CHANDIGARH ENGINEERING COLLEGE CGC LANDRAN Building Careers. Transforming lives.	**CHANDIGARH ENGINEERING COLLEGE-CGC** **Department of Applied Sciences**

Assignment No 1 **Max. marks: 30**

Subject and Subject code: Mathematics –II/ BTAM--201-23

Semester :I (All branches)

Course Outcomes:
Students will be able to:

CO1	determine the existence and uniqueness of the solution of system of linear equations using matrix alzebra
CO2	relate the concepts of Basis and Dimension of a vector space in linear transformation.
CO3	utilize the acquired knowledge of eigen values and eigen vectors to diagonalize the matrix.
CO4	solve ODE using different methods
CO5	apply the concepts of ODE in RLC circuit, Deflection of beams, Simple harmonic motion, Simple population decay model, Orthogonal trajectories of a given family of curves.
CO6	solve Partial Differential Equations using Lagrange's and Charpit's method

Bloom's Taxonomy Levels

L1 – Remembering, L2 – Understanding, L3 – Applying, L4 – Analysing, L5 – Evaluating, L6 - Creating

	Assignment related to COs	Bloom's Taxonomy Level	Relevance to CO No.
	SECTION - A (2Marks Each)		
Q1.	Define similar matrices with an example.	**L-1**	**CO-3**
Q2.	Find the rank of matrix A= $\begin{bmatrix} 1 & 1 & 1 \\ 1 & -1 & 1 \\ 2 & 1 & -1 \end{bmatrix}$	**L-3**	**CO-1**

Q3.	Verify Cayley-Hamilton theorem for the matrix $\begin{bmatrix} 1 & 4 \\ 3 & 2 \end{bmatrix}$ and find its inverse.	**L-3**	**CO-3**
Q4.	State the conditions for consistency of non-homogeneous system of equations.	**L-1**	**CO-1**
Q5.	Express$(1,1,1)$ as linear combination of the vectors $(1,2,3), (-4,5,6), (7,-8,9)$.	**L-2**	**CO-2**
SECTION – B (4 Marks Each)			
Q6.	Is the matrix $A = \begin{bmatrix} -2 & 2 & -3 \\ 2 & 1 & -6 \\ 1 & -2 & 0 \end{bmatrix}$ is diagonalizable? If yes, hence find diagonal matrix.	**L-4**	**CO-3**
Q7.	Find a linear transformation $T: R^2 \to R^2$ such that $T(1,0) = (1,1)$ *and* $T(0,1) = (-1,2)$. Prove that T maps the square with vertices $(0,0)$, $(1,0)$, $(1,1)$, $(0,1)$ into a parallelogram.	**L-5**	**CO-2**
Q8.	For what values of λ *and* μ does the system of equations $x + y + z = 6,\ x + 2y + 3z = 10,\ x + 2y + \lambda z = \mu$ has (i) No solution (ii) Infinitely many solutions (iii) Unique solution	**L-4**	**CO-1**
Q9.	Let W be a sub-space generated by the polynomials $f_1 = x^3 - 2x^2 + 4x + 1$, $f_2 = 2x^3 - 3x^2 + 9x - 1$, $f_3 = x^3 + 6x - 5,\ f_4 = 2x^3 - 5x^2 + 7x + 5$. Find basis and dimension.	**L-6**	**CO-2**
Q10.	Solve by Gauss elimination method $2x + y + z = 10,\ 3x + 2y + 3z = 18,\ x + 4y + 9z = 16$	**L-5**	**CO-1**