REG.NO.: 24BBT0300

VIT

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

SCHOOL OF ADVANCED SCIENCES
CONTINUOUS ASSESSMENT TEST - I
FALL SEMESTER 2025-2026

SLOT:A2+TA2+TAA2

Programme Name & Branch	**: B.Tech & Biotechnology**
Course Code and Course Name	**: BMAT203L & Linear Algebra and Differential Equations**
Faculty Name(s)	**: Dr. Vijaya Kumar A G. & Dr. Raghavendar. K**
Class Number(s)	**: VL2025260100709 & VL2025260100703**
Date of Examination	**: 17.08.2025**
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)
- CO1-Solve a system of equations by matrix method.
- CO2-Apply concepts of sequences and series to model real life problems.

Q. No	Question	M	CO	BL
1.	Solve the following system of linear equations by Gauss elimination method $x - 2y + z = 3$, $2x + y + z = 4$, $3x + 4y + 3z = -1$	10	1	3
2.	Find the Eigen values and Eigen vectors of the matrix $\begin{bmatrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{bmatrix}$	10	1	2
3.	a) Derive its row Echelon form for the matrix $\begin{bmatrix} -1 & 1 & 0 & 1 \\ 2 & 3 & 1 & 2 \\ 3 & 1 & 2 & 1 \end{bmatrix}$	4	1	1
	b) Find the Reduced Row Echelon form for the matrix A= $\begin{bmatrix} 2 & -3 & -2 & 3 \\ -2 & 2 & -2 & 0 \\ -1 & 3 & 3 & 1 \\ -3 & -2 & -2 & 2 \end{bmatrix}$	6	1	1
4.	a) Calculate the first ten terms of the sequence $a_n = \frac{3n}{1+6n}$. Does the sequence appear to have a limit? If so, calculate it.	5	2	2
	b) Show that the series $\sum_{n=1}^{\infty} \frac{1}{n(n+1)}$ is convergent, and find it is sum.	5	2	2
5.	a) Determine whether the series $\sum_{n=1}^{\infty} \frac{2n^2+3n}{\sqrt{5+n^5}}$ is converges or diverges with appropriate series test.	5	2	3
	b) Examine the convergence of the series $\sum_{n=1}^{\infty} (-1)^n \frac{1}{n!}$ By absolute convergence series test.	5	3	