Roll No. _____

24032

B. Tech. 3rd Semester (CS & IT) Examination – February, 2022

DATA STRUCTURE USING 'C'

Paper : CSE-201-F

Time : Three hours] *[Maximum Marks : 100*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting ***one*** question from each Section. Question No. **1** is ***compulsory***.

1. Write short note on : $2 \times 10 = 20$

(a) Why do we need data structures ?

(b) Which operation on stack gives value of top item without removing it.

(c) Explain Big 'O' notation used in algorithms.

(d) What are the applications of Priority queues ?

(e) What are the advantages of linked lists over arrays ?

(f) Why do we need pointers in data structures ?

(g) Explain different types of binary tree.

(h) How graphs are represented in memory ?

(i) What is the use of AVL tree ?

(j) Write applications of sets.

SECTION – A

2. (a) Convert the given infix expression into postfix expression using Stacks (a+b*c^d)*(e+f/g). 10

   (b) How 2D arrays are stored in memory ? Explain row-major representation of an array. 10

3. (a) What is circular queue ? Discuss its advantages over linear queue. 10

   (b) What do you mean by searching ? Write an algorithm for Binary search. 10

SECTION – B

4. Write an algorithm to insert a new node at the end of the singly linked list. 20

5. Why doubly linked list is better than linked list ? Justify your answer by taking suitable example. 20

SECTION – C

6. (a) What are tree traversal techniques ? Explain each with an example. 10

   (b) What is threaded binary tree ? Explain types of threaded binary tree by taking suitable examples. 10

7. What is graph ? Explain Breadth First Traversal and Depth First Traversal with the help of suitable examples. 20

SECTION – D

8. (a) State the need of file organization. 5

   (b) Discuss different types of file organization in C by taking suitable example. 15

9. Write short note on the following : 20

   (a) Skip lists

   (b) List representation of sets
