VIT

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

REG.NO.: 24BAT0014

SCHOOL OF ADVANCED SCIENCES

CONTINUOUS ASSESSMENT TEST - II

FALL SEMESTER 2025-2026

SLOT: B2+TB2+TBB2

Programme Name & Branch : B.Tech

Course Code and Course Name : BMAT201L - Complex Variables and Linear Algebra

Faculty Name(s) : Common question paper for this slot

Class Number(s) : Common question paper for this slot

Date of Examination : 06-Oct-2025

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)
- Course Outcomes (Type the CO statements covered in this question paper. Use the CO number as per the syllabus copy)

Q. No	Question	M	CO	BL
1.	Apply Residue theorem to evaluate $\int_C \frac{z^2+2z}{(z+1)^2(z^2+4)}dz$ where C is $\lvert z\rvert=\frac{3}{2}$.	10	3	3
2.	Apply contour integration to evaluate $\int_0^\infty \frac{2x^2-1}{x^4+5x^2+4}dx$.	10	3	3
3.	Apply Cayley-Hamilton theorem to find A^{-1} for $A=\begin{pmatrix}5&2&0\\2&5&0\\-3&4&6\end{pmatrix}$ and find the values of $a,\ b,\ c$ such that $A^4=aA^2+bA+cI$.	10	5	3
4.	Apply Gauss Jordan method to solve the following system of equations $x-y+2z-3w=-1;$ $2x+y-3z+w=1;$ $3x-2y+z+2w=4;$ $x+3y-z+4w=7$	10	5	2
5.	(a) Verify that W=$\{(x, y, z, w) \mid x=y+z-w\}$ is a subspace of a vector space $R^4(R)$.	5	4	2
	(b) Verify that the set $S=\{(1, 1, 2), (1, 2, 5), (5, 3, 4)\}$ form a basis for $R^3(R)$.	5	4	2

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