If we run the command: `curl http://127.0.0.1:5000/api/user -X GET` on a new terminal; it will return;

```
{
  "name": "mad1_admin",
  "role": "admin"
}
```

6406532577524. ✔ The endpoint, `/<admin>` is mapped with GET HTTP method.

If we run the command: `curl http://127.0.0.1:5000/user-data -X POST` on a new terminal; it will return;

```
{
  "message": "user added successfully"
}
```

6406532577525. ✔

MLF

Section Id :	64065353265
Section Number :	9
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	10
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 :	Yes

Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653112612
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 141 Question Id : 640653770556 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 :

6406532577526. ✔ YES

6406532577527. ✖ NO

Sub-Section Number :	2
Sub-Section Id :	640653112613
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 142 Question Id : 640653770557 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider two complex matrices *A* and *B* such that both are the Hermitian matrices. Which of the following statements is/are true?

Options :

6406532577528. ✔ $A + B$ is also a Hermitian matrix.

6406532577529. ✔ $\overline{A+B}$ is a Hermitian matrix, where $\overline{A+B}$ is a conjugate of $A + B$.

6406532577530. ✖ AB is also a Hermitian matrix.

6406532577531. ✖ $\overline{AB}$ is Hermitian matrix, where $\overline{AB}$ is conjugate of AB.

Sub-Section Number :	3
Sub-Section Id :	640653112614
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653770558 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (143 to 144)

Question Label : Comprehension

Consider a matrix $A = \begin{pmatrix} 1 & -i \\ i & 1 \end{pmatrix}$. Use this information to answer the given sub-questions.

Sub questions

Question Number : 143 Question Id : 640653770559 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following statements is/are true about *A*?

Options :

6406532577532. ✔ *A* is the Hermitian matrix.

6406532577533. ✖ *A* is the Unitary matrix.

6406532577534. ✔ All eigenvalues are real.

6406532577535. ✖ Eigenvalues are complex.

Question Number : 144 Question Id : 640653770560 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following statements is/are true about *A*?

Options :

6406532577536. ✔ $$A = \begin{pmatrix} \frac{-i\sqrt{2}}{2} & \frac{i\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix} \begin{pmatrix} 2 & 0 \\ 0 & 0 \end{pmatrix} \begin{pmatrix} \frac{-i\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{i\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$$

6406532577537. ✔ $$A^2 = \begin{pmatrix} \frac{-i\sqrt{2}}{2} & \frac{i\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix} \begin{pmatrix} 4 & 0 \\ 0 & 0 \end{pmatrix} \begin{pmatrix} \frac{-i\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{i\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$$

6406532577538. ✔ $\begin{pmatrix} i \\ 1 \end{pmatrix}$ is an eigenvector of A

6406532577539.

✖ A is not diagonalizable.

Question Id : 640653770561 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (145 to 146)

Question Label : Comprehension

Consider a matrix $A = \begin{pmatrix} 2 & 1 \\ 1 & 0 \\ 0 & 1 \end{pmatrix}$. Let $A = Q_1 \sum Q_2^T$ be the SVD form of A.
Use this matrix to answer the given sub-questions.

Sub questions

Question Number : 145 Question Id : 640653770562 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following options is/are true?

Options :

6406532577540. ✖ $A^T A = \begin{pmatrix} 5 & 2 \\ 3 & 2 \end{pmatrix}$

6406532577541. ✖ Eigenvalues of $A^T A$ are 6 and 2.

6406532577542. ✔ An eigenvector of $A^T A$ corresponding to eigenvalue 6 is $\begin{pmatrix} 2 \\ 1 \end{pmatrix}$

6406532577543. ✔

Orthonormalized eigenvectors of A^TA

are $\begin{pmatrix} \frac{2\sqrt{5}}{5} \\ \frac{\sqrt{5}}{5} \end{pmatrix}$ and $\begin{pmatrix} -\frac{\sqrt{5}}{5} \\ \frac{2\sqrt{5}}{5} \end{pmatrix}$

Question Number : 146 Question Id : 640653770563 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following options is/are true?

Options :

6406532577544. ✖ $\sum = \begin{pmatrix} \sqrt{6} & 0 \\ 0 & \sqrt{2} \\ 0 & 0 \end{pmatrix}$

6406532577545. ✔ $\sum = \begin{pmatrix} \sqrt{6} & 0 \\ 0 & 1 \\ 0 & 0 \end{pmatrix}$

6406532577546. ✔ $Q_2 = \begin{pmatrix} \frac{2\sqrt{5}}{5} & -\frac{\sqrt{5}}{5} \\ \frac{\sqrt{5}}{5} & \frac{2\sqrt{5}}{5} \end{pmatrix}$

6406532577547. ✖ $Q_2 = \begin{pmatrix} \frac{2\sqrt{5}}{5} & \frac{\sqrt{5}}{5} \\ \frac{\sqrt{5}}{5} & \frac{2\sqrt{5}}{5} \end{pmatrix}$

Sub-Section Number : 4

Sub-Section Id : 640653112615

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653770564 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (147 to 148)

Question Label : Comprehension

Consider a quadratic function

$f_1(x_1, x_2) = \begin{pmatrix} x_1 & x_2 \end{pmatrix} A \begin{pmatrix} x_1 \\ x_2 \end{pmatrix} = 2x_1^2 + 12x_1x_2 + 7x_2^2$, where A is a matrix.

Use the above information to answer the given sub-questions.

Sub questions

Question Number : 147 Question Id : 640653770565 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

Which of the following options represents matrix *A*?

Options :

6406532577548. ✔ $A = \begin{pmatrix} 2 & 6 \\ 6 & 7 \end{pmatrix}$

6406532577549. ✖ $A = \begin{pmatrix} 2 & -6 \\ -6 & 7 \end{pmatrix}$

6406532577550. ✖ $A = \begin{pmatrix} -2 & 6 \\ 6 & -7 \end{pmatrix}$

6406532577551. ✖ $A = \begin{pmatrix} -2 & -6 \\ -6 & -7 \end{pmatrix}$

Question Number : 148 Question Id : 640653770566 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

Which of the following options is/are true?

Options :

6406532577552. ✖ *A* is a negative definite matrix.

6406532577553. ✖ *A* is a positive definite matrix.

6406532577554. ✖ *A* is a negative semi-definite matrix.

6406532577555. ✖ *A* is a positive semi-definite matrix.

6406532577556. ✔ *A* is a indefinite matrix.

Sub-Section Number :	5
Sub-Section Id :	640653112616
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653770567 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (149 to 151)

Question Label : Comprehension

Consider the following dataset:

$$\left\{\begin{pmatrix}-1\\-1\end{pmatrix}, \begin{pmatrix}1\\1\end{pmatrix}, \begin{pmatrix}3\\3\end{pmatrix}\right\}$$

Suppose we want to project the above dataset onto a 1 dimensional space.

Based on the above data, answer the given subquestions

Sub questions

Question Number : 149 Question Id : 640653770568 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

Compute the sample covariance matrix *C* for the given dataset.

Options :

6406532577557. ✔ $C = \frac{1}{3}\begin{pmatrix}8 & 8\\8 & 8\end{pmatrix}$

6406532577558. ✖ $C = \begin{pmatrix}0 & 0\\0 & 0\end{pmatrix}$

6406532577559. ✖ $C = \frac{1}{3}\begin{pmatrix}10 & 10\\10 & 10\end{pmatrix}$

6406532577560. ✖ $C = \frac{1}{3}\begin{pmatrix}11 & 11\\11 & 11\end{pmatrix}$

Question Number : 150 Question Id : 640653770569 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

Which is the principal direction that is chosen for performing PCA?

Options :

6406532577561. ✖ $\begin{pmatrix} -1/\sqrt{2} \\ 1/\sqrt{2} \end{pmatrix}$

6406532577562. ✔ $\begin{pmatrix} 1/\sqrt{2} \\ 1/\sqrt{2} \end{pmatrix}$

6406532577563. ✖ $\begin{pmatrix} 1 \\ 0 \end{pmatrix}$

6406532577564. ✖ $\begin{pmatrix} 0 \\ 1 \end{pmatrix}$

Question Number : 151 Question Id : 640653770570 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

If $\tilde{x}_1, \tilde{x}_2$ and $\tilde{x}_3$ are the projections of the data points onto the first principal component, then which among the following are true?

Options :

6406532577565. ✖ $\tilde{x_1} = \begin{pmatrix} -1 \\ 1 \end{pmatrix}, \tilde{x_2} = \begin{pmatrix} 1 \\ 1 \end{pmatrix}, \tilde{x_3} = \begin{pmatrix} 3 \\ 1 \end{pmatrix}$

6406532577566. ✖ $\tilde{x_1} = \begin{pmatrix} 1 \\ 1 \end{pmatrix}, \tilde{x_2} = \begin{pmatrix} 1 \\ 1 \end{pmatrix}, \tilde{x_3} = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$

6406532577567. ✖ $\tilde{x_1} = \begin{pmatrix} -1/2 \\ 1/2 \end{pmatrix}, \tilde{x_2} = \begin{pmatrix} 1/2 \\ 1/2 \end{pmatrix}, \tilde{x_3} = \begin{pmatrix} 3/2 \\ 1/2 \end{pmatrix}$

6406532577568. ✔ $\tilde{x_1} = \begin{pmatrix} -1 \\ -1 \end{pmatrix}, \tilde{x_2} = \begin{pmatrix} 1 \\ 1 \end{pmatrix}, \tilde{x_3} = \begin{pmatrix} 3 \\ 3 \end{pmatrix}$

Sub-Section Number : 6

Sub-Section Id : 640653112617

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 152 Question Id : 640653770571 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

Which of the following statements is true about the matrix $A = \begin{pmatrix} 3 & 2 \\ -2 & -1 \end{pmatrix}$?

Options :

6406532577569. ✔ A is positive definite.

6406532577570. ✖ A is positive semi-definite.

6406532577571. ✖ A is negative definite.

6406532577572. ✖ A is negative semi-definite.

Sub-Section Number : 7

Sub-Section Id : 640653112618

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 153 Question Id : 640653770572 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

Consider a function $f(x,y) = x^2 - 4x + 2y + 1$. Using gradient descent algorithm, with an initial guess of $(3, 2)$ and learning rate of $\frac{1}{t+1}$, where $t = 1, 2, 3, \ldots$. What will be the value of (x, y) after two iterations?

Options :

6406532577573. ✖ $x = 0.5, y = 0$

6406532577574. ✖ $x = 2.512, y = 1.612$

6406532577575. ✖ $x = 0, y = 0$

6406532577576. ✔ $x = 2, y = 0.33$

Question Number : 154 Question Id : 640653770573 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

Find the point(s) on the circle $y^2 = 4 + x^2$ closest to the point $(3, 0)$.

Options :

6406532577577. ✖ -1.5, -2.5

6406532577578. ✔ 1.5, 2.5

6406532577579. ✖ 1.5, -2.5

6406532577580. ✖ -1.5, 2.5

Sub-Section Number :	8
Sub-Section Id :	640653112619
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 155 Question Id : 640653770574 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

The value of a function at point 5 is 10. The values of the function's first and second order derivatives at this point are 5 and 2 respectively. What will be the function's approximate value at the point 5.1? (Enter the answer correct up to two decimal places).

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

10.2 to 10.8

Java

Section Id :	64065353266
Section Number :	10
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	16
Number of Questions to be attempted :	16
Section Marks :	100
Display Number Panel :	Yes