C16-CM-304/ IT– **304**

6230

BOARD DIPLOMA EXAMINATION, (C-16)

MARCH/ APRI L— 2021

DCME - THIRD SEMESTER EXAMINATION

DATA STRUCTURES THROUGH C

Time : 3 hours] [*Total Marks* : 80

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. List the differences between data type and abstract data type.

2. What are time and space complexities of an algorithm?

3. List the drawbacks of arrays and how those are eliminated in linked lists.

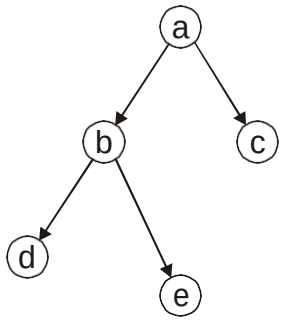
4. List the different types of linked lists along with their structures.

5. List the applications of stacks in computer science.

6. Evaluate the following postfix expression ab+ c* if a = 2, b = 3 and c = 2.

7. Define binary tree. List any three operations that are performed on binary trees.

8. Write the three traversals for the following tree.



9. List the sorting methods which use divide and conquer technique.

10. What is searching? List different searching methods along with their time complexities.

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 an algorithm to perform insertion and deletion of elements in a doubly linked list.

12. Write a C program to implement stacks using arrays.

13. Write a C program to implement priority queues.

14. Convert a * (b + c) – d to postfix notation.

15. Explain how to convert a general tree to binary tree with an example.

16. Write an algorithm to delete the given element from binary tree.

17. Explain C program to sort the given elements using merge sort.

18. *(a)* Write an algorithm for bubble sort.

(b) Write a C program to search for the given element in the list using linear search.