

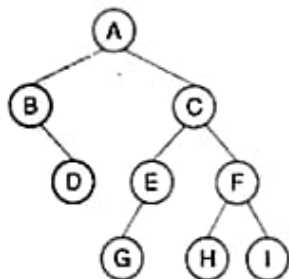
- Note:**
1. All questions are compulsory with internal choice.
  2. Draw neat diagrams wherever necessary.
  3. Figures to the right indicate full marks.

**Q.1 Answer the following (any FOUR) (20)**

- (a) What is a linked list? List & explain types of linked list.
- (b) What is ADT? Explain the types of ADT in detail.
- (c) What is a Circular Queue? Write and explain an algorithm to insert elements into a circular queue.
- (d) Explain how polynomials are represented using a linked list.
- (e) Write the algorithm for converting infix to postfix and convert the following expression to postfix notation using stack:  
$$I = A/B * C - D + E / F (G + H)$$
- (f) What is a double ended queue? Explain its types.

**Q.2 Answer the following (any FOUR) (20)**

- (a) What is an AVL tree? Explain different types of rotations with the help of an example.
- (b) Explain the structure of doubly linked list in detail.
- (c) What is heap? Explain the concept of maximum & minimum heap with examples.
- (d) Explain applications of trees like Huffman coding in detail.
- (e) For a given binary tree perform in-order, pre-order and post-order traversal.

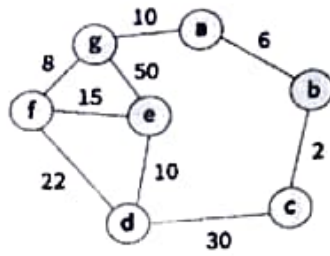


- (f) What is a binary search tree? Explain with the help of an example.

**Q.3 Answer the following (any FOUR) (20)**

- (a) List & explain any two collision resolution techniques.
- (b) Explain shortest path algorithm & its types.
- (c) What is a graph? Explain directed & undirected graphs.
- (d) Consider a hash table of size 16. Insert the records with key values 30, 16, 103, 93, 73, 23 using the 'K mod n' method.
- (e) Write and explain the concept for Depth first search in a graph.

- (f) Find the adjacency matrix & list representation of the following graph.



Q.4 Answer the following (any FIVE)

(15)

- (a) Discuss the basic operation performed on the stack also explains overflow and underflow conditions of the stack.
- (b) Explain the concept of priority queue.
- (c) What are hash functions? Explain in detail.
- (d) Explain the concept of hashing.
- (e) Draw mix and min heap with the following elements:  
45 25 16 7 9 80 75 3 103
- (f) What is data structure? Explain its classification.

---X---