6406533043553. ✔ 4500 kilometers

6406533043554. ✖ 3000 kilometers

Question Number : 286 Question Id : 640653903836 Question Type : MCQ Calculator : Yes Correct Marks : 3

Question Label : Multiple Choice Question

What will be the round-trip latency (milliseconds) of the network if the router is placed at exactly midway from the client and the server?

Options :

6406533043555. ✖ 45

6406533043556. ✖ 90

6406533043557. ✔ 180

6406533043558. ✖ 270

MLF

Section Id :	64065364123
Section Number :	10
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	13
Number of Questions to be attempted :	13
Section Marks :	40
Display Number Panel :	Yes
Section Negative Marks :	0
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	No
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653134037
Question Shuffling Allowed :	No

Question Number : 287 Question Id : 640653903856 Question Type : MCQ Calculator : Yes 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 :

6406533043635. ✔ YES

6406533043636. ✖ NO

Sub-Section Number :	2
Sub-Section Id :	640653134038
Question Shuffling Allowed :	No

Question Id : 640653903857 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (288 to 289)

Question Label : Comprehension

A company produces two types of products P_1 and P_2. The cost price per unit of P_1 and P_2 are ₹4 and ₹3, respectively. The production process requires two types of resources: labor hours and machine hours. Each unit of P_1 requires 2 labor hours and 1 machine hour, while each unit of P_2 requires 1 labor hour and 3 machine hours. The company has constraints on the availability of labor and machine hours, which are 80 and 90 hours, respectively. Use the above information to answer the given sub-questions.

Sub questions

Question Number : 288 Question Id : 640653903858 Question Type : MCQ Calculator : Yes Correct Marks : 2

Question Label : Multiple Choice Question

Choose the correct **Primal** optimization problem from the following.

Options :

6406533043637. ✔ $\text{Minimize: } 4x + 3y$
$\text{Subject to: } 2x + y \leq 80, x + 3y \leq 90, x \geq 0, y \geq 0$

6406533043638. ✖ $\text{Minimize: } 2x + 3y$
$\text{Subject to: } 2x + y \leq 80, x + 3y \leq 90, x \geq 0, y \geq 0$

6406533043639. ✖ $\text{Minimize: } 3x + 4y$
$\text{Subject to: } 2x + y \leq 90, x + 3y \leq 80, x \geq 0, y \geq 0$

6406533043640. ✖ $\text{Minimize: } 4x + 3y$
$\text{Subject to: } 2x + y \leq 90, x + 3y \leq 80, x \geq 0, y \geq 0$

Question Number : 289 Question Id : 640653903859 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

Find the minimum cost price of the products.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

90

Sub-Section Number :	3
Sub-Section Id :	640653134039
Question Shuffling Allowed :	Yes

Question Number : 290 Question Id : 640653903860 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following represents the convex set in $\mathbb{R}^2$.

Options :

6406533043642. ✔ $\{(x, y) \mid \text{Region between the curves } y = 4x^2 \text{ and } y = 2x + 5\}$

6406533043643. ✖ $\{(x, y) \mid \text{Region between the curves } y = 4x^2 \text{ and } y = 2x^2 + 1\}$

6406533043644. ✖ $\text{epi}(f) = \{(x, f(x)) \mid f(x) = |(x-1)(x-2)(x-3)|\}$

6406533043645. ✔ A triangular region with vertices at $(0, 0)$, $(1, 0)$, and $(0, 1)$.

Question Number : 291 Question Id : 640653903861 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following options is/are true?

Options :

6406533043646. ✖ $f(x) = (x^2 - 3x + 2)(x^2 - 7x + 12)$ is a convex function.

6406533043647. ✔ $f(v) = v^T Av$ is a convex function, where $A = \begin{bmatrix} -2 & -1 \\ -1 & 1 \end{bmatrix}$ and $v = \begin{bmatrix} x \\ y \end{bmatrix}$.

6406533043648. ✔ $f(x, y) = x^2 + y^2 + 3$ is a convex function.

6406533043649. ✖ $f(v) = v^T Av$ is a convex function, where $A = \begin{bmatrix} -2 & 0 \\ 0 & 1 \end{bmatrix}$ and $v = \begin{bmatrix} x \\ y \end{bmatrix}$.

Sub-Section Number : 4
Sub-Section Id : 640653134040
Question Shuffling Allowed : Yes

Question Number : 292 Question Id : 640653903862 Question Type : SA Calculator : None Correct Marks : 3

Question Label : Short Answer Question

A gardener has 200 meters of fencing and wants to enclose a rectangular garden that borders a straight wall. The gardener does not need to fence along the wall. Find the maximum possible enclosed area of the garden.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :

5000

Question Number : 293 Question Id : 640653903866 Question Type : SA Calculator : None Correct Marks : 3

Question Label : Short Answer Question

Suppose a random variable *X* has a mean μ of 70 and a standard deviation σ of 8. Using Chebyshev's inequality, determine the maximum probability that *X* will deviate from the mean by more than 24 units. Enter the answer correct to two decimal places.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :

0.09 to 0.13

Question Number : 294 Question Id : 640653903870 Question Type : SA Calculator : None Correct Marks : 3

Question Label : Short Answer Question

Consider the following input data points:

x	y
$[1,2,3]$	2
$[0,0,0]$	1
$[1,1,2]$	3
$[-1,0,1]$	-1
$[3,1,3]$	4

Suppose we fit a linear model $f(\mathbf{x}) = x_1 + 3x_2 - x_3$, where $\mathbf{x} = (x_1, x_2, x_3)$. Compute the value of the loss function L for this dataset which is defined as $L = \frac{1}{n}\sum_{i=1}^{n}(f(\mathbf{x}^i) - y^i)^2$. Enter the answer correct to one decimal place.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
1.6

Question Number : 295 Question Id : 640653903871 Question Type : SA Calculator : None Correct Marks : 3
Question Label : Short Answer Question

Let X and Y be two independent random variables, where $X \sim \text{Normal}(-1, 11)$ and $Y \sim \text{Normal}(1, 9)$. Define $U = 2X - 3Y$. Find the value of $P(U < 2)$. Enter the answer correct to three decimal places.
Hint: Use the following values of F_Z if required. F_Z stands for the CDF of the standard normal.

- $F_Z(0.62) = 0.7343$
- $F_Z(-0.62) = 0.2656$
- $F_Z(1.25) = 0.8947$
- $F_Z(-1.25) = 0.1052$

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
0.731 to 0.737

Sub-Section Number : 5
Sub-Section Id : 640653134041
Question Shuffling Allowed : Yes

Question Number : 296 Question Id : 640653903863 Question Type : MSQ Calculator : Yes
Correct Marks : 4 Max. Selectable Options : 0
Question Label : Multiple Select Question
Consider a square matrix *A* of order 3 such that trace(*A*) = 3 and det(*A*) = 2. If 1 is an eigenvalue of *A*, then which of the following options is/are true?
Options :
6406533043651. ✔ Matrix *A* can be a symmetric matrix.
6406533043652. ✔ All eigenvalues of *A* are distinct.
6406533043653. ✖ $2 - i$ is an eigenvalue of *A*.
6406533043654. ✖ Matrix *A* is not diagonalizable.

Question Number : 297 Question Id : 640653903865 Question Type : MSQ Calculator : Yes
Correct Marks : 4 Max. Selectable Options : 0
Question Label : Multiple Select Question
Suppose we have 10 data points randomly distributed in space $\mathbb{R}^3$ given by $D = \{x_1, x_2, \ldots x_{10}\}$. Let $g(p) = \sum_{i=1}^{10} ||p - x_i||^2$ be a function defined to calculate the sum of the square of distances of data points from a fixed point, say $p \in \mathbb{R}^3$. If $g(p)$ attains the minimum at $q = \begin{bmatrix} 3 \\ 0 \\ 3 \end{bmatrix}$, then which of the following options is/are true?
Options :
6406533043659. ✔ $x_1 + x_2 + \ldots + x_{10} = \begin{bmatrix} 30 \\ 0 \\ 30 \end{bmatrix}$
6406533043660. ✖ $x_1 + x_2 + \ldots + x_{10} = \begin{bmatrix} 0 \\ 30 \\ 30 \end{bmatrix}$
6406533043661. ✖ The distance of point $(x_1 + x_2 + \ldots + x_{10})$ from the origin is 50.
6406533043662. ✔ The distance of point $(x_1 + x_2 + \ldots + x_{10})$ from the origin is $30\sqrt{2}$.

Sub-Section Number : 6
Sub-Section Id : 640653134042
Question Shuffling Allowed : Yes

Question Number : 298 Question Id : 640653903864 Question Type : MSQ Calculator : Yes Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following is/are true about PCA?

Options :

6406533043655. ✔ PCA will transform the original data set onto a lower dimension subspace such that the variance of the project is maximized.

6406533043656. ✖ PCA calculates the mean of each data set to determine its significance.

6406533043657. ✔ PCA can be used to reduce the dimensionality of the dataset.

6406533043658. ✖ PCA will transform the original data set onto a lower dimension subspace such that the reconstruction error is maximized.

Sub-Section Number :	7
Sub-Section Id :	640653134043
Question Shuffling Allowed :	No

Question Id : 640653903867 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (299 to 300)

Question Label : Comprehension

Let X and Y have the following joint density function

$$f(x,y) = \begin{cases} 18x^2y^2 & x,y \geq 0, x+y \leq 1 \\ 0 & \text{otherwise} \end{cases}$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 299 Question Id : 640653903868 Question Type : MCQ Calculator : Yes Correct Marks : 3

Question Label : Multiple Choice Question

Find the conditional distribution $f_{X|Y}(x \mid y)$.

Options :

6406533043664. ✖ $f_{X|Y}(x \mid y) = \dfrac{3x^2}{(1-y)^3},\ 0 < x < 1$

6406533043665. ✔ $f_{X|Y}(x \mid y) = \dfrac{3x^2}{(1-y)^3},\ 0 < x < 1-y$

6406533043666. ✖ $f_{X|Y}(x \mid y) = 3x^2(1-y)^3,\ 0 < x < 1$

6406533043667. ✖ $f_{X|Y}(x \mid y) = 3x^2(1-y)^3,\ 0 < x < 1-y$

Question Number : 300 Question Id : 640653903869 Question Type : SA Calculator : None Correct Marks : 2

Question Label : Short Answer Question

Find the value of $P\left(X < \frac{1}{2} \mid Y = \frac{1}{2}\right)$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Sub-Section Number :	8
Sub-Section Id :	640653134044
Question Shuffling Allowed :	Yes

Question Number : 301 Question Id : 640653903872 Question Type : MCQ Calculator : Yes Correct Marks : 2

Question Label : Multiple Choice Question

Let $A = \begin{pmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \\ 0 & 1 & 2 \end{pmatrix}$. Find the column space of A.

Options :

6406533043671. ✖ $\text{span}\left\{\begin{pmatrix} 1 \\ -2 \\ 1 \end{pmatrix}\right\}$

6406533043672. ✖ $\text{span}\left\{\begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix}, \begin{pmatrix} 2 \\ 3 \\ 4 \end{pmatrix}\right\}$

6406533043673. ✖ $\left\{\begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}\right\}$

6406533043674. ✔

$$\text{span}\left\{\begin{pmatrix}1\\2\\0\end{pmatrix}, \begin{pmatrix}2\\3\\1\end{pmatrix}\right\}$$

Java

Section Id :	64065364124
Section Number :	11
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	24
Number of Questions to be attempted :	24
Section Marks :	100
Display Number Panel :	Yes
Section Negative Marks :	0
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	No
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653134045
Question Shuffling Allowed :	No

Question Number : 302 Question Id : 640653903873 Question Type : MCQ Calculator : Yes

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL : PROGRAMMING CONCEPTS USING JAVA (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 :

6406533043675. ✔ YES

6406533043676. ✖ NO

Sub-Section Number :	2
Sub-Section Id :	640653134046
Question Shuffling Allowed :	Yes