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**MCS-021**

# MCA (Revised) / BCA (Revised)

## Term-End Examination

08095

## December, 2016

## MCS-021 : DATA AND FILE STRUCTURES

*Time : 3 hours* *Maximum Marks : 100*

*(Weightage 75%)*

***Note :*** *Question number **1** is **compulsory**. Attempt any **three** questions from the rest. All algorithms should be written nearer to 'C' language.*

**1.** (a) Write an algorithm for multiplication of two matrices. *5*

(b) Find the order of the function 3n + 2. *5*

(c) Write an algorithm to add two polynomials. *10*

(d) Write the recursive algorithm for various tree traversals. Trace your algorithm for the following data of a Binary Tree : *10*

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

(e) What is a red-black tree ? Explain the properties of a red-black tree with an example. *10*

2. (a) Write the algorithms for various operations performed on a circular linked list. *10*

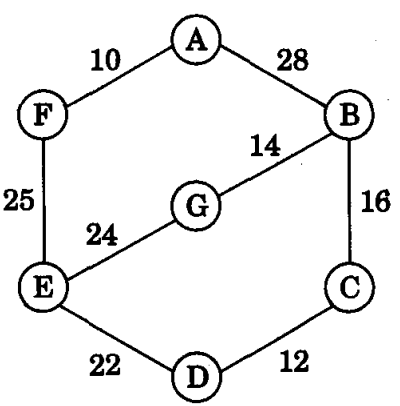
(b) Explain the advantages and disadvantages of a Circularly Linked List over a Singly Linked List. *10*

3. (a) What are the merits and demerits of using pointers over arrays ? Explain. *10*

(b) What are the different operations that can be performed on a stack ? Explain with examples. *10*

4. (a) Explain any two rotations performed on an AVL tree with examples. *10*

(b) What is meant by minimum cost spanning tree ? Apply Kruskal's algorithm to find the minimum cost spanning tree of the following graph : *10*



5. (a) Write an algorithm for quick sort. Trace the algorithm for the following set of data : *10*

25, 0, 8, 78, 6, 34, 56, 90, 100

(b) Compare and contrast linear search and binary search. *10*