



**B.Tech III Semester Supplementary Examinations, July 2022**  
**DATA STRUCTURES**

(CSE & CSE(AIML))

**Maximum Marks: 70**

Date: 29.07.2022 Duration: 3 hours

- Note:**
1. This question paper contains two parts A and B.
  2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
  3. Part B consists of 5 Units. Answer any one full question from each unit.
  4. Each question carries 10 marks and may have a, b, c, d as sub questions.

**Part-A**

All the following questions carry equal marks

(10x2M=20 Marks)

- 1 Differentiate between recursive and iterative algorithms
- 2 Define the term Data abstraction?
- 3 What is a stack?
- 4 List out the basic operations that can be performed on a queue?
- 5 Define full binary tree?
- 6 Define path in a tree?
- 7 what is searching? List various search methods
- 8 list the various sorting methods?
- 9 What are the two traversal strategies used in traversing a graph?
- 10 List the different AVL tree rotations to insert a node.

**Part-B**

Answer All the following questions.

(10M X 5=50Marks)

- 11 Describe the role of time complexity and space complexity in measuring the performance of the algorithm. Define asymptotic notations of Big Oh, Big Theta, and Big Omega. Suppose that given function  $F(n)=n/100$ , show that  $F(n)=\Omega(n)$ . 10
- OR
- 12 Define recursion. Write a recursive algorithm to calculate factorial of a number. 10
- 13 Explain priority queue and its operations. 10
- OR
- 14 Explain the operations of circularly linked lists 10
- 15 Write a program to perform insertion and deletion from a Max Heap. 10
- OR
- 16 Write the algorithm for Quick sort technique, Explain the technique with example, analyze its time complexity. 10
- 17 Explain in detail multi-way merge with examples. 10
- OR
- 18 Explain the searching algorithms 10
- 19 Write an algorithm for the depth first search of a graph? State its advantages and disadvantages 10
- OR
- 20 Explain Red Black Trees in detail with example. 10