USN [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]   **[23TCSE206]**

SECOND SEMESTER B.Tech EXAMINATION, APRIL-2024
DATA STRUCTURES USING JAVA

Time: 3 Hours   **Maximum Marks: 100**

Instructions: **i.**   Missing data may be suitably assumed.

ANSWER ALL QUESTIONS

		PART-A		05 X 02=10	
1.	**a.**	Why do we need data structures?	L1	CO1	02
	b.	What are the types of queue?	L1	CO2	02
	c.	Define AVL Tree.	L1	CO3	02
	d.	List the sorting algorithms.	L2	CO4	02
	e.	What is B+ File Organization.	L1	CO5	02
		PART-B		06 X 05=30	
2.	**a.**	What is an array? Discuss different types of array with examples.	L2	CO1	05
		OR			
	b.	Explain Asymptotic Analysis and how to calculate f(n)?	L2	CO1	05
3.	**a.**	Explain recursion. Write a recursive algorithm to calculate factorial of a number.	L2	CO2	05
		OR			
	b.	Explain the procedure to convert infix expression to postfix expression with the following expression: A+B*C.	L3	CO2	05
4.	**a.**	Explain threaded binary trees and their representation with a neat diagram.	L2	CO3	05
		OR			
	b.	Explain the breadth first search algorithm.	L2	CO3	05
5.	**a.**	Explain Merge sort with suitable example .	L2	CO4	05
		OR			
	b.	Define Hash table and Explain Hash function.	L1	CO4	05
6.	**a.**	Explain Direct access file organization.	L2	CO5	05
		OR			
	b.	Explain Hash file organization with example.	L2	CO5	05
7.	**a.**	Write a java program to implement a Heap Sort.	L3	CO4	05

		OR			
	b.	Write a java program to implement Quick Sort.	L3	CO4	05
		PART-C		**06 X 10=60**	
8.	a.	Discuss the basic operations that can be performed on arrays.	L2	CO1	10
		OR			
	b.	Explain the concepts of asymptotic notations. Provide examples to illustrate each notation.	L2	CO1	10
9.	a.	Explain the steps involved in insertion and deletion into a singly and doubly linked list.	L2	CO2	10
		OR			
	b.	What is a Queue? Explain its operation.	L2	CO2	10
10.	a.	Define binary search tree. Show how to insert and delete an element from binary search tree.	L2	CO3	10
		OR			
	b.	Explain the various representation of graph with example in detail.	L2	CO3	10
11.	a.	Explain radix sort algorithm with suitable example.	L1	CO4	10
		OR			
	b.	Explain binary search algorithm in detail with suitable example.	L3	CO4	10
12.	a.	Write a short note on B+ File Organization.	L2	CO5	10
		OR			

	b.	Explain the following file structures
		   i. Sequential access
		   ii. Direct Access
		   iii. Indexed sequential Access
			L1	CO5	10

13.	a.	Write a java program using two different (recursive and non-recursive) functions to solve tower of Hanoi.	L3	CO3	10
		OR			
	b.	Write a java program to create functions for push and pop operations of stack.	L3	CO2	10