



VIT
Vellore Institute of Technology

SCHOOL OF ADVANCED SCIENCES

Fall Semester 2023-2024

Continuous Assessment Test – II

Programme Name & Branch: B.Tech

Slot: B2+TB2+TBB2

Course Name & code: Complex Variables and Linear Algebra -BMAT201L

Exam Duration: 90 Min.

Maximum Marks: 50

Q.No.	Question	Max Marks	CO	BL
1.	Evaluate $\int_{-\infty}^{\infty} \frac{x^2 - x + 2}{x^4 + 10x^2 + 9} dx$ using residue theorem.	10	CO3	BL5
2.	For a matrix $A = \begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix}$. (i) Find the Eigen values and Eigen vectors of A (ii) Verify Cayley-Hamilton theorem and hence find the inverse of A.	10	CO5	BL2
3.	Solve the following system of linear equations using Gauss Jordan method. $x + 2y - 3z + w = 4$; $2x - y + z + 5w = 1$; $3x + y + 2z - w = 5$; $x + y + 3z - 2w = 2$.	10	CO5	BL3
4.	Let $V = \{(a, b, c, d) b - 2c + d = 0\}$ and $W = \{(a, b, c, d) a = d, b = 2c\}$ be the subspaces of a vector space $R^4(R)$, where R is the set of real numbers. Find bases and the dimension of V , W and $V \cap W$.	10	CO4	BL4
5.	Find the basis and dimension of the null space $A = \begin{pmatrix} -3 & 6 & -1 & 1 & -7 \\ 1 & -2 & 2 & 3 & -1 \\ 2 & -4 & 5 & 8 & -4 \end{pmatrix}$	10	CO4	BL3