



C09-CM-305/C09-IT-305

**3231**

**BOARD DIPLOMA EXAMINATION, (C-09)**  
**MARCH/APRIL—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) Answer should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Define non-linear data structure and give an example.
2. What is an abstract data type?
3. Write how a singly linked list is different from a singly circular linked list.
4. List the applications of the stack data structure.
5. What do you mean by a circular queue?
6. Define a sparse matrix.
7. Define (a) root, (b) leaf and (c) sub-tree.
8. List the applications of tree.
9. Write the time complexities for (a) selection sort, (b) insertion sort and (c) bubble sort.
10. Write why the searching has importance in computer science.

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**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 and display a singly linked list.
- 12.** (a) Write how a node is inserted in a doubly linked list.  
(b) Write how a node is deleted from a doubly linked list.
- 13.** Explain the algorithm for evaluating a postfix expression with an example.
- 14.** Write a C program for implementing queue operations using arrays.
- 15.** Explain how to construct a tree for the given in-order and pre-order traversal outputs :
- In-order : D G B A H E I C F  
Pre-order : A B D G C E H I F
- 16.** Explain the operations on a binary tree with example.
- 17.** Explain the method of quick sort with an example.
- 18.** (a) Write a pseudocode for bubble sort.  
(b) Explain the method of binary search with an example.

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