735433

B040210

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

II Semester B.C.A. 6 Degree Examination, August/September - 2024
DATA STRUCTURES USING C
(Regular/Repeater)

Time : 2 Hours **Maximum Marks : 60**

Instructions to Candidates :

1) Attempt all questions according to internal choice.
2) Draw neat diagrams wherever necessary.

Answer any Six questions. **(6×2=12)**

1. a) Define data structures.
   b) List the various operations on data structures.
   c) Write an iterative functions for Linear search.
   d) Define recursion.
   e) Convert the following expression from infix to postfix: a+b*c/d-e.
   f) Mention the applications of queue.
   g) How do you represent a node of a linked list.
   h) What is a complete binary tree?

Answer any Three full questions. **(3×4=12)**

2. a) Explain Primitive and Non-Primitive data structures.
   b) Differentiate between static and dynamic memory allocation.
   c) Write a note on Pointer arithmetic.
   d) Explain malloc ( ) and free ( ) functions with syntax and example.

Answer any Three full questions. **(3×4=12)**

3. a) Write a program to find GCD of two numbers using recursive function.
   b) Sort the following elements using bubble sort method:
      5, 1, 4, 2, 8.
   c) Explain binary search with an example.
   d) Write a program to implement selection sort.

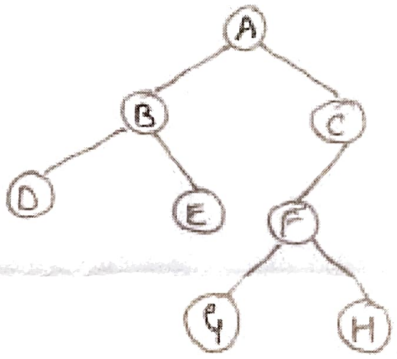
[P.T.O.

Answer any Three full questions. (3×4=12)

4. a) Define the term stack. Explain the primitive operations on a stack.
   b) Explain circular queue and priority queue.
   c) Write a note on evaluation of postfix expression using stack.
   d) Write a program to implement simple queue.

Answer any Three full questions. **(3×4=12)**

5. a) Describe the concept of singly and doubly linked list.
   b) Define the following terminologies:
      i) root node ii) degree of a node iii) level iv) depth
   c) Traverse the following binary tree using preorder, inorder and postorder traversal:



   d) Write a program to create a singly linked list and implement the following operations on it:
      i) Insert a node at the beginning of the list.
      ii) Delete a node at the beginning of a list.