



VIT

Vellore Institute of Technology
(Deemed to be University) under section 3 of U.G.A. Act, 1956

REG. No.:

SCHOOL OF ADVANCED SCIENCES
CONTINUOUS ASSESSMENT TEST - II
FALL SEMESTER 2024-2025

SLOT: C1+TC1+TCC1

Programme Name & Branch : Integrated M. Tech
 Course Code and Course Name : IMAT201L and Complex Variables and Linear Algebra
 Faculty Name(s) : Sharief Basha S, Lakshminarayana P, Kavitha A,
 Thilagavathi K and Chandru M
 Class Number(s) : VL2024250102526, 2527, 2528, 2529 and 2530
 Date of Examination : 15/10/2024
 Exam Duration : 90 minutes Maximum Marks: 50

General instruction(s):

- Answer All Questions.
- M – Max. mark; CO – Course Outcome; BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create).

Q. No	Question	M	CO	BL
1.	Evaluate $\oint_C \frac{12z-7}{2z^3-z^2-4z+3} dz$, where C is $ z+i = \sqrt{3}$.	10	CO3	BL1
2.	Evaluate the following real integral $\int_0^{2\pi} \frac{d\theta}{a^2-2a\sin\theta+1}$ where $-1 \leq a \leq 1$ using the concept of complex integration.	10	CO3	BL3
3.	Verify Cayley-Hemilton theorem for the matrix $A = \begin{bmatrix} 1 & 3 & 7 \\ 4 & 2 & 3 \\ 1 & 2 & 1 \end{bmatrix}$. Also, find A^{-1} .	10	CO5	BL3
4.	Solve the system of equations using the Gauss Jordan method $45x + 2y + 3z = 58$; $5x + y + 20z = 67$ and $-3x + 22y + 2z = 47$.	10	CO5	BL2
5.	a) Check the vectors $v_1 = (1,2,3)$, $v_2 = (4,1,5)$ and $v_3 = (-4,6,2)$ are linearly independent or dependent in $V_3(\mathbb{R})$.	4	CO4	BL3
	b) Find the basis and dimension of the following subspaces $U = \{(a,b,c,d,e)/2a-b-c=0, d-3e=0\}$ and $W = \{(a,b,c,d,e)/c+d=0\}$. Also, determine the dimension of $U \cap W$.	6		
