

B.E. / B.Tech.(Part Time) End Semester DEGREE EXAMINATION, APRIL / MAY 2009

First Semester

Common to Computer Science and Engineering & Information Technology

PTCS 9151 – PROGRAMMING AND DATA STRUCTURES - I

(Regulation 2009)

Time : 3 Hours

Answer ALL Questions

Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. Define linear and non linear data structure
2. State the usage of structure with example.
3. What is Queue? How it can be represented in "C" using arrays?
4. State the various application of queue.
5. State the linear representation of the binary tree.
6. What are balanced and unbalanced tree?
7. What is sorting? List the different types of sorting techniques
8. State the complexity of insertion sort
9. Define the need of adjacency matrix in graphs
10. What is topological sorting?

PART B (16 * 5 = 80 MARKS)

11.

a.

- i. Describe in brief, the various data structures. Explain the different operation to be performed on data structures. (8)
- ii. State the steps involved for adding and deleting an element from an array. What are the major drawbacks in array handling? (8)

12.

a.

- i) Write the algorithms for the insertion and deletion operations performed on the circular queue. (8)
- ii) Given an integer K, write a procedure which deletes the Kth element from a singly linked list. (8)

OR

b.

- i. Explain in detail the different applications of stack. (8)
- ii. Explain the different operation that can be performed on Stacks? Implement the stack using linked representation. (8)

13.

- a. What are the different Storage representations for a binary tree? Write an algorithm to create a binary tree and do the various tree traversals.

OR

- b. What are AVL trees? Formulate an algorithm which will insert a node in a balanced tree and leave the resulting tree balanced. Trace the algorithm using the following inputs
Sun, Mon, Tue, wed, Thu, Fri, sat.

14.

a.

- i. Explain the two phase of heap sort with suitable example (8)

- ii. Write an algorithm for selection sort. Sort the following list in ascending order using selection sort. (8)
56, 57, 92, 38, 44, 90, 61, 73

OR

- a. What are different searching techniques? Explain any two of searching techniques with e.g.

15.

- a. State the various graph traversal algorithm Explain each of them in detail with example?

OR

- b.
i. What are the different representations of graph? State their application. (8)
ii. Design an algorithm for single source shortest path? Explain with an example. (8)