No. of Printed Pages : 3

MCS-021

MCA (Revised) / BCA (Revised)

Term-End Examination

December, 2018

09633

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.*

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1. (a) Describe big O notation and Ω notation. *10*

(b) Explain the process of converting a tree into a binary tree. *10*

(c) Write an algorithm to implement stack, using array. *10*

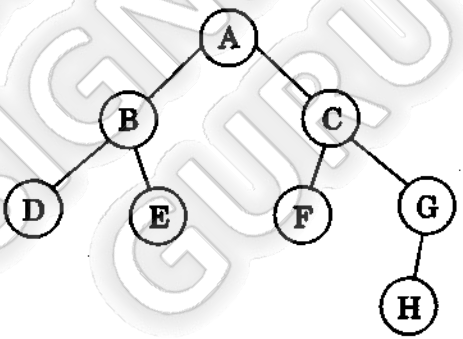
(d) What is linear search ? Write linear search algorithm and find its time complexity. *10*

2. (a) What is sparse matrix ? Explain 3-tuple representation of a sparse matrix with the help of an example. *10*

(b) Explain Indexed Sequential File Organization. *10*

3. (a) Write an algorithm for creation of a *circular queue* and deletion of an element from a *circular queue*. *10*

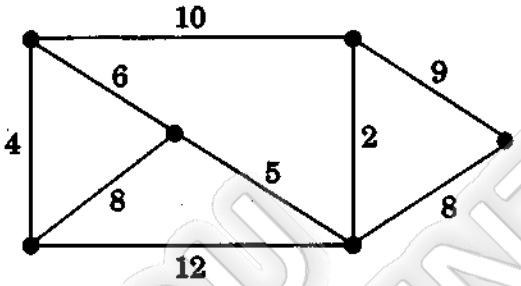
(b) Traverse the following binary tree in Pre-order and Post-order. *10*



4. (a) Explain inserting an element into a heap with the following numbers : *10*

4, 5, 21, 18, 16, 64, 2

(b) Find Minimum Cost Spanning Tree (MCST) of the following graph using Prim's algorithm. Show all the intermediate steps. *10*



5. (a) Sort the following set of data using Insertion sort : *10*

25, 15, 10, 18, 12, 4, 17

(b) Write algorithms for the following : *10*

(i) Inserting element in a doubly linked list

(ii) Deleting element from a doubly linked list