✖ A browser sandbox causes any browser based malware to directly affect the user's system.

6406531885727. ✖ All of these

Question Number : 411 Question Id : 640653564121 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Suppose an endpoint in your flask application triggers a celery task, which generates a CSV file named "data.csv" and saves it in the static folder of a flask application. The file generator takes anywhere between 20 and 40 seconds to generate and save the CSV file.

The below fetch call is used to get the file generated by the above explained celery task.

```
fetch("/static/data.csv").then(response => response.blob()
).then(data => {
    // does something with the response data
})
```

Which of the following is the most efficient way to make the above fetch call so that it doesn't fail and return the desired response?

Options :

6406531885744. ✔ Use short polling to check the state of the celery task after every 5 seconds, and make the fetch call, when the task succeeds.

6406531885745. ✖ Use javascript function "setTimeout" to make the fetch after 41 seconds, which makes sure that the file is generated and saved to the desired location.

MLF

Section Id :	64065338332
Section Number :	15
Section type :	Online

Mandatory or Optional :	Mandatory
Number of Questions :	17
Number of Questions to be attempted :	17
Section Marks :	50
Display Number Panel :	Yes
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	64065380447
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 412 Question Id : 640653564137 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL : MACHINE LEARNING FOUNDATIONS (COMPUTER BASED EXAM)"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?
CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

(IF IT IS NOT THE CORRECT SUBJECT, PLS CHECK THE SECTION AT THE TOP FOR THE SUBJECTS REGISTERED BY YOU)

Options :

6406531885806. ✔ YES

6406531885807. ✖ NO

Sub-Section Number :	2

Sub-Section Id : 64065380448

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 413 Question Id : 640653564138 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Selectable Option : 0

Question Label : Multiple Select Question

Which of the following statements regarding classification and regression models are correct ?

Options :

6406531885808. ✔ In Regression, the output variable must be of continuous nature or real value but In Classification, the output variable is categorical.

6406531885809. ✔ In Regression, we try to find the best fit line, which can predict the output more accurately but In Classification, we try to find the decision boundary, which can divide the dataset into different classes.

6406531885810. ✖ The Classification Algorithm can be further divided into Linear and Non-linear classifier and the regression algorithms can be divided into Binary regression and Multi-class regression.

6406531885811. ✔ Regression algorithms can be used to solve the regression problems such as Weather Prediction, House price prediction, etc and Classification Algorithms can be used to solve classification problems such as Identification of spam emails, Speech Recognition, Identification of cancer cells, etc.

Sub-Section Number : 3

Sub-Section Id : 64065380449

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 414 Question Id : 640653564139 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Correct Marks : 3 Selectable Option : 0

Question Label : Multiple Select Question

Which of the following can be the equation of the line passing through point (1, 1, 1) and normal to the tangent of the function $x^2 + yz + z^2$ at the point (1, 1, 1)?

Options :

6406531885812. ✔ $[1,1,1]^T + \lambda * [1,1,-1]^T$

6406531885813. ✔ $[1,1,1]^T + \lambda * [-2,1,1]^T$

6406531885814. ✖ $[1,1,1]^T + \lambda * [2,1,1]^T$

6406531885815. ✔ $[1,1,1]^T + \lambda * [1,-5,1]^T$

Question Number : 415 Question Id : 640653564140 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3 Selectable Option : 0

Question Label : Multiple Select Question

Which among the following options are correct?

Options :

6406531885816. ✖ If the columns of A are linearly independent, then $Ax = b$ has exactly one solution for every b.

6406531885817. ✔ If the columns of A are linearly independent and if the solution for $Ax = b$ exists, then it is unique.

6406531885818. ✖ If $Ax = b$ has a unique solution, then A is a square matrix.

6406531885819. ✔ If the columns of a matrix A are linearly dependent, then $Ax = 0$ has a nontrivial

solution.

Question Number : 416 Question Id : 640653564141 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3 Selectable Option : 0

Question Label : Multiple Select Question

Which among the following statement is/are true?

Options :

6406531885820. ✔ If A and Q are orthogonal matrices then AQ is also an orthogonal matrix.

6406531885821. ✔ If Q is an orthogonal matrix and x is any vector then $||Qx|| = ||x||$

6406531885822. ✔ If λ is an eigenvalue of an orthogonal matrix, then $|\lambda| = 1$

6406531885823. ✖ If λ is an eigenvalue of an orthogonal matrix, then $\lambda = 0$

Question Number : 417 Question Id : 640653564143 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3 Selectable Option : 0

Question Label : Multiple Select Question

Suppose *A* is a symmetric positive definite matrix and *Q* is orthogonal matrix, then which of the following statements is/are true?

Options :

6406531885828. ✖ Q^TAQ is a diagonal matrix.

6406531885829.

✔ Q^TAQ is positive definite.

6406531885830. ✔ Q^TAQ has the same eigenvalues as A.

6406531885831. ✖ Q^TAQ is skew-symmetric.

Question Number : 418 Question Id : 640653564146 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3 Selectable Option : 0

Question Label : Multiple Select Question

Which among the following is a convex function?

Options :

6406531885834. ✔ $x \log_2 x, x > 0$

6406531885835. ✔ $-\log(1+x), x > 1$

6406531885836. ✔ $5x^6 + 3x^2 - 1000, x \in \mathbb{R}$

6406531885837. ✖ $x^3, x \in \mathbb{R}$

Sub-Section Number :	4
Sub-Section Id :	64065380450
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 419 Question Id : 640653564142 Question Type : MCQ Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Let *A* be a Hermitian matrix. Then, which of the following statements are false?

Options :

6406531885824. ✖ The diagonal entries of *A* are all real.

6406531885825. ✖ There exists a unitary *U* such that $U^{\dagger}AU$ is a diagonal matrix.

6406531885826. ✖ If $A^3 = I$, then $A = I$

6406531885827. ✔ If $A^2 = I$, then $A = I$

Question Number : 420 Question Id : 640653564149 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

A consumer wants to maximize his utility subject to some constraints. He consumes two goods *x* and *y* and the utility function is the product of *x* and *y*. His budget is Rs.1000. The per unit price of goods *x* and *y* are Rs.15 and Rs.20 respectively. For the given optimization problem, choose the equivalent Lagrange function.

Options :

6406531885843. ✖ $L(x, y, z) = x + y - \lambda(15x + 20y - 1000)$

6406531885844. ✖ $L(x, y, z) = x + y + \lambda(15x + 20y - 1000)$

6406531885845. ✔ $L(x, y, \lambda) = xy + \lambda(15x + 20y - 1000)$

6406531885846. ✖ $L(x, y, \lambda) = xy - \lambda(15x + 20y + 1000)$

Question Number : 421 Question Id : 640653564151 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Let $X_1, X_2, \cdots, X_{15}$ i.i.d. Geometric$\left(\frac{1}{3}\right)$. Find the probability that $(X_1 = 5, X_2 = 5, \ldots, X_{15} = 5)$.

Options :

6406531885848. ✔ $\left(\frac{2}{3}\right)^{60}\left(\frac{1}{3}\right)^{15}$

6406531885849. ✖ $\left(\frac{2}{3}\right)^{14}\left(\frac{1}{3}\right)$

6406531885850. ✖ $\left(\frac{2}{3}\right)^{75}$

6406531885851. ✖ $\left(\frac{2}{3}\right)^{15}$

Sub-Section Number :	5
Sub-Section Id :	64065380451
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 422 Question Id : 640653564144 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Short Answer Question

Suppose you have a two-dimensional dataset $x_1, x_2, x_3, ...x_n$ with mean zero.

Suppose the covariance matrix $C = \sum_{i=1}^{n} x_i x_i^T = \begin{bmatrix} 4 & 2 \\ 2 & 4 \end{bmatrix}$

Using PCA, project the data onto a line, What is the projected variance ?

Enter the answer as integer.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

6

Question Number : 423 Question Id : 640653564147 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Short Answer Question

What is the minimum possible distance from the point (4, 0) to a point on the circle $x^2 + y^2 = 1$ is

Enter the answer as integer.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Sub-Section Number :	6
Sub-Section Id :	64065380452
Question Shuffling Allowed :	Yes

Is Section Default? : null

Question Number : 424 Question Id : 640653564145 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

By using first order taylor series approximation, what would be the value of $f([1,2,3]^T)$, if $f([1,1,1]^T) = 10$ and $\nabla f([1,1,1]^T) = [2,1,3]^T$? Enter the answer as integer.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

17

Sub-Section Number : 7

Sub-Section Id : 64065380453

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 425 Question Id : 640653564148 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Selectable Option : 0

Question Label : Multiple Select Question

A student wants to purchase a snack from a bakery to meet certain dietary requirements by chossing the best combination of brownies and cheesecake. The student is following some new diet trend which requires her to eat at maximum of 8 brownies and maximum of 12 cakes. Also total number of cakes and choclates together a student can eat should exceed 14. The cost of 1 piece of brownie(x_1) and 1 piece of cake(x_2) is 50 units and 80 units respectively. Her goal is to satisfy these requirements at minimal cost.

Options :

6406531885839. ✔ In primal linear program, the function to be minimized is $50x_1 + 80x_2$.

6406531885840. ✔ Constraints of primal linear program are $x_1 \leq 8$, $x_2 \leq 12$, and $x_1 + x_2 > 14$.

6406531885841. ✖ In primal linear program, the function to be minimized is $6x_1 + 10x_2 + 8x_3$.

6406531885842. ✖ Constraints of primal linear program are $x_1 \geq 8$, $x_2 \geq 12$, and $x_1 + x_2 > 14$.

Sub-Section Number :	8
Sub-Section Id :	64065380454
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 426 Question Id : 640653564150 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Short Answer Question

The joint density function of random variables X and Y is given by

$$f_{XY}(x,y) = \begin{cases} 2(x^3+y^3), & 0<x<1, 0<y<1, \\ 0, & \text{otherwise} \end{cases}$$

What is the value of $P(0 < X < 0.5, 0 < Y < 0.5)$? Enter the answer correct to three decimals accuracy.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.029 to 0.033

Question Number : 427 Question Id : 640653564153 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Short Answer Question

Suppose you want to estimate the average marks μ of Class 10 students in India. To this end, you randomly select n students from the entire population. The standard deviation of Class 10 marks of the population is known to be 10. Find the minimum value of n so that Chebyshev's inequality guarantees the estimate to be within 5 marks from μ, with probability at least 0.99. Enter the answer as integer.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

400

Sub-Section Number :	9
Sub-Section Id :	64065380455
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 428 Question Id : 640653564152 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

Let $Z_1, Z_2 \sim$ i.i.d. Normal$(0, 1)$. Define

$$X_1 = Z_1 + 3Z_2 - 2$$

$$X_2 = Z_1 - 2Z_2 + 1$$

What will be the distribution of $X = (X_1, X_2)$?

Options :

6406531885852. ✖ $X \sim \text{Normal}\left(\begin{bmatrix}-2\\1\end{bmatrix}, \begin{bmatrix}1 & 3\\1 & -2\end{bmatrix}\right)$

6406531885853. ✔ $X \sim \text{Normal}\left(\begin{bmatrix}-2\\1\end{bmatrix}, \begin{bmatrix}10 & -5\\-5 & 5\end{bmatrix}\right)$

6406531885854. ✖ $X \sim \text{Normal}\left(\begin{bmatrix}0\\0\end{bmatrix}, \begin{bmatrix}1 & 3\\1 & -2\end{bmatrix}\right)$

6406531885855. ✖ $X \sim \text{Normal}\left(\begin{bmatrix}0\\0\end{bmatrix}, \begin{bmatrix}10 & -5\\-5 & 5\end{bmatrix}\right)$