Indira Gandhi Delhi Technical University For Women

(Formerly Indira Gandhi Institute of Technology)
Kashmere Gate, Delhi-110006

APPLIED MATHEMATICS-1(BAS-101)

TUTORIAL SHEET -2

(MATRICES)

Q.1 Test for consistency of the following system of equations

$$3x + 3y + 2z = 1$$
$$x + 2y = 4$$
$$10y + 3z = -2$$
$$2x - 3y - z = 5$$

Q.2 Test for consistency of the following system of equations

$$x + 3y + 2z = 0$$
$$2x - y + 3z = 0$$
$$3x - 5y + 4z = 0$$
$$x + 17y + 4z = 0$$

and, if consistent, solve the system.

Q.3 Discuss the consistency of the system of equations

$$2x - 3y + 6z - 5w = 3$$
$$Y - 4z + w = 1$$
$$4x - 5y + 8z - 9w = \lambda$$

for various values of λ, If consistent, find the solution.

Q.4 Check whether the following sets of vectors are linearly dependent or independent.

$$(1, 2, 1), \quad (2, 1, 4), \quad (4, 5, 6)$$

Q.5 Find the values of a and b for which the equations

$$x + ay + z = 3$$
$$x + 2y + 2z = b$$
$$x + 5y + 3z = 9$$

are consistent.

Q.6 Solve the homogeneous system of equations

$$4x + 2y + z + 3w = 0$$
$$6x + 3y + 4z + 7w = 0$$
$$2x + y + w = 0$$

Q.7 Test whether the following sets of vectors are linearly dependent or independent. If dependent find relation between them.

X = $(2, -1, 4)$, $Y = (0, 1, 2)$, $Z = (6, -1, 16)$

Q.8 Investigate for consistency of the following equations and if possible find the solutions

$$4x - 2y + 6z = 8, x + y - 3z = -1, 15x - 3y + 9z = 21$$

ANSWER KEY :

1. Consistent, x = 2, y = 1, z = - 4
2. x = 11 k, y = k, z = -7k, where k is arbitrary
3. No solution if $\lambda \neq 7$ and infinite number of solutions if $\lambda = 7$
4. Linearly dependent
5. a = -1, b = 6
6. Infinite number of solutions with z = -w, y = -2x – w, where x and w are parameters
7. linearly dependent, Z = 3X + 2Y
8. consistent, x = 1, y = 3z – 2