Reg.No.:												

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 50050

M.E. / M.Tech. DEGREE END-SEMESTER EXAMINATIONS – FEB. 2025
First Semester
Computer Science and Engineering
P23CS101 – ADVANCED ALGORITHMS
(Regulation 2023)

Time : Three Hours | Maximum : 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Define Θ(Theta) notation.	2	K1	CO1
2.	List any five problems that are solved using divide and conquer technique.	2	K3	CO1
3.	What is a spanning tree?	2	K2	CO2
4.	List any four problems that are solved using greedy methods.	2	K3	CO2
5.	Define a sparse graph.	2	K1	CO3
6.	Explain Matrix- Chain multiplication.	2	K2	CO3
7.	Define the phrase "speedup of parallel algorithms".	2	K1	CO4
8.	List any four applications of fork-join operations.	2	K3	CO4
9.	Discuss any two regression techniques in brief.	2	K2	CO5
10.	Explain the significance of K in K-means clustering.	2	K2	CO5

PART – B

(5 x 13 = 65 Marks)

Q. No.		Questions	Marks	KL	CO
11.	a)	Explain Asymptotic notations and differences with suitable examples.	13	K4	CO1
		(OR)			
	b)	Discuss a randomized algorithm for sorting N elements.	13	K3	CO1
12.	a)	Propose a greedy method to solve the activity-selection problem.	13	K3	CO2
		(OR)			
	b)	Explain the differences between working of the greedy method and dynamic programming.	13	K4	CO2
13.	a)	Explain the differences between the working of the Prim's method and Kruskal's method.	13	K4	CO3
		(OR)			
	b)	Write Dijkstra's algorithm to solve the single source shortest path problem. Derive the time complexity also.	13	K2	CO3
14.	a)	Discuss the key issues in designing parallel algorithms.	13	K5	CO4
		(OR)			
	b)	Discuss parallel algorithm for FFT.	13	K2	CO4
15.	a)	Illustrate the working of the Rabin-Karp algorithm for string matching. Derive the time complexity also.	13	K3	CO5
		(OR)			
	b)	Write a note on machine learning algorithms.	13	K3	CO5

PART – C

(1 x 15 = 15 Marks)

Q. No.		Questions	Marks	KL	CO
16.	a)	The Clique Decision Problem is to find if a clique of size k exists in the given graph or not. Prove the NP-completeness of the Clique Decision Problem.	15	K5	CO5
		(OR)			
	b)	Devise a PRAM algorithm to multiply two matrices, each of size NxN. Derive the time complexity and speedup of your parallel algorithm.	15	K4	CO5