C16–CM–304/C16–IT–304

6230

BOARD DIPLOMA EXAMINATION, (C–16)

MARCH/APRIL—2018

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. Define data structure and classify them.

2. Define abstract data type.

3. What is a singly-circular linked list?

4. Evaluate the given postfix expression 842/+9+.

5. What is a priority queue?

6. List the applications of stack.

7. Define the following :

(a) Root

(b) Depth of tree

(c) Degree of node

8. List the applications of trees.

9. What is sorting? State the need of sorting.

10. Compare between linear and binary search techniques.

PART—B   10×5=50

Instructions : (1) Answer *any* **five** questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. Explain how to insert and delete elements in a singly-linked list.

12. Explain how to convert an infix expression to postfix form with an example.

13. Write a C program for insertion and deletion operations in a queue.

14. Explain in detail about operations in a doubly-linked list.

15. (a) Explain how to convert a general tree into binary tree with an example.   5

(b) Explain an algorithm to create a binary tree.   5

16. Explain the linear representation and linked list representation of a binary tree.

17. *(a)* Write a C program to implement merge sort on two sorted lists.   5

     (b) Write an algorithm for linear search.   5

18. Write an algorithm for bubble sort and derive its time complexity.

★ ★ ★