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C16–CM–304/C16–IT–**304**

6230

BOARD DIPLOMA EXAMINATION, (C–16)

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 non-linear data structure and give an example.

2. Define time and space complexity.

3. List the advantages of singly-circular linked list over singly-linked list.

4. Write how PUSH operation is performed in a stack.

5. List any two advantages and disadvantages of a linked list.

6. How the overflow and underflow error situations occur in a stack?

7. Define the following terms :

(a) Tree

(b) Binary tree

(c) Complete binary tree

8. List any three applications of trees.

9. Write how the merge sort works.

10. Write any two 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)* Explain in detail about priority queue. 5

(b) Write an algorithm to create a doubly-circular linked list. 5

12. Explain how to search and replace an elements in a singly-linked list.

13. Write a C program to implement queue using array representation.

14. Explain how to insert and delete elements in a doubly-linked list.

15. *(a)* Explain the representation of binary tree using arrays. 5

(b) Explain how to construct a binary tree for given in-order and pre-order traversals : 5

In-order : Z A Q P Y X C B

Pre-order : Q A Z Y P C X B

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

17. *(a)* Explain the working of quick sort with example and write the algorithm. 5

(b) Write an algorithm for binary search. 5

18. Write a C program to implement insertion sort.

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