

SSN COLLEGE OF ENGINEERING, KALAVAKKAM – 603 110
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

B.E. Computer Science and Engineering
 CS8451 Design and Analysis of Algorithms

Date: 7.02.2019, 8.00-9.30 AM

UNIT TEST –1 Retest

Max. Marks: 50

Academic Year: 2018-2019 Even

Batch: 2017-2021

Semester: 4

Faculty: V. Balasubramanian / S. Manisha

Qn. No	Part – A (5 * 2 = 10)	Marks	(KL,COn)
1	What is the worst case complexity of binary search?	2	K2,CO1
2	Write the recursive Fibonaaci algorithm and its recurrence relation.	2	K3,CO1
3	Compare the order of growth of $\frac{n(n-1)}{2}$ and n^2	2	K2,CO1
4	Given the recurrence relation $T(n) = 7 T(n/5)$ for $n > 1$ $T(1) = 1$, find $T(625)$.	2	K2,CO1
5	State the characteristic of basic operations. Which of the following are not basic operations? add, multiply, power, logical or	2	K4,CO2
Part – B Answer all questions (13+13)			
6	<p>ALGORITHM <i>MaxElement</i>($A[0..n - 1]$)</p> <p>//Determines the value of the largest element in a given array</p> <p>//Input: An array $A[0..n - 1]$ of real numbers</p> <p>//Output: The value of the largest element in A</p> <p>$maxval \leftarrow A[0]$</p> <p>for $i \leftarrow 1$ to $n - 1$ do</p> <p style="padding-left: 20px;">if $A[i] > maxval$</p> <p style="padding-left: 40px;">$maxval \leftarrow A[i]$</p> <p>return $maxval$</p> <p>(i)Analyse the algorithm and solve it for the basic operation.</p> <p>ALGORITHM <i>Mystery</i>(n)</p> <p>//Input: A nonnegative integer n</p> <p>$S \leftarrow 0$</p> <p>for $i \leftarrow 1$ to n do</p> <p style="padding-left: 20px;">$S \leftarrow S + i * i$</p> <p>return S</p> <p>(ii)Analyse the algorithm and find what it does, find how many times the basic operation is executed.</p>	8	K3,CO1
7	<p>ALGORITHM <i>S</i>(n)</p> <p>//Input: A positive integer n</p> <p>//Output: The sum of the first n cubes</p> <p>if $n = 1$ return 1</p> <p>else return $S(n - 1) + n * n * n$</p>	8	K3,CO1

	(i)Analyse the algorithm and find what this algorithm computes, and solve the recurrence relation for the basic operation. (ii)Write the recursive and iterative algorithm for computing nth fibonacci number and solve the recurrence relation.	5	
7	ALGORITHM $Q(n)$ //Input: A positive integer n if $n = 1$ return 1 else return $Q(n - 1) + 2 * n - 1$ (i)Set up a recurrence relation for this function's values and solve it to determine what this algorithm computes? (ii) Discuss briefly the sequence of steps in designing and analyzing algorithm	8 6	K2,CO1

*****BEST OF LUCK*****

Prepared by

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Reviewed by HoD, CSE

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