Malla Reddy University

I B.Tech II Semester – CSE/AIML/CS/DS/IT/IOT

Question Bank

Data Structures and Its Applications

Course Code: MR22-1CS0105

UNIT-III

1. Explain the structure of a doubly linked list node and its key components with examples.
2. Write a python program to implement doubly linked list.
3. What is a circular linked list and how it is different from a single & double linked list? Discuss in detail its operations with examples.
4. Explain how to implement a stack using linked list with example. Describe the operations supported by stack using a singly linked list with an example program.
5. Explain how to implement a queue using linked list, also describe the operations supported by queue using a singly linked list with an example program.

UNIT-IV

1. Define Tree. Why do we need tree data structure and explain the following: **a**. Root node **b**. Parent & child node **c**. ancestor d. path e. sibling
2. Discuss in detail the characteristics of Tree and the operations performed on Trees with suitable examples.
3. What is Binary search Tree? Discuss the properties of BST and explain the **insert** operation in BST with suitable examples. Write a python program for it?
4. Write a Python program to implement Tree traversal techniques.
5. What is Binary Tree? What are the applications of trees and explain in detail how Trees are used in real time applications.

UNIT-V

1. Define a graph and its characteristics. How is a graph different from other data structures? Explain with suitable examples.
2. Describe the characteristics of a graph. Discuss the concepts of vertices, edges, directed and undirected graphs, weighted and unweighted graphs.
3. Write the difference between linear and non-linear data structures. Explain with suitable examples discussing pros and cons.
4. Explain Depth First Search with an example.
5. Explain Breadth First Search with an example.
6. Compare and contrast BFS and DFS algorithms in terms of their implementation, traversal order, and the data structures used. Discuss the advantages and disadvantages of each algorithm.