Duration :- 2.30 hrs | G417ODS19 | Maximum Marks : 75

Note: - All Questions are Compulsory

Q.1 Attempt the following questions (Any Three) (15)

a. List and explain the different asymptotic notations used in data structure.
b. What is bubble sort? Sort the following data items using bubble sort method 24, 33, 20, 15, 10.
c. Write an algorithm for searching the element in array
d. Explain primitive and non primitive data structure
e. What is sparse matrix? Explain different ways of representing sparse matrix into m/m
f. What are the different operations that can be performed on data structure.

Q.2. Attempt the following questions (Any Three) (15)

a. What is linked list? Explain its types
b. Write an algorithm to insert new element in single linked list
c. What is circular linked list? How to traverse a circular linked list?
d. Explain how one linked list is copied to another linked list.
e. Explain different categories of header linked list
f. Explain how memory is allocated and deallocated for linked list.

Q.3. Attempt the following questions (Any Three) (15)

a. Write short note on double ended priority queue.
b. What is stack? Explain different basic operations performed on the stack.
c. Write steps for converting postfix to infix expression.
d. Write an algorithm to insert and delete a node from a circular queue.
e. Explain recursion with example.
f. Explain priority queue with example.

Q.4. Attempt the following questions (Any Three) (15)

a. Re-cons ruct binary tree whose in order and pre-order traversals are:
In-Order traversal : g d b h e i a f c
Pre-Order traversal : a b d g e h i c f
b. Write short note on 2-3 trees. Explain how to insert element in 2-3 trees.
c. Explain insertion sort algorithm to sort following elements.
7 8 10 2 3 1 12
d. What is binary search tree construct BST for the following :
20, 13, 12, 10, 15, 18, 40, 35, 55.
e. Explain algorithm for inserting node in Red-Black tree.
f. Explain in order and preorder traversal of the tree.

Q.5. Attempt the following questions (Any Three) (15)

a. Describe various collision resolution techniques.
b. What is Graph? Explain directed and undirected graph.
c. Explain spanning tree with example.
d. Explain diff. hashing methods.
e. Explain Dijkstra's shortest path algorithm with eg.
f. What is adjacency matrix? Generate adjacency matrix for the following undirected graph.