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NPTEL

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Unit 3 - Week 2 : Unit 2

Week 2 : Assignment 2

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment. **Due on 2018-08-15, 23:59 IST.**

1) Which of the following statements are true *1 point*

1. Gauss Jordan method is used to find the inverse of square matrix
2. Gauss Jordan method is used to find Eigen value of a square matrix
3. Gauss Jordan method converts the augmented matrix into a reduced row echelon form to find the solution of system of linear equations
4. Gauss Jordan method can be used to find the rank of a matrix

- a) Only 1 and 3
- b) Only 2, 3 and 4
- c) All
- d) only 1, 3 and 4

No, the answer is incorrect.
Score: 0

Accepted Answers:
d) only 1, 3 and 4

2) *1 point*

If a matrix $A=\begin{bmatrix}\sin\theta & \cos\theta\\ -\cos\theta & \sin\theta\end{bmatrix}$ is decomposed by LU decomposition, where $L=\begin{bmatrix}a_1 & 0\\ a_2 & a_3\end{bmatrix}$ and $U=\begin{bmatrix}b_1 & b_2\\ 0 & b_3\end{bmatrix}$ then find out $\frac{b_1}{b_2}$

- a) 1
- b) $cot\theta$
- c) $tan\theta$

3) *1 point*

If $a=\begin{bmatrix}1\\2\\3\end{bmatrix}$ and $b=\begin{bmatrix}4\\5\\6\end{bmatrix}$ are two vector then a^Tb is

- a) Scalar
- b) Vector
- c) rectangular matrix
- d) Singular matrix

No, the answer is incorrect.
Score: 0

Accepted Answers:
a) Scalar

4) *1 point*

$(x-y)\begin{bmatrix}1\\4\\7\end{bmatrix}+y\begin{bmatrix}2\\5\\8\end{bmatrix}+(z-1)\begin{bmatrix}3\\6\\9\end{bmatrix}=\begin{bmatrix}0\\0\\0\end{bmatrix}$ represent $Ax=b$ then find the correct A matrix and b vector

- a) $A=\begin{bmatrix}1&1&3\\4&1&6\\7&1&9\end{bmatrix}, b=\begin{bmatrix}0\\0\\0\end{bmatrix}$
- b) $A=\begin{bmatrix}1&2&3\\4&5&6\\7&8&9\end{bmatrix}, b=\begin{bmatrix}0\\0\\0\end{bmatrix}$
- c) $A=\begin{bmatrix}1&1&3\\4&1&6\\7&1&9\end{bmatrix}, b=\begin{bmatrix}3\\6\\9\end{bmatrix}$
- d) $A=\begin{bmatrix}1&2&3\\4&5&6\\7&8&9\end{bmatrix}, b=\begin{bmatrix}3\\6\\9\end{bmatrix}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
c) $A=\begin{bmatrix}1&1&3\\4&1&6\\7&1&9\end{bmatrix}, b=\begin{bmatrix}3\\6\\9\end{bmatrix}$

5) In solving Ax=b using gauss elimination method, by the forward elimination steps the coefficient matrix A transforms to *1 point*

- a) Upper triangular matrix
- b) Lower triangular matrix
- c) Unity matrix
- d) Diagonal matrix

No, the answer is incorrect.
Score: 0

Accepted Answers:
a) Upper triangular matrix

6) ***1 point***

Consider a system of linear equations $Ax = b$ where $A = \begin{bmatrix} 9 & 3 & 4 \\ 4 & 3 & 4 \\ 1 & 1 & 1 \end{bmatrix}$ and $b = \begin{bmatrix} 7 \\ 8 \\ 3 \end{bmatrix}$ then,

- a) Ax=b has no solution
- b) Ax=b has infinite solution
- c) Ax=b can be solved using gauss elimination method
- d) None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
c) Ax=b can be solved using gauss elimination method

7) If is a square matrix then ***1 point***

- a) A is lower triangular matrix if and only if A^T is lower triangular
- b) A is lower triangular matrix if and only if A^T is upper triangular
- c) A is lower triangular matrix if and only if A^T is a symmetric matrix
- d) None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
b) A is lower triangular matrix if and only if A^T is upper triangular

8) If A and B are two upper triangular square matrices and $c \epsilon R$ be any real scalar then find ***0 points***
the correct option from the following statements
1. cA is upper triangular
2. A+B is upper triangular
3. AB is upper triangular
4. AB is diagonal

- a) Only 1 and 2 are correct
- b) 1, 2 and 3 are correct
- c) Only 1 and 3 are correct
- d) 2, 3 and 4 are correct

No, the answer is incorrect.
Score: 0

Accepted Answers:
b) 1, 2 and 3 are correct

9) Consider a $n \times n$ linear system of the form Ax-b where A is the upper triangular matrix ***1 point***
then

a) $x_n = \frac{b_n}{a_{nn}}$ if $a_{nn} = 1$

b) $x_n = \frac{b_n}{a_{nn}}$ if $a_{nn} \neq 1$

c) $x_n = \frac{b_n}{a_{nn}}$ if $a_{nn} = 0$

d) $x_n = \frac{b_n}{a_{nn}}$ if $a_{nn} \neq 0$

No, the answer is incorrect.
Score: 0

Accepted Answers:

d) $x_n = \frac{b_n}{a_{nn}}$ if $a_{nn} \neq 0$

10) ***1 point***

Let A, A_1 and A_2 be $n \times n$ matrices then find the correct option from the following statements

1. If A has an inverse then there is **only** one inverse matrix
2. If A^{-1} exists then $\left(A^{-1}\right)^T = \left(A^T\right)^{-1}$
3. If A_1 and A_2 have inverses then $A_1 A_2$ has an inverse such that $\left(A_1 A_2\right)^{-1} = A_2^{-1} A_1^{-1}$
4. If A has an inverse then $x = A^{-1}b$ is the **only** solution of $Ax = b$

a) All are correct

b) Only 2 and 3 are correct

c) 1, 2, 3 are correct but 4 is incorrect

d) 2, 3, 4 are correct but 1 is incorrect

No, the answer is incorrect.
Score: 0

Accepted Answers:

a) All are correct

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