	Reg. No.:	
	Name :	

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Mid-Term Examinations – October 2021

Programme	:	**B.Tech (BAI, BCE, MIM)**	Semester	:	**Fall 2021-22**
Course	:	**Design and Analysis of Algorithms**	Code	:	**CSE3004**
Faculty	:	**Dr. Muneeswaran V**	Slot/ Class No.	:	**B11+B12+B13/0286**
Time	:	**1 ½ hours**	Max. Marks	:	**50**

Answer all the Questions

Q.No.	Sub. Sec.	Question Description	Marks
1	(a)	Solve the following recurrence relations and find the time complexity: $$r(n)=\begin{cases} n-1, if\ n=1,2 \\ 3, if\ n=3 \\ r(n-1)+(n-1), if\ n>3 \end{cases}$$	**5**
1	(b)	Find the total number of multiplications and the total number of additions made by the following non recursive algorithm. *ALGORITHM PolynomialEvaluation(P[0..n], x)* *//Computes the value of polynomial P at a given point x by the //"highest //to lowest term" brute-force algorithm* *//Input: An array P[0..n] of the coefficients of a polynomial of degree //n,* *// stored from the lowest to the highest and a number x* *//Output: The value of the polynomial at the point x* *p ← 0.0* *for i ← n downto 0 do* *power ← 1* *for j ← 1 to i do* *power ← power ∗ x* *p ← p + P[i] ∗ power* *return p*	**5**
2		Find an Optimal parenthesization of a matrix chain product whose sequence of dimensions is as follows. **M1**: 13 x 31; **M2**: 31 x 29; **M3**: 29 x 43; **M4**: 43 x 23; **M5**: 23 x 61; **M6**: 61 x 17 Find the Cost matrix and root matrix step by step.	**10**
3		Write pseudocode of the Huffman-tree construction algorithm and Consider the six-different programme students enrolled for a course with the number of students count. Construct and Huffman code with the student's data: ***Programme***: *AI*; *CE*; *CG*; *IM*; *CY*; *HI* ***Count***: *30*; *47*; *27*; *21*; *38*; *42*	**10**
4		Explain how to determine the occurrences of pattern P – "***ababba***" in the text T – "***abaabbababbabaaababbabbaba***" using KMP algorithm. Write the relevant pseudo code with their comparisons step by step results.	**10**

5		Alice has a text file of n – bits, and Bob similarly has a m – bit pattern file. To check the integrity of the file with Alice, Bob transmitted his m – bit file to Alice. Alice checked the pattern received from Bob with the Rabin Karp String matching algorithm. The prime number used by Alice is "***29***". The contents of the Text is: "***3141920535897920 53***" and content of the pattern is: "***2053***". How Alice checked the pattern received from Bob using the KMP algorithm with step by step results.	**10**
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