Question No : 1 of 26 Marks: 1 (Budgeted Time 1 Min)

$7x$ is an algebraic term in which 7 is a _____ and x is a _____.

Answer (Please select your correct option)

- term, expression
- coefficient, variable

- variable, coefficient
- numerical, alphabet

Question No : 2 of 26 Marks: 1 (Budgeted Time 1 Min)

Which of the following is the pivot element in the second row of the matrix?

$$\begin{pmatrix} 1 & 2 & 3 & 4 & 8 \\ 0 & 0 & -3 & 5 & 1 \\ 0 & 0 & 0 & 1 & 2 \\ 0 & 0 & 0 & 0 & -3 \end{pmatrix}$$

Answer (Please select your correct option)

- 0
- 1
- −3
- 5

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Question No : 3 of 26 Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

- It is an identity matrix.
- It is in reduced echelon form.
- It is in echelon form.
- It is a rectangular matrix.

Question No : 4 of 26 Marks: 1 (Budgeted Time 1 Min)

If reduced echelon form of a linear system is $\begin{bmatrix} 1 & 0 & 5 & 5 \\ 0 & 1 & 1 & 6 \\ 0 & 0 & 0 & 0 \end{bmatrix}$ when free variable $x_3 = 0$, then which of the following is true for it?

Answer (Please select your correct option)

- The particular solution is $(0, 5, 6)$.
- The particular solution is $(6, 5, 0)$.
- The particular solution is $(5, 6, 0)$.
- The particular solution is $(0, 6, 5)$.

Question No : 5 of 26 Marks: 1 (Budgeted Time 1 Min)

If $\vec{b} = c_1\vec{u}_1 + c_2\vec{u}_2$ and $\vec{a} = d_1\vec{u}_1 + d_2\vec{u}_2$ where c_1, c_2, d_1 and d_2 are scalars, then which of the following options is correct?

Answer (Please select your correct option)

- Only $\vec{b} \in Span\{\vec{u}_1, \vec{u}_2\}$.
- Only $\vec{a} \in Span\{\vec{u}_1, \vec{u}_2\}$.
- Both $\vec{a}, \vec{b} \in Span\{\vec{u}_1, \vec{u}_2\}$.
- Both $\vec{a}, \vec{b} \notin Span\{\vec{u}_1, \vec{u}_2\}$.

Question No : 6 of 26 Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

- −1
- 0
- 1
- 2

Question No : 7 of 26 Marks: 1 (Budgeted Time 1 Min)

If a homogeneous system $Ax = 0$ has non-trivial solution, then which of the following is true for the system?

Answer (Please select your correct option)

- The system has at least no free variable.
- The system has at least one free variable.
- The system has at least two free variables.
- The system has at least three free variables.

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Question No : 8 of 26 Marks: 1 (Budgeted Time 1 Min)

If $x = \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} -1+6x_3 \\ 3 \\ x_3 \end{bmatrix} = \begin{bmatrix} -1 \\ 3 \\ 0 \end{bmatrix} + x_3 \begin{bmatrix} 6 \\ 0 \\ 1 \end{bmatrix}$ be the general solution of $Ax = b$, then which of the following is parametric equation for the given solution?

Answer (Please select your correct option)

- $p = s\,x + t\,u + v$
- $x = p + t\,v$
- $v = p + t\,x$
- $t\,x = p + v$

Question No : 9 of 26 Marks: 1 (Budgeted Time 1 Min)

If the equation $T(\vec{x}) = 0$ has only the trivial solution , then which of the following is true for the linear transformation $T : R^n \rightarrow R^m$?

Answer (Please select your correct option)

- T is one-to-one.
- T is onto.
- T is a rotation.
- T is a reflection.

Question No : 10 of 26 Marks: 1 (Budgeted Time 1 Min)

If linear transformation $T : R^n \rightarrow R^m$ is transformed into a matrix A, then which of the following is the order of A ?

Answer (Please select your correct option)

- $n \times m$
- $m \times m$
- $m \times n$
- $n \times n$

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Question No : 11 of 26 Marks: 1 (Budgeted Time 1 Min)

If $A = A^t$ (where A is a square matrix) , then which of the following is the most appropriate option for A ?

Answer (Please select your correct option)

- A is an invertible matrix.
- A is a singular matrix.
- A is a symmetric matrix.
- A is a scalar matrix.

Question No : 12 of 26 Marks: 1 (Budgeted Time 1 Min)

If A is an invertible matrix , then which of the following is true ?

Answer (Please select your correct option)

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

- $(A^{-1})^{-1} = \frac{1}{A}$
- $(A^{-1})^{-1} = A^{-1}$
- $(A^{-1})^{-1} = \det(A)$

Question No : 13 of 26 Marks: 1 (Budgeted Time 1 Min)

If $A = \begin{bmatrix} 4 & -1 \\ 5 & 3 \end{bmatrix}$, then which of the following is the value of $\det(A)$?

Answer (Please select your correct option)

- 7
- -17
- 17
- 11

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Question No : 14 of 26 Marks: 1 (Budgeted Time 1 Min)

If a system of equations is solved using the Jacobi's method , then which of the following is NOT true about the matrix M that is derived from the coefficient matrix ?

Answer (Please select your correct option)

- All of its entries below the diagonal must be zero .
- All of its entries above the diagonal must be zero .
- It may or may not be invertible .
- It is a non-singular matrix .

Question No : 15 of 26 Marks: 1 (Budgeted Time 1 Min)

If the matrix $A = \begin{bmatrix} 5 & 4 \\ 3 & 3 \end{bmatrix}$, then which of the following is the most suitable option for it ?

Answer (Please select your correct option)

- It is not strictly diagonally dominant.
- It is strictly diagonally dominant.
- It is not diagonally dominant.
- It is diagonally dominant.

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Question No : 16 of 26 Marks: 1 (Budgeted Time 1 Min)

If $A = \begin{bmatrix} 2 & 3 \\ 4 & 5 \end{bmatrix}$, then which of the following is the minor of entry a_{21} ?

Answer (Please select your correct option)

- 2
- 3
- 4
- 5

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Question No : 17 of 26 Marks: 1 (Budgeted Time 1 Min)

If $A = \begin{bmatrix} 4 & 5 \\ 6 & 7 \end{bmatrix}$, then which of the following is the value of C_{21} ?

Answer (Please select your correct option)

- 5
- -5
- 6
- -6

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Question No : 18 of 26 Marks: 1 (Budgeted Time 1 Min)

If the determinant of the matrix $A=\begin{bmatrix} 2 & 3 & 4 \\ 1 & 2 & 2 \\ 3 & 4 & 5 \end{bmatrix}$ is -1 and the matrix B is obtained by adding 2 times of the second row in the first row of the matrix A, then which of the following is true about the matrix B ?

Answer (Please select your correct option)

- Its determinant is -1 .
- Its determinant is 1 .
- Its determinant can not be evaluated .
- The information is not sufficient to calculate the determinant .

Question No : 19 of 26 Marks: 1 (Budgeted Time 1 Min)

If the matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 0 & 1 & 2 \\ 0 & 0 & 2 \end{bmatrix}$, then which of the following is true about it ?

Answer (Please select your correct option)

- Its determinant is 0.
- Its determinant is 1.
- Its determinant is 2.
- Its determinant is 4.

Question No : 20 of 26 Marks: 1 (Budgeted Time 1 Min)

If a set $S = \{ v_1 = (1,2) , v_2 = (4,8) \}$, then which of the following is the most appropriate option ?

Answer (Please select your correct option)

- It is a basis of R^2.
- It is linearly independent.
- It spans R^2.
- It is linearly dependent.

Question No : 21 of 26 Marks: 2 (Budgeted Time 4 Min)

If $A=\begin{bmatrix}1 & 2\\ 3 & 7\end{bmatrix}$ and $A^{-1}=\begin{bmatrix}7 & -2\\ -3 & 1\end{bmatrix}$, then calculate the inverse of A^t (if exists).

Answer (Please click here to Add Answer)

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Question No : 22 of 26 Marks: 2 (Budgeted Time 4 Min)

Evaluate the determinant $\begin{vmatrix} 2 & 4 & 8 & 16 \\ 0 & 3 & 6 & 12 \\ 0 & 0 & -2 & -4 \\ 0 & 0 & 0 & -3 \end{vmatrix}$.

Answer (Please click here to Add Answer)

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Question No : 23 of 26 Marks: 3 (Budgeted Time 6 Min)

If $A=\begin{bmatrix}1 & 2\\ 3 & 7\end{bmatrix}$ and $B=\begin{bmatrix}4 & 5\\ 3 & 4\end{bmatrix}$, then calculate the inverse of AB (if exists); where $A^{-1}=\begin{bmatrix}7 & -2\\ -3 & 1\end{bmatrix}$ and $B^{-1}=\begin{bmatrix}4 & -5\\ -3 & 4\end{bmatrix}$.

Answer (Please click here to Add Answer)

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Question No : 24 of 26 Marks: 3 (Budgeted Time 6 Min)

Let S be a parallelogram determined by the vectors $\vec{b}_1=\begin{bmatrix}-2\\3\end{bmatrix}$, $\vec{b}_2=\begin{bmatrix}-2\\5\end{bmatrix}$ and $A_1=\begin{bmatrix}6&-2\\-3&2\end{bmatrix}$. Compute the area of the image of S under the mapping $\vec{x}\rightarrow A\vec{x}$.

Answer (Please click here to Add Answer)

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Question No : 25 of 26 Marks: 5 (Budgeted Time 10 Min)

Find an LU - decomposition of the matrix $A = \begin{bmatrix} 2 & 3 \\ 5 & 7 \end{bmatrix}$.

Answer (Please click here to Add Answer)

Question No : 26 of 26 Marks: 5 (Budgeted Time 10 Min)

If $A = \begin{bmatrix} 4 & 1 & 6 \\ -7 & 5 & -3 \\ 9 & -3 & 3 \end{bmatrix}$, then find the minors of first row and determinant of A using these minors .

Answer (Please click here to Add Answer)

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