VIT®

Vellore Institute of Technology

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Continuous Assessment Test I – September 2022

Programme	: B.Tech.	Semester	:	Fall 2022 – 23
Course Title	: Linear Algebra and Transform Techniques	Code	:	MAT3008
		Slot	:	E1+TE1
Faculty (s)	: Dr. Poulomi De, Dr. Sushmitha P	Max. Marks	:	50
Class Nbr.	: CH2022231001856, CH2022231001859	Time	:	90 minutes

Answer all the Questions (5X10=50)

Q.No.	Sub. Sec.	Question Description	Marks
1.		Solve the system of linear equations $x + y + z = 1; 4x + 3y - z = 6; 3x + 5y + 3z = 4$ by using LU factorization.	10
2.		Find inverse of $A = \begin{bmatrix} 1 & 3 & -4 \\ 1 & 5 & 1 \\ 3 & 13 & -6 \end{bmatrix}$ using Gauss Jordan Method.	10
3.	a	Express the vector (1,7,-4) as linear combination of u=(1,-3,2) and v=(2,-1,1) in the vector space V_3 of R.	5
	b	Determine k so that the vectors (1,2,1), (k,1,1) and (1,1,2) are linearly independent.	5
4		Find the basis of R^4 containing the vectors (1,2,-1,1) and (0,1,2,-1). Hence find dimension.	10
5.		Find the basis of row space of $A = \begin{bmatrix} 1 & 3 & 1 & -2 & -3 \\ 1 & 4 & 3 & -1 & -4 \\ 2 & 3 & -4 & -7 & -3 \\ 3 & 8 & 1 & -7 & -8 \end{bmatrix}$ Hence verify Rank Nullity Theorem.	10

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