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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.

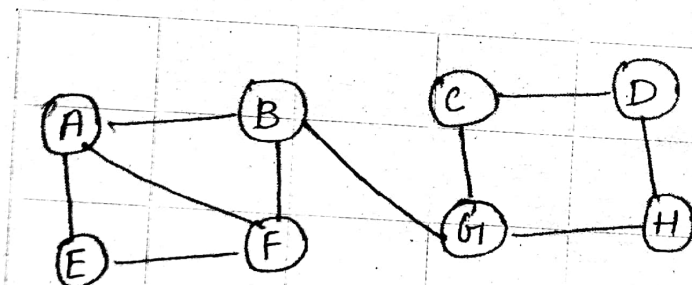
PART - A



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)

