

Time: 2½ hrs.

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 data structure? Explain different categories of data structure.
- (b) Define stack. Write an algorithm for PUSH operation.
- (c) What is Circular Queue? Write and explain an algorithm to insert element into a circular queue.
- (d) What is ADT? Explain the types of ADT in details.
- (e) Write the algorithm for converting infix to postfix and convert the following expression to postfix notation using stack:

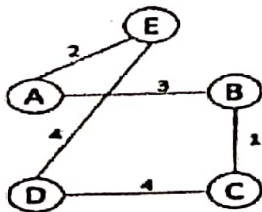
$$I = a*b+c+d/(e+f)$$
- (f) Write an algorithm for deque.

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

- (a) What is AVL tree? How balancing is done in AVL tree? Explain with example.
- (b) Explain double linked list in details.
- (c) What is heap? Explain the concept of maximum heap with example.
- (d) Explain applications of trees in details.
- (e) Explain inorder and preorder traversals of the tree.
- (f) Explain how polynomials are represented using linked list.

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 graphs? Explain its types.
- (d) What are hash table and hash functions? Explain in details.
- (e) Write an explain the algorithm for best 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) List & explain different operations that can be performed on data structure.
- (b) Explain with example priority queue.
- (c) What is data structure? Explain primitive and non-primitive data structure.
- (d) Explain the structure & types of linked list
- (e) Draw mix and min heap with the following elements:
 40 20 15 6 8 90 70 3 101
- (f) What is queue? Explain its basic operations.

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