MTH501 - Linear Algebra - Q. No. 1 (M - 1)
If for a linear transformation the equation T(x)=0 has only the trivial solution then T is

► one-to-one
► onto

MTH501 - Linear Algebra - Q. No. 2 (M - 1)
Which one of the following is an elementary matrix?

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

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

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

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

MTH501 - Linear Algebra - Q. No. 3 (M - 1)
Let A = [$\begin{smallmatrix} a & b \\ c & d \end{smallmatrix}$] and let k be a scalar .A formula that relates det kA to k and det A is

► det kA= k det A
► det kA = det (k+A)
► det k A = k^2 det A
► det kA = det A

MTH501 - Linear Algebra - Q. No. 4 (M - 1)
The equation x = p + t v describes a line

► through v parallel to p
► through p parallel to v
► through origin parallel to p

MTH501 - Linear Algebra - Q. No. 5 (M - 1)
Determine which of the following sets of vectors are linearly dependent.

MTH501 - Linear Algebra - Q. No. 6 (M - 1)
Every linear transformation is a matrix transformation

► True
► False

MTH501 - Linear Algebra - Q. No. 7 (M - 1)
A null space is a vector space.

► True
► False

MTH501 - Linear Algebra - Q. No. 8 (M - 1)
If two row interchanges are made in succession, then the new determinant

► equals to the old determinant
► equals to -1 times the old determinant

MTH501 - Linear Algebra - Q. No. 9 (M - 1)
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 A

MTH501 - Linear Algebra - Q. No. 10 (M - 1)
If A is invertible, then $\det(A)\det(A^{-1})=1$.

- ► True
- ► False

MTH501 - Linear Algebra - Q. No. 11 (M - 1)
A square matrix $A= [a_{ij}]$ is lower triangular if and only if $a_{ij}= 0$ for

- ► $i > j$
- ► $i < j$
- ► $i \leq j$
- ► $i = j$

MTH501 - Linear Algebra - Q. No. 12 (M - 1)
The product of upper triangular matrices is

- ► lower triangular matrix
- ► upper triangular matrix
- ► diagonal matrix

MTH501 - Linear Algebra - Q. No. 13 (M - 1)
The matrix multiplication is associative

- ► True
- ► False

MTH501 - Linear Algebra - Q. No. 14 (M - 1)
We can add the matrices of _______________.

- ► same order
- ► same number of columns.
- ► same number of rows
- ► different order

MTH501 - Linear Algebra - Q. No. 15 (M - 1)
By solving system of equations with iterative method, we stop the process when the entries in two successive iterations are _________.

- ► repeat
- ► large difference

► different

MTH501 - Linear Algebra - Q. No. 16 (M - 1)
Jacobi's Method is _____________ converges to solution than Gauss Siedal Method.

► slow
► fast
► better

MTH501 - Linear Algebra - Q. No. 17 (M - 1)
A system of linear equations is said to be homogeneous if it can be written in the form _______________.

► AX = B
► AX = 0
► AB = X
► X = A^{-1}

MTH501 - Linear Algebra - Q. No. 18 (M - 1)
The row reduction algorithm applies only to augmented matrices for a linear system.

► True
► False

MTH501 - Linear Algebra - Q. No. 19 (M - 1)
Whenever a system has no free variable, the solution set contains many solutions.

► True
► False

MTH501 - Linear Algebra - Q. No. 20 (M - 1)
Which of the following is not a linear equation?

► $x_1 + 4 x_2 + 1 = x_3$
► $x_1 = 1$
► $x_1 + 4x_2$ – (square root of) 2 x_3 + (square root of) 4
► $x_1 + 4 x_1 x_2$ – (square root of) 2 x_3 = (square root of) 4

MTH501 - Linear Algebra - Q. No. 21 (M - 2)

If a square idempotent matrix A is non singular then show that A is equal to the identity matrix I.

MTH501 - Linear Algebra - Q. No. 22 (M - 2)

Let $v_1 = \begin{bmatrix} 7 \\ 4 \\ -9 \\ -5 \end{bmatrix}, v_2 = \begin{bmatrix} 4 \\ -7 \\ 2 \\ 5 \end{bmatrix}, v_3 = \begin{bmatrix} 1 \\ -5 \\ 3 \\ 4 \end{bmatrix}$

, and $H = \text{span}\{v_1, v_2, v_3\}$. **It can be verified that** $v_1 - 3v_2 + 5v_3 = 0$

Use this information to find a basis for H.

MTH501 - Linear Algebra - Q. No. 23 (M - 3)

Find $\begin{vmatrix} 1 & 2 & 3 \\ -4 & 5 & 6 \\ 7 & -8 & 9 \end{vmatrix}$

MTH501 - Linear Algebra - Q. No. 24 (M - 3)

Determine bases for the plane 3x – 2y + 5z = 0 as a subspace of $\boldsymbol{R}^3$

MTH501 - Linear Algebra - Q. No. 25 (M - 5)

Show that $\begin{bmatrix} I & 0 \\ A & I \end{bmatrix}$ is invertible and find its inverse.

MTH501 - Linear Algebra - Q. No. 26 (M - 5)

Find the condition for r and s such that the vectors (r, 2,s) , (r+1,2,1) and (3,s,1) are linear dependent.