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Total No. of Pages : 02

Total No. of Questions : 07

B.Sc.(IT)   (Sem.–2)
DATA STRUCTURES THROUGH 'C'
Subject Code : BS-108
Paper ID : [B0408]

Time : 3 Hrs.   **Max. Marks : 60**

INSTRUCTION TO CANDIDATES :
1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains SIX questions carrying TEN marks each and a student has to attempt any FOUR questions.**

SECTION-A

1. **Write briefly :**

    a) Define Algorithm

    b) Explain array with an example.

    c) Define time complexity of an algorithm.

    d) Give any two advantages of using linked list.

    e) Explain stack with example.

    f) Convert the infix notation $(A + B)^* (C - D)$ to postfix.

    g) Explain sparse matrix with example.

    h) Explain dequeue with example.

    i) Here is an array of ten integers : 5 3 8 9 1 7 0 2 6 4

        Suppose we partition this array using Quicksort's partition function and using 5 for the pivot. Draw the resulting array after the partition finishes.

    j) Explain circular queue in brief.

SECTION-B

2. a) Compare and contrast array and linked list.

   b) Write a C program to insert a node '*t*' before a node pointed to by X in a single linked list L.

3. a) Discuss various applications of stacks.

   b) Discuss any two operations on queues with an example of each.

4. a) Discuss important properties of binary tree.

   b) Write a program in C for comparison of two strings.

5. a) Construct a binary tree from a given preorder and inorder sequence :

   Preorder : A B D G C E H I F

   Inorder : D G B A H E I C F

   b) Discuss any five operations which can be performed on strings.

6. a) Compare and contrast binary search and linear search with example.

   b) Sort the sequence 3, 1, 4, 5, 9, 2, 6, 5 using insertion sort.

7. a) Write a program for addition of two sparse matrix in C.

   b) Explain Quick sort with example.