MTH-501 Quiz-1 BY Attiq Kundi

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MCSQ

AND Many MoRe

1. If the determinant of the matrix A = $\begin{pmatrix} 2 & 3 & 4 \\ 1 & 2 & 3 \\ 3 & 4 & 5 \end{pmatrix}$ adding 2 times of the second row in the first row of the matrix A, then which of the following is true for the matrix B?

Its determinant is -1.

2. The solution of Ax = b exists if and only if b can be written as a linear combination of of A.

Columns

3. A sufficient condition for the jacobi's method to converge for the linear system Ax=b

A is diagonally dominant

4. Two simultaneous linear equations in two variables have no solution if their corresponding lines are .

parallel and distinct

5. Which of the following will be the Matrix Product corresponding to Linear Combination: $\begin{pmatrix} -2 \\ 5 \end{pmatrix} x + \begin{pmatrix} 3 \\ 1 \end{pmatrix} y$?

$\begin{pmatrix} -2 & 3 \\ 5 & 1 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix}$

6. Which of the following will be the Linear Combination corresponding to $\begin{pmatrix} -2 & 3 \\ 5 & 1 \end{pmatrix}\begin{pmatrix} x \\ y \end{pmatrix}$

$\begin{pmatrix} -2 \\ 5 \end{pmatrix}x + \begin{pmatrix} 3 \\ 1 \end{pmatrix}y$?

7. If a homogeneous system Ax = 0 has atrivial solution, then which of the following is(are) the value (s)of the vector x?

0

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

Diagonal matrix

9. Why inverse of the matrix A= [1 2] is NOT possible?

Because it is a saquare matrix

10. Which of the following Elementary Row operations would perform in order to $\begin{pmatrix} 1 & 2 & -5 \\ -4 & 1 & -6 \\ 6 & 3 & -4 \end{pmatrix} \sim \begin{pmatrix} 1 & 2 & -5 \\ 0 & 9 & -36 \\ 0 & -9 & 26 \end{pmatrix}$?

$[R_2 \to R_2 + 4R_1, R_3 \to R_3 \to 6R_1]$

11. What is the maximum possiblle number of pivots in a 6 × 6 matrix?

6

12. A homogeneous linear system always has the trivial solution: there are only two possibilities for its solutions:

The system has infinitely much solutionsnin addition to trivial solution

13. A system of linear equations is said to be homogeneous if the constant terms are all

Zero

14. In A is a square matrix, then the minor of entry ith row and jth column is to be the determinant of the sub matrix that remains when the ith row and jth column of A are

Added

15. 7x is an algebraic term in which 7 is a and x is a .

coefficient, variable

16. Which of the following is the coefficient matrix for the system $\begin{matrix} x_1 - 2x_2 + x_3 = 0 \\ 2x_2 - 7x = 8 \\ -4x_1 + 3x_2 + 9x_3 = \end{matrix}$

$$\begin{pmatrix} 1 & -2 & 1 \\ 0 & 2 & -7 \\ -4 & 3 & 9 \end{pmatrix}$$

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

Trivial

18. Two simultaneous linear equations in two variables have no solution if their corresponding lines are .

Parallel and distinct

19. The solution of Ax = b exists if and only if b can be written as a linear combination of of A.

Columns

20. Let V be a five-dimensional vector space, and let S be a subset of V which spans

V. Then S

Must have at most five elements

21. Gauss-Seidel method is also termed as a method of

Successive Displacement

22. If A be the standard matrix of linear transformation T : Rn → Rm , then which of the following is true for the mapping from R^n onto R^m ?

The columns of A R^m span .

23. If T be a transformation, then which of the following is true for its linearity?

$T(cu^r + dv^r) : cT^r(u^r) + dT(v^r)$

where 'c' and 'd' are scalars

24. Which of the following is true for the matrix $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 3 \end{pmatrix}$

It is a diagonal matrix.

25. $9x^2 + 3x + 4$ is .

Quadratic equation

26. An n × n matrix A is said to be diagonalizable if and only if A has n _ eigenvectors.

Linearly Independent

27. 7x is an algebraic term in which 7 is a and x is a .

Coefficient, variable

28. Let A be n × n matrix, then A is invertible if and only if

det A is not zero

29. What is Eigen value?

A scalar associated with a given linear transformation

30. If one of the eigenvalues of [A] n x n is zero, it implies

TheDeterminant [A] of is zero

31. Which of the following is true about the existence of free variables (parameter) in a system of linear equations?

They guarantee the Consistency.

32. If a matrix equation is solved using the Jacobi's method. Then which of the following is true about its main diagonal?

It has two zeros along its main diagonal.

It has at least one zero along its main diagonal

It has more than one zero along its main diagonal

It has no zero along its diagonal.

33. As soon as an approximate solution of a linear system is sufficiently accurate for practical work than which of the following is true for an iterative process?

The process may be stopped.

The reduced row-echelon method may be used.

The row-echelon method may be used.

The process may be stopped.

34. If determinant of a matrix is not zero then which of the following is true for that system?

The inversion method is applies.

he inversion method is fails.

35. 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

Non zero skew symmetric

Nonzero symmetric

Unit

Zero

36. If A is strictly diagonal dominant matrix. Then which of the following is true for A.

It is a singular matrix.

It is a rectangular matrix.

It is an invertible matrix.

It is a null matrix.

37. A matrix can be subdivided into sub matrices in various ways by inserting lines between selected _ and columns.

Elements

Rows

Blocks

Diagonals.

38. The determinant of a triangular matrix is the sum of the entries of the main diagonal

True

False

39. What is the maximum possible number of pivots in a '3by 3' matrix?

0

3

1

5

40. Let A be a square n×n matrix. Then which of the following statement(s) is(are) equivalent?

A row is equivalent to the n×n identity matrix.

A has n pivot positions.

Options (b to d).

A is an invertible matrix.

41. What is the maximum possible number of pivots in a 4×6 matrix?

4

8

6

10

42. In LU-decomposition, if A is the square matrix of order m, then the order of both lower and upper triangular matrices will be _.

m^2

$m + 1$

2

m

43. A sufficient condition for the Jacobi's method to converge for the linear system Ax=b

A is diagonally dominant

A is non singular

None of the above

A-I is diagonally dominant

44. An m×m matrix is only square matrix that is both unit lower triangular and upper triangular.

Scalar

Null

Identity

Diagonal

45. homogeneous linear system always has the trivial solution; there are only two possibilities for its solutions:

None of the given.

Both c and d.

The system has only the trivial solution.

The system has infinitely many solutions in addition to the trivial solution.

46. 15.A null space is the vector space.

False

True

47. LU-factorization is used to solve system of linear equations are calculate the .

Row

Column

Diagonal

Determinant

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

2×3

3×5

3×3

2×5

49. LU-decomposition converts the problem of solving the single system A x=b into the problem of solving the two systems. Ly=b and U x=y. these systems are easy to solve because their co-efficient matrices are_ .

Symmetric

Identity

Diagonal

Triangular

50. The computational efficiency of the LU factorization depends on knowing matrix (matrices).

Upper triangular

Lower triangular

Diagonal

Diagonal both a and b

51. In matrix factorization A=LU , where L is a lower triangular matrix with any on the diagonal and U is an upper triangular matrix.

Fixed constant

Constant

Variable

Fixed variable

52. Which one of the following is null matrix?

1 0 0

0 0 0

53. If A is invertible and b in □□ be any vector. Then we must have a matrix □–□ b,which is solution of .

$Ax = b$

$A^{-1}x = b$

$A^{t}x = b$

$A^{2}x = b$

54. If A is an invertible square matrix then

$(A^{T})^{T} = (A^{-1})^{T}$

$(AT)^{-1}$ = $(A^{-1})^{T}$ $(A^{T})^{-1} = (A^{-1})^{-1}$

None of the above

55. For which of the matrix; the Gauss-seidel method is applicable?

Rectangular matrix

Null matrix

Diagonally dominant matrix

Strictly diagonally dominant matrix

56. Multiplication of a partitioned matrix by a scalar is also computed .

Block by block

Column by column

Diagonal by diagonal

Row by row

57. Gauss-seidel method is similar to the

Newton Raphson Method

Regula-Falsi Method

Jacobi Method

Iteration Method

58. Let T: R2→ R2be transformation T (x1,x2) =(x,0). The null space (or ker nel)N(T) of T is

(0,1)

(1,0)

(0,x2)

(x_1,0)

59. Which of the following system will have a trivial solution?

a. x = y = 1

b. x = 1, y = 0

c. x = 0, y = 1

d. x = y = 0

60. The system of equations:

x1=0=x2

61. can be expressed in the form

Ax=0

Ax=b

Ax=0, By=1

Ax=1, By=0

62. Which of the following is Row - Equivalent of $\begin{pmatrix} 3 & 4 \\ 1 & 2 \end{pmatrix}$?

$\begin{matrix} 2 & -4 \\ -1 & 3 \end{matrix}$

$\begin{matrix} 3 & 1 \\ 4 & 2 \end{matrix}$

$\begin{pmatrix} 4 & 3 \\ 2 & 1 \end{pmatrix}$

$\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$

63. The system of equations : y=0 and x=5 has solution(s).

No

Unique

Infinite many

distinct multiple

64. The equation : 0x-0y=-5 has solution(s)

No

Unique

Infinite many

distinct finite

65. Which of the following is an example of Matrix in reduced Echelon form?

$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$

66. Under which of the following condition, a system of Linear Equations whose Row-Reduce

form is $\left(\begin{array}{cc|c} 1 & 2 & -1 \\ 0 & 0 & h-3k \end{array}\right)$ has Infinite many solutions?

h=3k

h ≠ 3k

(h,k) = (0,0)

(h,k) ≠(0,0)

67. For the following system of Equation: x+2y = 0, 2x-y=0; the solution set is

Real line $\mathbb{R}$

Line through origin in $\mathbb{R}^2$

Line through origin in $\mathbb{R}^3$

Any arbitrary line in $\mathbb{R}2$

68. Which of the following corresponding Matrix form of the Linear equation x+y=3?

x |1| + y |1| = 3|1|

69. .Cant be expressed in Matrix Form

$\begin{pmatrix} -2 \\ 3 \end{pmatrix}$ and $\begin{pmatrix} -66 \\ 99 \end{pmatrix}$ are linearly?

Dependent

Independent

70. Which of the following is true about the existence of free variables (parameter) in a system of Linear Equations?

They guarantee the Consistency

They guarantee the inconsistency

They do not guarantee the consistency

None

71. Slope and y-intercept of the line: 2x+3y=-1 respectively

a. -2/3 and -1/3

2/3 and -1/3

-2/3 and 1/3

2/3 and 1/3

72. The equation 0x-0y=0 has solution(s).

Infinite many

73. If the determinant of the matrix A = $\begin{pmatrix} 1 & 3 & 5 \\ 3 & 1 & 1 \\ 5 & 7 & 7 \end{pmatrix}$

is 32 and the matrix B is obtained by multiplying any row of A with an integer value 4, then which of the following istrue for the matrix B?

Its determinant is 128.

74. The elementary Row operations: $[R_2 \to R_2 \to 4R_1]$ and $[R_3 \to R_3 \to 6R_1]$ are performed on to get $\begin{pmatrix} 1 & 2 & -5 \\ -4 & 1 & -6 \\ 6 & 3 & -4 \end{pmatrix}$

$\begin{pmatrix} 1 & 2 & -5 \\ 0 & 1 & 26 \\ 0 & -9 & -26 \end{pmatrix}$

75. 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 $AB = AB$ equals to a (an)___matrix.

Identity

76. If λ is an eigenvector of A, then every nonzero vector x such that Ax = λx is calledan _of A corresponding to_.

Eigenvector, λ

77. If x + 2 is a factor of the characteristic polynomial of matrix C then an eigenvalueof C is

-2

78. Let A be n × n matrix, then A is invertible if and only if

det A is not zero

79. Gauss-Seidel method is also termed as a method of

Successive Displacement

80. If one of the eigenvalues of is zero, $[A]_{n \times n}$ it implies __.

The determinant of | A | is Zero

81. If u + v = u + w, then:

v = w