

PAPER II—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.

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- (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. $2 \times 7 = 14$

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.

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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.

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

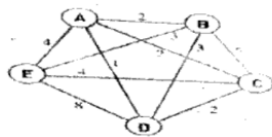
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- (b) Define a heap. How can it be used to represent a priority queue ?

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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 ?

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6. (a) Differentiate between Breadth First Search and Depth First Search with an example. <https://www.haryanapapers.com>
- (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.

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

- (b) Explain circular queue and its implementation.

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