KTU NOTES

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KTU STUDY MATERIALS | SYLLABUS | LIVE NOTIFICATIONS | SOLVED QUESTION PAPERS

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(I MODULE)

1. Determine the rank of the matrix $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & 3 \\ 1 & 2 & 5 \end{bmatrix}$ (Dec 2019)

2. If 2 is an eigen value of $\begin{bmatrix} 3 & -1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{bmatrix}$ without using its characteristic equation, find the other eigen values (Dec 2019)

3. Solve the system of equations by Gauss elimination method

$$x + 2y + 3z = 1$$
$$2x + 3y + 2z = 2$$
$$3x + 3y + 4z = 1$$

(Dec 2019)

4. Find the eigen values and eigen vectors of $\begin{bmatrix} 4 & 2 & -2 \\ 2 & 5 & 0 \\ -2 & 0 & 3 \end{bmatrix}$ (Dec 2019)

5. Find the values of λ and μ for which the system of equations

$$2x + 3y + 5z = 9$$
$$7x + 3y - 2z = 8$$
$$2x + 3y + \lambda z = \mu$$

has (i) no solution (ii) a unique solution (iii) infinite solution (dec 2019)

6. Find the matrix of transformation that diagonalize the matrix $A = \begin{bmatrix} 1 & -3 & 3 \\ 3 & -5 & 3 \\ 6 & -6 & 4 \end{bmatrix}$. Also write the diagonal matrix (dec 2019)

7. Determine the rank of the matrix $A = \begin{bmatrix} 1 & -1 & 0 \\ 1 & 3 & -1 \\ 5 & 3 & -2 \end{bmatrix}$ (jan 2021)

8. What kind of conic section is represented by the quadratic form $7x_1^2 + 6x_1x_2 + 7x_2^2 = 200$ transform it in to canonical form (jan 2021)

9. Test for consistency and solve the system of equations.

$$x + 2y - z = 3$$
$$3x - y + 2z = 1$$
$$2x - 2y + 3z = 2$$
$$x - y + z = -1$$

(jan 2021)

10. find the eigen values and eigen vectors of $\begin{bmatrix} 1 & 1 & 2 \\ -1 & 2 & 1 \\ 0 & 1 & 3 \end{bmatrix}$ (jan 2021)

11. For what values of a and b do the system of equations

$$x + y + z = 6$$
$$x + 2y + 3z = 10$$
$$x + 2y + az = b$$

have i) no solution (ii) unique solution (iii) more than one sol^n (jan 2021)

12. Find the matrix of transformation that diagonalize the matrix

$A = \begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$ Also write the diagional matrix (jan 2021)

13. Find the rank of the matrix $\begin{bmatrix} 0 & 1 & 0 \\ -1 & 0 & -4 \\ 0 & 4 & 0 \end{bmatrix}$ (Dec 2021)

14. Find the Eigen values of the matrix $A = \begin{bmatrix} 1 & 2 \\ 0 & 3 \end{bmatrix}$ What are the eigen values of A^2, A^{-1} without using its characteristic equation (Dec 21)

15. Solve the following linear system of equations using Gauss Elimination method

$$x + 2y - z = 3$$
$$3x - y + 2z = 1$$
$$2x - 2y + 3z = 2$$

[dec 21]

16. Find the eigen values and eigen vectors of $\begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$ [dec 21]

17. Solve the following linear system of equations using Gauss Elimination method

$$2x - 2y + 4z = 0$$
$$-3x + 3y - 6z + 5w = 15$$
$$x - y + 2z = 0$$

[dec 21]

18. Find the matrix of transformation that diagonalize the matrix $A = \begin{bmatrix} -5 & 2 \\ 2 & -2 \end{bmatrix}$ also write the diagonal matrix [dec 21]

19 Determine the rank of the matrix $A=\begin{bmatrix} 2 & 1 & -1 \\ 0 & 3 & -2 \\ 2 & 4 & -3 \end{bmatrix}$ (dec 2020)

20 Show that the quadratic form $4x^2+12xy+13y^2$ is positive definite [dec 2020]

21 Solve the following linear system of equations using Gauss elimination method [dec 2020]

$x+y+z=6,\quad x+2y-3z=-4,\quad -x-4y+9z=18$

22. find eigen values and eigen vectors of the matrix

$$A=\begin{bmatrix} 1 & 1 & 2 \\ -1 & 2 & 1 \\ 0 & 1 & 3 \end{bmatrix}$$

[dec 2020]

23. Show that the equations

$x+y+z=a$

$3x+4y+5z=b$

$2x+3y+4z=c$

i) have no solution $a=b=c=1$

ii) have many solutions if $a=\frac{b}{2}=c=1$ (dec 2020)

24. find the matrix of transformation that diagonalize the matrix

$$A=\begin{bmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & -1 & 3 \end{bmatrix}$$

Also, find the diagonal matrix (dec 2020)

25. Find the rank of the matrix $\begin{bmatrix} 1 & 2 & -1 & 3 \\ 2 & 2 & 4 & 1 \\ 5 & 6 & 7 & 5 \end{bmatrix}$ (dec 2020)

26. What type of conic section the following quadratic form represent? $Q = 17x_1^2 - 30x_1x_2 + 17x_2^2 = 128$ (dec 2020)

27. Using Gauss elimination method find the solution of the system $x+y-z=9$, $8y+6z=-6$, $-2x+4y-6z=40$ (dec 2020)

28. Find the matrix of transformation that diagonalize the matrix $\begin{bmatrix} 3 & 1 & -1 \\ -2 & 1 & 2 \\ 0 & 1 & 2 \end{bmatrix}$ Also, find the diagonal matrix (dec 2020)

29. Find the value of λ and μ for which the system of equations

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

$7x+3y-2z=8$

$2x+3y+\lambda z=\mu$

has a) no solution b) unique solution c) more than one solution (dec 2020)

30. Find the eigen values and eigen vectors for the matrix $\begin{bmatrix} -2 & 2 & -3 \\ 2 & 1 & -6 \\ -1 & -2 & 0 \end{bmatrix}$ (dec 2020)