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Reg. No. | | | | | | | | |

I Semester M.C.A. Degree Examination June/July - 2024

COMPUTER SCIENCE

Data Structures

(CBCS Scheme Y2K20)

Paper : IMCA6

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates :

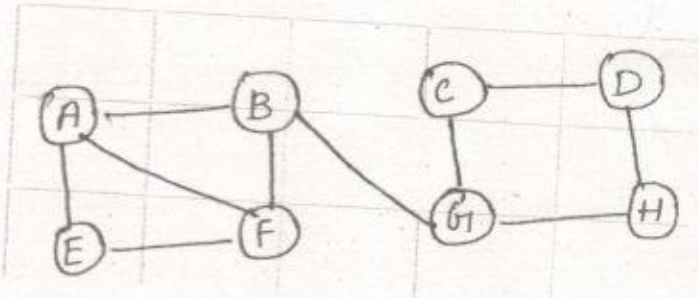
Part A :- Answer any five questions.

Part B :- Answer any four questions.

PART - A

I. Answer any Five questions. Each carries 6 marks. **(5×6=30)**

1. What do you mean by data structures? Explain the different types of data structures.
2. Write short notes on Asymptotic notations for complexity of Algorithms.
3. What is a linked list? Write an algorithm to search an element in a sorted linked list.
4. Convert the following infix expression to a postfix expression using stack.
   $(a+b)/(c-d)*(e+f-g)$.
5. Construct a heap tree for the following data [max heap tree]
   35,33,42,10,14,19,27,44.
6. Perform DFS Traversal for the following Graph.



7. Sort the numbers 12,11,10,6,13,5,4,7,1 using the insertion sort algorithm.
8. What do you mean by hashing? Explain any two hashing techniques.

[P.T.O.

PART - B

II. Answer any four questions. Each carries 10 marks. **(4×10=40)**

9. (a) Explain the concept of Abstract Data Type with a neat and labelled diagram. (5)

   (b) Write a C program to perform concatenation of two strings without using inbuilt string function. (5)

10. (a) What is a two dimensional array? What are the different storage representations of a 2D array? (5)

    (b) What is a header linked list? What are the different types of a header linked list? (5)

11. (a) What is a postfix expression? Evaluate the following postfix expression: 123+*54 - +. (5)

    (b) Write the insertion and deletion operation in a queue. (5)

12. (a) Construct a binary search tree for the following: 45,15,79,90,10,55,12,20,26,32. (5)

    (b) Write Inorder, Preorder, Postorder algorithm for the above BST. (5)

13. (a) Explain the sequential search using an example. (5)

    (b) Perform merge sort algorithm on the following 50,60,10,1,86,90,72,3,12,4. (5)

14. (a) What do you understand by collision? Explain any two collision resolution techniques. (5)

    (b) Perform topological sort on the following graph. (5)