

23/3/17



**DOON UNIVERSITY, DEHRADUN**

**Mid Semester Examination, 2016-17**

**School of Physical Sciences**

**Integrated M.Sc. (Semester II)**

**Course: CSG – 151 Data Structures using C**

*Time Allowed: 2Hours*

*Maximum Marks: 30*

**SECTION A**

**Attempt any 6 of the following**

**(6×1=6 Marks)**

1. What is a circular linked list?
2. Define a complete binary tree.
3. What is the basic principle of a stack?
4. Define the node of a linked list with integer data using C language.
5. Write 2 computer based applications of queues.
6. What is the problem with BST?
7. Write the syntax of dynamic memory allocation for integers in C language.

**SECTION B**

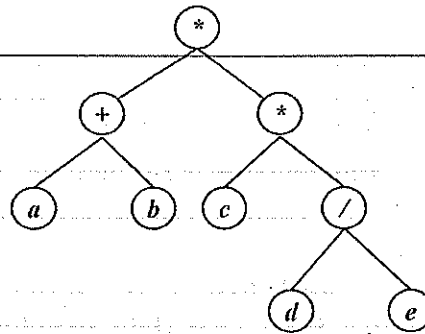
**Attempt any 4 questions**

**(4×3=12 Marks)**

8. Define the node of a binary tree with integer data. How is this node different from a node of a doubly linked list?
9. Write the function to traverse a linked list. The traversal operation will simply count the number of nodes.
10. Write the function to insert an element to a queue. How is the overflow condition handled?
11. Write down the steps to create a binary tree and a binary search tree for following data:

12    7    16    3    8    11    19    2

12. What is the inorder and preorder sequence of following expression tree?



### SECTION C

Attempt any 2 questions

(2×6=12 Marks)

13. Write down a recursive function. Explain how stack data structure is used to execute this function.
14. Explain how queue may be implemented by using stack data structure. Write down the procedure/algorithm to explain the steps.
15. Write down *push()* and *pop()* functions to implement a stack of fixed size. The stack can be implemented with the help of a static array.

(End of the Paper)