

(3 Hours)

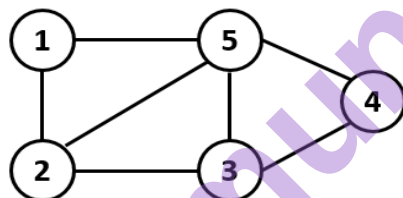
Total Marks: 80

- N.B:** (1) Question No. 1 is compulsory
 (2) Attempt any three questions out of the remaining five questions
 (3) Figures to the right indicate full marks
 (4) Make suitable assumptions wherever necessary with proper justifications

- Q1 A What is Hashing? Explain Hash collision with example. [05]
 B Explain types of Double Ended Queue with example. [05]
 C Differentiate between arrays and linked list. [05]
 D List different data structures along with one application. [05]

- Q2 A Construct Binary Search Tree by inserting the following elements in sequence [10]
 45, 28, 34, 63, 87, 76, 31, 11, 50, 17.
 B Write a program in C to implement Queue using singly linked list. [10]

- Q3 A Write a program to perform the following operations on doubly linked list: [10]
 i) Insert a node at the front of the list
 ii) Delete a node from the front of the list
 iii) Count the number of nodes in the list
 iv) Display the list
 B Define Graph. Show the adjacency matrix and adjacency list representation for the following graph [05]



- C Explain stack overflow and underflow conditions with example. [05]
- Q4 A Write an algorithm to check the well-formedness of parenthesis. [10]
 B Show the result of inserting the elements 16, 18, 5, 19, 11, 10, 13, 21, 8, 14 one at a time into an initially empty AVL tree. [10]
- Q5 A Define tree traversal. Explain binary tree traversal techniques with example. [10]
 B A hash table of size 10 uses linear probing to resolve collisions. The key values are integers and the hash function used is $\text{key} \% 10$. Draw the table that results after inserting in the given order the following values: [10]
 28, 55, 71, 38, 67, 11, 10, 90, 44, 9
- Q6 A Explain Depth First Search and Breadth First Search traversal of a graph with example. [10]
 B Construct Huffman tree and determine the code for each symbol in the string "PROGRAMMING". [10]
