Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV /DEC 2024

Third Semester

Information Technology

CD3291-Data Structures and Algorithms

Regulations - 2021

Duration : 3 Hrs *Maximum : 100 Marks*

*PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)*

Q.No	*Questions*	*BLT*	*CO*	*Marks*
1.	Identify how you will measure input size of an algorithm?	AP	1	2
2.	Define accessors method in python.	RE	1	2
3.	Name any two applications where dequeue can be used.	RE	2	2
4.	Identify the data structures to represent stack.	AP	2	2
5.	Compare bubble sort with insertion sort in terms of time complexity.	UN	3	2
6.	Distinguish between linear search and binary search.	AN	3	2
7.	Compare binary Tree with binary search Tree.	EV	4	2
8.	Construct a max heap with the following data 20,1,2,40,30.	CR	4	2
9.	Write the steps required to construct the minimum spanning tree	UN	5	2
10.	List any three operations that can be performed on a graph.	RE	5	2

*PART – B (ANSWER ALL QUESTIONS) (Marks 5*13 = 65)*

Q.No			*Questions*	*BLT*	*CO*	*Marks*
11.	a		Discuss in detail about the different classification of algorithms.	UN	1	13
			Or			
	b	i	Differentiate data types, data structures and abstract data types.	UN	1	6
		ii	How do you create class in python? Explain with an Example.	RE	1	7
12.	a		Explain the insertion operation in linked list. How nodes are inserted after a specified node?	UN	2	13
			Or			
	b		Explain stack ADT and its operations?	RE	2	13
13.	a		Write an algorithm to perform Quick sort and analyse the bestcase complexity of it. Apply it to sort 24,56,47,35,10,90,82,31.	AP	3	13
			Or			
	b		Explain an algorithm to implement insertion sort with suitable examples.	UN	3	13

14.	a	Create a Binary search Tree using the following data elements 40,35,58,15,73,31,5,85,51,63,79.	AP	4	13
		Or			
	b	Describe an algorithms used to perform single and double rotation on AVL Tree.	UN	4	13
15.	a	Build an algorithm for greedy approach and give one real time example.	AP	5	13
		Or			
	b	Explain the various representation of graph with example in detail.	UN	5	13

*PART – C (Marks 1*15 = 15)*

Q.No		*Questions*	*BLT*	*CO*	*Marks*
16.	a	Construct an expression tree for the expression(a+b*c)+((d*e+1)*g). Give the outputs when you apply preorder, in order and post order traversals.	CR	4	15
		Or			
	b	What is collision? How is it overcome using separate chaining? Using hash function key mod 7 hash the keys 50,700,76,85,92,73,101. Use separate chaining when collision occurs.	AP	3	15