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C09–CM–305/C09–IT–**305**

3231

BOARD DIPLOMA EXAMINATION, (C–09)

OCT/NOV—2017

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.

2. Define *(a)* time complexity and *(b)* space complexity.

3. Write the purpose of a dummy header.

4. Write how the push operation is performed in a stack.

5. List the applications of queues.

6. Define a sparse matrix.

7. List the operations that can be performed on a binary tree.

8. What are the applications of tree?

9. What is sorting? Why is it needed?

10. Write the differences 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. *(a)* Write how to search elements in a singly linked list.

(b) Write how to reverse elements in a singly linked list.

12. Explain how insertions and deletions are performed on a doubly linked list.

13. Write the procedure for conversion of an infix expression to postfix expression and explain with an example.

14. Write a program for implementing a queue using arrays.

15. Explain how to construct a tree for the given in-order and post-order traversal output :

In-order : H D I B J E A F K C L G M

Post-order : H I D J E B K F L M G C A

16. Explain the procedure for converting a general tree into equivalent binary tree with an example.

17. Write the algorithm and program for insertion sort.

18. *(a)* Write about the selection sort.

(b) Write the algorithm for binary search.

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