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C16–CM–304/C16–IT–**304**

6230

BOARD DIPLOMA EXAMINATION, (C–16)

OCT/NOV—2018

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.

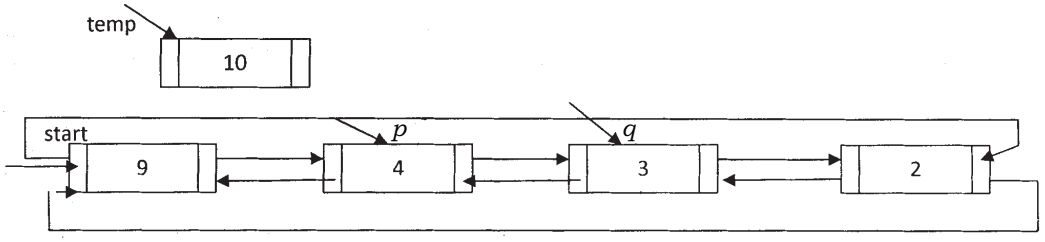
1. What are primitive and non-primitive data structures?

2. Find the time complexity of linear search algorithm.

3. List the differences between arrays and linked lists.

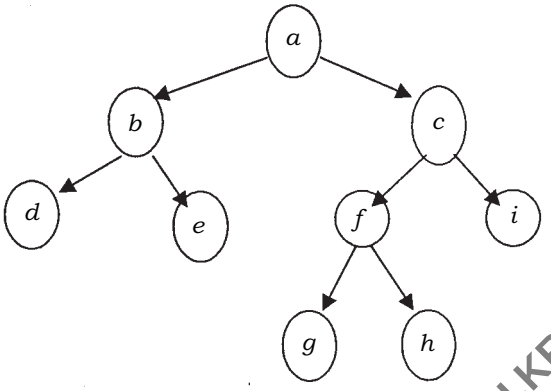
4. What is linked list?

5. Write down the necessary statements required to insert 'temp node' between the nodes *p* and *q* :



6. What is queue? List the applications of queues.

7. For the following tree, identify height of the tree, root node and leaf nodes :



8. What is tree traversal? List the different traversal techniques of a binary tree.

9. What is sorting? List different methods of sorting.

10. Specify the best suitable search technique when the list contains large number of elements in sorted order along with reason.

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. Write a C program to implement queue using linked list.

13. Write a C program to convert given infix expression to postfix notation.

14. Write an algorithm that will reverse the given doubly-linked list.

15. Write an algorithm to find given element in the binary tree.

16. Construct a binary tree with given tree traversals :

In-order traversal : 1, 2, 3, 4, 5, 6, 7
Post-order traversal : 1, 3, 2, 5, 7, 6, 4

17. Write a C program to merge two sorted arrays into a single sorted array.

18. *(a)* Write an algorithm for insertion sort.

(b) Compare linear search with binary search.

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