

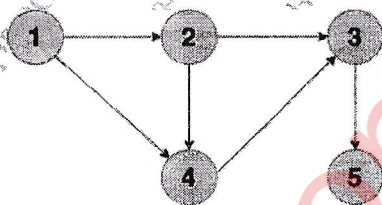
(3 Hours)

**N.B: (1) Question No. 1 is compulsory
(2) Attempt any three questions out of the remaining five questions**

- Q.1 (a) Explain various types of data structures with example. 5
 (b) Define Graph and explain various graph representation techniques. 5
 I Convert the following expression to postfix. 5
 $(f-g) * ((a+b) * (c-d)) / e$
 (d) Differentiate between B tree and B+ tree. 5

- Q.2 (a) Apply linear probing and quadratic probing hash functions to insert values in the Hash table of size 10. Show number of collisions occurs in each technique. 10
 27, 72, 63, 42, 36, 18, 29, 101
 (b) Construct B+ tree of order 3 for the following dataset 10
 90, 27, 7, 9, 18, 21, 3, 4, 16, 11, 1, 72

- Q.3 (a) Write BFS algorithm. Show BFS traversal for the following graph with all the steps. 10



- (b) Write a C program to implement linear queue using array. 10

- Q.4 (a) Write a program to perform the following operations on the Singly linked list: 10
 i. Insert a node at the end
 ii. Delete a node from the beginning
 iii. Search for a given element in the list
 iv. Display the list

- (b) Write a C program to implement Stack using Linked List 10

- Q.5 (a) Write a program to evaluate postfix expression using stack data structure 10

- (b) Construct AVL for following elements 10
 50, 25, 10, 5, 7, 3, 30, 20, 8, 15

- Q.6 (a) Construct Binary Tree from following traversal. 10
 In-order Traversal: D B H E I A F J C G
 Post order Traversal: D H I E B J F G C A

- (b) Write a C program for polynomial addition using a Linked-list. 10