



Reg. No. :

Name :

**II Semester M.C.A. Degree (Reg./Sup./Imp.) Examination, July 2015
(2013 and Earlier Admn.)**

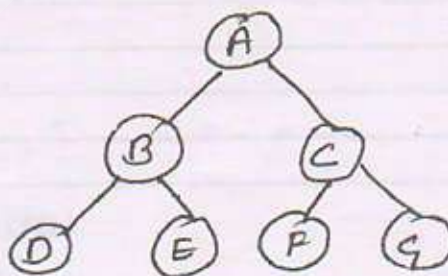
MCAC 2.3 : DATASTRUCTURE AND ALGORITHMS

Time : 3 Hours

Max. Marks : 80

Instructions : 1) Answer any five questions.
2) All questions carry equal marks.

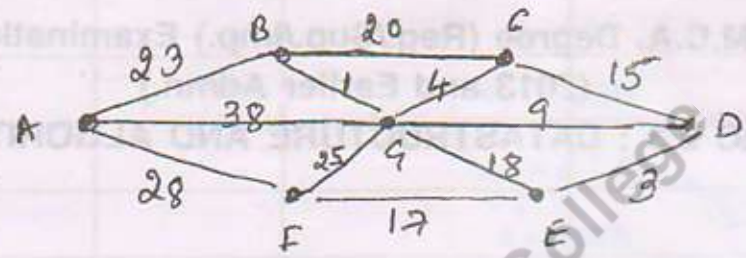
1. a) Explain TOPDOWN and BOTTOMUP approaches for algorithm design. **8**
b) Using Stacks, write an algorithm to determine whether an infix expression has balanced parenthesis or not. **8**
2. a) Write an algorithm to insert a node after a given node in a linear linked list. **8**
b) Using array to implement the queue structure. Write an algorithm/program to
 - i) Insert an element in the Queue. **8**
 - ii) Delete an element from the Queue. **8**
3. a) Explain Dijkstra's algorithm for finding the shortest path in a given graph. **8**
b) Write an algorithm to add an element at the end of circular linked list. **8**
4. a) Write an algorithm for binary search. What are the conditions under which sequential search of a list is preferred over binary search ? **8**
b) What do you understand by tree traversal ? Write a procedure for traversing a binary tree in preorder and execute it on the following tree. **8**





5. a) What is a spanning tree of a graph ? What is minimum spanning tree ?
Execute Kraskal's algorithm to find the minimum spanning tree of the following graph.

8



b) Write an algorithm for bubble sort and also give its complexity.

8

6. a) Sort the following list using Heap Sort:
66, 33, 40, 20, 50, 88, 60, 11, 17, 30, 45, 65.

8

b) What is a hash function ? Describe any three hash functions.

8

7. a) Explain various graph traversal schemes and write their merits and demerits.

8

b) What are B-trees ? Construct a B-tree of order 3 for the following set of input data :

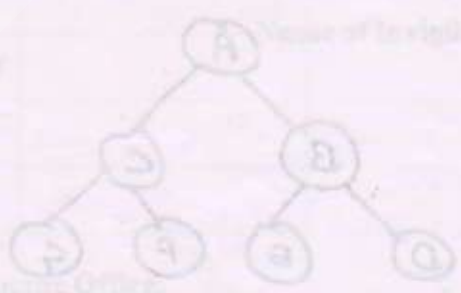
69, 19, 43, 16, 25, 40, 132, 100, 145, 7.

8

8. Write a short notes on :

(4×4=16)

- i) Binary search trees
- ii) Game trees
- iii) Sparse matrix
- iv) Abstract data types.



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Date: 14/07/2015