



MTH501-Linear Algebra

(Solved MCS's)

**LECTURE FROM
(23 to 45)**



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ALL answers are verified if found any mistake then Correct ACCORDINGLY

1. Which statement about the General Least Square Method is true?

- ❖ Solution obtained by this method is always Unique.
- ❖ This is a numerical method for the solution of system of Linear Equations.
- ❖ This method find an X that make Ax as close possible to the b .
- ❖ This method gives us exact solution of the System.

2. Let $v = (1, -2, 2, 0)$. The unit vector in the same direction as v is:

$$\frac{1}{3}, \frac{-2}{3}, \frac{2}{3}, 0$$

$$\frac{1}{3}, \frac{2}{3}, \frac{-2}{3}, 0$$

$$\frac{1}{3}, \frac{2}{3}, \frac{2}{3}, \frac{1}{3}$$

3. Let $u = (3, -2)$, $v = (4, 5)$. For the weighted Euclidean inner product $(u, v) = 4u_1v_1 + 5u_2v_2$

$$(v, u) =$$

$$2$$

$$-2$$

$$3$$

$$-3$$

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4. Let $v = (0, 2, 2, 1)$. The unit vector in the same direction as v is

❖ $0, \frac{2}{3}, \frac{2}{3}, \frac{1}{3}$

❖ $0, \frac{12}{3}, \frac{2}{3}, \frac{1}{3}$

❖ $0, \frac{1}{3}, \frac{2}{3}, \frac{2}{3}$

❖ $0, 1, \frac{2}{3}, \frac{2}{3}$

5. Let I^3 have the Education inner product. Then $u = (2, 1, 3)$, $V = (1, 7, k)$ are orthogonal for

❖ $K=9$

❖ $K= -3$

❖ $K= -9$

❖ $K= 3$

6. Let A be an $n \times n$ Matrix whose entries are real. If λ is an eigenvalue of A with x a corresponding eigenvector in $\mathbb{R}^n$, then

❖ $Ax = \lambda x$

❖ $Ax = \lambda x$

❖ $Ax = \lambda x$

❖ $Ax = \lambda x$

7. Suppose that $A = \begin{bmatrix} 1.25 & -0.75 \\ -0.75 & 1 \end{bmatrix}$ has eigenvalues 2 and 0.5.

then Origin is a

❖ Saddle point

❖ Repellor

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❖ Attractor

8. Suppose that $A = \begin{bmatrix} 0.5 & 0.6 \\ -0.3 & 1.4 \end{bmatrix}$ has eigenvalues 0.8 and

1.1. then Origin is a

❖ Saddle point

❖ Repellor

❖ Attractor

9. if A is an $m \times n$ matrix with linearly independent column vector, then A can be factored as

$$A = QR$$

Where Q is an $m \times n$ matrix orthonormal column vector, and R is an $n \times m$.

❖ Upper triangular matrix

❖ Invertible matrix

❖ Invertible lower triangular matrix

❖ invertible Upper triangular matrix

10. The matrix equation $A^T A \hat{x} = A^T b$ represent a system of linear equation Commonly referred to as the

❖ Normal equation for x

❖ Normal equation for $\hat{x}$

❖ Normal equation for A

❖ Normal equation for b

11. By the best Approximation theorem, the distance from y to W is $\|y - \hat{Y}\|$, where $\hat{Y} =$

❖ $\text{Proj}_W \hat{Y}$

❖ $\text{Proj}_W y$

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❖ proj_W

12. $\|u + v + w\| \leq \|u\| + \|v\| + \|w\|$ for all vectors u, v and w in an inner product space.

❖ True

❖ False

13. The dominant for the matrix $A =$

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

❖ $\lambda = 1$

❖ $\lambda = -3$

❖ $\lambda = -1$

❖ $\lambda = 0$

14. A square matrix A is invertible if and only if and only if $X = 0$ is not an Eigen Value of A

❖ True

❖ False

15. A square matrix with orthogonal columns -----
-----matrix.

❖ Is an orthogonal

❖ May be an orthogonal

❖ May not be an orthogonal

❖ Is not an orthogonal

16. if two rows are orthogonal, they are-----.

❖ Linearly independent

❖ Linearly Dependent

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17. if X is orthogonal to both U and V, then must be ---
-----to $u+v$.

- ❖ Orthogonal
- ❖ Orthonormal
- ❖ Perpendicular
- ❖ Parallel

18. the given system $\begin{cases} 2x + 3y = 3 \\ 6x + 9y = 7 \end{cases}$ has

- ❖ Unique solution
- ❖ Infinitely many solution
- ❖ No solution
- ❖ None of these

19. Which statement about the matrix $\begin{bmatrix} 1 & 0 & 0 \\ 7 & 2 & 0 \\ 0 & 0 & 0 \end{bmatrix}$ is

false?

- ❖ Eigenvalue 2 has algebraic multiplicity 1
- ❖ Eigenvalue of the matrix 1, 2 and -1
- ❖ Characteristic polynomial of the matrix is $(1 - \lambda)(2 - \lambda)^2(-1 - \lambda)$
- ❖ Eigenvalue -1 has multiplicity 1

20. if $A = \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$ is diagonalizable A has 2 distinct

eigenvalues.

- ❖ True
- ❖ False

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21. A is diagonalizable if $A = PDP^{-1}$ where

- ❖ D is any matrix and P is an invertible matrix
- ❖ D is a diagonal matrix and P is any matrix
- ❖ **D is a diagonal matrix and P is invertible**
- ❖ D is a invertible matrix and p is any matrix

22. How many terms are there the algebraic expression $8X^2 + \sqrt{9x} \times 25X^3$?

- ❖ 4
- ❖ 3
- ❖ **2**
- ❖ 1

23. if two matrixes are added, then which of following should be true for them?

- ❖ **Both must have same order**
- ❖ Both must have different order
- ❖ Both must be rectangular
- ❖ Both must be square

24. if a matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 2 & 3 \\ 6 & 1 & 1 \end{bmatrix}$, then which of the

following is true for A ?

- ❖ It is a rectangular matrix
- ❖ It is row matrix
- ❖ **It is singular matrix**
- ❖ It is scalar matrix

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25. if v_1, v_2 and v_3 are in R^m then which of the

following is equivalent to $[v_1, v_2, v_3]$?

❖ $2v_1 - 7v_2 + 5v_3$

❖ $5v_1 - 7v_2 + 2v_3$

❖ $5v_1 + 2v_2 - 7v_3$

❖ $2v_1 + 5v_2 - 7v_3$

26. if (v_1, v_2, v_3) is linearly dependent set and c_1, c_2, c_3

(where 'c' is a scalar), which option is true?

❖ $v_1 \in \text{span}(v_1, v_2)$

❖ $v_3 \in \text{span}(v_1, v_2)$

❖ $v_2 \in \text{span}(v_1, v_3)$

❖ $v_3 \in \text{span}(v_1, v_2)$

27. if $A = \begin{bmatrix} 1 & 2 & 3 \\ 0 & 0 & 1 \\ 0 & -1 & 1 \end{bmatrix}$, then which of the following is true

for the matrix A?

❖ It is an invertible matrix

❖ It is a singular matrix

❖ It is a non – invertible matrix

❖ It is a rectangular matrix

28. which of the following is true for the partitioned matrices $A = \begin{pmatrix} C & D \end{pmatrix}$ and $B = \begin{pmatrix} E & F \end{pmatrix}$, where Sub-

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matrices C and D have the same size As E and F respectively?

$$\diamond A + B = (CE \quad DF)$$

$$\diamond A + B = \begin{vmatrix} C + E \\ D + F \end{vmatrix}$$

$$\diamond A + B = [C + E \quad D + F]$$

$$\diamond A + B = \begin{vmatrix} CE \\ DF \end{vmatrix}$$

29. If a matrix A is factorized into lower and upper triangular matrices, then which of the following is true for the matrix?

- ❖ It is called an LU- procedure.
- ❖ It is called an LU –decomposition
- ❖ It is called an LU- matrices.
- ❖ It is called an LU- algorithm.

30. if the matrix $A = \begin{vmatrix} 1 & 5 & 4 \\ 0 & 1 & 7 \\ 0 & 0 & 0 \end{vmatrix}$, then which of the following is true about it?

- ❖ Its determinant is 0.
- ❖ Its determinant is 2.
- ❖ Its determinant is 4.
- ❖ Its determinant is 6.

31. Let a set S is a basis of a vector space V, then which of the following is NOT true about it?

- ❖ It is linearly dependent.
- ❖ Each element of S belong to V.

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- ❖ It spans V .
- ❖ It is linearly independent.

32. if $B =$

$\begin{bmatrix} 0 & 1 & 2 \\ 1 & 1 & 1 \end{bmatrix}$ for $\mathbb{R}^2$ and $x^1 \in \mathbb{R}^2$ has coordinate vector $[x^1]_B = \begin{bmatrix} 1 \\ 3 \end{bmatrix}$, then which of the following is the value of x^1 ?

$\begin{bmatrix} 0 & 1 & 2 \\ 1 & 1 & 1 \end{bmatrix}$

❖ $x^1 = \begin{bmatrix} 6 \\ 1 \end{bmatrix}$

❖ $x^1 = \begin{bmatrix} 2 \\ 1 \end{bmatrix}$

❖ $x^1 = \begin{bmatrix} 0 \\ 1 \end{bmatrix}$

❖ $x^1 = \begin{bmatrix} 1 \\ 0 \end{bmatrix}$

❖ $x^1 = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$

❖ $x^1 = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$

❖ $x^1 = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$

33. if a set $S = \{1, x, x^2\}$ is a basis for P_2 and $[p^1]_S = (2, 4, 7)$, then which of the following is the most appropriate option?

❖ $P_2 = 2 - 4x + 7x^2$

❖ $P_2 = 2 - 4x - 7x^2$

❖ $P_2 = 2 + 4x + 7x^2$

❖ $P_2 = 4x + 7x^2$

34. which of the following is the set of standard basis for $\mathbb{R}^3$?

❖ $\{(1, 1, 0), (0, 1, 0), (1, 0, 1)\}$

❖ $\{(1, 0, 0), (0, 1, 1), (0, 0, 1)\}$

❖ $\{(1, 0, 0), (1, 1, 0), (0, 0, 1)\}$

❖ $\{(1, 0, 0), (0, 1, 0), (1, 1, 1)\}$

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35. Consider the bases for $\mathbb{R}^3$ given by $B = \{ \mathbf{r}_b^1, \mathbf{r}_b^2 \}$

and $C = \{ \mathbf{r}_c^1, \mathbf{r}_c^2 \}$; where $\mathbf{r}_b^1 = \begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix}, \mathbf{r}_b^2 = \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}, \mathbf{r}_c^1 = \begin{bmatrix} 5 \\ 3 \\ 1 \end{bmatrix}, \mathbf{r}_c^2 = \begin{bmatrix} 2 \\ 1 \\ 1 \end{bmatrix}$,

also assume that $P_{B \leftarrow C} = \begin{bmatrix} 2 & -1 \\ 3 & 1 \end{bmatrix}$; then which of the

following is the change of –coordinates matrix from B to C?

❖ $P_{B \leftarrow C} = \begin{bmatrix} 1 & 1 \\ 3 & -2 \end{bmatrix}$

❖ $P_{B \leftarrow C} = \begin{bmatrix} 1 & 5 \\ 3 & -2 \end{bmatrix}$

❖ $P_{B \leftarrow C} = \begin{bmatrix} 1 & 1 \\ 3 & -2 \end{bmatrix}$

❖ $P_{B \leftarrow C} = \begin{bmatrix} -8 & -3 \\ 3 & 1 \end{bmatrix}$

36. if the general term of a typical signal is $(0.6)^k$, then determine which of the following is the signal for $k = -2$?

❖ $(0.6)^{-2} = 0$

❖ $(0.6)^{-2} = 0.6$

❖ $(0.6)^{-2} = (0.6)^2$

❖ $(0.6)^{-2} = 1/(0.6)^2$

37. if the casorati matrix is not is not invertible, then which of the following is the most appropriate option regarding the associated signals?

❖ The signals are linearly independent.

❖ The signals are linearly dependent.

❖ The signals may or may not dependent

❖ The signals may or may not independent

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38. if $\{Y_k\} = \{..., 1, 0.7, 0, -0.7, 0, 0.7, 1, 0.7, 0, ...\}$ and $0.35Y_{K+2} + 0.6Y_{K+1} + 0.42Y_K = Z_k$;

$$K=0$$

Then which of the following is the value of Z_0 ?

❖ 0.840

❖ 0.049

❖ -0.770

❖ -1.139

39. A system of linear equation is said to be homogenous if it can be written in the form-----

❖ $AX = B$

❖ $AX = 0$

40. if $AB = I = BA$ for matrices A, B and I, where I is an identity matrix, then

❖ B is Inverse of A

❖ A is inverse of B

❖ $A^{(-1)} = B, B^{(-1)} = A$

❖ All of the above

41. A square matrix A is said to be diagonal if A is similar to a matrix

❖ Column matrix

❖ Zero matrix

❖ Diagonal matrix

❖ None of these

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42. Let A be the matrix of order 2×3 and B be the matrix order 3×5 , then which of the following is the order of the matrix AB?

- ❖ 2×3
- ❖ 3×5
- ❖ 3×3
- ❖ 2×5

43. Let ' $Ax = 0$ ' be a homogeneous linear system of ' n ' equation and ' n ' unknowns. Then, the coefficient matrix ' A ' is invertible if and only if this system has --- solution.

- ❖ No
- ❖ Trivial
- ❖ Non-trivial
- ❖ Infinite many

44. If $X - 2$ is a factor of the characteristic polynomial of matrix C then an eigenvalue of C is.

- ❖ 2
- ❖ -2
- ❖ $1/2$
- ❖ 0

45. if $\lambda + 2$ is a factor of the characteristic polynomial of matrix C. then which of the following is the eigenvalue of C?

- ❖ 2
- ❖ -2

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❖ 1 / 2

❖ 0

46. Let A and B be the square matrices. Then A and B are invertible with $B = A^{-1}$ and $A = B^{-1}$ if and only if $AB = BA$ equals to a (an) --- matrix

❖ Singular

❖ Square

❖ Identity

❖ Rectangular

47. Let V be a five – dimensional vector space . and let S be a subset of V which spans V. Then S

❖ Must be linearly dependent

❖ Must be a basis for V

❖ Must have infinitely many elements

❖ Must have at most five element.

48. If $U + V = U + W$ then

❖ $V = W$

❖ $V \cap W$

❖ $V = W$

❖ None of the above

49. if one of the eigenvalues of $[A]_{n \times n}$ is zero , it implies-----

❖ The solution to $[A][X] = [C]$ a system of equation is unique

❖ The determinant of $[A]$ is zero.

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- ❖ The solution to $[A][X] = [0]$ system of equation is trivial
- ❖ The determinant of $[A]$ is nonzero

50. If a matrix A has both negative and positive Eigen values, so in this case origin behaves as a----- point

- ❖ Saddle
- ❖ Critical

51. If λ is an eigenvector of A , then every nonzero vector x such that $Ax = \lambda x$ is called an ----- of A corresponding to---

- ❖ Eigenvalue. λ
- ❖ Eigenvector. λ
- ❖ Eigenvalue. A
- ❖ Eigenvector. A

52. Let A be $n \times n$ matrix, then A invertible if and only if

- ❖ Det A is not Zero
- ❖ Det A is zero

**53. The invertible matrix theorem applies only to -----
-----matrices.**

- ❖ Rectangular
- ❖ Square
- ❖ Identity
- ❖ Scalar

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54. A 3×3 identity matrix have three and ----- eigenvalues.

- ❖ Same
- ❖ Distinct

55. An $n \times n$ matrix A is said to be diagonalizable if and only if A has n ----- eigenvectors.

- ❖ Linearly dependent
- ❖ Linearly independent

56. What is Eigen value?

- ❖ A vector obtained from the coordinates
- ❖ A matrix determined from the algebraic equation
- ❖ A scalar associated with a given linear transformation
- ❖ It is the inverse of the transform

57. A column replacement operation on A does not change the

- ❖ Determinant
- ❖ Matrix
- ❖ Row
- ❖ Column

58. Let a matrix A has both negative and positive eigen values, so in this case origin behaves as a ---- point

- ❖ Saddle
- ❖ Critical

59. A null space is a vector space

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❖ True

❖ False

60. Each pair of eigenvalue and its corresponding eigenvector provides a solution of the equation $X' = Ax$ which is called

❖ Eigen solution

❖ Eigen function

61. If A is invertible and b in R^n be any vector. Then, we must have a matrix $A^{-1}b$, which is a solution of ---

❖ $A^{-1}b = b$

❖ $A^2b = b$

❖ $A^tb = b$

❖ $Ax = b$

62. What is the maximum possible number of pivots in a 6×6 matrix?

❖ 0

❖ 2

❖ 4

❖ 6

63. If 3 is an eigenvalue of A and x is corresponding eigenvector, then what is the eigenvalue of A^2 ?

❖ 12

❖ 9

❖ 6

❖ 3

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64. The characteristics polynomial of 3 X 3 identity matrix is ----- if x is the eigen values of the given 3 x 3 identity matrix.

❖ $(x - 1)^3$

❖ $(x + 1)^3$

❖ X^3

❖ $(1 - x)^3$

65. A partitioned matrix 'A' is said to be block diagonal if the matrices on the main diagonal are square and all other position matrices are

❖ Zero

❖ Unit

❖ NonZero Symmetric

❖ nonzero Skew Symmetric

66. If A is an invertible square matrix then

❖ $(A^T)^{-1} = (A^{-1})^T$

❖ $(A^T)^T = (A^{-1})^T$

❖ $(A^T)^{-1} = (A^{-1})^{-1}$

❖ None of these

67. A blocked matrix in which block are repeated the down the diagonals of the matrix is called a ----- matrix.

❖ Blocked Square

❖ Blocked diagonal- constant

❖ Blocked identity

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- ❖ Blocked rectangular

68. Two equivalent vector must have the same initial point.

- ❖ True
- ❖ False
- ❖ May be

69. λ is an eigenvalue of a matrix A if and only if the equation $(A - \lambda I)x = 0$ has a-----

- ❖ Non-trivial solution
- ❖ Trivial solution

70. which of following is the eigenvalue of the matrix?

- ❖ 3
- ❖ 5
- ❖ 3.4
- ❖ 3.5

71. the complex conjugate of a vector in C^n is the vector x in C^n whose entries are the conjugates of the entries in x

- ❖ Real
- ❖ Complex

72. Multiplication of a partitioned matrix by a scalar is also computed-----

- ❖ Row by Row
- ❖ Column by column
- ❖ Diagonal by diagonal

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❖ Block by block

73. if the real part the eigenvalue is zero, then the trajectories from ----- around the origin.

- ❖ Parabola
- ❖ Hyperbola
- ❖ Ellipse
- ❖ None of these

74. A row interchange ----- the of the determinant.

- ❖ Change
- ❖ Does not change

75. For any subspace W of a vector space V , which one is not the axiom for subspace. 0 must be in W .

- ❖ For all u, v in W and $u - v$ must be in W .
- ❖ For all u, v in W and $u \cdot v$ must be in W .
- ❖ For any scalar k and u in W then $k \cdot u$ in W .

76. Which one is not the axiom for vector space?

- ❖ $0 + u = u$
- ❖ $0 \cdot u = u$
- ❖ $1 \cdot u = u$
- ❖ $u + v = v + u$

77. The Gauss-Seidel method is applicable to strictly diagonally dominant matrix.

- ❖ TRUE
- ❖ FALSE

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78. If a multiple of one row of a square matrix A is added to another row to produce a matrix B, then which of the following condition is true?

- ❖ $\det B = \det A$
- ❖ $\det B = k \det A$
- ❖ $\det A \det B = 0$
- ❖ $\det A \det B = \det A$

79. Which of the following is the volume of the parallelepiped determined by the columns of A where A is a 3×3 matrix?

- ❖ $|\det A|$
- ❖ $[A]$
- ❖ $\det A$
- ❖ $A^{(-1)}$, that is inverse of A

80. Determinant of a non-invertible(singular) matrix always

- ❖ vanish
- ❖ unity
- ❖ non zero negative
- ❖ non zero positive

81. Rank of a zero matrix of any order is

- ❖ zero
- ❖ three
- ❖ four
- ❖ nine

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82. can add the matrices of_____.

- ▶ **same order**
- ▶ same number of columns.
- ▶ same number of rows
- ▶ different orde

83. solving system of equations with iterative method, we stop the process when the entries in two successive iterations are_____.

- ▶ **repeat**
- ▶ large difference
- ▶ different

84. Jacobi's Method is_____converges to solution than Gauss Siedal Method.

- ▶ **slow**
- ▶ fast
- ▶ better

85. is invertible, then $\det(A)\det(A^{-1})=1$.

- ▶ True
- ▶ **False**

86. The determinant of A is the product of the pivots in any echelon form U of A , multiplied by $(-1)^r$, Where r is

- ▶ the number of rows of A
- ▶ the number of row interchanges made during row reduction from A to U
- ▶ **the number of rows of U**
- ▶ the number of row interchanges made during row reduction U to

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87. If a system of equations is solved using the Gauss-Seidel method, then which of the following is the most appropriate answer about the matrix M that is derived from the coefficient matrix ?

- ❖ All of its entries on the diagonal must be zero.
- ❖ All of its entries below the diagonal must be zero.
- ❖ All of its entries above the diagonal must be zero
- ❖ All of its entries below and above the diagonal must

88. If M is a square matrix having two rows equal then which of the following about the determinant of the matrix is true?

- ❖ $\det(M)$ is not equal to '1'
- ❖ $\det(M)=1$
- ❖ $\det(M)$ is not equal to '0'
- ❖ $\det(M)=0$

89. if both the Jacobi and Gauss-Seidel sequences converge for the solution of $Ax=b$, for any initial $x(0)$, then which of the following is true about both the solutions?

- ❖ No solution
- ❖ Unique solution
- ❖ Different solutions

90. Let t be any $m \times n$ matrix with orthonormal columns and v be any vector then $\|t \cdot v\| = \underline{\hspace{2cm}}$.

- ❖ $\|v\|$

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❖ $|v|$

❖ V

❖ $t \cdot \|v\|$

91. If the augmented matrices of two linear systems are row equivalent, then the two systems have the same solution set.

❖ **TRUE**

❖ FALSE

92. Every linear transformation is a matrix transformation.

▶ **True**

▶ False

93. All the lines those passes through origin are not the subspace of a plane.

❖ **FALSE**

❖ TURE

94. Why inverse of the matrix $A = \begin{bmatrix} 1 & 2 \end{bmatrix}$ is NOT possible?

❖ Because it is a square matrix

❖ Because it is a zero matrix.

❖ Because it is an identity matrix.

❖ **Because it is a rectangular matrix.**

95. Let $W = \{(1, y) \text{ such that } y \text{ in } \mathbb{R}\}$. Is W a vector subspace of plane.

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❖ YES

❖ NO

96. If a system of equations is solved using the Jacobi's method , then which of the following is the most appropriate answer about the matrix M that is derived from the coefficient matrix ?

- ❖ All of its entries on the diagonal must be zero.
- ❖ All of its entries above the diagonal must be zero.
- ❖ All of its entries below and above the diagonal must
- ❖ All of its entries below the diagonal must be zero.

97. How many different permutations are there in the set of integers {1,2,3}?

- ❖ 2
- ❖ 4
- ❖ 6
- ❖ 8

98. Which one is the numerical method used for approximation of dominant eigenvalue of a matrix.

- ▶ Power method
- ▶ Jacobi's method
- ▶ Guass Seidal method
- ▶ Gram Schmidt process

99. The inverse of an invertible lower triangular matrix is.

- ▶ lower triangular matrix

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- ▶ upper triangular matrix
- ▶ diagonal matrix

100. A is diagonalizable if $A = PDP^{-1}$ Where.

- ▶ D is any matrix and P is an invertible matrix
- ▶ D is a diagonal matrix and P is any matrix
- ▶ **D is a diagonal matrix and P is invertible matrix**
- ▶ D is a invertible matrix and P is any matrix.

101. The characteristic polynomial of a 5x5 matrix is, the eigenvalues are:

$$\lambda^5 - 4\lambda^4 + 45\lambda^3 = 0$$

- ▶ 0, -5, 9
- ▶ 0, 0, 0, 5, 9
- ▶ **0, 0, 0, -5, 9 (true)**
- ▶ 0, 0, 5, -9

102: A partitioned square matrix 'A' is said to be block upper triangular matrix if the matrices on the main diagonal square and all matrices above the main diagonal are zero.

- **Block lower triangular**

103: if there is a vector $v = (2, 1, 0)$ then $\|v\|$ is

- **5**

104: Each pair of eigenvalue and its corresponding eigenvectors provide a solution of equation.

Eigen function

105: which of the following is true for the matrix

Where M_{11} , M_{22} and M_{33} are square sub – matrices, and O is Zero sub matrix?

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It is block upper triangular matrix

106: suppose that real solution y_1 and y_2 of $x^1 = Ax$ from a basis for the two- dimensional real vector space if y_1 and y_2 are

Linearly independent

107: Let W be a subspace of R and $(u_1, u_2, \dots, u_p)$ is any orthogonal basis of W , then $y = c_1u_1 + c_2u_2 + \dots + c_nu_n$ where

$$C_j = \frac{y \cdot u_j}{u_j \cdot u_j}$$

108: Elementary row operation on a matrix do not affect the relation among the column of the matrix

Linear dependence

109: Two vector are if at least one of the vector is a multiple of the other

Linearly dependent

110: Electric circuit rotation is caused by sine and cosine function if there eigenvalues are complex and hence the origin is called....

Spiral point

111: Multiplication of a partitioned matrix by a scalar is also computed.....

Column by column

112: The invariable Matrix .Theorem applies only to.....

Square

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113: Let A be a real 2 by 2 matrix with complex eigen values $\lambda = a - b + i(b + i)$ and associated eigenvectors v in C^2 then $A = P C P^{-1}$ where $P =$ -----

$$P = [Re \ v \ Im \ v]$$

114: Let $Ax = 0$ be a homogeneous linear system of 'n' unknown, then the coefficient matrix 'A' is invertible if and only if this system has ----- solution

Trivial

115: the two vector are said to be equivalent if

Same length and same direction

116: if one of the eigenvalues of $[A]_{n \times n}$ is zero .it implies

The determinant of $[A]$ is zero

117: let V be a five – dimensional vector space. And let U be a subset of V consisting of five vectors.

U must be linearly dependent, but may or may not span V

118: Suppose x, y, z are some vectors in an inner product space $(V, \langle, \rangle)$ such that $\langle x, y \rangle = \langle x, z \rangle$ for all x

$\forall x \in V$ then $y = z$

TRUE

119: let U, V and W be vectors in R^n , then

$$(U + V) \cdot W = U \cdot W + V \cdot W$$

Q120: if u and v non zero vector in either R^2 or R^3 then by the law of cosines $\|u - v\|^2 = \dots\dots\dots$

$$\|u - v\|^2 = \|u\|^2 + \|v\|^2 - 2 \|u\| \|v\| \cos \theta$$

121: If $u + v = w$, then

$$|u + v| = |w|$$

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122: Two vectors u and v in R^n are orthogonal if.....

$$u \cdot v = 0$$

123: A vector whose length 1 is called

Unit vector

124: A Matrix with orthogonal columns is an orthogonal matrix.

Square 1:

125: if a square matrix has orthogonal columns then it also has rows.

Orthogonal

126: The norm of v is the non-negative scalar $\|v\|$ defined by

$$\|v\| = \sqrt{v_1^2 + v_2^2 + \dots + v_n^2}$$

127: the matrix $A^T \times A$ is invertible if and only if the columns of A are linearly independent

True

128: let V be a one Eigen vector then conjugate eigen vector is repeated by.

V

129: Any finite dimensional inner product space has an orthonormal basis.

True

130: the vector is orthogonal to every vector in R^n .

Zero

131: Each pair of eigenvalue and its corresponding eigenvector provides a solution of the

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equation $\dot{X} = Ax$ which is called of the differential equation.

Eigen function

132: if we divide a non – zero vector by its length we get a

Unit vector

133: A matrix $A - (n \times n)$ has both positive and negative eigenvalues so in this case origin behave as a

Saddle point

