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MCS-021

M.C.A. (REVISED)/B.C.A. (REVISED)

(MCA/BCA)

Term-End Examination

June, 2020

MCS-021 : DATA AND FILE STRUCTURES

Time : 3 Hours *Maximum Marks : 100*

Weightage : 75%

Note : *(i) Question No. 1 is compulsory.*

(ii) Attempt any ***three*** *questions from the rest.*

(iii) All algorithms should be written near to 'C' language.

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1. (a) Write linear/sequential search algorithm and calculate time and space complexity of it. 10

(b) Write an algorithm for linked list to : 10

(i) insert an element after a given element.

(ii) delete an element after searching it in the list.

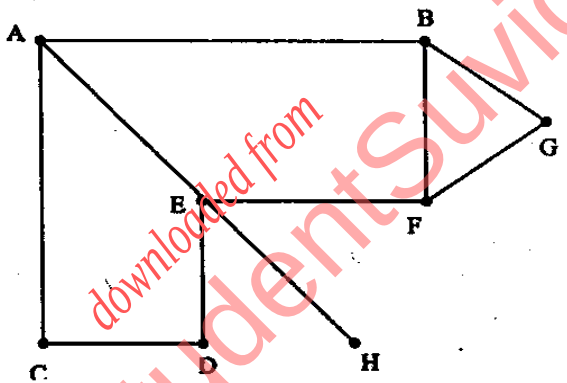
(c) What is splay tree ? How is it different from a tree ? Explain. 10

(d) Explain any *two* rotations performed on an AVL tree with the help of example. 10

2. (a) Write algorithm which take a matrix as input and display 3-tuple representation of the matrix. 10

(b) What is binary tree ? Write non-recursive pre-order binary tree traversal algorithm. 10

3. (a) Write adjacency list and adjacency matrix representation of the following graph : 10



(b) What is the need of file organization ? Explain division-remainder hashing with the help of an example. 10

4. (a) Sort the following list using bubble sort algorithm. Show intermediate steps of sorting : 10

5, 18, 29, 6, 22, 8, 1

(b) Explain Depth First Search (DFS) with the help of algorithm. Also tell the time complexity of DFS. 10

5. (a) What is B-Tree ? Explain the structure of B-Tree. Write B-Tree search algorithm. 10

(b) What is circular queue ? List any *two* applications of circular queue. Write algorithm to delete a given element from a circular queue. 10

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