(220-CU-211641/C14) Roll No. .....

PAPER ID—10709

B. Tech. (CSE/AI/IOT/CS all Computer)

EXAMINATION, 2023

(Second Semester)

DATA STRUCTURE USING C

Time : 3 *Hours* *Maximum Marks* : 70

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

Note : Attempt any *Five* questions. Q. No. 1 is compulsory. All questions carry equal marks.

1. (a) Explain the process of declaring and initializing pointers. Give an example.
   (b) Explain about free( ) and realloc( ) allocation functions with an example.
   (c) Define time-space tradeoff.

(d) How are data structures classified ?

(e) How to design and develop an Algorithm ?

(f) Discuss different file related operations in C.

(g) Discuss the advantages and disadvantages of Linear and Binary search. 2×7=14

2. (a) Simulate the Merge Sort using sorting algorithm and show the step by step of the given values :
23, 11, 37, 28, 15, 19, 55, 9.

(b) Write a C program to illustrate the multiplication of two sparse matrices. 14

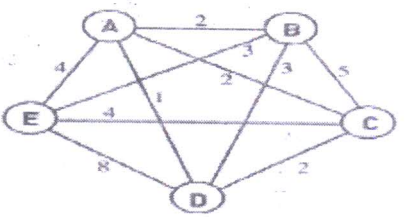
3. (a) Write a C Program to illustrate a polynomial addition using linked list.

(b) Why is doubly linked list better than linked list ? Justify it with a suitable example. 14

4. (a) Give the pre & postfix form of the expression (a + ((b*(c-e))/f).

(b) Define a heap. How can it be used to represent a priority queue ? 14

5. (a) Describe Prim's Algorithm and find the cost of minimum spanning tree using Prim's Algorithm.



(b) What are the different ways of representing a Binary Tree ? 14

6. (a) Differentiate between Breadth First Search and Depth First Search with an example.

(b) If the inorder of the binary tree is B,I,D,A,C,G,E,H,F and its post order is I,D,B,G,C,H,F,E,A then draw its corresponding binary tree with neat and clear steps from the above assumption. 14

7. (a) How is the stack implemented by linked list ?

(b) Explain circular queue and its implementation. 14