

**Tribhuvan University**  
**Institute of Science and Technology**  
**2071**

Bachelor Level / third-semester / Science

**Computer Science and Information Technology(CSC206)**

(Data Structures and Algorithms)

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Full marks: 60

Pass marks: 24

Time: 3 hours

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**Section (A)**

**Attempt any two questions:(8x5=40)**

1. What is stack? How is it different from queue? Write a program to implement all stack operations.
2. What is linked list? Explain the process of inserting and removing nodes from a linked list.
3. What is graph traversal? Discuss depth-first traversal technique with suitable example.

**Section (B)**

**Attempt any eight questions:(8x5=40)**

4. Discuss array as an ADT.
5. Transform the postfix expression  $AB - C + DEF - + \$$  to infix.
6. What is recursion? Write a recursive program to find factorial of a number.
7. Explain almost complete binary tree with example.
8. Write a program to sort an array using selection sort.
9. Discuss binary search technique along with its efficiency.
10. Why do we need Hashing? Discuss linear probing in detail.
11. How to find complexity of algorithms? Explain.
12. Hand test the insertion sort algorithm with following array of numbers.  
  
16 7 31 2 9 41 -10
13. Write short notes on:
  - a. Tree traversal
  - b. Circular queue