

**TRIBHUVAN UNIVERSITY**  
2081 (New/Old Course)

**Bachelor / Education / 3rd Semester**  
ICT.Ed.435 Data Structures and Algorithms

**Full Marks: 40**  
**Time: 3 hrs.**

*Candidates are required to give answers in their own words as far as practicable. The figures in the margin indicate full marks.*

**Attempt all questions**

**Group "B"**

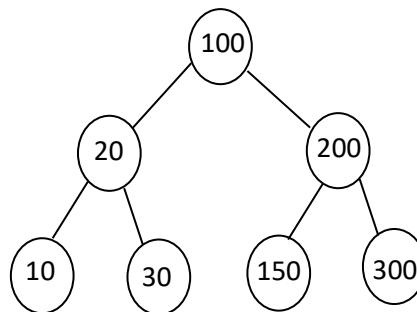
**6 x 5 marks = 30**

1. Define algorithm and list its types. Explain Big O notation.
2. Write recursive function that calculates value of  $a^b$ ; where a is base and b is power.
3. List the advantages of linked list over array list. Write program to display data stored in linked list.

OR

Define stack as an ADT? Write program to illustrate push and pop operation.

4. Why do we need hashing? Discuss any two collision resolution techniques.
5. Explain tree traversal and list its types. Find the pre-order and post-order traversal of the following binary tree elements:



OR

Construct AVL tree for the following data: 21, 26, 30, 9, 4, 14, 28, 18, 15, 10, 2, 3, 7.

6. Define circular queue. Write program to implement circular queue.