M 27621

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

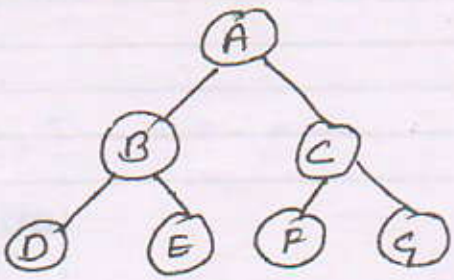
Instructions : *1) Answer **any five** questions.*
*2) **All** questions carry **equal** marks.*

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.
      ii) Delete an element from the Queue. 8

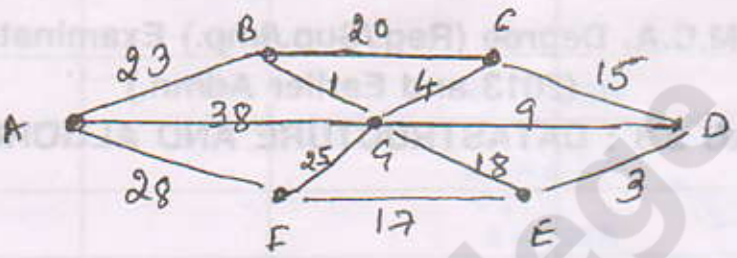
3. a) Explain Dijkstra's algorithm for finding the shortest path in a given graph. 8
   b) Write an algorithm to add an element at the end of circular linked list. 8

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



P.T.O.

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 : 8

66, 33, 40, 20, 50, 88, 60, 11, 17, 30, 45, 65.

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.