Total No. of Questions: 10] [Total no. of pages: 02

II/IV B. TECH DEGREE EXAMINATIONS, JULY/AUGUST-2023

First Semester

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

DATA STRUCTURES USING 'C'

Time: Three Hours **Maximum: 70 Marks**

Answer ONE Question from each unit. **5 x 14 = 70 M**

All Questions carry equal marks.

UNIT-I

1. a) Define Data Structure? Explain the classification of Data Structures..
   b) Write a program to implement linear search.

(OR)

2. a) What is the worst case complexity in Quick sort? Explain with a suitable example.
   b) Define Asymptotic Notation? Explain different Asymptotic Notations with an example.

UNIT-II

3. Write an algorithm for the following operations on a circularly linked list:
   (i) Insertion at beginning.
   (ii) Insertion at a particular position
   (iii) Deletion at end
   (iv) Deletion based on value of element.

(OR)

4. a) What is circular linked list? What are the advantages of circular linked list compared to single linked list?
   b) Write a program to implement insertion, deletion operations on Single Linked List.

UNIT-III

5. a) Convert the following infix expression into prefix expression (a-(b/(c*(d-e)))).
   b) What is a stack? How to represent a stack using array? Give suitable example.

(OR)

6. a) Develop an algorithm to evaluate postfix expression. Trace the algorithm on the following input: 623+-84/+23^+ (all numbers are single digits).
   b) Write a C program to implement various Queue operations in detail.

UNIT-IV

7. a) Explain the array and linked representations of binary tree with examples.
   b) Explain Different Tree Traversals with suitable examples.

(OR)

8. a) Draw Binary tree and BST for the following operations.
   (i) Insert 32,16,56,25,12,6,9,34,42 in sequence (ii) Delete 25,32,6 after insertion.
   b) Write and explain an algorithm to delete a node form BST?

UNIT-V

9. a) Define graph? Explain various representations of the graph.
   b) Develop an algorithm for Breadth First Search. Demonstrate BFS using suitable example.

(OR)

10. a) What is minimum cost spanning tree? Write the prims algorithm for it.
    b) Describe the adjacent matrix and adjacency list representation of graphs with the help of an example.

AM 214 (R-20)

Total No. of Questions : 10] [Total No.of Pages : 02

II/IV B. Tech. DEGREE EXAMINATIONS, FEB / MAR - 2023

First Semester

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

DATA STRUCTURES USING 'C'

Time : **Three Hours** Maximum : **70** Marks

Answer All Questions

Answer ONE question from each Unit. 5x14=70 M

UNIT - I

1. a) Define Data Structure ? Explain the classification of Data Structures.

   b) Write a Program to implement Binary Search.

(OR)

2. a) Define Asymptotic Notation ? Explain different Asymptotic Notations with examples.

   b) Write an algorithm to find the factorial of a number and find the time complexity of the algorithm.

UNIT - II

3. a) Define linked list. Explain how the memory allocation and garbage collection is done for linked lists ?

   b) Write the algorithm to delete a node from front end in single linked list.

(OR)

4. a) What is circular linked list ? What are the advantages of circular linked list compared to single linked list ?

   b) Explain Circular Linked List with insertion program.

UNIT - III

5. a) Define Stack ? How are Insert and Delete operations carried out in a Stack ? Explain with examples.

   b) Write a C Program to convert Infix to Postfix Expression.

P.T.O.

(OR)

6. a) Define Queue and how to implement queue using Linked List ? Explain.

   b) Explain in detail about different applications of Queues with examples.

UNIT - IV

7. a) What is Binary Tree ? Explain the concept of Binary Tree Traversals.

   b) What is tree ? Explain the various representations of a Tree.

(OR)

8. Define Binary Search Tree ? Write a C program to implement insertion, deletion operation on a BST.

UNIT - V

9. a) Define Spanning Tree ? Write an algorithm for BFS.

   b) Define Graph ? Explain various representations of the Graph.

(OR)

10. a) Write about Prims Algorithm with an example.

    b) Develop an algorithm for Breadth First Search, Demonstrate BFS using suitable example.