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C14–CM–305/C14–IT–305

4235

BOARD DIPLOMA EXAMINATION, (C–14)

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 structures and classify them.

2. Define time complexity and space complexity.

3. Write the syntax of single-linked list node creation.

4. Write any three differences between double-linked list and single-linked list.

5. Define stack and list the operations that can be performed on stack.

6. List any three applications of queues.

7. Define a binary tree and give an example.

8. List the applications of trees.

9. Define sorting and list any two sorting methods.

10. Differentiate between linear search and binary search.

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. Write a C program to create singly linked circular list.

12. Explain how to insert and delete an element in a doubly linked list.

13. Explain how to convert the given infix expression to postfix expression ((*a* *b*) *c*) / *d*.

14. Write a C program to implement operations on queue using arrays.

15. Construct a binary tree for the given pre-order {7, 10, 4, 3, 1, 2, 8, 11} and in-order {4, 10, 3, 1, 7, 11, 8, 2}.

16. What is a tree traversal? Explain various ways of tree traversal techniques with an example. 1+3+3+3=10

17. Write the algorithm for quick-sort and explain with an example.

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

(b) Write a C program for linear search.

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