

6230

BOARD DIPLOMA EXAMINATION, (C-16)  
OCTOBER/NOVEMBER—2023  
DCME - THIRD SEMESTER EXAMINATION  
DATA STRUCTURES THROUGH C

Time : 3 Hours ]

[ Total Marks : 80

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PART—A

3×10=30

- Instructions :** (1) Answer **all** questions.  
(2) Each question carries **three** marks.  
(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. Define and classify data structures.
2. What is abstract data type? Give examples for ADT.
3. Write three comparisons between arrays and linked list.
4. What is the need of dummy head node?
5. Define queue and list any two operations of queue.
6. What is postfix expression? Give an example.
7. Write the importance of Binary tree over general tree.
8. List any three applications of trees.
9. What is sorting? What is the need of sorting?
10. Write the worst case and best case time complexity of linear search and binary search.

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**PART—B**

10×5=50

- Instructions :** (1) Answer *any five* questions.  
(2) Each question carries **ten** marks.  
(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

- 11.** Write a C program to implement stack data structure using arrays. 10
- 12.** (a) Explain about how insertion operation is performed in doubly linked list. 5  
(b) Write a C program to search and replace an element in singly linked list. 5
- 13.** Write a C program to implement queue using arrays. 10
- 14.** (a) Write a C program to perform deletion operation at specified node in doubly linked list. 5  
(b) Explain about how to represent a node of singly circular linked list using C structure. 5
- 15.** Construct a binary tree for the given inorder and postorder traversals 10  
Inorder : D G B A H E I C F  
Postorder : G D B H I E F C A
- 16.** Write a C program to find a given element in binary tree. 10
- \* **17.** Write a C program to implement merge sort on two sorted lists. 10
- 18.** (a) Write an algorithm for linear search and derive its complexity. 5  
(b) Write an algorithm for insertion sort. 5

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