

K. J. Somaiya Institute of Engineering and Information Technology, Sion, Mumbai-
22

(Autonomous College Affiliated to University of Mumbai)

End Semester Exam

Nov – Dec 2021

(B.Tech/M.Tech.) Program: B.Tech *AI DS & COMP*

Examination: SY Semester: III

Course Code: 1UCEC303 and Course Name: Data Structure

1UAIC303

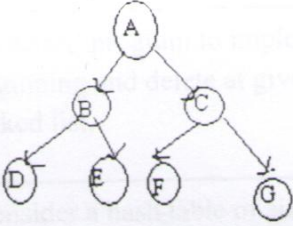
Duration: 03 Hours

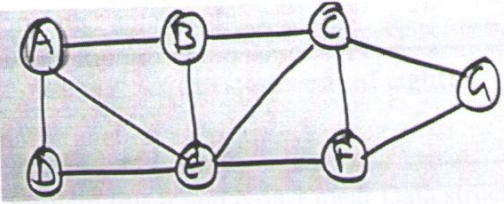
Max. Marks: 60

Instructions:

- (1) All questions are compulsory.
- (2) Draw neat diagrams wherever applicable.
- (3) Assume suitable data, if necessary.

| | | Max. Marks | CO | BT level |
|------|---|------------|-----|----------|
| Q 1 | Solve any six questions out of eight: | 12 | | |
| i) | Explain linear and Non-Linear Data structure with examples. | 2 | CO1 | U |
| ii) | List real-time applications of Queues. | 2 | CO2 | U |
| iii) | Mention the advantages of representing stacks using linked lists than arrays. | 2 | CO3 | U |
| iv) | State the AVL tree. | 2 | CO3 | U |

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|------------|--|-----------|-----|----|
| v) | State the properties of a binary tree. | 2 | CO4 | U |
| vi) | Traverse the given tree using Inorder, Preorder and Postorder traversals.  | 2 | CO4 | Ap |
| vii) | List the two important key points of depth first search. | 2 | CO5 | U |
| viii) | What are the types of collision resolution strategies in open addressing? | 2 | CO6 | U |
| Q.2 | Solve any four questions out of six. | 16 | | |
| i) | Write a program to reverse a string of the stack. | 4 | CO2 | Ap |
| ii) | Write ADT for Queue. | 4 | CO2 | Ap |
| iii) | Write a program to construct a binary search tree. | 4 | CO4 | Ap |
| iv) | Write a Function for BFS traversal of a graph. | 4 | CO5 | Ap |
| v) | Implement function to insert an element at given position function for Doubly Linked List. | 4 | CO3 | Ap |
| vi) | Write a program to implement Hashing. | 4 | CO6 | Ap |

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|------------|--|-----------|-----|----|
| Q.3 | Solve any two questions out of three. | 16 | | |
| i) | Write a C program to implement Queue with Enqueue, Dequeue, peek, display functions. | 8 | CO2 | Ap |
| ii) | Write a C program to implement insert at beginning and delete at given position for singly linked list. | 8 | CO3 | Ap |
| iii) | Consider a hash table of size 10. Using Quadratic probing, insert the keys 72, 27, 36, 24, 63, 81, 92 into the table. Use modulo division hash function. | 8 | CO6 | Ap |
| Q.4 | Solve any two questions out of three. | 16 | | |
| i) | Build an AVL tree with the following values: 15, 20, 24, 10, 13, 7, 30, 36, 25 | 8 | CO4 | Ap |
| ii) | Write a C program to implement Queue ADT using linked list. | 8 | CO2 | Ap |
| iii) |  <p>Give the Depth first Search (DFS) traversal of the above graph showing all the steps.</p> | 8 | CO5 | Ap |