# MTH501-Linear Algebra

## SOLVED MCQS QUIZ 1

## LEACTURE (8 to 15)

## Solved by JUNAID MALIK




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1. **If a matrix equation is solved using the Jacobi's method. Then which of the following is true about its main diagonal?**
   a) It has two zeros along its main diagonal.
   b) It has at least one zero along its main diagonal
   c) It has more than one zero along its main diagonal
   d) It has no zero along its diagonal.

2. **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?**

   a) The process may be stopped.
   b) The reduced row-echelon method may be used.
   c) The row-echelon method may be used.
   d) The process may be stopped.

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

   a) The inversion method is applies.
   b) The inversion method is fails.

4. **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 _____.**
   a) Non zero skew symmetric
   b) Nonzero symmetric
   c) Unit
   d) Zero

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

   a) It is a singular matrix.
   b) It is a rectangular matrix.
   c) It is an invertible matrix.
   d) It is a null matrix.

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**6. A matrix can be subdivided into sub matrices in various ways by inserting lines between selected _____ and columns.**

a) Elements
b) Rows
c) Blocks
d) Diagonals.

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

a) True
b) False

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

a) 0
b) 3
c) 1
d) 5

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

a) A row is equivalent to the n×n identity matrix.
b) A has n pivot positions.
c) Options (b to d).
d) A is an invertible matrix.

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

a) 4
b) 8
c) 6
d) 10

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

a) $m^2$
b) $m + 1$
c) 2
d) m

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

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a) A is diagonally dominant
b) A is non singular
c) None of the above
d) A-I is diagonally dominant

**13. An m×m _____matrix is only square matrix that is both unit lower triangular and upper triangular.**

a) Scalar
b) Null
c) Identity
d) Diagonal

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

a) None of the given.
b) Both c and d.
c) The system has only the trivial solution.
d) The system has infinitely many solutions in addition to the trivial solution.

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

a) False
b) True

**16. LU-factorization is used to solve system of linear equations are calculate the_____.**

a) Row
b) Column
c) Diagonal
d) Determinant

**17. 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?**

a) 2×3
b) 3×5
c) 3×3
d) 2×5

**18. 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_____.**

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a) Symmetric
b) Identity
c) Diagonal
d) Triangular

**19. The computational efficiency of the LU factorization depends on knowing _____matrix (matrices).**

a) Upper triangular
b) Lower triangular
c) diagonal
d) Diagonal both a and b

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

a) Fixed constant
b) Constant
c) Variable
d) Fixed variable

**21. Which one of the following is null matrix?**

a) 1 0 0
b) 0 0 0

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

a) $Ax = b$
b) $A^{-1}x = b$
c) $A^t x = b$
d) $A^2 x = b$

**23. If A is an invertible square matrix then**

a) $(A^T)^T = (A^{-1})^T$
b) $(A^T)^{-1} = (A^{-1})^T$
c) $(A^T)^{-1} = (A^{-1})^{-1}$
d) None of the above

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

a) Rectangular matrix
b) Null matrix
c) Diagonally dominant matrix
d) Strictly diagonally dominant matrix

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**25. Multiplication of a partitioned matrix by a scalar is also computed_____.**

a) Block by block
b) Column by column
c) Diagonal by diagonal
d) Row by row

**26. Gauss-seidel method is similar to the**

a) Newton Raphson Method
b) Regula-Falsi Method
c) Jacobi Method
d) Iteration Method

**27. Let T: $R^2 \rightarrow R^2$ be transformation T $(x_1,x_2) = (x,0)$. The null space (or ker nel )N(T) of T is**

a) (0,1)
b) (1,0)
c) $(0,x_2)$
d) $(x_1,0)$

**28.** 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

**29.** The system of equations:

$x_1=0=x_2$

can be expressed in the form

a. Ax=0
b. Ax=b
c. Ax=0, By=1
d. Ax=1, By=0

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

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

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

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

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

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

a. No

b. Unique

c. Infinite many

d. distinct multiple

**32.** The equation : 0x-0y=-5 has ___ solution(s)

a. No

b. Unique

c. Infinite many

d. distinct finite

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

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

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

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

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

**34.** 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?

**a.** h=3k

**b.** h ≠ 3k

**c.** (h,k) = (0,0)

**d.** (h,k) ≠(0,0)

**35.** For the following system of Equation:

x+2y = 0, 2x-y=0;

the solution set is ___

**a.** Real line $\mathbb{R}$

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

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

**d.** Any arbitrary line in $\mathbb{R}^2$

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

a. $x\begin{pmatrix}1\\0\end{pmatrix}+y\begin{pmatrix}0\\1\end{pmatrix}=3\begin{pmatrix}1\\0\end{pmatrix}$

b. $x\begin{pmatrix}1\\0\end{pmatrix}+y\begin{pmatrix}0\\1\end{pmatrix}=3\begin{pmatrix}0\\1\end{pmatrix}$

c. x |1| + y |1| = 3 |1|

d. can't be expressed in Matrix form

**37.** Vectors

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

are linearly?

a. Dependent

b. Independent

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

a. They guarantee the Consistency

b. They guarantee the inconsistency

c. They do not guarantee the consistency

d. None

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

**a.** -2/3 and -1/3

**b.** 2/3 and -1/3

**c.** -2/3 and 1/3

**d.** 2/3 and 1/3

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

a. No

b. Unique

c. Infinite many

d. multiple finite