```
course found App Dev III
```

6406532732086. ✖

```
course found App Dev I
course found App Dev II
```

6406532732087. ✔

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course found App Dev I
course found App Dev II
course found App Dev III
```

6406532732088. ✖

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IndexError: list index out of range
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MLF

Section Id :	64065356674
Section Number :	9
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	12
Number of Questions to be attempted :	12
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 : 640653118801

Question Shuffling Allowed : No

Is Section Default? : null

Question Number : 194 Question Id : 640653815531 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 :

6406532732177. ✔ YES

6406532732178. ✖ NO

Sub-Section Number : 2

Sub-Section Id : 640653118802

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653815532 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 : (195 to 197)

Question Label : Comprehension

A person went to the market to buy hens. Old hens can be bought for ₹ 200.00 each but young hens can be bought for ₹ 500.00 each. The old hens lay 3 eggs per week and the young hens lay 5 eggs per week. Each egg costs Rs. 11. A hen costs ₹ 50.00 per week to feed. If the financial constraint is ₹ 8000 per week to buy hens and the capacity constraint is that the total number of hens bought cannot exceed 20 per week. The objective is to earn more profit. Let *x* represent the number of old hens and *y* represent the number of young hens.

Use the above information to answer the given subquestions

Sub questions

Question Number : 195 Question Id : 640653815533 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

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

Options :

6406532732179. ✔ $\text{Maximize: } 5y - 17x$
$\text{Subject to: } x + y \leq 20, 200x + 500y \leq 8000, x \geq 0, y \geq 0$

6406532732180. ✖ $\text{Maximize: } -5y + 17x$
$\text{Subject to: } x + y \leq 20, 200x + 500y \leq 8000, x \geq 0, y \geq 0$

6406532732181. ✖ $\text{Maximize: } 33y + 55x$
$\text{Subject to: } x + y \leq 20, 200x + 500y \leq 8000, x \geq 0, y \geq 0$

6406532732182. ✖ $\text{Maximize: } 55y - 17x$
$\text{Subject to: } x + y \leq 20, 200x + 500y \leq 8000, x \geq 0, y \geq 0$

Question Number : 196 Question Id : 640653815534 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

If (x^*, y^*) is the optimal solution of the primal, u_1 and u_2 are Lagrange multipliers then which of the following options is/are true?

Options :

6406532732183. ✖ Complimentary Slackness Condition is
$u_1 + 200u_2 = -17$
$u_1 + 500u_2 = 5$

6406532732184. ✖ Stationary condition is
$u_1 + 200u_2 = -17$
$u_1 + 500u_2 = -5$

6406532732185. ✔ Complimentary Slackness Condition is
$u_1(x^* + y^* - 20) = 0$
$u_2(200x^* + 500y^* - 8000) = 0$

6406532732186. ✖ Complimentary Slackness Condition is
$u_1(x^* + y^* - 20) = 0$
$u_2(200x^* + 500y^* + 8000) = 0$

6406532732187. ✖ Stationary condition is
$u_1(x^* + y^* - 20) = 0$
$u_2(200x^* + 500y^* - 8000) = 0$

Question Number : 197 Question Id : 640653815535 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 :

6406532732188. ✖ The Given LPP is infeasible.

6406532732189. ✔ The Given LPP is feasible.

6406532732190. ✔ The optimum value is $x = 0$ and $y = 16$

6406532732191. ✖ The optimum value is $x = 20$ and $y = 0$

Sub-Section Number : 3

Sub-Section Id : 640653118803

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 198 Question Id : 640653815536 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

Find the maximum value of the function $f(x, y) = xy$, subject to constraints $\frac{x^2}{8} + \frac{y^2}{2} = 2$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

4

Sub-Section Number : 4

Sub-Section Id : 640653118804

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 199 Question Id : 640653815537 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 functions $f(x,y) = 2x^2 + 3y^2$ and $g(x) = -(x+1)^2$. Which of the following options is/are true?

Options :

6406532732193. ✔ $f(x,y)$ is a convex function.

6406532732194. ✖ $g(x)$ is a convex function.

6406532732195. ✔ $g \circ f$ is not a convex function.

6406532732196. ✔ The local minimum value of the function $f(x,y)$ is the global minimum of the function.

Question Number : 200 Question Id : 640653815538 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 following set is/are convex sets in $\mathbb{R}^2$?

Options :

6406532732197. ✖ $\{(x,y) \mid x^2 + y^2 = 1\}$

6406532732198. ✔ $\{(x,y) \mid x^2 + y^2 \leq 1\}$

6406532732199. ✖ $\{(x,y) \mid x^2 + y^2 > 1\}$

6406532732200. ✔ $\{(x, y) \mid \frac{x^2}{4} + \frac{y^2}{9} < 1\}$

Sub-Section Number :	5
Sub-Section Id :	640653118805
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653815539 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 : (201 to 202)

Question Label : Comprehension

Consider a function

$$f(x) = \begin{cases} 2x^2 & \text{if } x < 2 \\ (x-2)^3 & \text{if } 2 \leq x < 4 \\ 4 & \text{if } 4 \leq x \end{cases}$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 201 Question Id : 640653815540 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

Find the number of discontinuous points.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 202 Question Id : 640653815541 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

Find the number of points where the function is not differentiable.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Sub-Section Number :	6
Sub-Section Id :	640653118806
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 203 Question Id : 640653815542 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

Let A be a real symmetric positive definite matrix. Which of the following options is/are true?

Options :

6406532732203. ✔ The eigenvectors of A may or may not be orthogonal.

6406532732204. ✔ If A is similar to a diagonal matrix B, then B is also positive definite.

6406532732205. ✖ $A^T A$ is not positive definite.

6406532732206. ✖ $A^T A$ is not similar to a diagonal matrix.

Question Number : 204 Question Id : 640653815543 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 a data set $\{x_1, x_2, \ldots, x_n\}$, where $x_i \in \mathbb{R}^d, i = 1, 2, \ldots n$ and $d >> n$.

Let $A = \begin{bmatrix} (x_1 - \overline{x})^T \\ (x_2 - \overline{x})^T \\ \vdots \\ (x_n - \overline{x})^T \end{bmatrix}$ and $C = \frac{1}{n} A^T A$, where $\overline{x} = \frac{1}{n} \sum_{i=1}^{n} x_i$. Which of the following options is/are true?

Options :

6406532732207. ✖ $Rank(C) \geq n$

6406532732208. ✔ $Rank((x_i - \overline{x})(x_i - \overline{x})^T) = 1$ for all $i = 1, 2, \ldots, n$

6406532732209. ✔ For this problem, it is efficient to perform PCA using eigenvalues/eigenvectors of $\frac{1}{n} AA^T$.

6406532732210. ✖ For this problem, it is efficient to perform PCA using eigenvalues/eigenvectors of C.

Sub-Section Number :	7
Sub-Section Id :	640653118807
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 205 Question Id : 640653815544 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 and X_2 be independent exponential random variables with parameters λ_1 and λ_2. Let the joint probility density function of X_1 and X_2 be $f_{X_1X_2}$. Define $Y_1 = X_1 + X_2$ and $Y_2 = X_1 - X_2$. Which of the following represents the joint density function of Y_1 and Y_2 in terms of $f_{X_1X_2}$?
Note: The probability density function of an exponential random variable (X) with parameter λ is given by, $\lambda e^{-\lambda x}$.

Options :

6406532732211. ✔

$$f_{Y_1Y_2}(y_1,y_2) = \begin{cases} \frac{\lambda_1\lambda_2}{2} e^{\{-\lambda_1(\frac{y_1+y_2}{2})-\lambda_2(\frac{y_1-y_2}{2})\}} & y_1+y_2 \geq 0, y_1-y_2 \geq 0 \\ 0 & \text{otherwise} \end{cases}$$

6406532732212. ✖

$$f_{Y_1Y_2}(y_1,y_2) = \begin{cases} \frac{\lambda_1\lambda_2}{2} e^{\{-\lambda_1(\frac{x_1+x_2}{2})-\lambda_2(\frac{x_1-x_2}{2})\}} & y_1+y_2 \geq 0, y_1-y_2 \geq 0 \\ 0 & \text{otherwise} \end{cases}$$

6406532732213. ✖

$$f_{Y_1Y_2}(y_1,y_2) = \begin{cases} \frac{\lambda_1\lambda_2}{2} e^{\{-\lambda_1(\frac{y_1-y_2}{2})-\lambda_2(\frac{y_1+y_2}{2})\}} & y_1+y_2 \geq 0, y_1-y_2 \geq 0 \\ 0 & \text{otherwise} \end{cases}$$

6406532732214. ✖

$$f_{Y_1Y_2}(y_1,y_2) = \begin{cases} \frac{\lambda_1\lambda_2}{2} e^{\{-\lambda_1(\frac{y_1+y_2}{2})-\lambda_2(\frac{y_1-y_2}{2})\}} & y_1 \geq 0, y_2 \geq 0 \\ 0 & \text{otherwise} \end{cases}$$

Sub-Section Number :	8
Sub-Section Id :	640653118808
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 206 Question Id : 640653815545 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 joint probability density function of X and Y is given by,

$$f(x,y) = \begin{cases} e^{-(x+y)} & 0 < x < \infty, 0 < y < \infty \\ 0 & \text{otherwise} \end{cases}$$

Find the expected value of X i.e. $E[X]$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 207 Question Id : 640653815546 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

In a large town, it is estimated that 20% of students own a laptop. A random sample of 400 students is selected from the town. What is the variance of the number of students with the laptops in a given sample?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

64

Question Number : 208 Question Id : 640653815547 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

A quality control manager at a factory measures the thickness of glass sheets produced. Five randomly selected sheets have the thicknesses(in *mm*) 10, 8, 11, 9, 12 respectively. Assuming the thickness follows a normal distribution and the variance is known, what is the maximum likelihood estimator (MLE) of the mean thickness, (μ), in *mm* of the glass sheets?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

10

Java

Section Id :	64065356675
Section Number :	10
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