

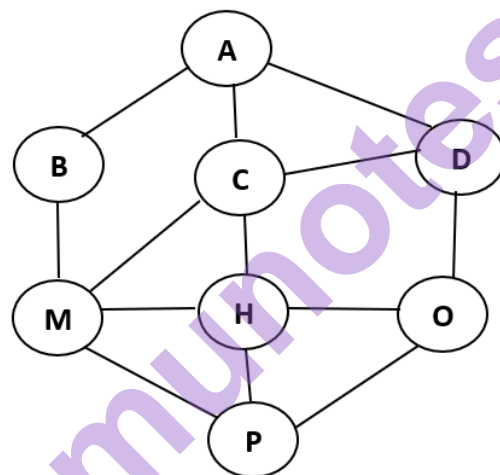
Duration: 3hrs

[Max Marks:80]

- N.B.: (1) Question No 1 is Compulsory.
 (2) Attempt any three questions out of the remaining five.
 (3) All questions carry equal marks.
 (4) Assume suitable data, if required, and state it clearly.

1 Attempt any FOUR [20]

- Explain ADT. List linear and nonlinear data structures with examples.
- Write an algorithm to check for balanced parenthesis in an expression using stack.
- Write a short note on Big O notation with examples.
- What are the different collision avoidance techniques? Explain
- Consider the following graph: Write adjacency matrix and adjacency list.



- Write a C program to implement a queue using Arrays. Write a function for Enqueue, Dequeue, and display. [10]
 - Construct binary search tree. Consider the following list of numbers: 18, 25, 16, 36, 08, 29, 45, 12, 32, 19 [10]
- What is hashing? What properties should a hash function demonstrate? [10]
 - Write a C program to implement a stack using a linked list. [10]

- 4 a What is the advantage of a binary search over linear search? Distinguish between linear search and binary search. [10]
- b What are Expression Trees? Draw the tree structure for the following expression: [10]
- $$(a - 3b)(2x - y)^3$$
- 5 a Explain insertion sort using an example. Write an algorithm for it and comment on its complexity [10]
- b Write short notes on BFS and DFS algorithms. [10]
- 6 a Write an algorithm to convert infix expression to postfix using stack. [10]
- b Write a short note on the implementation of the Huffman tree. [10]
