April 2025

Time – Three hours
(Maximum Marks: 100)

[*N.B.* Answer all the questions, choosing any two subdivision from each question. Each subdivision carries 10 marks.]

1. (a) Explain about the python non primitive data types, list and dictionary with examples.

   (b) Explain about linear and non linear data structures.

   (c) Explain about ADT with the example of a student.

   (d) Explain about space complexity and time complexity.

2. (a) Write short notes on the following:
   Node, Null pointer and Empty list.

   (b) Elaborate about traversing the nodes, searching for a node in a singly linked list with example.

   (c) Explain about adding nodes, removing nodes in a circular linked list with example.

   (d) Compare the singly linked list, doubly linked list and circular linked list.

3. (a) Explain the implementations of push and pop in a stack using python list.

   (b) Discuss the evaluation of postfix expressions using an example.

   (c) Explain about queue and its operations.

   (d) Write notes on circular queue and priority queue.

[Turn over.....

4. (a) Discuss about level of a node, depth of a node, height of a tree with illustrations.

(b) Explain about full binary tree, complete binary tree with suitable diagram.

(c) Write a note on binary tree traversals.

(d) Write about the creation of Binary Search tree without duplicate node.

5. (a) Illustrate bubble sort with an example.

(b) Write notes on quick sort.

(c) Discuss merge sort with an example.

(d) Explain about binary search with an example.
