Roll Number | 2 | 3 | 1 | 1 | 0 | 2 | 6 | 3 |

Shiv Nadar University Chennai, Kalavakkam - 603 110

(A State Private University)

School of Engineering

Department of Computer Science and Engineering

Regulation 2021

"Continuous Assessment Test - I

Question Paper

Name of the Program & Branch	B.Tech. AI & DS, B.Tech., CSE (IoT) & B.Tech., CSE (Cybersecurity)	**Semester: I**
Course Code & Name	MA1001 & Linear Algebra	**Date: 20/09/2023**
Time: 60 Minutes (12.50 PM – 1.50 PM)	**Answer All Questions**	**Maximum: 20 Marks**

Q. No.	Questions	Marks	CO	KL
1	Let $V = \{(x, y): x, y \in R\} = R^2$. Define $(x_1, y_1) \oplus (x_2, y_2) = (x_1 + x_2 + 1, y_1 + y_2 - 3)$ and $c \odot (x_1, y_1) = (cx_1 + c - 1, cy_1 - 3c + 3)$. Find the additive identity and additive inverse with respect to these operations.	2	CO1	KL4
2	Let $V = R^3$. Check whether $W = \{(a_1, a_2, a_3) \in R^3: 2a_1 - 7a_2 + a_3 = 0\}$ is a subspace of V.	2	CO1	KL3
3	Verify whether the first polynomial can be expressed as a linear combination of the other two in $P_3(R)$ for the given $x^3 - 8x^2 + 4x$, $x^3 - 2x^2 + 3x - 1$ and $x^3 - 2x + 3$.	2	CO1	KL3
4	Can $(1, 2, 3)$ be expressed as a linear combination of vectors $(0, 1, 2)$, $(3, 5, 1)$, $(3, 7, 5)$?	2	CO1	KL3
5	Find a such that $(1, 1, 1)$, $(2, 1, 2)$, $(4, 1, a)$ are linearly dependent.	2	CO1	KL3
6	Let R^+ be the set of all positive real numbers for which addition and scalar multiplication are defined as follows $u + v = uv \; \forall \, u, v \in R^+, \alpha u = u^\alpha, \forall \, u \in R^+$. Prove that R^+ is a vector space.	5	CO1	KL3
7	Prove that the intersection of two subspaces in a vector space V over a field F is again a subspace in a vector space V over a field F. What about the union of two subspaces? Justify your answer.	5	CO1	KL2

KL - Bloom's Taxonomy Levels (KL1: Remembering, KL2: Understanding, KL3: Applying, KL4: Analyzing, KL5: Evaluating, KL6: Creating); CO - Course Outcomes