

Some questions in subject of **Linear Algebra**
With Application

Q₁/ If we have these systems of the linear equation $3x - y = 4$
 $-4x + 2y = -6$
Find all: 1) Solve the systems by used Substitution method
2) Rank of A by used normal form transformation way.

Q₂/ Solve this system of the linear equation by using gramer method.

$$x_1 - 2x_2 + 3x_3 = -2$$

$$x_2 - 2x_3 = 3$$

$$-x_1 + 2x_2 - 2x_3 = 1$$

Q₃/ In Q₃ find A^{-1} by used elementary transformation

Q₄/ Solve these systems of the linear equation by using gramer method.

$$2x_1 + x_3 = 2$$

if $x_1 - x_2 - 2x_3 = 3$

$$2x_2 - 3x_3 = 1$$

Q₅/ In Q₁ find A^{-1} by used elementary transformation.

Q₆ / If we have these systems of the linear equation: $3x + 2y = 9$
 $2x - y = 3$

Find all: 1) Solve the systems by used elimination method.
2) Rank of A by used canonical form transformation way.

Q₇/If we have these systems of the linear equation $2x_1 + 3x_2 = 2$
 $3x_1 - 3x_2 = 6$

Find all: 1) Solve the systems by used Substitution method
2) A^{-1} by used elementary transformation

Q₈/ Solve this system of the linear equation by using inverse method.

$$2x_1 + x_2 - 3x_3 = 3$$

$$-x_1 + 2x_2 = 2$$

$$x_1 + 3x_2 - x_3 = 1$$

Q₉/ In Q₂ find Rank of A by used normal form transformation way.

Q₁₀/ If $\lambda_1 = -2$, $\lambda_2 = -3$ and $C = \begin{bmatrix} a & -4 \\ b & -6 \end{bmatrix}$ find all:

The value of (a and b)

1- Eigenvector of C .

Q11/ Let $K = \begin{bmatrix} 3 & 2 & 4 \\ 1 & 1 & 1 \\ 4 & 3 & 3 \end{bmatrix}$, Find K^{-1} by using elementary transformation.

Q12/ If $F = \frac{1}{5} \begin{bmatrix} 4 & 3 \\ -3 & 4 \end{bmatrix}$ is (F) orthogonal matrix or not?

Q13/ Solve this system of the liner equations by using Gramar method.

$$x_1 + x_2 + 3x_3 = 4$$

$$x_1 + 4x_2 + 4x_3 = -1$$

$$2x_1 + 6x_2 + 7x_3 = 1$$

**Q14/ If the system of the liner equations has $x_1 - x_2 + 2x_3 = -1$
 $x_1 + x_2 + x_3 = 3$ find all:**

1) Solve this system by using elimination method.

2) Find rank of (A) by using normal form transformations.

Q15/ In this information of (10) observations:

$$\sum_{i=1}^{10} x_i = 34 \quad , \quad \sum_{i=1}^{10} x_i^2 = 142 \quad , \quad \sum_{i=1}^{10} y_i = 41 \quad , \quad \sum_{i=1}^{10} x_i y_i = 136$$

Find the estimated equation of the simple linear regression.

Q16/If A and B are two orthogonal matrix show that (A B) is orthogonal.

Q17/Find the eigenvalue & eigenvector of A if $A = \begin{bmatrix} 6 & 2 \\ 10 & 5 \end{bmatrix}$

Q18/ Is matrix B is orthogonal matrix or not? If $B = \begin{bmatrix} \frac{5}{13} & -\frac{12}{13} \\ \frac{12}{13} & \frac{5}{13} \end{bmatrix}$

Q19/ From the following data:

X	2	4	6	8	10	7
Y	3	1	7	5	9	8

Find the estimated equation of the regression line.