



C14-CM-305/C14-IT-305

4235

BOARD DIPLOMA EXAMINATION, (C-14)
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. What are the non-linear data structures? Give examples.
2. Define time and space complexities.
3. Write the C code for representing the node of singly linked list.
4. Define and draw doubly circular linked list.
5. Write any three applications of stacks.
6. What is a circular queue? Give an examples.

- * 7. Define the following terms :
- (a) Leaf
 - (b) Node
 - (c) Root
8. Define and draw a complete binary tree.
9. List out any three sorting techniques.
10. What is searching? List any two 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. (a) What are the differences between singly linked list and doubly linked list? 3
 (b) Write a C program to create and display singly linked list. 7
12. Define doubly linked list. Explain the operations of doubly linked list with diagrams.
13. Explain the process of converting expressions from infix to postfix using stack.

- * 14. (a) Explain the circular queues with examples. 7
 (b) Write a short note on priority queues. 3

15. Explain various representations of binary trees with example.

- * **16.** (a) Construct a binary tree for the given in-order and pre-order : 6
- In order : D B E A F C G
- Pre-order : A B D E C F G
- (b) Define the following terms of trees : 4
- (i) Height
- (ii) Degree
- 17.** (a) Write a C program for implementing bubble sort. 5
- (b) Show the step procedure to sort the following elements using bubble sort : 5
- 10, 3, 20, 5, 8
- 18.** (a) Write an algorithm for binary search. Apply binary search to find 68 from the list of elements 12, 34, 38, 45, 48, 56, 58, 68, 98, clearly show all the passes till the search is successful. 6
- (b) Explain the procedure of insertion sort. 4
