

**Advanced Diploma in Information Technology (ADIT) /
Bachelor in Information Technology (BIT)**

Term-End Examination

December, 2007

CST-103 : DATA STRUCTURES AND ALGORITHMS

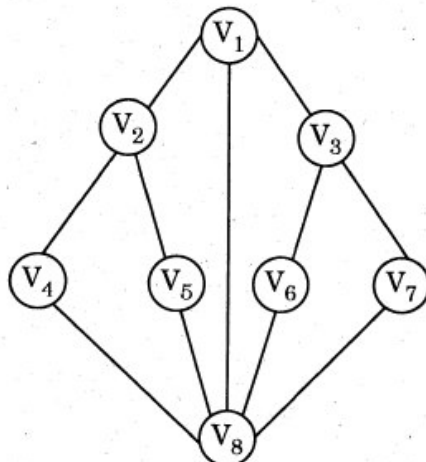
Time : 2 Hours

Maximum Marks : 50

Note : *There are two sections in this paper. All questions in Section A are **compulsory**. Answer any **two** questions from Section B.*

SECTION A

1. State *true/false* for the following statements : 5
- (i) Any linked list has First-In-First-Out (FIFO) property.
 - (ii) For any input pattern, Bubble Sort is the best sorting technique.
 - (iii) No node of a tree had more than two children.
 - (iv) Every Binary Tree is an AVL tree.
 - (v) Every graph is an Undirected Graph.
2. Traverse the graph given below by using DFS and BFS technique. 8



3. (a) Write algorithm of Bubble Sort. Use Bubble Sort to sort a list of 5 elements given below :

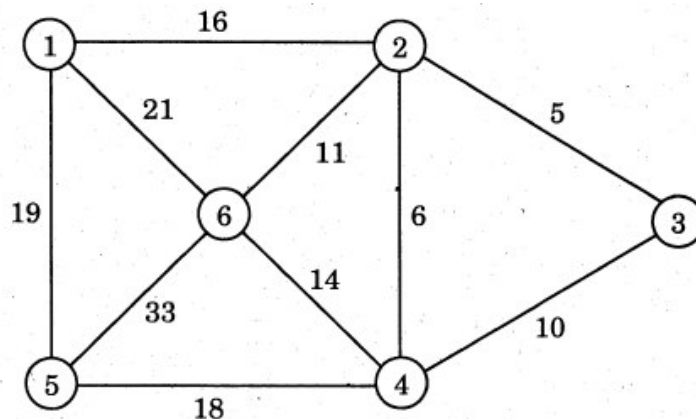
4 1 3 5 2

- (b) Write any two features of a Doubly Linked List. Also, write a program in 'C' language that accepts five integers as input and prints a Doubly Linked List with them.

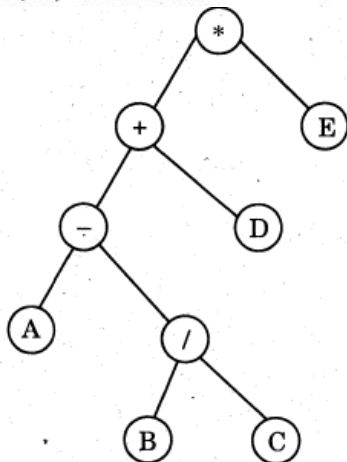
SECTION B

Attempt any **two** questions from this section.

4. (a) What is a Binary Search Tree ? Build a Binary Search Tree for the following list of elements : 7
 5, 9, 3, 15, 2, 25, 6, 500
- (b) Write an algorithm for the implementation of *Insert* and *Delete* operations on a queue. 5
5. (a) Draw the minimum cost spanning tree for the following graph. Also, indicate the minimum cost. 6



- (b) Traverse the tree given below in : 6
- (i) In-order
- (ii) Pre-order
- (iii) Post-order



6. (a) How are B-trees different from B⁺ trees ? Create a B-tree of degree 4 for the data given below : 7
- 1, 5, 6, 2, 8, 11, 13, 18, 20, 7, 9
- (b) Write an algorithm for the insertion of a node into a Binary tree. 5