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NPTEL (https://swayam.gov.in/explorer?ncCode=NPTEL) » **Data Science for Engineers (course)**

Announcements (announcements)   **About the Course (https://swayam.gov.in/nd1_noc20_cs28/preview)**

Ask a Question (forum)   Progress (student/home)   Mentor (student/mentor)

Unit 4 - Week 2

Course outline

How does an NPTEL online course work?

Week 0

Week 1

Week 2

🔵 Linear Algebra for Data science (unit? unit=14&lesson=15)

⚪ Solving Linear Equations (unit? unit=14&lesson=16)

⚪ Solving Linear Equations (Continued) (unit? unit=14&lesson=17)

⚪ Linear Algebra - Distance,Hyperplanes and Halfspaces,Eigenvalues,Eigenvectors (unit? unit=14&lesson=18)

⚪ Linear Algebra - Distance,Hyperplanes

Assignment 2 - Part 1

The due date for submitting this assignment has passed.   Due on 2020-02-12, 23:59 IST.
As per our records you have not submitted this assignment.

1)   *1 point*

The rank of the matrix $A = \begin{bmatrix} 4 & 5 & 16 & 7 \\ 2 & -3 & 2 & 3 \\ 3 & 4 & 5 & 6 \\ 4 & 7 & 8 & 9 \end{bmatrix}$

⚪ 3

⚪ 2

⚪ 4

⚪ 0

No, the answer is incorrect.
Score: 0
Accepted Answers:
4

2)   *1 point*

Given the matrix $A = \begin{bmatrix} 1 & 0 & -1 & 2 \\ 0 & 3 & 1 & -1 \\ 2 & 4 & 0 & 3 \\ -3 & 1 & 2 & 4 \end{bmatrix}, B = \begin{bmatrix} 1 & 2 \\ 3 & -1 \\ 0 & -1 \\ 4 & 2 \end{bmatrix},$

$C = \begin{bmatrix} 3 & 8 & 0 & 5 \\ 1 & 0 & -4 & 8 \end{bmatrix}$

If $D = CAB$ exists, then the value at D_{22} is

⚪ -37

⚪ 107

○ -25

○ -33

No, the answer is incorrect.
Score: 0

Accepted Answers:
-25

3)   *1 point*

The determinant of the matrix $Z = \begin{bmatrix} -2 & 32 & 24 \\ 92 & 66 & 25 \\ -80 & 40 & 20 \end{bmatrix}$ is

○ 115506

○ 91520

○ 1155

○ Does not exist

No, the answer is incorrect.
Score: 0

Accepted Answers:
91520

4)   *1 point*

The inverse of the matrix $P = \begin{bmatrix} 2 & 1 & 2 \\ 1 & 0 & 1 \\ 3 & 1 & 3 \end{bmatrix}$ is

○ 0

○ $\begin{bmatrix} -0.25 & -0.25 & 0.25 \\ 0 & -3 & 1 \\ 0.25 & 1.25 & -0.25 \end{bmatrix}$

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

○ Inverse does not exist

No, the answer is incorrect.
Score: 0

Accepted Answers:
Inverse does not exist

5) If *b* is a non-singular matrix of order *n* then the maximum possible rank of *b* is   *1 point*

○ *n*

○ 0

○ *n*-1

○ 1

No, the answer is incorrect.
Score: 0

Accepted Answers:
n

6) If the number of variables in a non-homogenous system *AX*= *B* is *n* then the system   *1 point*
possesses no solution if

○ Rank(*A*) = Rank*(A,B)* = *n*

○ Rank(A) < Rank($[A,B]$)

○ Rank(A) = Rank($[A,B]$) < n

○ Rank(A) > Rank(A,B)

No, the answer is incorrect.
Score: 0

Accepted Answers:
Rank(A) < Rank([A,B])

7) State whether the following statements are True / False   *1 point*

In a matrix (A) of data ($m*n$) with rank r

(i) m rows usually represent number of samples

(ii)   If m=n , A is not full rank ,there exist a unique solution

○ (i) – True (ii) – False

○ (i)- False (ii) – True

○ (i) - True (ii) – True

○ (i) - False (ii) – False

No, the answer is incorrect.
Score: 0

Accepted Answers:
(i) – True (ii) – False

8)   *1 point*

Given the matrix $A = \begin{bmatrix} 2 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 5 \end{bmatrix}$

Sum of the eigen values of the matrix A is

○ 2

○ 3+0i

○ 1

○ 8

No, the answer is incorrect.
Score: 0

Accepted Answers:
8

9)   *1 point*

Given the matrix $Z = \begin{bmatrix} 1 & 6 & 1 \\ 1 & 2 & 3 \\ 0 & 0 & 3 \end{bmatrix}$

Smallest eigen values of the matrix Z is

○ -1

○ 4

○ 3

○ 6

No, the answer is incorrect.
Score: 0

Accepted Answers:
-1

10) If Eigenvalue of a matrix A is λ, and A^{-1} exists, then Eigenvalue of A^{-1} is: *1 point*

○ λ^2

○ 1/λ

○ 1

○ 1/λ²

No, the answer is incorrect.
Score: 0
Accepted Answers:
1/λ

11) If A and B are square matrices of size n*n then which of the following statements is true? **1 point**

     I.   det(A B)= det(A) det (B)
     II.   det(k A)=k^n det(A) , where k is constant
     III. det(A+B)= det(A) +det(B)
     IV. det(A^T)=1/det(A^{-1})

○ I,II

○ II, III,IV

○ III

○ I,II,IV

No, the answer is incorrect.
Score: 0
Accepted Answers:
I,II,IV

12) Rank of null matrix is **1 point**

○ 0

○ 1

○ Not defined

○ ∞

No, the answer is incorrect.
Score: 0
Accepted Answers:
0

13) Given a square matrix of order n and λ is a scalar , then the characteristic polynomial of A is obtained by expanding determinant **1 point**

○ λ

○ |λA-In|

○ |A-λI|

○ |λA|

No, the answer is incorrect.
Score: 0
Accepted Answers:
|A-λI|

14) The system of equations 2x +3y -3z = 8, 4x -2y +6z = 9, 10x +3y - 3z = 5 has **1 point**

○ Unique solution

○ No solution

○ Two solutions

○ Infinitely many solutions

No, the answer is incorrect.
Score: 0

Accepted Answers:
Unique solution

15) If $A = \begin{bmatrix} -3i & -6i \\ 3i & i \end{bmatrix}$ then $|A| = ?$ *1 point*

- ○ -18
- ○ 15
- ○ -15
- ○ 21

No, the answer is incorrect.
Score: 0
Accepted Answers:
-15

16)   *1 point*

x ,y and z that satisfy the below equation are $x \begin{bmatrix} 6 \\ 3 \\ 12 \end{bmatrix} + y \begin{bmatrix} -4 \\ 8 \\ 1 \end{bmatrix} + z \begin{bmatrix} 0 \\ 3 \\ 1 \end{bmatrix} = \begin{bmatrix} -14 \\ 25 \\ -6 \end{bmatrix}$

- ○ x=-1, y=-4, z= -2
- ○ x=-1, y=2, z = 4
- ○ x=-1, y=2, z = 11
- ○ x=3, y=1, z =-5

No, the answer is incorrect.
Score: 0
Accepted Answers:
x=-1, y=2, z = 4

17) The system of equations 6x+y-2z=-8, 5x+3y-3z=4 and 12x+2y-4z=-16 has   *1 point*

- ○ No solution
- ○ Unique solution
- ○ Infinite solutions
- ○ Two solutions

No, the answer is incorrect.
Score: 0
Accepted Answers:
Infinite solutions

18)   *1 point*

The matrix $\begin{bmatrix} 1 & 5 & -8 \\ 0 & 8 & 5 \\ 0 & 0 & 6 \end{bmatrix}$ is

- ○ Upper triangular matrix
- ○ Lower triangular matrix
- ○ Skew symmetric matrix
- ○ Null matrix

No, the answer is incorrect.
Score: 0
Accepted Answers:
Upper triangular matrix

19) For a matrix **A** if the rank is r and the nullity is given by a, the total number of attributes   *1 point*

- ○ is always equal to 0

    ○ is equal to r - a

    ○ cannot be determined

    ○ is equal to r + a

No, the answer is incorrect.
Score: 0

Accepted Answers:
is equal to r + a

20) **1 point**

For a matrix $A = \begin{bmatrix} t & 8 & 2 \\ 2 & 3 & t \\ 6 & t & 2 \end{bmatrix}$, the determinant of A is

    ○ $-t^3+58t-68$

    ○ $t^3+52t-62$

    ○ $t^3+16t+16$

    ○ $t^3-14t+38$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$-t^3+58t-68$