Chapter 1 (linear Algebra)

Assignment

1 Solve the linear equation by checking consistency.

$x + 2y - z = 3$

$3x - y + 2z = 1$

$2x - 2y + 3z = 2$

2 Check the consistency and solve by using Gauss elimination method

$4y + 3z = -3$

$x + y - z = 9$

$-x + 2y - 3z = 20$

3 Investigate for what values of p and q, the system of simultaneous equations $x + y + z = 6$, $x + 2y + 3z = 10$, $x + 2y + pz = q$ has

(i)no solution (ii)a unique solution (iii)an infinite number of solutions

4 Define consistency of a system of equations. Check consistency of the equations: $5x+3y+7z = 4$, $3x+26y+2z = 9$, $7x+2y+10z = 5$. If it is consistence find its solution.

5 Define basis of a vector space over the field. Check the following vectors form a basis of R^3.(1,1,1),(1,3,2), (-1,0,1).

Define Eigen value and Eigen vectors of a square matrix A. Find Eigen value and

6 0 1 1

Eigen vector of

A·

=

DefinFind rank of the matrix.
Find the rank of the matrix

7

1 0 1

1 1 0

− −

1 0 1 1 3 1 2 2 1 1 2 0

−

0 1 3 1

8 Define eigen values and eigen vectors of the square matrix. Find eigen value and vectors of the square matrix A

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2 1 4

1 2 3

3 1 1

9 State Cayley Hamilton Theorem and use it to find the inverse of (1 3 7 4 2 3 1 2 1)

10 Verify Cayley-Hamilton Theorem Where 3 1

4

A = [5
0 2 6 0 0]

11 Find eigen value and eigen vector of [

1 1 2

−

= 0 2 1 −

A

0 0 3

12 Short questions

1 2 3

+ x

a) Show that $_2$ 1 2 3 (6)

+ = +

x x x

1 2 3 + x

b) Find the rank of $A = $ 4 1 1 4 / 1 2 5 3 1

c) Let T: $R^2 \to R^2$ be a transformation which is defined by $T(x, y) = (x + y, x - y)$, check the linearity of T.

d) Prove that: | �� + �� �� �� �� / �� �� �� / �� �� + �� �� + �� | = 4������.

e) Show that the transformation $T: R^2 \to R$ defined by $T(x, y) = x + y$ is not linear.

f) Check the following transformation is linear or not

T: $R^2 \to R^2$ be defined by T(x, y) = (x + 3, y)