

Ganpat University-Institute of Computer Technology

Computer Science & Engineering Department

Subject : Linear Algebra

Faculty : DSD

Assignment 1

Q.1 Find out the Linear Dependence / Independence of vectors for following. If dependent find the relation :

1) $x_1 = (1, -1, 1)$; $x_2 = (2, 1, 1)$; $x_3 = (3, 0, 2)$

2) $x_1 = (3, 2, 7)$; $x_2 = (2, 4, 1)$; $x_3 = (1, -2, 6)$

3) $x_1 = (1, 3, 4, 2)$; $x_2 = (3, -5, 2, 6)$; $x_3 = (2, -1, 3, 4)$

Q.2 Check whether the systems of linear equations are consistent. If they are, then find solution also.

1) $x - 3y - 8z = -10$

$$3x + y - 4z = 0$$

$$2x + 5y + 6z = 13$$

2) $4x - 2y + 6z = 8$

$$x + y - 3z = -1$$

$$15x - 3y + 9z = 21$$

Q.3 Find the values of λ for which the equations $x + 2y + z = 3$; $x + y + z = \lambda$ and $3x + y + 3z = \lambda^2$ are consistent. Solve them for these values of λ .

Q.4 Find the Eigen Values & Eigen Vectors for following matrices :

(1)
$$\begin{pmatrix} 3 & 10 & 5 \\ -2 & -3 & -4 \\ 3 & 5 & 7 \end{pmatrix}$$

(2)

$$\begin{pmatrix} 11 & -4 & -7 \\ 7 & -2 & -5 \\ 10 & -4 & -6 \end{pmatrix}$$

(3)

$$\begin{pmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & -1 & 3 \end{pmatrix}$$