(Regulations: VCE-R22)

DESIGN AND ANALYSIS OF ALGORITHMS
(Common to CSE, CSE(AIML), IT and AIML)

Date: 10 April 2024 **Time: 2 Hours** **Maximum Marks: 30**

Answer all Questions in Part-A

Answer any FOUR Questions in Part-B

Course Outcomes with Bloom's Levels:

CO#	*CO Statement*	*Bloom's Level (L#)*
CO1	Make use of asymptotic notations, divide and conquer techniques to decompose complex problems into small and simple.	L3
CO2	Choose Greedy method to find out feasible solutions of problems.	L3
CO3	Examine complex engineering problems in finding the optimal solution.	L4
CO4	Construct all possible solutions using backtracking methods	L3
CO5	Inspect Branch and Bound techniques and NP complete problems significance in algorithms.	L4

Questions:

PART-A (Multiple Choice / Fill in the Blanks / Match the Following / Short Answer Type Questions)					
			CO#	*BL#*	*Marks*
1.	a)	Worst case time complexity of quick sort is.....	CO1	BL1	*1 M*
	b)	Define an algorithm	CO1	BL1	*1 M*
	c)	Porformance of an algorithm is depends on..... and	CO1	BL2	*1 M*
	d)	Prove that 3n+2=Θ(n)	CO1	BL2	*1 M*
	e)	Define Theta notation.	CO1	BL2	*1 M*
	f)	What are the applications of greedy approach	CO2	BL1	*1 M*
	g)	Kruskal's algorithm is ..... method	CO2	BL1	*1 M*
	h)	Discuss knapsack problem	CO2	BL1	*1 M*
	i)	Given a weighted graph where weights of all edges are unique then there is always a unique shortest path from source to a destination (True / False)	CO2	BL1	*1 M*
	j)	Define minimal cost spanning tree.	CO2	BL1	*1 M*
PART-B (Descriptive Questions)					
2.	Solve the recurrence relation using Substitution Method $T(n)=\begin{cases}1, & n=1\\ 2T(n/2)+n, & n>1\end{cases}$		CO1	BL2	*5 M*
3.	Sort the given list using merge sort [50, 25, 6, 20, 60, 30, 90, 10]		CO1	BL3	*5 M*
4.	Write an algorithm to find out the maximum and minimum of array elements		CO1	BL2	*5 M*