

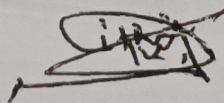
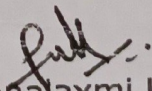
CONTINUOUS INTERNAL EVALUATION- 1

Dept: CSE	Sem / Div: 4 th (A&B)	Sub: Design and Analysis of Algorithms	S Code: 18CS42
Date: 4/7/2022	Time: 3-4.30 P M	Max Marks: 50	Elective: N

Note: Answer any 2 full questions, choosing one full question from each part.

QN	Questions	Marks	RBT	CO's
PART A				
1	a Define algorithm. Discuss the criteria's that an algorithm must satisfy.	9	L1	CO1
	b Write the algorithm to find maximum element in the given array and explain the mathematical analysis of non-recursive algorithm.	8	L1	CO1
	c Solve the recurrence relation $M(n) = 2M(n-1) + 1$ for $n > 1$; $M(1) = 1$	8	L2	CO1
OR				
2	a Explain asymptotic notations Big O, Big Ω and Big θ , that are used to compare the order of growth of an algorithm with example	9	L2	CO1
	b Explain important fundamental data structures used in algorithm design.	8	L2	CO1
	c Prove that If $t_1(n) \in O(g_1(n))$ and $t_2(n) \in O(g_2(n))$, then $t_1(n) + t_2(n) \in O(\max\{g_1(n), g_2(n)\})$.	8	L3	CO1
PART B				

3	a	Write a recursive algorithm for binary search and also bring out its efficiency.	9	L1	CO2
	b	Write an algorithm for sorting the numbers using Quick sort. Derive the best case, worst case, average case time efficiency of the algorithm.	8	L1	CO2
	c	List the advantages and disadvantages of Divide and Conquer.	8	L2	CO2
OR					
4	a	Write the algorithm for Merge Sort. Illustrate with an example. Derive the time efficiency (best case, average case, worst case) of the algorithm.	9	L1	CO2
	b	Explain the general concept of divide and conquer method.	8	L2	CO2
	c	Solve the recurrence relationship using Master theorem and Backward Substitution i) $T(n) = 2T(n/2) + n$ Where $T(1) = 2$ ii) $a = 1, b = 2, f(n) = c$	8	L2	CO2

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HOD