Subject Code: 24CT11RC09 **R-24** **Reg No:** | | | | | | | | | | | |

GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN

(Autonomous)

(Affiliated to Andhra University, Visakhapatnam)

II B.Tech. - I Semester Regular Examinations, Nov – 2025

DATA STRUCTURES

(Common to **CSE, CSE (AI&ML), IT, ECE**)

1. All questions carry equal marks
2. Must answer all parts of the question at one place

Time: 3Hrs. **Max Marks: 70**

UNIT-I

1. a. Illustrate the different operations performed on an Array Abstract Data Type (ADT) with examples.
   b. Write a program for bubble sort

OR

2. a. Explain binary search with suitable example and its advantages over linear search

   b. Illustrate the working of quick sort on the following elements : 34,27,6,48,66,9,53,26,72

UNIT-II

3. a. Explain the procedure to convert infix to postfix with the following expression A*(B+D)/E-F*(G+H/K)
   b. Explain the operations of circular Queue with an example

OR

4. a. Write a program to implement queue using arrays
   b. Define a Priority Queue. Outline the algorithms for insertion and deletion of elements in a priority queue with examples.

UNIT-III

5. a. Outline single linked list insertion algorithm with example?
   b. Write a program to implement queue using linked list

OR

6. a. Demonstrate the search and display operations of double linked lists with example
   b. Describe the linked list representation of a sparse matrix with example

UNIT-IV

7. a. Illustrate Binary Tree traversal techniques in detail with an example
   b. Define Binary search Tree? Construct binary search Tree from the following elements 22, 34,17,16,24,18,19,26,14,9,55,10,8

OR

8. a. Explain how to delete an element from binary search tree with an example?
   b. Discuss the different types of rotations in an AVL Tree with suitable examples

UNIT-V

9. a. Explain the various representation of graph with example in detail?
   b. Discuss collision resolution techniques in detail with example

OR

10. a. Discuss following with reference to graphs
    i) Weighted graph ii) Cyclic graph iii) Complete graph iv) Degree of vertex
    V) Directed graph
    b. Illustrate graph traversal in detail with example