

**CONTINUOUS INTERNAL EVALUATION- 1**

Dept:CSE	Sem / Div:4/A & B	Sub: Design and Analysis of Algorithms	S Code:18CS42
Date:24/05/2021	Time:3:00-4:30 pm	Max Marks:50	Elective: N
Note: Answer any 2 full questions, choosing one full question from each part.			

QN	Questions	Marks	RBT	COs									
<b>PART A</b>													
1	a Design an algorithm to search an element in an array using sequential search. Discuss the best case, worst and average case efficiency of this algorithm	9	L2	CO1									
	b Explain in detail the important problem types.	6	L2	CO1									
	c Give general plan of mathematical analysis of recursive algorithms. Describe Towers of Hanoi Problem and Illustrate mathematical analysis of the Towers of Hanoi Problem.	10	L3	CO1									
<b>OR</b>													
2	a Explain asymptotic notations Big O, Big $\Omega$ and Big $\theta$ , that are used to compare the order of growth of an algorithm with example	9	L2	CO1									
	b Explain two common ways to represent the graph with example	6	L2	CO1									
	c Give general plan of mathematical analysis of non-recursive algorithms. Design an algorithm to check all the elements are distinct and derive its worst case time efficiency.	10	L3	CO1									
<b>PART B</b>													
3	a Explain the concept of Divide and conquer. Design an algorithm for merge sort and derive its time efficiency.	10	L3	CO2									
	b Discuss quick-sort approach to sort an array and trace for the following data set. Draw the tree of recursive calls made. Derive the best case complexity of quick sort algorithm.  <div style="border: 1px dashed black; padding: 5px; display: inline-block; margin: 10px 0;"> <table style="border-collapse: collapse;"> <tr> <td style="border: 1px dashed black; padding: 2px 10px;">65</td> <td style="border: 1px dashed black; padding: 2px 10px;">70</td> <td style="border: 1px dashed black; padding: 2px 10px;">75</td> <td style="border: 1px dashed black; padding: 2px 10px;">80</td> <td style="border: 1px dashed black; padding: 2px 10px;">85</td> <td style="border: 1px dashed black; padding: 2px 10px;">60</td> <td style="border: 1px dashed black; padding: 2px 10px;">55</td> <td style="border: 1px dashed black; padding: 2px 10px;">50</td> <td style="border: 1px dashed black; padding: 2px 10px;">45</td> </tr> </table> </div>	65	70	75	80	85	60	55	50	45	15	L3	CO2
65	70	75	80	85	60	55	50	45					
<b>OR</b>													
4	a Write a recursive algorithm for binary search and also bring out its efficiency	10	L3	CO2									
	b Discuss Strassen's matrix multiplication and derive its time complexity.	15	L3	CO2									