S.No. : 549 BCS 2403

No. of Printed Pages : 04

Following Paper ID and Roll No. to be filled in your Answer Book.

PAPER ID : 23209 Roll No.

B. Tech. Examination 2021-22

(Even Semester)

DATA STRUCTURE USING 'C'

Time : Three Hours] *[Maximum Marks : 60*

Note :– Attempt all questions.

SECTION–A

1. Attempt all parts of the following : 8×1=8

   (a) How can you represent a sparse matrix in memory?

   (b) Give some applications of stack.

   (c) Explain tail recursion.

   (d) Define full binary tree.

   (e) What is spanning tree?

[P. T. O.

(f) Write overflow conditions for circular queue.

(g) Define data structure and its types.

(h) Define hashing.

SECTION – B

2. Attempt any two parts of the following : $2 \times 6 = 12$

(a) Explain various data structure operations with example.

(b) Write an algorithm for the conversion of infix to postfix expression using suitable example.

(c) What is tower of Hanoi problem? Draw recursion tree for three disks.

(d) Write an algorithm for the insertion of an element in the linked representation of queue.

SECTION – C

Note :– Attempt all questions. Attempt any two parts from each questions. $5 \times 8 = 40$

3. (a) Write C function for push and pop operations of stack.

(b) Write an algorithm for the traversal of singly linked list.

(c) Write a program in C for the insertion of an element in the beginning of the array.

4. (a) What are the disadvantages of simple queue over circular queue? Write an algorithm for the deletion of an element in the circular queue.

(b) Write algorithm for the deletion of an element in the binary search tree.

(c) Explain abstract data type with example.

5. (a) Write a program in C for the implementation of bubble sort.

(b) Write an algorithm for the addition of two polynomial equations using linked list.

(c) Define AVL tree. Explain all the rotations used in AVL tree wtih example.

6. (a) Explain Dijkstra's algorithm with suitable example.

(b) Construct a binary tree for the following preorder and inorder traversals :

Preorder : A B D I E H J C F K L G M

Inorder : D I B H J E A F L K C G M

(c) Explain depth first search algorithm with suitable example.

⌘⌘⌘