CODE:M3020006
COURSE LEVEL: 300

Reg No:	TOTAL DURATION: 3 hours TOTAL MARKS: 100

INSTRUCTIONS TO STUDENTS

1. Attempt all questions.
2. Draw neat diagrams wherever applicable.
3. Mobile phones should be kept out of the room.

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COURSE NAME:DATA STRUCTURES AND ALGORITHMS
COURSE CODE:M3000006

QUESTIONS

Section-A **FOUNDATIONAL KNOWLEDGE ON THE SUBJECT (30%)**

1. Illustrate array and linked list representation of Stack and Queue. (10 marks)
2. Explain quick sort with example. Show the worst case scenario. (10 marks)
3. Demonstrate the process of finding minimal spanning tree with example. (10 marks)

Section-B **CONCEPTUAL UNDERSTANDING ON THE SUBJECT (50%)**

4. A binary search tree is formed by adding100, 80, 90, 200, 85, 70,deleting 80, adding 110, 150, 300, deleting 100 in sequence. Show the final BST. (5 marks)
5. Evaluate time complexity for bubble sort,with example. (5 marks)
6. Compare binary search tree and binary search in an array. (5 marks)
7. Explain why linear data structures are not sufficient, and we need non-linear data structures. (5 marks)
8. Explain BFS and DFS in graph with example. (10 marks)
9. Compare pre-order, in-order, and post-order traversals of a tree with example. (10 marks)
10. Illustrate array representation of a complete binary tree. Demonstrate its use for heap sort. (10 marks)

Section-C **CRITICAL THINKING (20%)**

11. A sorted array is rotated towards left or right. Write an efficient searching algorithm to be applied on the array. (10 marks)
12. Outline an algorithm to determine if two given nodes are connected in a directed graph. (10 marks)

*************END OF EXAM***************