END SEMESTER EXAMINATION, JULY-2022
COURSE TITLE (COURSE CODE)

Programme:B.Tech **Semester:4th**
Full Marks: 60 **Time: 3 Hours**

Subject/Course Learning Outcome	*Taxonomy Level	Ques. Nos.	Marks
Analysis algorithm using time and space complexity	L1,L4	Q7	6
Sorting Technique	L1,L3	q1,q2,q10	6
Problem solving approach on array	L1	q1(a,b)	4
Problem solving approach on searching		q1,q3,q5,q8	16
Linked list and problem solving on Linked list	L1,L3	q7,q9	10
Stack , Queue and application of stack	L3	q8,q10	10
Understanding tree and problem on tree	L1,L4	q6	6
Collection framework	L3	q4	2

*Bloom's taxonomy levels: Knowledge (L1), Comprehension (L2), Application (L3), Analysis (L4), Evaluation (L5), Creation (L6)

Answer all questions. Each question carries equal mark.

1 (a) Write a method that will return the sum of all the elements of the integer Array, given Array as an input argument. 2

(b) Given a sorted array , write a method which will represent element of array in max-min form 2
Input: |1, 2, 3, 4, 5, 6, 7|
Output: |7, 1, 6, 2, 5, 3, 4|

(c) Given an array of integers, write a method which will make the array in ascending order using the bubble sort approach. 2

2	(a)	Given an array of integers, write a method which will print number of swap perform while making array in ascending order using bubble sort approach	2
	(b)	Write a method which will return factorial value of a number using recursion	2
	(c)	Define the Tower of Hanoi Problem.	2
3	(a)	Given N, find the Nth number in the Fibonacci series.	2
	(b)	Write a program to search an element using binary search.	2
	(c)	Given an integer , Write a method which will count the number of digits present in the given integer.	2
4	(a)	Write a program to create a hash set of type string, insert some element into it and display it.	2
	(b)	Given an array containing 0's and 1's, sort the array such that all the 0's come before 1's. Explain time complexity as well	2
	(c)	write a recursive equation of merge sort and find the time complexity for given input size n.	2
5.	(a)	Given an array of size N, the elements in the array may be repeated. You need to find the sum of distinct elements of the array. If there is some value repeated continuously then they should be added once.	2
	(b)	In a given list of n-1 elements, which are in the range of 1 to n. There are no duplicates in the array. One of the integer is missing. Find the missing element.	2
	(c)	Given an array of n numbers, find two elements such that their sum is equal to "value"	2
6.	(a)	Create a complete binary tree from values given as array.	2
	(b)	Define Binary search tree	2
	(c)	Write a method which will perform Post-Order Traversal of binary tree , you have given root node of the tree	2
7.	(a)	Write a method which will enqueue an integer in the queue using array implementation and find time complexity	2
	(b)	Write a method which will insert a node in the beginning of the double linked list and derive time and space complexity.	2

	(c)	Write a method which will delete last node of single linked list and find time and space complexity as well	2
8.	(a)	Write a program to check balanced symbols (such as {}, (), []). The closing symbol should be matched with the most recently seen opening symbol. e.g. (()) is legal, (() (())) is legal, but ((() and (()) are not legal	2
	(b)	Write a method which will perform pop operation in the stack using array implementation	2
	(c)	Given an array of integers with both +ve and -ve values. Find the two elements in the array such that their sum is minimum (closest to zero).	2
9.	(a)	Write a method which will insert an node in sorted order in linked list given head pointer	2
	(b)	Write a method which will return true if there is a loop in a linked list and return false if there is no loop in the linked list.	2
	(c)	Write a method which will delete a node from singly linked list given its value	2
10	(a)	Explain quick sort	2
	(b)	write five application of stack	2
	(c)	What is the advantage of linked list over array	2

End of Questions