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C09–CM–**305**

3231

BOARD DIPLOMA EXAMINATION, (C–09)

MARCH/APRIL—2014

DCM—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 time and space complexities.

3. Define stack. List the operations of stack.

4. State the purpose of dummy header.

5. Define priority queue.

6. What is meant by sparse matrix? Give an example.

7. Define *(a)* root, *(b)* depth and *(c)* sib.

8. List the applications of tress.

9. What is the time complexities of various sorting algorithms?

10. Define searching. List some searching 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 the insertion and deletion operations of a single-linked list.

12. Write an algorithm to reverse a single-linked list.

13. Write an algorithm to push and pop operation of stack.

14. *(a)* Convert the following infix expression to postfix expression :

$$A \quad B \quad C / D \quad E$$

(b) Evaluate the postfix operation which is formed for the above infix expression for A 5, B 4, C 3, D 6, E 2.

15. Construct a tree for the given inorder and perorder

Inorder : *D B E A F C G*

Preorder : *A B D E C F G*

16. Write a C program to create and display a binary tree.

17. *(a)* Write an algorithm to perform insertion sort. 5

(b) Explain the procedure of merge sort. 5

18. *(a)* Write a C program to implement linear search. 5

(b) What is sorting? Explain the need of sorting. 5

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