[Nov-12]

[EURCS-304/EURIT-304]
B. Tech. Degree Examination

CSE & IT
III SEMESTER

DATA STRUCTURES
(Effective from the admitted batch 2007–08)

Time: 3 Hours **Max.Marks: 60**

Instructions: Each Unit carries 12 marks.
Answer all units choosing one question from each unit.
All parts of the unit must be answered in one place only.
Figures in the right hand margin indicate marks allotted.

UNIT-I

1. a) Why a matrix is called sparse? Explain with an example 6
   b) What are simulated pointers? Using them, write a program for DELETE and INSERT operations 6

OR

2. a) What is a linked list? What are the different types of linked lists? Explain circular linked list with all the operations that can be performed on it 8
   b) Define Data Structures and list the various types of Data Structures 4

UNIT-II

3. a) Write the array and linked list operations of stacks and write the applications of stacks 8
   b) Distinguish between stacks and queues 4

OR

4. Write an algorithm to implement a Queue to perform all the operations using the Array representation 12

UNIT-III

5. Define and explain the following with an example 12
   a) AVL Tree b) Red-Black Tree c) Splay Tree

OR

6. What is Binary Tree and explain the various tree traversal algorithms in detail 12

UNIT-IV

7. a) Write an algorithm for selection sort with an example, and mention the time and space complexity of selection sort 6
   b) Write a program for Linear Search 6

OR

8. a) Explain about internal sorting with suitable example 6
   b) Explain about various types of hashing techniques 6

UNIT-V

9. a) Explain the concept of minimum spanning tree with the help of an illustrative example 8
   b) What is a graph and what are the different types of representation of graphs 4

OR

10. a) Write an algorithm for determining shortest paths from a single source in an undirected graph 8
    b) Specify the applications of graphs 4