

[4]

- c) Which data structure would you use for DFS Traversal of a graph? What about BFS?
- d) What is an AVL tree? How the insertion and deletion can be performed in the AVL tree?

OR

Describe depth first search or Breadth first search method of traversing a graph.

Total No. of Questions :5]

[Total No. of Printed Pages :4

Roll No

MCA-203

MCA. II Semester

Examination, Decèmber 2016

Data Structure

Time : Three Hours

Maximum Marks : 70

- Note:*
- i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
 - ii) All parts of each question are to be attempted at one place.
 - iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.
 - iv) Except numericals, Derivation, Design and Drawing etc.

Unit - I

1. a) Name a linear data structure that allows insertion and deletion on only one end. Also state its Two uses?
- b) What is the difference between FIFO and LIFO?
- c) Convert infix expression to its equivalent postfix expression.

$$(x + y - z) / (h + k) - z$$

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- d) Write down the logic to implement two stack using one array.

OR

Describe circular queue. Write algorithm to add and delete an item from circular queue.

Unit - II

- 2. a) Which operation works faster with a linked list as compared to an array? Why?
- b) What are the various applications of linked list?
- c) What is doubly linked list? Compare doubly linked list and singly linked list.
- d) Explain write an algorithm to insert node into a linked list.

OR

Given a pointer P to a node in a doubly linked list, write algorithm to insert a node after the node pointed to by P, and to delete the node before the node pointed by P.

Unit - III

- 3. a) In an expression tree, what is evaluated first, the leaf nodes or the internal nodes?
- b) How many null branches are there in a binary tree with 20 nodes?
- c) What are basic trees? Discuss the various relationships that exist between the various nodes of a tree.

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- d) What is meant by traversing a tree? Write a program in C to traverse a Binary tree using preorder traversal.

OR

A binary tree has 9 nodes the inorder and preorder traversals of yield the following sequence of nodes:

Inorder : E A C K F H D B G

Preorder: F A E K C D H G B

Unit - IV

- 4. a) Which sorting algorithm is used for external sorting? Why?
- b) Which internal sorting algorithm would you use in case the input is almost sorted? Why?
- c) What is Hashing? Explain various methods to find hash functions.
- d) Compare the performance of binary search and sequential search.

OR

Write quick sort algorithm for sorting

Unit - V

- 5. a) What do you mean by complete graph?
- b) What is a B-tree? What is the need for B-trees?