

Indian Institute of Technology, Madras - Centre for Continuing Education

Notations :

- 1.Options shown in **green** color and with ✓ icon are correct.
- 2.Options shown in **red** color and with ✗ icon are incorrect.

| | |
|--|---|
| Question Paper Name : | IIT M DIPLOMA AN2 EXAM QPD2 02 Apr 2023 |
| Subject Name : | 2023 Apr2: IIT M DIPLOMA AN2 EXAM QPD2 |
| Creation Date : | 2023-03-29 17:01:22 |
| Duration : | 120 |
| Total Marks : | 700 |
| Display Marks: | Yes |
| Share Answer Key With Delivery Engine : | Yes |
| Actual Answer Key : | Yes |
| Calculator : | Scientific |
| Magnifying Glass Required? : | No |
| Ruler Required? : | No |
| Eraser Required? : | No |
| Scratch Pad Required? : | No |
| Rough Sketch/Notepad Required? : | No |
| Protractor Required? : | No |
| Show Watermark on Console? : | Yes |
| Highlighter : | No |
| Auto Save on Console? | Yes |
| Change Font Color : | No |
| Change Background Color : | No |

| | |
|----------------------------|----|
| Change Theme : | No |
| Help Button : | No |
| Show Reports : | No |
| Show Progress Bar : | No |

Group I

| | |
|--|-------------|
| Group Number : | 1 |
| Group Id : | 64065312269 |
| Group Maximum Duration : | 0 |
| Group Minimum Duration : | 90 |
| Show Attended Group? : | No |
| Edit Attended Group? : | No |
| Break time : | 0 |
| Group Marks : | 700 |
| Is this Group for Examiner? : | No |
| Examiner permission : | Cant View |
| Show Progress Bar? : | No |
| Revisit allowed for group Instructions? : | Yes |
| Maximum Instruction Time : | 0 |
| Minimum Instruction Time : | 0 |
| Group Time In : | Minutes |
| Navigate To Group Summary From Last Question? : | No |
| Disable Submit Button During Assessment? : | No |
| Section Selection Time? : | 0 |
| No of Optional sections to be attempted : | 0 |

| | |
|---|-------------|
| Section Id : | 64065333929 |
| Section Number : | 1 |
| Section type : | Online |
| Mandatory or Optional : | Mandatory |
| Number of Questions : | 9 |
| Number of Questions to be attempted : | 9 |
| Section Marks : | 25 |
| 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 : | 64065373899 |
| Question Shuffling Allowed : | No |
| Is Section Default? : | null |

Question Number : 1 Question Id : 640653520978 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 "MATHEMATICS FOR DATA SCIENCE 2"

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 :

6406531736542. ✓ YES

6406531736543. ✘ NO

| | |
|-------------------------------------|-------------|
| Sub-Section Number : | 2 |
| Sub-Section Id : | 64065373900 |
| Question Shuffling Allowed : | Yes |
| Is Section Default? : | null |

Question Number : 2 Question Id : 640653520993 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

Consider the vector space $V = \left\{ \begin{pmatrix} a & b \\ a & b \end{pmatrix} \mid a, b \in \mathbb{R} \right\}$ and $T : \mathbb{R}^3 \rightarrow V$ defined by $T(x, y, z) = \begin{pmatrix} x+y & x+y+z \\ x+y & x+y+z \end{pmatrix}$. Choose the correct option.

Options :

6406531736564. ✓ T is onto but not one-one

6406531736565. ✘ T is one-one but not onto.

6406531736566. ✘ T is both one-one and onto

6406531736567. ✘ T is neither one-one nor onto.

| | |
|-------------------------------------|-------------|
| Sub-Section Number : | 3 |
| Sub-Section Id : | 64065373901 |
| Question Shuffling Allowed : | Yes |
| Is Section Default? : | null |

Question Number : 3 Question Id : 640653520994 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

Let A be an $n \times n$ orthogonal matrix. Choose the correct option(s).

Options :

6406531736568. ✓ A is invertible.

6406531736569. ✓ $\det(A) = \pm 1$.

6406531736570. ✗ $\det(A)$ may be zero.

6406531736571. ✗ Nullity of A may be 1.

Sub-Section Number :

4

Sub-Section Id :

64065373902

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 4 Question Id : 640653520980 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 options is/are true?

Options :

6406531736545. ✓ If the rows of a 3×4 matrix A are linearly independent, then AA^T is an invertible matrix.

6406531736546. ✓ If the columns of a 4×3 matrix A are linearly independent, then A^TA is an invertible matrix.

6406531736547. ✗ If the rows of a 3×4 matrix A are linearly independent, then A^TA is an invertible matrix.

6406531736548. ✗ If the columns of a 4×3 matrix A are linearly independent, then AA^T is an invertible matrix.

Question Number : 5 Question Id : 640653520989 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

An inner product on a vector space V is a function $\langle \cdot, \cdot \rangle : V \times V \rightarrow \mathbb{R}$ satisfying the following conditions:

Condition 1: $\langle v, v \rangle > 0$ for all $v \in V \setminus \{0\}$; $\langle v, v \rangle = 0$ if and only if $v = 0$.

Condition 2: $\langle v_1 + v_2, v_3 \rangle = \langle v_1, v_3 \rangle + \langle v_2, v_3 \rangle$, $\forall v_1, v_2, v_3 \in V$.

Condition 3: $\langle v_1, v_2 \rangle = \langle v_2, v_1 \rangle$, $\forall v_1, v_2 \in V$.

Condition 4: $\langle cv_1, v_2 \rangle = c\langle v_1, v_2 \rangle$, $\forall v_1, v_2 \in V$.

Let $V = \mathbb{R}^2$ and consider the function defined as:

$$\begin{aligned}\langle \cdot, \cdot \rangle : V \times V &\rightarrow \mathbb{R} \\ \langle (x_1, x_2), (y_1, y_2) \rangle &= x_1y_1 - x_2y_1 + x_2y_2.\end{aligned}$$

Which of the following is/are satisfied by the above function?

Options :

6406531736558. ✓ Condition 1 is satisfied.

6406531736559. ✓ Condition 2 is satisfied.

6406531736560. ✗ Condition 3 is satisfied.

6406531736561. ✓ Condition 4 is satisfied.

Sub-Section Number : 5

Sub-Section Id : 64065373903

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 6 **Question Id :** 640653520979 **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

Let $V = \left\{ \begin{pmatrix} a & b \\ c & d \end{pmatrix} \in M_{2 \times 2}(\mathbb{R}) : a + b = c + d \right\}$ and $T : V \rightarrow \mathbb{R}^2$ be a linear transformation.

If T is onto, what is the dimension of the kernel of T ?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

| | |
|-------------------------------------|-------------|
| Sub-Section Number : | 6 |
| Sub-Section Id : | 64065373904 |
| Question Shuffling Allowed : | No |
| Is Section Default? : | null |

Question Id : 640653520990 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 : (7 to 8)

Question Label : Comprehension

Let W be the subspace of \mathbb{R}^3 with the standard inner product, spanned by the ordered set $\beta = \{(1, -1, 0), (0, 1, 1)\}$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 7 Question Id : 640653520991 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

If $\{\frac{w_1}{\|w_1\|}, \frac{w_2}{\|w_2\|}\}$ denotes the orthonormal basis of W obtained by applying the Gram Schmidt process on β , what is $2\|w_2\|^2$?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Question Number : 8 **Question Id :** 640653520992 **Question Type :** SA **Calculator :** None

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

Correct Marks : 1

Question Label : Short Answer Question

Let P_W denote the projection of \mathbb{R}^3 onto W . If $P_W(1, 0, 1) = (a, b, c)$, what is $a + b + c$?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Sub-Section Number : 7

Sub-Section Id : 64065373905

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653520986 **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 : (9 to 10)

Question Label : Comprehension

Let $T : \mathbb{R}^2 \rightarrow \mathbb{R}^3$ be a linear transformation defined by

$$T(x, y) = (x + y, x - y, 3x + y).$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 9 Question Id : 640653520987 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

If $A = \begin{pmatrix} a & b \\ c & d \\ e & f \end{pmatrix}$ denotes the matrix of

T with respect to $\{(1, 1), (1, -1)\}$ for \mathbb{R}^2 and

$\{(1, 1, 1), (1, 1, 0), (-1, 0, 0)\}$ for \mathbb{R}^3 , then

what is $a + d + e$?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 10 Question Id : 640653520988 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

Let B denote the matrix of T with respect to the standard ordered bases for \mathbb{R}^2 and \mathbb{R}^3 . Choose the correct option(s).

Options :

6406531736554. ✓ A is equivalent to B.

6406531736555. ✗ A is not equivalent to B.

6406531736556. ✓ There exist two invertible matrices C and D such that $BD = CA$.

6406531736557. ✗ There are no matrices C and D such that $BD = CA$.

Sub-Section Number : 8

Sub-Section Id : 64065373906

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653520981 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 : (11 to 14)

Question Label : Comprehension

Consider the system of linear equations $AX = b$,

where $A = \begin{pmatrix} 1 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & -1 & 1 \end{pmatrix}$, $X = \begin{pmatrix} x \\ y \\ z \end{pmatrix}$ and $b = \begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix}$.

Let L denote the set of all solutions of the above system.

Clearly, L forms an affine space. Let W denote the subspace corresponding to L . Answer the given sub questions.

Sub questions

Question Number : 11 Question Id : 640653520982 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Short Answer Question

What is the nullity of A ?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 12 **Question Id :** 640653520983 **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

What is the dimension of L ?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 13 **Question Id :** 640653520984 **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

Define $T : W \rightarrow \mathbb{R}^2$ by $T(x, y, z) = (0, x - z)$.

What is the rank of T ?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 14 Question Id : 640653520985 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

If the $m \times n$ matrix B is the matrix of T with respect to some basis for W and the standard ordered basis for \mathbb{R}^2 , then what is $m + n$?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Statistics2

Section Id : 64065333930

Section Number : 2

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

Group All Questions : No

Enable Mark as Answered Mark for Review and Yes

Clear Response :

Maximum Instruction Time : 0
Sub-Section Number : 1
Sub-Section Id : 64065373907
Question Shuffling Allowed : No
Is Section Default? : null

Question Number : 15 Question Id : 640653520995 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 "STATISTICS FOR DATA SCIENCE 2"

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 :

6406531736572. ✓ YES

6406531736573. ✗ NO

Question Number : 16 Question Id : 640653520996 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

Discrete random variables:

| Distribution | PMF ($f_X(k)$) | CDF ($F_X(x)$) | $E[X]$ | $\text{Var}(X)$ |
|--|---|---|-----------------|--------------------|
| Uniform(A) $A = \{a, a+1, \dots, b\}$ | $\frac{1}{n}, \quad x = k$ $n = b - a + 1$ $k = a, a+1, \dots, b$ | $\begin{cases} 0 & x < 0 \\ \frac{k-a+1}{n} & k \leq x < k+1 \\ & k = a, a+1, \dots, b-1, b \\ 1 & x \geq n \end{cases}$ | $\frac{a+b}{2}$ | $\frac{n^2-1}{12}$ |
| Bernoulli(p) | $\begin{cases} p & x = 1 \\ 1-p & x = 0 \end{cases}$ | $\begin{cases} 0 & x < 0 \\ 1-p & 0 \leq x < 1 \\ 1 & x \geq 1 \end{cases}$ | p | $p(1-p)$ |
| Binomial(n, p) | ${}^n C_k p^k (1-p)^{n-k},$ $k = 0, 1, \dots, n$ | $\begin{cases} 0 & x < 0 \\ \sum_{i=0}^k {}^n C_i p^i (1-p)^{n-i} & k \leq x < k+1 \\ & k = 0, 1, \dots, n \\ 1 & x \geq n \end{cases}$ | np | $np(1-p)$ |
| Geometric(p) | $(1-p)^{k-1} p,$ $k = 1, \dots, \infty$ | $\begin{cases} 0 & x < 0 \\ 1 - (1-p)^k & k \leq x < k+1 \\ & k = 1, \dots, \infty \end{cases}$ | $\frac{1}{p}$ | $\frac{1-p}{p^2}$ |
| Poisson(λ) | $\frac{e^{-\lambda} \lambda^k}{k!},$ $k = 0, 1, \dots, \infty$ | $\begin{cases} 0 & x < 0 \\ e^{-\lambda} \sum_{i=0}^k \frac{\lambda^i}{i!} & k \leq x < k+1 \\ & k = 0, 1, \dots, \infty \end{cases}$ | λ | λ |

Continuous random variables:

| Distribution | PDF ($f_X(k)$) | CDF ($F_X(x)$) | $E[X]$ | $\text{Var}(X)$ |
|---------------------------|---|---|-------------------------------|--|
| Uniform $[a, b]$ | $\frac{1}{b-a}, a \leq x \leq b$ | $\begin{cases} 0 & x \leq a \\ \frac{x-a}{b-a} & a < x < b \\ 1 & x \geq b \end{cases}$ | $\frac{a+b}{2}$ | $\frac{(b-a)^2}{12}$ |
| Exp(λ) | $\lambda e^{-\lambda x}, x > 0$ | $\begin{cases} 0 & x \leq 0 \\ 1 - e^{-\lambda x} & x > 0 \end{cases}$ | $\frac{1}{\lambda}$ | $\frac{1}{\lambda^2}$ |
| Normal(μ, σ^2) | $\frac{1}{\sigma\sqrt{2\pi}} \exp\left(\frac{-(x-\mu)^2}{2\sigma^2}\right), -\infty < x < \infty$ | No closed form | μ | σ^2 |
| Gamma(α, β) | $\frac{\beta^\alpha}{\Gamma(\alpha)} x^{\alpha-1} e^{-\beta x}, x > 0$ | | $\frac{\alpha}{\beta}$ | $\frac{\alpha}{\beta^2}$ |
| Beta(α, β) | $\frac{\Gamma(\alpha+\beta)}{\Gamma(\alpha)\Gamma(\beta)} x^{\alpha-1} (1-x)^{\beta-1} \quad 0 < x < 1$ | | $\frac{\alpha}{\alpha+\beta}$ | $\frac{\alpha\beta}{(\alpha+\beta)^2(\alpha+\beta+1)}$ |

1. **Markov's inequality:** Let X be a discrete random variable taking non-negative values with a finite mean μ . Then,

$$P(X \geq c) \leq \frac{\mu}{c}$$

2. **Chebyshev's inequality:** Let X be a discrete random variable with a finite mean μ and a finite variance σ^2 . Then,

$$P(|X - \mu| \geq k\sigma) \leq \frac{1}{k^2}$$

3. **Weak Law of Large numbers:** Let $X_1, X_2, \dots, X_n \sim \text{iid } X$ with $E[X] = \mu, \text{Var}(X) = \sigma^2$.

Define sample mean $\bar{X} = \frac{X_1 + X_2 + \dots + X_n}{n}$. Then,

$$P(|\bar{X} - \mu| > \delta) \leq \frac{\sigma^2}{n\delta^2}$$

4. **Using CLT to approximate probability:** Let $X_1, X_2, \dots, X_n \sim \text{iid } X$ with $E[X] = \mu, \text{Var}(X) = \sigma^2$.

Define $Y = X_1 + X_2 + \dots + X_n$. Then,

$$\frac{Y - n\mu}{\sqrt{n}\sigma} \approx \text{Normal}(0, 1).$$

5. Use the following values of F_Z if required:

$F_Z(\frac{-5}{6}) = 0.20, F_Z(\frac{5}{6}) = 0.80, F_Z(2) = 0.977, F_Z(-2) = 0.023, F_Z(1) = 0.84,$

$F_Z(\frac{2}{3}) = 0.75, F_Z(\frac{-2}{3}) = 0.25, F_Z(\frac{5}{2}) = 0.994, F_Z(\frac{5}{6}) = 0.797$

$$6. \int x^n dx = \frac{x^{n+1}}{n+1}.$$

Options :

6406531736574. ✓ Useful Data has been mentioned above.

6406531736575. ❌ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number :

2

Sub-Section Id :

64065373908

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 17 Question Id : 640653521000 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 $(X, Y) \sim \text{Uniform}(D)$, where $D = \{(x, y) : 2 < x + y < 4, x > 0, y > 0\}$. Find $P(Y < 2)$.

Options :

6406531736584. ✘ $\frac{1}{3}$

6406531736585. ✓ $\frac{2}{3}$

6406531736586. ✘ $\frac{1}{4}$

6406531736587. ✘ $\frac{3}{4}$

Question Number : 18 Question Id : 640653521003 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, \dots, X_n be i.i.d. X with mean $\mu = 0$ and variance $\sigma^2 = 1$. Using Chebyshev's inequality, what should be the minimum value of n such that the probability that the sample mean $\frac{X_1 + X_2 + \dots + X_n}{n}$ lies between -0.5 and 0.5 is at least 0.95 ?

Options :

6406531736590. ✘ 40

6406531736591. ✓ 80

6406531736592. ✗ 100

6406531736593. ✗ 95

Sub-Section Number : 3

Sub-Section Id : 64065373909

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 19 Question Id : 640653521001 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 probability density function of a continuous random variable X is given by

$$f(x) = \begin{cases} \frac{6x+1}{10}, & \text{if } 1 \leq x \leq 2 \\ 0, & \text{otherwise} \end{cases}$$

Find the value of $E[X]$. 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 :

1.53 to 1.57

Question Number : 20 Question Id : 640653521002 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 $X_1, X_2, X_3, X_4 \sim$ i.i.d. Bernoulli($\frac{2}{3}$). Define a random variable

$Y = 2X_1 + 3X_2 + 4X_3 + 5X_4$. Find $\text{Var}(Y)$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

12

Sub-Section Number : 4

Sub-Section Id : 64065373910

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653520997 **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 : (21 to 22)

Question Label : Comprehension

Suppose a fair die is thrown twice independently. Let a random variable X denote the number obtained on the first die and a random variable Y denote the number obtained on the second die.

Define $Z = | 7 - X - Y |$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 21 **Question Id :** 640653520998 **Question Type :** MCQ **Is Question**

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

Correct Marks : 1

Question Label : Multiple Choice Question

Find the range of Z.

Options :

6406531736576. ✓ $T_Z = \{0, 1, 2, 3, 4, 5\}$

6406531736577. ✗ $T_Z = \{1, 2, 3, 4, 5\}$

6406531736578. ✗ $T_Z = \{1, 2, 3, 4, 5, 6\}$

6406531736579. ✗ $T_Z = \{0, 1, 2, 3, 4, 5, 6\}$

Question Number : 22 Question Id : 640653520999 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

Find the value of $P(0 < Z < 3)$.

Options :

6406531736580. ✗ $\frac{5}{18}$

6406531736581. ✗ $\frac{5}{6}$

6406531736582. ✓ $\frac{1}{2}$

6406531736583. ✗ $\frac{2}{3}$

Sub-Section Number : 5

Sub-Section Id : 64065373911

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653521004 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 : (23 to 24)

Question Label : Comprehension

Kunal throws a dart onto a circular board. Let a random variable X denote the distance from the center to the point where the dart hits the board. Suppose the PDF of X is

$$f_X(x) = \begin{cases} kx(1-x), & 0 \leq x \leq 1, \\ 0, & \text{otherwise.} \end{cases}$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 23 Question Id : 640653521005 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

Find the value of k .

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

6

Question Number : 24 Question Id : 640653521006 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 value of $P(|X - 0.5| \leq 0.25)$. 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 :

0.66 to 0.72

Question Id : 640653521007 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 : (25 to 26)

Question Label : Comprehension

30% of the total candidates in a competitive exam were boys and 70% were girls. The distribution of the marks of the boys is $\text{Normal}(60,36)$ and the distribution of the marks of the girls is $\text{Normal}(55,49)$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 25 Question Id : 640653521008 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 PDF of the marks of a candidate chosen uniformly at random.

Options :

6406531736596. ✓

$$\frac{1}{20\sqrt{2\pi}} \left(\exp\left(\frac{-(y-60)^2}{72}\right) + 2\exp\left(\frac{-(y-55)^2}{98}\right) \right)$$

$$6406531736597. \text{ ✖ } \frac{1}{20\sqrt{2\pi}} \left(2\exp\left(\frac{-(y-60)^2}{36}\right) + \exp\left(\frac{-(y-55)^2}{49}\right) \right)$$

$$6406531736598. \text{ ✖ } \frac{7}{60\sqrt{2\pi}} \exp\left(\frac{-(y-60)^2}{72}\right) + \frac{3}{70\sqrt{2\pi}} \exp\left(\frac{-(y-55)^2}{98}\right)$$

$$6406531736599. \text{ ✖ } \frac{1}{2\sqrt{2\pi}} \left(\frac{1}{6} \exp\left(\frac{-(y-60)^2}{72}\right) + \frac{1}{7} \exp\left(\frac{-(y-55)^2}{98}\right) \right)$$

Question Number : 26 Question Id : 640653521009 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

If a randomly selected candidate got 60 marks, what is the probability that the selected candidate is a boy?

Options :

$$6406531736600. \text{ ✖ } \frac{2}{2 + \exp\left(\frac{-25}{49}\right)}$$

$$6406531736601. \text{ ✖ } \frac{2}{2 + \exp\left(\frac{-25}{98}\right)}$$

$$6406531736602. \text{ ✖ } \frac{1}{20\sqrt{2\pi}}$$

6406531736603. ✓

$$\frac{1}{1 + 2\exp\left(\frac{-25}{98}\right)}$$

Question Id : 640653521010 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 : (27 to 28)

Question Label : Comprehension

At a particular petrol pump, petrol is stocked in a bulk tank each week. Let a random variable X denote the proportion of the tank's capacity that is stocked in a given week, and let Y denote the proportion of the tank's capacity that is sold in the same week. The petrol pump cannot sell more than what was stocked in a given week. Assume the joint density function of X and Y is given by

$$f_{XY}(x, y) = \begin{cases} cxy, & \text{if } 0 \leq y \leq x \leq 2, \\ 0, & \text{otherwise.} \end{cases}$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 27 Question Id : 640653521011 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

Find the value of c . Enter the answer correct to one decimal place.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.48 to 0.52

Question Number : 28 Question Id : 640653521012 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 probability that the amount of petrol sold in a given week is less than half the amount stocked in that week. 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 :

0.23 to 0.27

Question Id : 640653521013 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 : (29 to 30)

Question Label : Comprehension

In a manufacturing company, each machine produces 600 bottles daily. If a bottle is selected uniformly at random, then the probability that the bottle is of good quality is 60%.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 29 Question Id : 640653521014 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 a sample of 20 bottles is selected for a quality inspection. Let a random variable X denote the total number of bottles that are of bad quality in the selected sample. Which of the following is true?

Options :

6406531736606. ❌ $X \sim \text{Binomial}(600, 0.6)$

6406531736607. ❌ $X \sim \text{Binomial}(20, 0.6)$

6406531736608. ✓ $X \sim \text{Binomial}(20, 0.4)$

6406531736609. ❌ $X \sim \text{Binomial}(600, 0.4)$

Question Number : 30 Question Id : 640653521015 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

Using the Central Limit Theorem, find the approximate probability that a machine will produce more than 370 bottles that are of good quality on a particular day. 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 :

0.17 to 0.23

Question Id : 640653521016 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 : (31 to 32)

Question Label : Comprehension

Let X be a random variable with PMF as follows:

| | | | |
|----------|-----|-----|-----|
| x | 0 | 1 | 2 |
| $f_X(x)$ | 1/4 | 1/2 | 1/4 |

Suppose $X_1, X_2 \sim$ i.i.d. X . Define a random variable $Y = X_1 + X_2$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 31 Question Id : 640653521017 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 option(s) is (are) true about the moment generating function of the random variable Y ?

Options :

6406531736611. ✓ $M_Y(\lambda) = M_{X_1}(\lambda) \times M_{X_2}(\lambda)$

6406531736612. ✗ $M_Y(\lambda) = M_{X_1}(\lambda) + M_{X_2}(\lambda)$

6406531736613. ✗ $M_Y(\lambda) = \frac{1}{2} + e^\lambda + \frac{1}{2}e^{2\lambda}$

6406531736614. ✗ $M_Y(\lambda) = \frac{1}{16} + \frac{1}{8}e^\lambda + \frac{3}{8}e^{2\lambda} + \frac{3}{8}e^{3\lambda} + \frac{1}{16}e^{4\lambda}$

6406531736615. ✓
$$M_Y(\lambda) = \frac{1}{16} + \frac{1}{4}e^\lambda + \frac{3}{8}e^{2\lambda} + \frac{1}{4}e^{3\lambda} + \frac{1}{16}e^{4\lambda}$$

Question Number : 32 Question Id : 640653521018 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

Find the expected value of Y .

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

CT

Section Id : 64065333931

Section Number : 3

Section type : Online

Mandatory or Optional : Mandatory

Number of Questions : 14

Number of Questions to be attempted : 14

Section Marks : 50

Display Number Panel : Yes

Group All Questions : No

Enable Mark as Answered Mark for Review and Yes

Clear Response :

Maximum Instruction Time : 0
Sub-Section Number : 1
Sub-Section Id : 64065373912
Question Shuffling Allowed : No
Is Section Default? : null

Question Number : 33 Question Id : 640653521019 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 "COMPUTATIONAL THINKING"

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 :

6406531736617. ✓ YES

6406531736618. ✗ NO

Question Number : 34 Question Id : 640653521020 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

Scores

| SeqNo | Name | Gender | DateOfBirth | TownCity | Mathematics | Physics | Chemistry | Total |
|-------|-----------|--------|-------------|----------|-------------|---------|-----------|-------|
| 0 | Bhuvanesh | M | 7 Nov | Erode | 68 | 64 | 78 | 210 |
| ■ ■ ■ | | | | | | | | |
| 29 | Naveen | M | 13 Oct | Vellore | 72 | 66 | 81 | 219 |

Words

| SeqNo | Word | PartOfSpeech | LetterCount |
|-------|-------|--------------|-------------|
| 0 | It | Pronoun | 2 |
| ■ ■ ■ | | | |
| 64 | cane. | Noun | 4 |

Library

| SeqNo | Name | Author | Genre | Language | Pages | Publisher | Year |
|-------|----------------|---------|------------|----------|-------|----------------|------|
| 0 | Igniting Minds | Kalam | Nonfiction | English | 178 | Penguin | 2002 |
| ■ ■ ■ | | | | | | | |
| 29 | Malgudi Days | Narayan | Fiction | English | 150 | Indian Thought | 1943 |

Olympics

| SeqNo | Name | Gender | Nationality | Host country | Year | Sport | Medal |
|-------|-------------------|--------|-------------|--------------|------|---------------|--------|
| 0 | Karnam Malleswari | F | Indian | Australia | 2000 | Weightlifting | Bronze |
| - - - | | | | | | | |
| 49 | Michael Phelps | M | American | China | 2008 | Swimming | Gold |

Three sample cards out of 30 for Shopping Bills dataset

Item List

| SV Stores | | Srivatsan | | 1 |
|-----------|------------------|-----------|-------|------|
| Item | Category | Qty | Price | Cost |
| Carrots | Vegetables/Food | 1.5 | 50 | 75 |
| Soap | Toiletries | 4 | 32 | 128 |
| Tomatoes | Vegetables/Food | 2 | 40 | 80 |
| Bananas | Vegetables/Food | 8 | 8 | 64 |
| Socks | Footwear/Apparel | 3 | 56 | 168 |
| Curd | Dairy/Food | 0.5 | 32 | 16 |
| Milk | Dairy/Food | 1.5 | 24 | 36 |
| | | | | 567 |

| Sun General | | Vignesh | | 14 |
|----------------|-------------|---------|-------|------|
| Item | Category | Qty | Price | Cost |
| Phone Charger | Utilities | 1 | 230 | 230 |
| Razor Blades | Grooming | 1 | 12 | 12 |
| Razor | Grooming | 1 | 45 | 45 |
| Shaving Lotion | Grooming | 0.8 | 180 | 144 |
| Earphones | Electronics | 1 | 210 | 210 |
| Pencils | Stationery | 3 | 5 | 15 |
| | | | | 656 |

| Big Bazaar | | Sudeep | | 2 |
|---------------|-----------------|--------|-------|------|
| Item | Category | Qty | Price | Cost |
| Baked Beans | Canned/Food | 1 | 125 | 125 |
| Chicken Wings | Meat/Food | 0.5 | 600 | 300 |
| Cocoa powder | Canned/Food | 1 | 160 | 160 |
| Capsicum | Vegetables/Food | 0.8 | 180 | 144 |
| Tie | Apparel | 2 | 390 | 780 |
| Clips | Household | 0.5 | 32 | 16 |
| | | | | 1525 |

Options :

6406531736619. ✓ Useful Data has been mentioned above.

6406531736620. ✗ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number : 2

Sub-Section Id : 64065373913

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 35 Question Id : 640653521021 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

Let Y be a card in the "Shopping Bills" dataset. Consider the following procedure.

```

1 Procedure findsomething(Y)
2     D = {}
3     foreach z in Y.ItemList{
4         if(isKey(D, z.category)){
5             return(z.category)
6         }
7         D[z.category] = True
8     }
9     return("None")
10 End findsomething

```

What will **findSomething(X)** return where X represents the card given below.

| SV Stores | | Akshaya | | | 3 |
|---------------|-----------------|---------|-------|------|------|
| Item | Category | Qty | Price | Cost | |
| Face Wash | Toiletries | 1 | 89 | 89 | |
| Shampoo | Toiletries | 1 | 140 | 140 | |
| Onions | Vegetables/Food | 1 | 98 | 98 | |
| Bananas | Fruits/Food | 4 | 8 | 32 | |
| Milk | Dairy/Food | 1 | 24 | 24 | |
| Biscuits | Packed/Food | 2 | 22 | 44 | |
| Maggi | Packed/Food | 1 | 85 | 85 | |
| Horlicks | Packed/Food | 1 | 270 | 270 | |
| Chips | Packed/Food | 1 | 20 | 20 | |
| Chocolates | Packed/Food | 4 | 10 | 40 | |
| Cereal | Packed/Food | 1 | 220 | 220 | |
| Handwash | Toiletries | 1 | 139 | 139 | |
| Air freshener | Toiletries | 2 | 70 | 140 | |
| | | | | | 1341 |

Options :

6406531736621. ✖ "None"

6406531736622. ✓ "Toiletries"

6406531736623. ✖ "Packed/Food"

Question Number : 36 Question Id : 640653521022 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

Consider the following pseudocode. At the end of the execution of the following pseudocode, if **flag** has valueTrue, then choose the possible value of **L** from the given choices.

```
1 flag = False
2 position = 0
3 foreach element in L{
4     if((position == 1) and (element == 'y')){
5         flag = True
6     }
7     position = position + 1
8 }
```

Options :

6406531736625. ✓ ['z', 'y']

6406531736626. ✘ ['y', 'x', 'z']

6406531736627. ✘ ['y']

6406531736628. ✘ ['z', 'x', 'y']

Sub-Section Number : 3

Sub-Section Id : 64065373914

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 37 Question Id : 640653521023 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 the following procedure, where **L1** and **L2** are two non-empty lists.

```
1 Procedure findsomething(L1, L2)
2     if(length(L1) != length(L2)){
3         return(False)
4     }
5     while(length(L1 > 0)){
6         if(first(L1) != last(L2)){
7             return(False)
8         }
9         L1 = rest(L1)
10        L2 = init(L2)
11    }
12    return(True)
13 End findsomething
```

findSomething(L1, L2) will return True when

Options :

6406531736629. ✓ all the elements of both lists **L1** and **L2** are same but arranged in the reverse order.

6406531736630. ✗ both lists **L1** and **L2** are same.

6406531736631. ✗ all the elements of list **L1** are present in **L2** where **length(L2) > length(L1)**.

6406531736632. ✗ all the elements of list **L2** are present in **L1** where **length(L1) > length(L2)**.

Sub-Section Number : 4

Sub-Section Id : 64065373915

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 38 Question Id : 640653521024 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

The following pseudocode is executed using the "Words" dataset and **explode(W)** returns the list of letters in the word **W**. For example **explode("common")** will return **[c, 'o', 'm', 'm', 'o', 'n']**. At the

end of the execution, **count** stores the number of words with at least two consecutive occurrences of the same letter. Choose the correct code fragment to complete the pseudocode.

```
1 count = 0, letterList = []
2 while(Table 1 has more rows){
3     Read the first row x in Table 1
4     letterList = explode(x.word)
5     count = count + consecute(letterList)
6     Move X to Table 2
7 }
8
9 Procedure consecute(L)
10    lastLetter = first(L)
11    restList = rest(L)
12    *****
13    ** Fill the code **
14    *****
15 End consecute
```

Options :

```
1 foreach letter in restList{
2     if(letter == lastLetter){
3         return(1)
4     }
5     lastLetter = letter
6 }
7 return(0)
```

6406531736633. ✓

```
1 foreach letter in restList{
2     if(letter == lastLetter){
3         return(1)
4     }
5     return(0)
6     lastLetter = letter
7 }
```

6406531736634. ✗

6406531736635. ✗

```
1 | foreach letter in restList{  
2 |     if(letter != lastLetter){  
3 |         return(0)  
4 |     }  
5 |     lastLetter = letter  
6 | }  
7 | return(1)
```

```
1 | foreach letter in restList{  
2 |     if(letter != lastLetter){  
3 |         return(0)  
4 |     }  
5 |     return(1)  
6 |     lastLetter = letter  
7 | }
```

6406531736636. *

Question Number : 39 Question Id : 640653521025 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

The following pseudocode is executed using the "Words" dataset. Assume that the rows in Table 1 are arranged in increasing order of sequence number from top to bottom. What will L store at the end of the execution?

```

1 L = []
2 A = "None"
3 Read the first row X in Table 1
4 A = X.Partofspeech
5 Move X to Table 2
6 while(Table 1 has more rows){
7     Read the first row Y in Table 1
8     if(Y.Partofspeech == "Noun"){
9         if(A == "Adjective"){
10            L = L ++ [Y.word]
11        }
12    }
13    A = Y.PartofSpeech
14    Move Y to Table 2
15 }
```

Options :

6406531736637. ✓ Number of nouns that appear immediately after an adjective
6406531736638. ✗ Number of adjectives that appear immediately after a noun
6406531736639. ✗ Number of sentences in which at least one noun appears immediately after an adjective
6406531736640. ✗ Number of sentences in which at least one adjective appears immediately after a noun

Sub-Section Number : 5

Sub-Section Id : 64065373916

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 40 Question Id : 640653521026 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

Let **X** be a row from the "Words" dataset. Procedure **isRich(X)** should return True if the number of distinct vowels is less than the number of distinct consonants in **X.Word**. But the code may have mistakes. Identify all such mistakes (if any). Assume that all statements not listed in the options below are free of errors. It is a Multiple Select Question (MSQ).

```

1 Procedure isRich(x)
2     vDict = {}, wDict = {}
3     i = 1
4     while(i <= x.LetterCount){
5         A = ith letter in x.Word
6         if(A is a vowel){
7             vDict[A] = True
8         }
9         wDict[A] = True
10        i = i + 1
11    }
12    if(length(keys(vDict)) < length(keys(wDict))){
13        return(True)
14    }
15    return(False)
16 End isRich

```

The return value of **isRich(Y)** will be True if

Options :

6406531736641. ❌ Line 2: **vDict** is initialized incorrectly

6406531736642. ❌ Line 10: **i** is updated incorrectly.

6406531736643. ✓ Line 12: Incorrect conditional statement to return True.

6406531736644. ✓ Line 15: return(True) should be replaced by return(False)

6406531736645. ❌ No error

Question Number : 41 Question Id : 640653521027 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

Consider the procedure given below, where **aList** is a non-empty list of real numbers.

```

1 procedure cumulative(aList)
2     sum = 0, cumuList = []
3     foreach element in aList{
4         sum = sum + element
5         cumuList = cumuList ++ [sum]
6     }
7     return(cumuList)
8 end cumulative

```

At the end of the execution, which of the following option(s) would be correct? It is a Multiple Select Question (MSQ).

Options :

6406531736646. ✓ The first element of both the lists, **cumuList** and **aList**, will be same.

6406531736647. ✗ Number of elements in **cumuList** will be one lesser than that of **aList**.

6406531736648. ✗ **cumuList** is a list of numbers in increasing order.

6406531736649. ✓ Number of elements in both lists, **cumuList** and **aList**, will be same.

Sub-Section Number : 6

Sub-Section Id : 64065373917

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 42 Question Id : 640653521028 Question Type : MSQ Is Question

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

Correct Marks : 5 Selectable Option : 0

Question Label : Multiple Select Question

The following pseudocode is executed using the "Olympics" dataset. At the end of the execution, **medalDict** stores a dictionary with player's name as key mapped to another dictionary. The nested dictionary stores the medal type as key mapped to a list of years in which the player won that medal. For example if player Xyz has won a silver medal in 2006, a gold medal in 2008, and another silver medal in 2011, then

medalDict = {"Xyz" : {"Silver" : [2006, 2011], "Gold" : [2008]}, ... }

Assume that every player has a distinct name. But the pseudocode may have mistakes. Identify all such mistakes (if any). Assume that all statements not listed in the options below are free of errors. It is a Multiple Select Question (MSQ).

```
1 | medalDict = {}
2 | while(Table 1 has more rows){
3 |     Read the first row X in Table 1
4 |     if(isKey(medalDict, X.Name)){
5 |         if(iskey(medalDict[X.Name], X.Medal)){
6 |             medalDict[X.Name][X.Medal] = [X.Year]
7 |         }
8 |     else{
9 |         medalDict[X.Name][X.Medal] = [X.Year]
10 |    }
11 | }
12 | else{
13 |     medalDict[X.Name][X.Medal] = [X.Year]
14 | }
15 | Move X to Table 2
16 }
```

Options :

6406531736650. ❌ Line 1: Incorrect initialization of **medalDict**

6406531736651. ✓ Line 6: The current statement should be replaced by

```
1 | medalDict[X.Name][X.Medal] = medalDict[X.Name][X.Medal] ++ [X.Year]
```

6406531736652. ❌ Line 9: The current statement should be replaced by

```
1 | medalDict[X.Name][X.Medal] = medalDict[X.Name][X.Medal] ++ [X.Year]
```

6406531736653. ✓ Line 13: The current statement should be replaced by

```
1 | medalDict[X.Name] = {X.Medal : [X.Year]}
```

6406531736654. ✶ No Mistakes

| | |
|-------------------------------------|-------------|
| Sub-Section Number : | 7 |
| Sub-Section Id : | 64065373918 |
| Question Shuffling Allowed : | Yes |
| Is Section Default? : | null |

Question Number : 43 Question Id : 640653521029 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

Consider the procedure **doSomething** given below. If **C** = [3, 4, 1, 9, 5, 3, 1, 9] and **B** = **doSomething(C)**, what would be the value of **first(B)**?

```
1 Procedure dosomething(A)
2     outList = [last(A)]
3     foreach x in A{
4         if(x != last(outList)){
5             outList = [x] ++ outList
6         }
7     }
8     return(outList)
9 End dosomething
```

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 : | 64065373919 |
| Question Shuffling Allowed : | Yes |

Is Section Default? :

null

Question Number : 44 Question Id : 640653521030 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

Consider the following pseudocode where **Y** is a row in the "Words" table. At the end of the execution, what will be the value of **length(keys(alphaDict))** if **Y.Word** is "think"?

```
1 alphaDict = {'t':2, 'e':1}
2 alphaDict = updateDict(Y, alphaDict)
3
4 Procedure updateDict(z, Dict)
5     i = 1
6     while(i <= z.LetterCount){
7         x = ith letter of z.word
8         if(not isKey(Dict, x)){
9             Dict[x] = 1
10        }
11        else{
12            Dict[x] = Dict[x] + 1
13        }
14        i = i + 1
15    }
16    return(Dict)
17 End updateDict
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

6

Sub-Section Number :

9

Sub-Section Id :

64065373920

Question Shuffling Allowed :

No

Is Section Default? :

null

Question Id : 640653521031 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 : (45 to 46)

Question Label : Comprehension

The following pseudocode is executed using the "Words" dataset.

```
1 count = 0, flag = True
2 while(Table 1 has more rows){
3     Read the first row x in Table 1
4     ****
5     ** Fill the code **
6     ****
7     Move x to Table 2
8 }
```

Answer the given subquestions.

Sub questions

Question Number : 45 Question Id : 640653521032 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

What will **count** represent at the end of the execution if the missing code is filled by

```
1 if(x.word ends with full stop){
2     if(x.word == "Noun"){
3         count = count + 1
4     }
5 }
```

Options :

6406531736657. ✘ Total number of nouns in the dataset
6406531736658. ✘ Number of sentences which start with a noun
6406531736659. ✘ Number of sentences having at least one noun
6406531736660. ✓ Number of sentences which end with a noun

Question Number : 46 Question Id : 640653521033 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

What will **count** represent at the end of the execution if the missing code is filled by

```
1 if(flag and x.Partofspeech == "Noun"){
2     count = count + 1
3 }
4 flag = False
5 if(x.word ends with full stop){
6     flag = True
7 }
```

Options :

6406531736661. ✘ Total number of nouns in the dataset
6406531736662. ✓ Number of sentences which start with a noun
6406531736663. ✘ Number of sentences having at least one noun
6406531736664. ✘ Number of sentences which end with a noun

Sub-Section Number : 10

Sub-Section Id : 64065373921

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653521034 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 : (47 to 48)

Question Label : Comprehension

The following pseudocode is executed using the “Shopping Bills” dataset.

```
1 D = { }
2 while(Pile 1 has more cards){
3     Read the top card X in Pile 1
4     foreach Y in X.ItemList{
5         if(isKey(D, Y.Category)){
6             if(isKey(D[Y.Category], Y.ItemName)){
7                 D[Y.Category][Y.ItemName] = D[Y.Category][Y.ItemName] ++
8                     [Y.Price]
9             }
10            else{
11                D[Y.Category][Y.ItemName] = [Y.Price]
12            }
13        else{
14            D[Y.Category] = {Y.ItemName : [Y.Price]}
15        }
16    }
17    Move card X to Pile 2
18 }
```

Answer the given subquestions.

Sub questions

Question Number : 47 Question Id : 640653521035 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

What will each value **D[j][k]** represent at the end of the execution?

Options :

6406531736665. ✘ Price of item j of category k across all bills

6406531736666. ✘ Price of item k of category j across all bills

6406531736667. ✘ List of prices of item j of category k across all bills

Question Number : 48 Question Id : 640653521036 Question Type : MCQ Is Question

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

Correct Marks : 5

Question Label : Multiple Choice Question

Consider the dictionary **D** created in the previous question, what will the value of **L** represent at the end of the execution of the following pseudocode?

```
1 A = 0, L = []
2 foreach i in keys(D){
3     foreach j in keys(D[i]){
4         B = findRange(D[i][j])
5         if(B == A){
6             L = L ++ [j]
7         }
8         if(B > A){
9             A = B
10            L = [j]
11        }
12    }
13 }
14
15 Procedure findRange(Y)
16     p = first(Y), q = first(Y)
17     foreach k in Y{
18         if(k > p){
19             p = k
20         }
21         if(k < q){
22             q = k
23         }
24     }
25     return(p - q)
26 End findRange
```

Options :

6406531736669. ❗ List of items for which the difference between the highest and lowest price is the same

6406531736670. ✓ List of items for which the difference between the highest and lowest price is

maximum

6406531736671. ✶ List of items for which the difference between the highest and lowest price is minimum

6406531736672. ✶ List of items with same price in all shops

DBMS

| | |
|---|-------------|
| Section Id : | 64065333932 |
| Section Number : | 4 |
| Section type : | Online |
| Mandatory or Optional : | Mandatory |
| Number of Questions : | 16 |
| Number of Questions to be attempted : | 16 |
| 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 : | 64065373922 |
| Question Shuffling Allowed : | No |
| Is Section Default? : | null |

Question Number : 49 Question Id : 640653521037 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 : DATABASE MANAGEMENT"

SYSTEMS"

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 :

6406531736673. ✓ YES

6406531736674. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 64065373923

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 50 Question Id : 640653521038 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

Consider the table **instructor** in the university database as shown in Table 1.

| id | name | dept_name | salary |
|-------|------------|------------|--------|
| 10101 | Srinivasan | Comp. Sci. | 65000 |
| 12121 | Wu | Finance | 90000 |
| 15151 | Mozart | Music | 40000 |
| 32343 | El Said | History | 60000 |
| 33456 | Gold | Physics | 87000 |
| 76766 | Crick | Biology | 72000 |
| 98345 | Kim | Elec. Eng. | 80000 |

Table 1: **instructor**

Based on the given **instructor** table, what will be the output of the Python code given below?

```
import psycopg2
def connectDb(dbname, username, pwd, address, portnum):
    try:

        connection = psycopg2.connect(database = dbname,
                                      user = username,
                                      password = pwd,
                                      host = address,
                                      port = portnum)

        cursor = connection.cursor()
        query = '''select salary from instructor
                   where dept_name like '%y%' order by salary DESC;'''
        cursor.execute(query)
        result = cursor.fetchmany(1)
        for row in result:
            sal=row[0]
            print(sal)

        cursor.close()

    except (Exception, psycopg2.DatabaseError) as error:
        print(error)
    finally:
        connection.close()
connectDb("university", "postgres", "root", "127.0.0.1", "5432")
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

Question Number : 51 Question Id : 640653521042 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

Consider a complete binary search tree that consists of 31 elements. What is the minimum height of the given binary search tree?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

4

Sub-Section Number : 3

Sub-Section Id : 64065373924

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653521039 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 : (52 to 53)

Question Label : Comprehension

Consider a magnetic disk with 32 platters, 2 surfaces/platter, 4096 tracks/surface, 1024 sectors/track, and 1024 bytes/sector.

The disk rotates with 2000 revolutions per minute.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 52 Question Id : 640653521040 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 number of bits required for addressing all the tracks?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

18

Question Number : 53 Question Id : 640653521041 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

Given that the rotational speed of the disk is 2000 revolutions per minute and the seek time is 5ms, what will be the disk access time?

Consider disk access time= seek time + rotational latency.

Options :

6406531736677. ✘ 20 sec

6406531736678. ✘ 35 ms

6406531736679. ✓ 20 ms

6406531736680. ✘ 35 sec

Sub-Section Number :

4

Sub-Section Id :

64065373925

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 54 Question Id : 640653521045 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 relation schema student_info(*roll_no, name, subject, marks*) with (*roll_no, name*) as candidate key. Which among the following functional dependencies violates the Third Normal Form (3NF)?

Options :

6406531736687. ❌ $roll_no, name \rightarrow marks$

6406531736688. ❌ $roll_no, name \rightarrow subject$

6406531736689. ❌ $roll_no \rightarrow name$

6406531736690. ✓ $subject \rightarrow marks$

Sub-Section Number : 5

Sub-Section Id : 64065373926

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 55 Question Id : 640653521043 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

Consider the tree as shown in Figure 1.

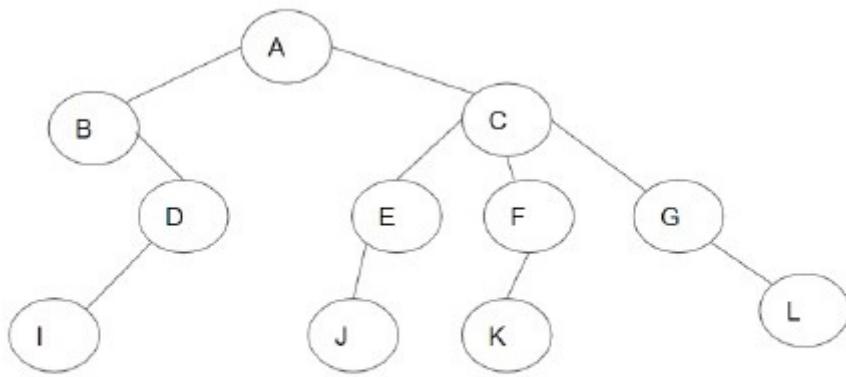


Figure 1: Tree

What is the arity of the given tree?

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 : 64065373927

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 56 **Question Id :** 640653521044 **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

Consider the relational schema $R(A, B, C, D)$ with the following set of functional dependencies

$$\mathcal{F} = \{A \rightarrow B, B \rightarrow C, C \rightarrow D, D \rightarrow A\}$$

If R is decomposed into $R1(A,B)$, $R2(B,C)$ and $R3(C,D)$, then which of the following options is true?

Options :

6406531736683. ✘ Not lossless decomposition but dependency preserving
6406531736684. ✘ A lossless decomposition but not dependency preserving
6406531736685. ✘ Neither a lossless decomposition nor a dependency preserving one
6406531736686. ✓ A lossless decomposition as well as a dependency preserving one

Question Number : 57 Question Id : 640653521046 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

Consider the relational schema $R(U, V, W, X, Y, Z)$ where the domain of every attribute consists of atomic values. The set of functional dependencies for the relation R is given as follows:

$$\mathcal{F} = \{UV \rightarrow W, W \rightarrow X, X \rightarrow VY, Y \rightarrow Z, Z \rightarrow U\}$$

What is the highest normal form of the given relation R ?

Options :

6406531736691. ✘ 1NF
6406531736692. ✘ 2NF
6406531736693. ✓ 3NF
6406531736694. ✘ BCNF

Question Number : 58 Question Id : 640653521048 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

Consider the relational schema $\text{movie}(m_id, title, year, producer_id, producer_name, director_id, rating)$ with the following set of functional dependencies.

$$\begin{aligned}\mathcal{F} = \{ \\ m_id \rightarrow title, \\ title \rightarrow producer_id, producer_name, \\ producer_id \rightarrow producer_name, \\ m_id \rightarrow producer_id, director_id, \\ m_id, title \rightarrow rating, year \\ \}\end{aligned}$$

Identify the number of candidate keys along with the total number of super keys for the above relation movie.

Options :

6406531736699. ✗ candidate keys = 2, super keys = 32

6406531736700. ✗ candidate keys = 1, super keys = 2

6406531736701. ✓ candidate keys = 1, super keys = 64

6406531736702. ✗ candidate keys = 2, super keys = 16

Question Number : 59 Question Id : 640653521050 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

Consider the relational schema Customer ($c_id, purchased_item, store_id, store_name$).

A customer can purchase multiple items from multiple stores. However, $store_id$ determines the $store_name$, i.e., $store_id \rightarrow store_name$.

Identify the most appropriate 4NF decomposition of the given schema.

Options :

6406531736707. ✗ R1($c_id, store_id$), R2($c_id, purchased_item, store_name$).

6406531736708. ✗ R1($store_id, store_name$), R2($c_id, purchased_item$).

6406531736709. ✓ R1($store_id, store_name$), R2($c_id, store_id$), and R3($c_id, purchased_item$).

6406531736710. ✗ R1($store_id, store_name$), R2($store_id, c_id, purchased_item$).

Question Number : 60 Question Id : 640653521053 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

Consider the following instance of the relational schema **R** given in Figure 2.

| A | B | C | D | E |
|---|---|---|---|---|
| 2 | 5 | 3 | 4 | 6 |
| 6 | 7 | 2 | 4 | c |
| a | 7 | 3 | 4 | 7 |
| b | 5 | 2 | 4 | d |

Figure 2: An instance of relation R

Identify the correct values of a, b, c and d such that $B \rightarrow E$ and $D \rightarrow\rightarrow AC$ holds true.

Options :

6406531736720. ✘ a=6, b=2, c=6, d=7

6406531736721. ✘ a=7, b=6, c=7, d=6

6406531736722. ✘ a=4, b=7, c=6, d=7

6406531736723. ✓ a=2, b=6, c=7, d=6

Sub-Section Number : 7

Sub-Section Id : 64065373928

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 61 Question Id : 640653521047 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

Consider the relational schema $R(A, B, C, D, E, F)$ with the following sets of functional dependencies:

$$X = \{BC \rightarrow D, D \rightarrow E, AF \rightarrow BE, E \rightarrow CF\}$$

$$Y = \{C \rightarrow BE, D \rightarrow A, AF \rightarrow BC, E \rightarrow BF\}$$

Which among the following statements is/are incorrect?

Options :

6406531736695. ✓ X covers Y

6406531736696. ✗ Y doesn't cover X

6406531736697. ✓ Y covers X

6406531736698. ✗ Neither X covers Y nor Y covers X

Sub-Section Number : 8

Sub-Section Id : 64065373929

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 62 Question Id : 640653521049 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

Consider the relational schema $\text{Contacts}(name, age, aadhar_no, address, mobile_no)$ with the multivalued dependency $(aadhar_no \rightarrow\rightarrow name, address)$. Identify the correct rule from the following options (which can be applied once), such that $(aadhar_no \rightarrow\rightarrow age, mobile_no)$ holds.

Options :

6406531736703. ✗ Augmentation

6406531736704. ✗ Transitivity

6406531736705. ✗ Replication

6406531736706. ✓ Complementation

Question Number : 63 Question Id : 640653521051 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 Flask functions serves as a decorator for telling the application which URL should be used to call the associated function?

Options :

6406531736711. ✓ route()

6406531736712. ✗ run()

6406531736713. ✗ cursor()

6406531736714. ✗ connect()

Question Number : 64 Question Id : 640653521054 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

Consider the relation **Student** as shown in Figure 3.

| name | department | roll_no |
|-------------|-------------------|----------------|
| Ashna | Civil Engg. | CE001 |
| Surbhi | Comp. Sci. | CS780 |
| Nil | Mechanical Engg. | ME312 |
| Komal | Civil Engg. | CE112 |
| Madhur | Comp. Sci. | CS458 |
| Ramesh | Comp. Sci. | CS321 |

Figure 3: Student relation

Choose the correct updated relation **Student**, when the following query is executed.

```
DELETE FROM Student
WHERE department = 'Civil Engg.' OR 1 = 1
```

Options :

Output:

| name | department | roll_no |
|-------------|-------------------|----------------|
| Ashna | Civil Engg. | CE001 |
| Surbhi | Comp. Sci. | CS780 |
| Nil | Mechanical Engg. | ME312 |
| Komal | Civil Engg. | CE112 |
| Madhur | Comp. Sci. | CS458 |
| Ramesh | Comp. Sci. | CS321 |

6406531736724. *

Output:

| name | department | roll_no |
|-------------|-------------------|----------------|
| Surbhi | Comp. Sci. | CS780 |
| Nil | Mechanical Engg. | ME312 |
| Madhur | Comp. Sci. | CS458 |
| Ramesh | Comp. Sci. | CS321 |

6406531736725. *

Output:

| name | department | roll_no |
|------|------------|---------|
| | | |

6406531736726. ✓

Output:

| name | department | roll_no |
|-------|-------------|---------|
| Ashna | Civil Engg. | CE001 |
| Komal | Civil Engg. | CE112 |

6406531736727. ✗

Sub-Section Number : 9

Sub-Section Id : 64065373930

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 65 Question Id : 640653521052 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

Consider a relational schema $R(P, Q, R, S, T, U, V)$ with the following set of functional dependencies:

$$F = \{T \rightarrow V, PR \rightarrow V, PQSU \rightarrow RT, RST \rightarrow U, Q \rightarrow S, PSUV \rightarrow TQ\}.$$

From the following options, identify the extraneous attribute(s) according to the given set of functional dependencies.

Options :

6406531736715. ✗ Q in $PQSU \rightarrow RT$

6406531736716. ✓ T in $PSUV \rightarrow TQ$

6406531736717. ✗ R in $RST \rightarrow U$

6406531736718. ✓ S in $PQSU \rightarrow RT$

PDSA

| | |
|---|-------------|
| Section Id : | 64065333933 |
| Section Number : | 5 |
| Section type : | Online |
| Mandatory or Optional : | Mandatory |
| Number of Questions : | 16 |
| Number of Questions to be attempted : | 16 |
| 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 : | 64065373931 |
| Question Shuffling Allowed : | No |
| Is Section Default? : | null |

Question Number : 66 Question Id : 640653521055 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 : PROGRAMMING, DATA STRUCTURES AND ALGORITHMS USING PYTHON"

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 :

6406531736728. ✓ YES

6406531736729. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 64065373932

Question Shuffling Allowed : Yes

Is Section Default? : null

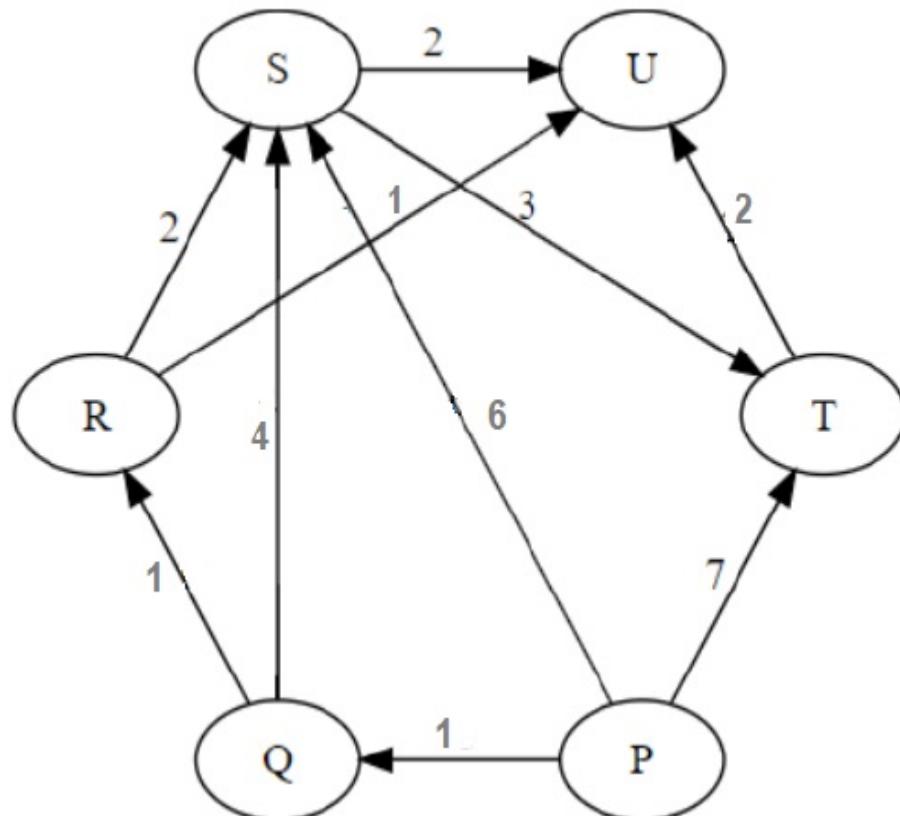
Question Number : 67 Question Id : 640653521056 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

In the given graph, if we try to find the shortest path from node P to all other nodes using Dijkstra's algorithm, in what order do the nodes get included in the visited set?



Options :

6406531736730. ✘ P, Q, R, S, T, U

6406531736731. ✘ P, Q, R, U, T, S

6406531736732. ✘ P, Q, T, R, U, S

6406531736733. ✓ P, Q, R, U, S, T

Question Number : 68 Question Id : 640653521057 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 statements is/are true?

I. Given a graph where all edges have positive weights, the shortest path produced by Dijkstra's and Bellman Ford algorithm may be different, but the path weight would be the same.

II. Given a weighted graph where the weights of all edges are unique, there is always a unique shortest path from a source to a destination in such a graph.

Options :

6406531736734. ✓ Only (I)

6406531736735. ✘ Only (II)

6406531736736. ✘ Both (I) and (II)

6406531736737. ✘ None of these

Question Number : 69 Question Id : 640653521058 Question Type : MCQ Is Question

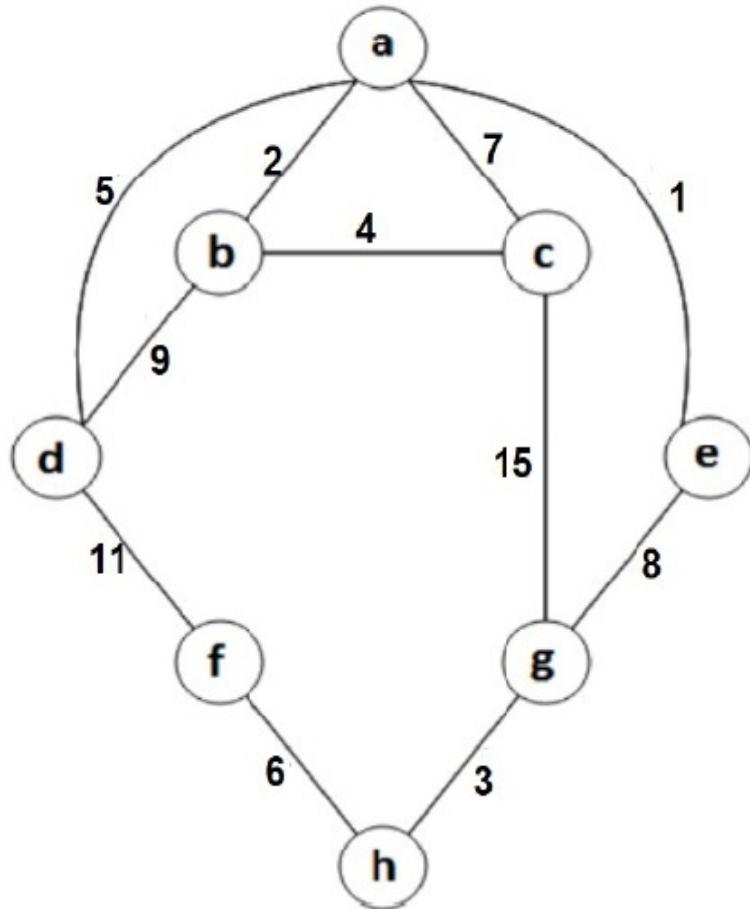
Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

For the undirected, weighted graph given below, which of the following sequences of edges represents a correct execution of **Prim's algorithm** started with vertex **a** to construct a Minimum Spanning Tree?



Options :

6406531736738. ❌ (a, e), (a, b), (b, c), (a, d), (g, h), (f, h), (e, g)

6406531736739. ✓ (a, e), (a, b), (b, c), (a, d), (e, g), (g, h), (f, h)

6406531736740. ❌ (a, e), (a, b), (g, h), (b, c), (a, d), (f, h), (e, g)

6406531736741. ❌ (a, e), (a, b), (g, h), (b, c), (a, d), (f, h), (a, c)

Question Number : 70 Question Id : 640653521060 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 binary **min-heap** operation has the highest time complexity? Consider the size of min-heap is **n** and implemented using an array.

Options :

6406531736747. ❌ Inserting a new element

6406531736748. ❌ Deleting the minimum element

6406531736749. ✓ Merging with another min-heap of size n

6406531736750. ❌ Update the value at the known index

Question Number : 71 Question Id : 640653521061 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 **max-heap** with 37 distinct elements implemented using array A with index 0 to 36. The smallest element be always situated at any position in between ____.

Options :

6406531736751. ❌ A[16] and A[36] (both inclusive)

6406531736752. ✓ A[18] and A[36] (both inclusive)

6406531736753. ❌ A[32] and A[36] (both inclusive)

6406531736754. ❌ A[31] and A[36] (both inclusive)

Question Number : 72 Question Id : 640653521062 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 statements is **true** about the worst case time complexity of searching operation in binary search tree of size n ?

Options :

6406531736755. ❌ $O(n)$ whether the tree is balanced or unbalanced.

6406531736756. ❌ $O(n)$ if the tree is balanced, $O(\log n)$ otherwise.

6406531736757. ❌ $O(\log n)$ whether the tree is balanced or unbalanced.

6406531736758. ✓ $O(\log n)$ if the tree is balanced, $O(n)$ otherwise.

Question Number : 73 Question Id : 640653521064 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 problem scenario where n Meetings M_1, M_2, \dots, M_n are to be conducted in a single available meeting room. Each meeting has `start_time` and `end_time`. If any meeting finishes at time T , then other meetings can be started at time T or afterward.

To find the maximum number of meetings that can be held in the meeting room without conflicts, Which of the following greedy strategy would always work correctly?

Options :

6406531736760. ✗ Always choose the meeting whose `start_time` is the earliest.

6406531736761. ✗ Always choose the meeting spanning the shortest interval.

6406531736762. ✗ Always choose the meeting that overlaps the minimum number of other meetings.

6406531736763. ✓ Always choose the meeting whose `end_time` is the earliest.

Question Number : 74 Question Id : 640653521067 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

What will be the minimum and maximum number of nodes possible in an AVL tree of height 7?

Consider that the height of the empty tree is 0.

Options :

6406531736766. ✘ 33, 63

6406531736767. ✓ 33, 127

6406531736768. ✘ 7, 127

6406531736769. ✘ 7, 63

Sub-Section Number : 3

Sub-Section Id : 64065373933

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 75 Question Id : 640653521070 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

| | Recurrence Relation | | Complexity |
|---|-------------------------|---|---------------|
| A | $T(n) = 2T(n/4) + O(n)$ | 1 | $O(\log n)$ |
| B | $T(n) = 3T(n/3) + O(n)$ | 2 | $O(n)$ |
| C | $T(n) = 9T(n/3) + O(n)$ | 3 | $O(n \log n)$ |
| D | $T(n) = T(n/2) + O(1)$ | 4 | $O(n^2)$ |

Note- Consider the base Case for each recurrence: $T(1) = 1$

Select the correct match of recurrence relation with corresponding complexity.

Options :

6406531736775. ✘ A-2, B-4, C-3, D-1

6406531736776. ✓ A-2, B-3, C-4, D-1

6406531736777. ✘ A-2, B-3, C-1, D-4

6406531736778. ✘ A-3, B-2, C-4, D-1

Sub-Section Number : 4

Sub-Section Id : 64065373934

Question Shuffling Allowed : Yes

Is Section Default? :

null

Question Number : 76 Question Id : 640653521059 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

Consider the following algorithm on a connected, weighted, and undirected graph with n vertices and m edges.

- Sort the edges as $[E_1, E_2, \dots, E_m]$ in decreasing order of weight.
- Consider each edge E_j in sorted order.
- If this edge E_j is part of any cycle of the graph, then delete it. Otherwise, keep it in the resulting graph.

Which of the following statements is/are true?

Options :

6406531736742. ✓ Exactly $m - n + 1$ edges will be deleted.

6406531736743. ✗ At most, $n - 1$ edges will be deleted.

6406531736744. ✓ After processing all m edges, the resulting graph is connected.

6406531736745. ✓ What remains at the end is a minimum cost spanning tree.

6406531736746. ✗ After processing all m edges, the resulting graph has exactly n edges.

Question Number : 77 Question Id : 640653521069 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 statement is **true** for searching the k^{th} smallest element in an unsorted array of size n , where all elements are distinct?

Options :

6406531736771. ✓ Using Quick Select strategy, the worst-case running time will be $O(n^2)$.

6406531736772. ✗ Using a max-heap of size k , the worst-case running time will be $O(k)$.

6406531736773. ✓ Using Fast Select (Quick Select using MoM for pivot selection) strategy, the worst-case running time will be $O(n)$.

6406531736774. ✗ Using Fast Select (Quick Select using MoM for pivot selection) strategy, the worst-case running time will be $O(n * k)$.

Sub-Section Number : 5

Sub-Section Id : 64065373935

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 78 Question Id : 640653521063 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 post-order traversal of a binary search tree is 1, 3, 4, 5, 2, 7, 8, 6. The height of a tree is the number of nodes in the longest path from the root to any leaf (including root and leaf node). The height of the binary search tree is ____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

Question Number : 79 Question Id : 640653521065 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

Consider the following 4 items (one unit for each) with their weights and value.

| Item No. | Weight(W) | Value(V) |
|----------|-----------|----------|
| 1 | 7 | 28 |
| 2 | 10 | 60 |
| 3 | 2 | 24 |
| 4 | 4 | 28 |

The task is to pick a subset of these items such that their total weight should be lesser or equal to 13 (maximum weight capacity $C \leq 13$) and their total value is maximized. Consider that each item has only one unit and it can not be split.

V_{opt} = The total value of items picked by an optimal algorithm.

V_{greedy} = The total value of items picked by one greedy approach that sorts the item by `value(v)` to `weight(w)` ratio in descending order and picks them greedily starting from the first item in the ordered list (pick the item if the total weight of that item is less than or equal to the remaining capacity, otherwise, skip that item).

The value of $V_{opt} - V_{greedy}$ is _____

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

4

Question Number : 80 Question Id : 640653521066 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

A networking company uses Huffman coding compression technique to encode the message before transmitting it over the network. An entire message is created using characters from the set $S = \{A, B, C, D, E, F\}$. The probability of occurrence of each character is given in the table below.

| Character | A | B | C | D | E | F |
|-------------|------|------|------|------|------|------|
| Frequencies | 0.12 | 0.28 | 0.06 | 0.16 | 0.14 | 0.24 |

How many bits(0 or 1) are required to transmit the message ABCDEF over the network?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

16

Question Number : 81 Question Id : 640653521068 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

Let L be an integer list of length n . The number of **inversions** is the number of the different pairs (i, j) where:

- $0 \leq i < j < n$
- $L[i] > L[j]$

The total number of **inversions** for $L = [9, 8, 7, 6, 5, 4, 3, 2, 1]$ is _____

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

36

AppDev1

Section Id : 64065333934

Section Number : 6

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

Yes

Clear Response :

Maximum Instruction Time : 0

Sub-Section Number : 1

Sub-Section Id : 64065373936

Question Shuffling Allowed : No

Is Section Default? : null

Question Number : 82 **Question Id :** 640653521071 **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 : MODERN APPLICATION

DEVELOPMENT 1"

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 :

6406531736779. ✓ YES

6406531736780. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 64065373937

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 83 Question Id : 640653521072 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

The ability of an application to work with different input modalities beyond keyboard highlights which of the following accessibility principle?

Options :

6406531736781. ✗ Perceivable

6406531736782. ✓ Operable

6406531736783. ✗ Understandable

6406531736784. ✗ Robust

Question Number : 84 Question Id : 640653521078 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 is true about the term “stateless” in the client-server model?

Options :

6406531736805. ❌ The server responds to the client based on the previous state.

6406531736806. ✓ Server is not required to maintain any state of client or session during transactions between client and server.

6406531736807. ❌ The server uses FTP protocol to respond to the client's request.

6406531736808. ❌ Server use the URL to convey information to the client.

Question Number : 85 Question Id : 640653521084 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 encoding techniques occupies the most space to store 1500 lines with approximately 3000 alphanumeric characters (including space)?

Options :

6406531736829. ✓ UCS-4

6406531736830. ❌ UCS-2

6406531736831. ❌ ASCII

6406531736832. ❌ Original 7 bit ASCII

Sub-Section Number : 3

Sub-Section Id : 64065373938

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 86 Question Id : 640653521080 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 is true about Asynchronous Updates?

Options :

6406531736813. ✓ It is first necessary to load the main page, then load the additional data in the background.

6406531736814. ✗ In every request, load the entire web page.

6406531736815. ✓ User experience is improved due to quick response.

6406531736816. ✗ As a result of asynchronous updates, server load has increased.

Sub-Section Number : 4

Sub-Section Id : 64065373939

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 87 Question Id : 640653521073 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 flask view functions will return a 404 error for the URL:

<http://127.0.0.1:5000/details/1001/Michael> ?

Options :

```
@app.route('/details/<int:id>/<string:name>')
def show(id, name):
    details = {'student_id': id, 'student_name': name}
    return details
```

6406531736785. ✗

```
@app.route('/details/<string:id>/<string:name>')
def show(id, name):
    details = {'student_id': id, 'student_name': name}
    return details
```

6406531736786. ✗

```
@app.route('/details/<id>/<name>')
def show(id, name):
    details = {'student_id': id, 'student_name': name}
    return details
```

6406531736787. ✘

6406531736788. ✓ None of these.

Question Number : 88 Question Id : 640653521074 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 the following view function.

```
@app.route('/weather', methods = ['GET', 'POST'])
def show_weather():
    val = request.args
    details = {
        'City': val['city'],
        'State': val['state'],
        'Temperature(F)': val['temp']
    }
    return details
```

If this flask app is running locally on <http://127.0.0.1:5000>, which of the following URLs will be handled by the controller correctly and return the weather details for a particular city?

Options :

<http://127.0.0.1:5000/weather/Denver/Colorado/29>

6406531736789. ✘

<http://127.0.0.1:5000/Denver/Colorado/29>

6406531736790. ✘

<http://127.0.0.1:5000?endpoint=weather&city=Denver&state=Colorado&temp=29>

6406531736791. ❌

<http://127.0.0.1:5000/weather?city=Denver&state=Colorado&temp=29>

6406531736792. ✓

Question Number : 89 Question Id : 640653521076 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 time function A such that, $T_A(N) = \left(\frac{k}{l}\right)^N$ where, k and l are parameters and $k \propto l$. Then what will the time complexity of the time function A if N is the number of inputs?

Options :

6406531736797. ❌ Quadratic

6406531736798. ❌ Logarithmic

6406531736799. ✓ Exponential

6406531736800. ❌ Linear

Question Number : 90 Question Id : 640653521081 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 the following Users table.

Users

| Email | Password |
|-----------|----------|
| 1@abc.com | P1Wd |
| 2@abc.com | P2Wd |
| 3@abc.com | P3Wd |

Which of the following syntax is correct for creating a unique index in the Users table using Email column called email_index?

Options :

6406531736817. ❌ CREATE UNIQUE INDEX AS email_index Users(Email);

6406531736818. ✓ CREATE UNIQUE INDEX email_index ON Users(Email);

6406531736819. ❌ CREATE email_index ON Users(Email) CONSTRAINTS UNIQUE INDEX;

6406531736820. ❌ CREATE UNIQUE INDEX email_index ON Email(Users);

Question Number : 91 Question Id : 640653521083 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 the following two statements:

Statement 1: A process of authentication involves verifying the identity of someone or something.

Statement 2: To control access to systems or data, the authorization process is used.

Options :

6406531736825. ❌ Statement 1 is correct and statement 2 is incorrect.

6406531736826. ❌ Statement 1 is incorrect and statement 2 is correct.

6406531736827. ✓ Both statement 1 and statement 2 are correct.

6406531736828. ❌ Both statement 1 and statement 2 are incorrect.

Question Number : 92 Question Id : 640653521085 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

What will be the output of the following Python program on the terminal.

```
from jinja2 import Template

template = """{% for s in students %}
    student_name:{{s.name}}
    student_mark1:{{s.m1}}
    student_mark2:{{s.m2}}
{% endfor %}
"""

stud = Template(template)

s1=[ {"name": "venu", "m1":76, "m2":88}, {"name": "renu", "m2":92},
     {"name": "seenu", "m1":44}, {"name": "ragu"} ]

print(stud.render(students=s1))
```

Options :

student_name:venu
student_mark1:76
student_mark2:88

6406531736833. *

student_name:venu
student_mark1:76
student_mark2:88

student_name:renu
student_mark2:92

student_name:seenu
student_mark1:44
student_name:ragu

6406531736834. *

name:venu

m1:**76**

m2:88

name:renu

m2:**92**

name:seenu

m1:**44**

name:ragu

6406531736835. *

student_name:venu

student_mark1:**76**

student_mark2:**88**

student_name:renu

student_mark1:

student_mark2:**92**

student_name:seenu

student_mark1:**44**

student_mark2:

student_name:ragu

student_mark1:

student_mark2:

6406531736836. ✓

Sub-Section Number : 5

Sub-Section Id : 64065373940

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 93 Question Id : 640653521082 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

Consider the following flask application:

```
from flask import Flask, request
app = Flask(__name__)

@app.route('/get_value')
def get_value():
    val1 = request.args.get("val1")
    return "The value is " + val1

if __name__ == '__main__':
    app.run(host= '127.0.0.1', port = 5000, debug = True)
```

Which of the following route(s) will return **The value is 10** in the browser?

Options :

6406531736821. ❌ <http://127.0.0.1:5000?val1=10>

6406531736822. ❌ http://127.0.0.1:5000/get_value?10

6406531736823. ✓ http://127.0.0.1:5000/get_value?val1=10

6406531736824. ✓ http://127.0.0.1:5000/get_value?val1=10&val2=10

Question Number : 94 Question Id : 640653521086 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

Consider the following code.

```

from flask import Flask
from flask_restful import Resource, Api

app = Flask(__name__)
api = Api(app)

Size_list = {1: "Nano", 2: "Macro", 3: "Micro"}

class size_list(Resource):
    def get(self):
        return size_list

class size(Resource):
    def get(self, f_id):
        return size_list[f_id]

api.add_resource(size_list, '/')
api.add_resource(size, '/<int:f_id>')

if __name__ == '__main__':
    app.run(debug=True)

```

If this flask application is running locally on “<http://127.0.0.1:5000>”, then which of the following statements is/are true about the code snippet given above?

Options :

6406531736837. ❌ On the URL, “<http://127.0.0.1:5000/>”, the browser will show ‘page not found’ error.

On the URL, “<http://127.0.0.1:5000/>”, the browser will render. { "1": "Nano", "2": "Macro",

6406531736838. ✓ "3": "Micro"}

6406531736839. ❌ On the URL, “<http://127.0.0.1:5000/3>”, the browser will render "Macro"

6406531736840. ✓ On the URL, “<http://127.0.0.1:5000/2>”, the browser will render "Macro"

Sub-Section Number : 6

Sub-Section Id : 64065373941

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 95 Question Id : 640653521075 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 4.5

Question Label : Multiple Choice Question

Which of the following is a valid JSON?

Options :

```
{  
    "name": "Harvard",  
    "brands": ("Rolex", "Porsche"),  
    "max":42  
}
```

6406531736793. ✘

```
{  
    "Cities": ["Mumbai", "Chennai"],  
    "stable": True,  
    "Objects": {"beverage": "Tea", "drinks": "Soft drinks"}  
}
```

6406531736794. ✘

```
{  
    "Type": "Invitro",  
    "Success_rate": "31.56",  
    "Metal": "Aluminium"  
}
```

6406531736795. ✓

```
{  
    "Cars": ["Audi X8", "Volvo S60", "Jeep"],  
    "failures": None,  
    "imported": true,  
}
```

6406531736796. ✘

Question Number : 96 Question Id : 640653521077 Question Type : MCQ Is Question

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

Correct Marks : 4.5

Question Label : Multiple Choice Question

The lens of an HDD can read data on the rotating disk with the speed of 48,000 bits per second.

The disk is designed such that 800 bits pass under the lens for every revolution of the disk, what should be the maximum speed of disk so that the lens does not miss any data?

Options :

6406531736801. ✘ 60 RPM

6406531736802. ✘ 100 RPM

6406531736803. ✓ 3600 RPM

6406531736804. ✘ 6000 RPM

Question Number : 97 Question Id : 640653521079 Question Type : MCQ Is Question

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

Correct Marks : 4.5

Question Label : Multiple Choice Question

Consider the following python file app.py:

```

from flask import Flask, jsonify, request
from flask_restful import Resource, Api

app = Flask(__name__)
api = Api(app)

class Hi(Resource):
    def get(self):
        return jsonify({'message': 'Say, Hi'})

    def post(self, name):
        message = 'Say, Hi ' + name
        return jsonify({'message': message})

class Bye(Resource):
    def get(self):
        return jsonify({'message': 'Say, Bye'})

    def post(self, name):
        message = 'Say, Bye ' + name
        return jsonify({'message': message})

api.add_resource(Hi,'/','/<string:name>')
api.add_resource(Bye, '/bye','/bye/<string:name>')

if __name__ == '__main__':
    app.run(debug = True)

```

Assuming app.py is running locally, what will be the output if the command:

```
curl http://127.0.0.1:5000/ -H "Content-type:application/json" -X GET
```

Is run on a new terminal?

Options :

```
{
    "message": "Say, Hi"
}
```

6406531736809. ✓

```
{
    "message": "Say, Hi Leo"
}
```

6406531736810. ❌

```
{  
    "message": "Say, Bye"  
}
```

6406531736811. *

```
{  
    "message": "Say, Bye Leo"  
}
```

6406531736812. *

Question Number : 98 Question Id : 640653521087 Question Type : MCQ Is Question

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

Correct Marks : 4.5

Question Label : Multiple Choice Question

Consider the table “stud” given below. The model class “Student” corresponds to table “stud” in the SQLite database.

| ID | First_name | Last_name | Email |
|----|------------|-----------|------------------|
| 1 | Ram | Kumar | kumar@gmail.com |
| 2 | Raj | Kumar | raj@gmail.com |
| 3 | Ravi | Kumar | ravi@gmail.com |
| 4 | Anil | | anil@gmail.com |
| 5 | Bala | vignesh | bala@gmail.com |
| 6 | Raj | madhan | madhan@gmail.com |

What will be the output of the flask_sqlalchemy command given below?

```
>>> user1= Student.query.filter_by(First_name="Raj").first()  
>>> user1.First_name= "Ragu"  
>>> db.session.commit()  
>>> s1 = Student.query.all()  
>>> for stud in s1:  
        print(stud.First_name)
```

Options :

6406531736841. *

Ram
Raj
Ravi
Anil
Bala
Raj

Ram
Ragu
Ravi
Anil
Bala
Ragu

6406531736842. *

Ram
Ragu
Ravi
Anil
Bala
Raj

6406531736843. ✓

Ragu
Raj

6406531736844. *

MLF

| | |
|--|-------------|
| Section Id : | 64065333935 |
| Section Number : | 7 |
| Section type : | Online |
| Mandatory or Optional : | Mandatory |
| Number of Questions : | 16 |
| Number of Questions to be attempted : | 16 |

| | |
|---|-------------|
| 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 : | 64065373942 |
| Question Shuffling Allowed : | No |
| Is Section Default? : | null |

Question Number : 99 Question Id : 640653521088 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](#)"

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 :

6406531736845. ✓ YES

6406531736846. ✘ NO

| | |
|-------------------------------------|-------------|
| Sub-Section Number : | 2 |
| Sub-Section Id : | 64065373943 |
| Question Shuffling Allowed : | Yes |
| Is Section Default? : | null |

Question Number : 100 Question Id : 640653521093 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

Find the rank one approximation of the matrix $A = \begin{bmatrix} 2 & 0 \\ 0 & -3 \\ 0 & 0 \end{bmatrix}$ corresponding to its largest eigenvalue.

Options :

$$\begin{bmatrix} 4 & 0 \\ 0 & 0 \\ 0 & 0 \end{bmatrix}$$

6406531736865. *

$$\begin{bmatrix} 0 & 0 \\ 0 & 3 \\ 0 & 0 \end{bmatrix}$$

6406531736866. *

$$\begin{bmatrix} 0 & 0 \\ 0 & -9 \\ 0 & 0 \end{bmatrix}$$

6406531736867. *

$$\begin{bmatrix} 0 & 0 \\ 0 & -3 \\ 0 & 0 \end{bmatrix}$$

6406531736868. ✓

Question Number : 101 Question Id : 640653521100 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

For the dataset $D = \{x_1, x_2, x_3, \dots, x_n\}$, the matrix

$$C = \frac{1}{n} \sum_{i=1}^n x_i x_i^T$$

is called the covariance matrix

Options :

6406531736889. ✘ always.

6406531736890. ✘ only when the dataset is centered.

6406531736891. ✘ only when the dataset has the maximum variance.

6406531736892. ✓ Both when the dataset is centered and when the dataset has the maximum variance are correct

Sub-Section Number : 3

Sub-Section Id : 64065373944

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 102 Question Id : 640653521092 Question Type : MCQ Is Question

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

Correct Marks : 5

Question Label : Multiple Choice Question

Let $A = \begin{bmatrix} 1 & -i & -1 \\ i & -1 & -i \\ -1 & i & -1 \end{bmatrix}$. What is the unitary diagonalization of A ?

Options :

6406531736861. ✓ $\begin{bmatrix} -2/\sqrt{6} & 1/\sqrt{3} & 0 \\ -i/\sqrt{6} & -i/\sqrt{3} & i/\sqrt{2} \\ 1/\sqrt{6} & 1/\sqrt{3} & 1/\sqrt{2} \end{bmatrix} \begin{bmatrix} 2 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -2 \end{bmatrix} \begin{bmatrix} -2/\sqrt{6} & i/\sqrt{6} & 1/\sqrt{6} \\ 1/\sqrt{3} & i/\sqrt{3} & 1/\sqrt{3} \\ 0 & -i/\sqrt{2} & 1/\sqrt{2} \end{bmatrix}$

6406531736862. ✘ $\begin{bmatrix} -2/\sqrt{6} & 1/\sqrt{3} & 0 \\ -1/\sqrt{6} & -i/\sqrt{3} & i/\sqrt{2} \\ i/\sqrt{6} & 1/\sqrt{3} & 1/\sqrt{2} \end{bmatrix} \begin{bmatrix} -2 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -2 \end{bmatrix} \begin{bmatrix} -2/\sqrt{6} & -1/\sqrt{6} & i/\sqrt{6} \\ 1/\sqrt{3} & -i/\sqrt{3} & 1/\sqrt{3} \\ 0 & i/\sqrt{2} & 1/\sqrt{2} \end{bmatrix}$

6406531736863. ❌ $\begin{bmatrix} -2/\sqrt{6} & 1/\sqrt{3} & 0 \\ -1/\sqrt{6} & -i/\sqrt{3} & i/\sqrt{2} \\ i/\sqrt{6} & 1/\sqrt{3} & 1/\sqrt{2} \end{bmatrix} \begin{bmatrix} -2 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 2 \end{bmatrix} \begin{bmatrix} -2/\sqrt{6} & -1/\sqrt{6} & i/\sqrt{6} \\ 1/\sqrt{3} & -i/\sqrt{3} & 1/\sqrt{3} \\ 0 & i/\sqrt{2} & 1/\sqrt{2} \end{bmatrix}$

6406531736864. ❌ $\begin{bmatrix} -1/\sqrt{2} & 1/\sqrt{3} & 0 \\ 0 & -i/\sqrt{3} & i/\sqrt{2} \\ i/\sqrt{2} & 1/\sqrt{3} & 1/\sqrt{2} \end{bmatrix} \begin{bmatrix} -2 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 2 \end{bmatrix} \begin{bmatrix} -1/\sqrt{2} & 0 & i/\sqrt{2} \\ 1/\sqrt{3} & -i/\sqrt{3} & 1/\sqrt{3} \\ 0 & i/\sqrt{2} & 1/\sqrt{2} \end{bmatrix}$

Sub-Section Number : 4

Sub-Section Id : 64065373945

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 103 Question Id : 640653521098 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

Let $f(x, y) = x^2y^2 - 2x - 2y$. Which among the following options are correct?

Options :

6406531736881. ❌ (0, 0) is a stationary point of f .

6406531736882. ✓ (1, 1) is a stationary point of f .

6406531736883. ❌ f attains the minimum at (0, 0).

6406531736884. ❌ f attains the minimum at (1, 1).

Sub-Section Number : 5

Sub-Section Id : 64065373946

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 104 Question Id : 640653521089 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

Given three unitary matrices A, B , and C , which of the following statements is/are true?

Options :

6406531736847. ✓ ABC is always a unitary matrix.

6406531736848. ✗ $A + B$ is a Hermitian matrix.

6406531736849. ✓ AB, BC , and AC are unitary matrices.

6406531736850. ✗ ABC may not be a unitary matrix.

Question Number : 105 Question Id : 640653521090 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

What can be the eigenvalues for a matrix that is both unitary as well as Hermitian?

Options :

6406531736851. ✗ 0

6406531736852. ✓ 1

6406531736853. ✓ -1

6406531736854. ✗ i

6406531736855. ✗ 2

6406531736856. ✗ -2

Question Number : 106 Question Id : 640653521097 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

Let A be a $n \times n$ positive definite matrix. Then which among the following statements are correct?

Options :

6406531736877. ✓ A^{-1} is positive definite

6406531736878. ✓ $A + B$ is positive definite, if B is positive definite.

6406531736879. ✘ $\text{Rank}(A) = n - 1$

6406531736880. ✓ A^2 is positive definite.

Question Number : 107 Question Id : 640653521099 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 are the limitations of PCA?

Options :

6406531736885. ✘ PCA does work well for non-linearly correlated data.

6406531736886. ✓ PCA always consider the low variance components in the data as noise and recommend us to throw away those components. But, sometimes those components play a major role in a supervised learning task.

6406531736887. ✓ If the variables are correlated, PCA can achieve dimension reduction. If not, PCA just orders them according to their variances.

6406531736888. ✓ PCA always finds orthogonal principal components. Sometimes, our data demands non-orthogonal principal components to represent the data.

Sub-Section Number : 6

Sub-Section Id : 64065373947

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 108 Question Id : 640653521091 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 matrices are both Hermitian and unitary?

Options :

$$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \end{bmatrix}$$

6406531736857. ✓

$$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & -1 & 0 \end{bmatrix}$$

6406531736858. ✓

$$\begin{bmatrix} 1 & -1 & 0 \\ -1 & 0 & -1 \\ 0 & -1 & 0 \end{bmatrix}$$

6406531736859. ✘

$$\begin{bmatrix} 0 & -1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

6406531736860. ✓

Sub-Section Number :

7

Sub-Section Id :

64065373948

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 109 Question Id : 640653521101 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

$$x_1 = \begin{bmatrix} 1 \\ 1 \end{bmatrix}, x_2 = \begin{bmatrix} 2 \\ 3 \end{bmatrix}, x_3 = \begin{bmatrix} 3 \\ 2 \end{bmatrix}$$

$$C = \frac{1}{n} \sum_{i=1}^n (x_i - \bar{x}_i)(x_i - \bar{x}_i)^T$$

Here $\bar{x}_i = \frac{x_1 + x_2 + x_3}{3}$

What is the sum of the eigenvalues of the covariance matrix C corresponding to the given data points x_1, x_2, x_3 ? Enter the answer correct to two decimals accuracy.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

1.32 to 1.36

Question Number : 110 Question Id : 640653521102 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

Consider the data points

$$x_1 = \begin{bmatrix} 1 \\ 2 \end{bmatrix}, x_2 = \begin{bmatrix} 0 \\ 0 \end{bmatrix}, x_3 = \begin{bmatrix} 2 \\ 1 \end{bmatrix}$$

If we are projecting this dataset onto the first principal component, then what is the projected variance? Enter the answer correct to two decimals accuracy.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.9 to 1.4

Question Number : 111 Question Id : 640653521105 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

If $f(20) = 1$, $f'(20) = 10$, and $f''(20) = 5$, then what is second order approximate value of $f(10)$? 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 :

151

Sub-Section Number : 8

Sub-Section Id : 64065373949

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 112 Question Id : 640653521103 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

What is the maximum area of rectangle than can be inscribed in an ellipse of the equation $\frac{x^2}{2} + y^2 = 1$? Enter the answer correct to 2 decimals accuracy.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

2.6 to 3

Question Number : 113 **Question Id :** 640653521104 **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

What is the value of the function $f(x_1, x_2, x_3) = x_1^2 + x_2^2 + x_3^2 - 2x_1x_2 - 2x_2x_3 - 2x_3x_1$ evaluated at the point obtained after one step of gradient descent where the current iterate is $(1, 1, 1)$? Assume $\eta = 1$. 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 : 9

Sub-Section Id : 64065373950

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653521094 **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 : (114 to 115)

Question Label : Comprehension

Consider a matrix $A = \begin{bmatrix} 2 & b \\ b & 8 \end{bmatrix}$. Answer the given subquestions:

Sub questions

Question Number : 114 Question Id : 640653521095 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

For what value of b is the matrix
 A positive definite?

Options :

6406531736869. ✘ $b < 4$

6406531736870. ✘ $b > -4$

6406531736871. ✘ $b > 4$ and $b < -4$

6406531736872. ✓ $-4 < b < 4$

Question Number : 115 Question Id : 640653521096 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

Find the minimum value of

$$\frac{1}{2}(2x^2 + 2bxy + 8y^2) - x \text{ for } b \text{ in the}$$

range defined in the previous question.

Options :

6406531736873. ✓ $\frac{4}{b^2 - 16}$

$$6406531736874. \times \frac{-4}{b^2 - 16}$$

$$6406531736875. \times \frac{8}{b^2 - 16}$$

$$6406531736876. \times \frac{-8}{b^2 - 16}$$

Java

| | |
|---|-------------|
| Section Id : | 64065333936 |
| Section Number : | 8 |
| Section type : | Online |
| Mandatory or Optional : | Mandatory |
| Number of Questions : | 16 |
| Number of Questions to be attempted : | 16 |
| 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 : | 64065373951 |
| Question Shuffling Allowed : | No |
| Is Section Default? : | null |

Question Number : 116 Question Id : 640653521106 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 : PROGRAMMING CONCEPTS USING JAVA"

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 :

6406531736898. ✓ YES

6406531736899. ✘ NO

Sub-Section Number : 2

Sub-Section Id : 64065373952

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 117 Question Id : 640653521107 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 the Java code given below.

```
abstract class CloudProviders{
    public abstract void storage();
}
class Azure extends CloudProviders{
    public void storage() {
        System.out.println("Azure storage");
    }
}
class AWS extends CloudProviders{
    public void storage() {
        System.out.println("AWS storage");
    }
}
class StorageList{
    private Object[] sArr = {new Azure(), new AWS()};
    public void getStorage(){
        for(int i = 0; i < sArr.length; i++){
            //LINE 1
        }
    }
}
public class Test{
    public static void main(String[] args) {
        StorageList sList = new StorageList();
        sList.getStorage();
    }
}
```

Identify the appropriate option to fill in place of LINE 1 such that the output is

Azure storage

AWS storage

Options :

6406531736900. ✓ ((CloudProviders)sArr[i]).storage();

6406531736901. ✗ sArr[i].storage();

6406531736902. ✗ ((Azure)sArr[i]).storage();

6406531736903. ✗ ((AWS)sArr[i]).storage();

Question Number : 118 Question Id : 640653521108 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 the Java code given below.

```
public class ArrayOperations{
    public <T> int countElement(T[] arr, T ele){
        // Counts the number of occurrences of ele in arr
    }
    public <T extends Comparable> void sort(T[] arr){
        // Sorts arr
    }
}
```

How does class ArrayOperations look after type erasure?

Options :

```
public class ArrayOperations{
    public int countElement(Object[] arr, Object ele){
        // Counts the number of occurrences of ele in arr
    }
    public void sort(Object[] arr){
        // Sorts arr
    }
}
```

6406531736904. ❌ }

```
public class ArrayOperations{
    public int countElement(Object[] arr, Object ele){
        // Counts the number of occurrences of ele in arr
    }
    public void sort(Comparable[] arr){
        // Sorts arr
    }
}
```

6406531736905. ✓ }

6406531736906. ❌

```
public class ArrayOperations{  
    public int countElement(Object[] arr, Object ele){  
        // Counts the number of occurrences of ele in arr  
    }  
    public void sort(T[] arr){  
        // Sorts arr  
    }  
}
```

```
public class ArrayOperations{  
    public int countElement(T[] arr, T ele){  
        // Counts the number of occurrences of ele in arr  
    }  
    public void sort(T[] arr){  
        // Sorts arr  
    }  
}
```

6406531736907. *

Question Number : 119 Question Id : 640653521110 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 the code given below

```
class Employee {  
    String name;  
    // Constructor  
    public String toString(){  
        return name;  
    }  
}  
  
class Manager extends Employee implements Cloneable {  
    int nteam;  
    // Constructor  
    public Manager clone() throws CloneNotSupportedException{  
        return (Manager)super.clone();  
    }  
    public String toString(){  
        return (super.toString() + ": " + nteam);  
    }  
}  
  
public class Test {  
    public static void main(String[] args) throws CloneNotSupportedException{  
        Manager m1 = new Manager("Hari", 4);  
        Manager m2 = m1.clone();  
        m2.name = "Reena";  
        m2.nteam = 10;  
        System.out.println(m1 + "\n" + m2);  
    }  
}
```

What will the output be?

Options :

Hari: 10
6406531736912. ❌ Reena: 10

Hari: 4
6406531736913. ✓ Reena: 10

Hari: 4
6406531736914. ❌ Reena: 4

Reena: 10
6406531736915. * Reena: 10

Question Number : 120 Question Id : 640653521113 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 the Java code given below that takes as input the points obtained by teams in the matches they have played, and computes the total points obtained by each team. You may make use of the method description given below.

`getOrDefault(Object key, V defaultValue)`: Returns the value to which the specified key is mapped, or defaultValue if this map contains no mapping for the key.

```
import java.util.*;
class Team{
    String name, year;
    int points;
    // Constructor
}
public class MapTest{
    public static void printTeams(ArrayList<Team> tL) {
        var map = new LinkedHashMap<String, Integer>();
        Team tm = null;
        for(Team t:tL) {
            map.put(t.name, map.getOrDefault(t.name, 0)+t.points);
        }
        for (Map.Entry<String, Integer> e:map.entrySet()) {
            System.out.println(e.getKey()+" = "+e.getValue());
        }
    }
    public static void main(String[] args) {
        ArrayList<Team> tList = new ArrayList<Team>();
        tList.add(new Team("CSK", "2008", 14));
        tList.add(new Team("RCB", "2008", 8));
        tList.add(new Team("RCB", "2009", 14));
        tList.add(new Team("CSK", "2009", 12));
        printTeams(tList);
    }
}
```

What will the output be?

Options :

CSK = 26
6406531736924. ✓ RCB = 22

RCB = 22
6406531736925. ✗ CSK = 26

RCB = 14
6406531736926. ✗ CSK = 12

CSK = 12
6406531736927. ✗ RCB = 14

Question Number : 121 Question Id : 640653521114 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 the following Java code.

```
import java.util.stream.*;
public class Test{
    public static void main(String[] args){
        Integer[] a = {12, 10, 13, 16};
        Stream.of(a)
            .map((i) -> i - 8).filter((i) -> i% 2 == 0)
            .forEach((x) -> System.out.println(x));
    }
}
```

What will the output be?

Options :

12
10
6406531736928. ✗ 16

4

6406531736929. ✘ 8

12

6406531736930. ✘ 16

4

2

6406531736931. ✓ 8

Question Number : 122 Question Id : 640653521115 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 the code given below.

```
class DaysException extends Exception{  
    public DaysException(String str) {  
        super(str);  
    }  
}  
class HR{  
    final static int no_of_hours = 20;  
    public double getHoursPerDay(int no_of_days) {  
        double hpd = 0.0;  
        try {  
            hpd = no_of_hours/no_of_days;  
        }  
        catch(ArithmeticException e) {  
            e.initCause(new DaysException("No of days should not be 0"));  
            throw e;  
        }  
        return hpd;  
    }  
}  
public class ChainedException {  
    public static void main(String[] args) {  
        HR h = new HR();  
        try {  
            System.out.println(h.getHoursPerDay(0));  
        }  
        catch(ArithmeticException e) {  
            System.out.println(e.getCause().getMessage());  
        }  
    }  
}
```

Choose the correct option.

Options :

This program generates the output:

6406531736932. ✓ No of days should not be 0

This program generates the output:

/ by zero

No of days should not be 0

6406531736933. ✗

6406531736934. ✗

This program generates the output:

No of days should not be 0

/ by zero

This program generates the output:

/ by zero

6406531736935. *

Question Number : 123 Question Id : 640653521116 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 the Java code given below.

```
import java.util.*;
public class QueueTest {
    public static void main(String[] args) {
        var queue = new ArrayDeque<Integer>();
        queue.add(23);
        queue.add(12);
        queue.add(43);
        while(queue.size() > 0) {
            System.out.println(queue.peek()+" "+queue.poll());
        }
    }
}
```

What will the output be?

You may make use of the descriptions of the methods given below. These are methods inside type Deque.

poll(): Retrieves and removes the head of the queue represented by this deque (in other words, the first element of this deque), or returns null if this deque is empty.

peek(): Retrieves, but does not remove, the head of the queue represented by this deque (in other words, the first element of this deque), or returns null if this deque is empty.

Options :

6406531736936. *

23:23
12:12
43:43
null:null

43:43
12:12
6406531736937. ✘ 23:23

23:23
12:12
6406531736938. ✓ 43:43

23:12
12:43
6406531736939. ✘ 43:null

Question Number : 124 Question Id : 640653521117 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 the Java code given below.

```
import java.util.*;
class Employee{
    String name;
    int no_of_leaves;
    //Constructor to initialize the instance variables
    //Method toString() to return name of the employee
}
public class IteratorTest {
    public static boolean property(int x) {
        if(x < 15)
            return true;
        return false;
    }
    public static void printAppraisalEmpList(List<Employee> eList){
        Iterator<Employee> it = eList.iterator();
        while (it.hasNext()) {
            Employee e = it.next();
            if(property(e.no_of_leaves))
                System.out.println(e);
            else
                it.remove(); // LINE 1
        }
    }
    public static void main(String[] args) {
        var list = new ArrayList<Employee>();
        list.add(new Employee("ABC", 15));
        list.add(new Employee("XYZ", 9));
        list.add(new Employee("PQR", 1));
        list.add(new Employee("MNO", 20));
        printAppraisalEmpList(list);
    }
}
```

Choose the correct option.

Options :

This program generates the output:

ABC

MNO

6406531736940. ✘

This program generates the output:

XYZ

6406531736941. ✓ PQR

LINE 1 generates the compilation error because method `remove()` is not defined in the `Iterator` interface.
6406531736942. *

LINE 1 should be replaced with `eList.remove(e);` to generate the output:
XYZ
PQR
6406531736943. *

Question Number : 125 Question Id : 640653521120 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 the Java code given below.

```
public class SetTest {  
    public static void main(String[] args) {  
        var set1 = new HashSet<String>();  
        set1.add("India");  
        set1.add("Sri Lanka");  
        set1.add("Bangladesh");  
        set1.add("Australia");  
        var set2 = new TreeSet<String>(set1);  
  
        Iterator<String> it1 = set1.iterator();  
        Iterator<String> it2 = set2.iterator();  
  
        while(it1.hasNext())  
            System.out.println(it1.next());  
  
        while(it2.hasNext())  
            System.out.println(it2.next());  
    }  
}
```

Choose the correct option.

Options :

it1 will visit elements of `set1` in sorted order.
6406531736952. * it2 will visit elements of `set2` in sorted order.

it1 will visit elements of `set1` in the order in which they were inserted

6406531736953. ❌ it2 will visit elements of `set2` in sorted order.

it1 will visit elements of `set1` in unspecified order.

6406531736954. ✓ it2 will visit elements of `set2` in sorted order.

it1 will visit elements of `set1` in the order in which they were inserted.

6406531736955. ❌ it2 will visit elements of `set2` in unspecified order.

Question Number : 126 Question Id : 640653521121 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

Match the following

| | |
|------------|---|
| A. throw | I. Lists the types of exceptions that a method might throw |
| B. throws | II. Used to throw an exception object explicitly |
| C. finally | III. Executes only if exception is raised |
| D. catch | IV. Executes irrespective of whether the exception is raised or not |

Options :

A---> II

B--> I

C--> IV

6406531736956. ✓ D--> III

A---> I

B--> II

C--> IV

6406531736957. ❌ D--> III

A---> II

B--> I

C--> III

6406531736958. ❌ D--> IV

A---> I
B---> II
C---> III
D---> IV

6406531736959. *

Sub-Section Number : 3
Sub-Section Id : 64065373953
Question Shuffling Allowed : Yes
Is Section Default? : null

Question Number : 127 Question Id : 640653521109 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

Consider the Java code given below that prints the sum of elements of a list. From among the options, identify the appropriate function header for function `elementSum` that takes as input a list of numbers, and prints the sum of the elements of the list.

```
import java.util.*;
class Test {
    // FUNCTION HEADER for function elementSum
    {
        // Prints the sum of elements of list
    }
    public static void main(String[] args) {
        List<Integer> l = new ArrayList<>();
        l.add(12);
        l.add(23);

        List<Float> l1 = new ArrayList<>();
        l1.add(12.2f);
        l1.add(23.4f);

        elementSum(l);
        elementSum(l1);
    }
}
```

Choose the correct option(s).

Options :

6406531736908. ❌ `public static void elementSum(List<Number> lst)`

6406531736909. ✓ `public static <T extends Number> void elementSum(List<T> lst)`

6406531736910. ✓ `public static void elementSum(List<? extends Number> lst)`

6406531736911. ❌ `public static void elementSum(List<Double> lst)`

Question Number : 128 Question Id : 640653521111 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

Consider the Java code given below that prints the highest tax among a set of given Taxable objects. From among the options, identify the appropriate function header for function printTax that takes as input an array of Taxable objects and prints the highest tax.

```
import java.util.*;
interface Taxable {
    public abstract double findTax();
}
class Employee implements Taxable{
    double salary;
    // Constructor
    // method findTax() that returns tax of Employee which is 10% of salary
}
class Manager extends Employee{
    // Constructor
}
public class Test{
    // LINE 1: FUNCTION HEADER
    {
        // invokes method findTax()
        // to print the value of highest tax
    }
    public static void main(String[] args) {
        Taxable[] t = {new Employee(400), new Manager(3000)};
        printTax(t);
    }
}
```

Choose the correct option(s).

Options :

6406531736916. ❌ public static void printTax(<?> t)

6406531736917. ✓ public static <T extends Taxable> void printTax(T[] c)

6406531736918. ❌ public static <T extends Manager> void printTax(T[] c)

6406531736919. ✓ public static void printTax(Taxable[] c)

Question Number : 129 Question Id : 640653521112 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

Consider the Java code given below that should print the names of students whose total is between 255 and 360 (both inclusive).

```
import java.util.*;
class Student{
    String name;
    double total;
    public Student(String name, double total) {
        this.name = name;
        this.total = total;
    }
}
public class Test {
    public static void main(String[] args) {
        List<Student> sList = new ArrayList<Student>();
        sList.add(new Student("s1", 360));
        sList.add(new Student("s2", 400));
        sList.add(new Student("s3", 200));
        sList.add(new Student("s4", 255));
        //CODE BLOCK
    }
}
```

Choose the correct option(s) to fill in place of CODE BLOCK to obtain the right answer.

Options :

6406531736920. ❌

```
sList.stream()
    .map(i -> i.total >= 255 && i.total <= 360)
    .forEach(s->System.out.println(s.name));
```

6406531736921. ✓

```
sList.stream()
    .filter(i -> i.total >= 255 && i.total <= 360)
    .forEach(s->System.out.println(s.name));
```

6406531736922. ✓

```
sList.stream()
    .filter(i -> i.total >= 255)
    .filter(i -> i.total <= 360)
    .forEach(s->System.out.println(s.name));
```

```
sList.stream()
    .filter(i -> i.total >= 255)
    .map(i -> i.total <= 360)
    .forEach(s->System.out.println(s.name));
```

6406531736923. *

Sub-Section Number : 4

Sub-Section Id : 64065373954

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 130 Question Id : 640653521118 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

Consider the Java code given below.

```
class Customer{  
    private String name, aadhar, pan;  
  
    //Constructor to initialize the instance variables  
  
    public void getDetails() {  
        String msg = ""PAN/Aadhar required"";  
        System.out.println(name);  
        assert aadhar.length() == 12 || pan.length() == 10: msg; //LINE 1  
        if(aadhar.length() == 12)  
            System.out.println(aadhar);  
        if(pan.length() == 10)  
            System.out.println(pan);  
    }  
}  
  
public class AssertionTest {  
    public static void main(String[] args) {  
        Customer c1 = new Customer("Shreyas Iyer", "", "BXPB1123D");  
        Customer c2 = new Customer("Venkatesh Iyer", "209005091129", "");  
        c1.getDetails(); // LINE 2  
        c2.getDetails(); // LINE 3  
    }  
}
```

Choose the correct option when the program is executed as:

java -ea AssertionTest

Options :

LINE 1 generates a compilation error, because you cannot write multiple conditions in a single assert statement.
6406531736944. ❌

6406531736945. ❌ LINE 1 throws AssertionError when LINE 2 is executed.

6406531736946. ❌ LINE 1 throws AssertionError when LINE 3 is executed.

This program generates the output:

Shreyas Iyer
BXPB1123D
Venkatesh Iyer

6406531736947. ✓ 209005091129

Question Number : 131 Question Id : 640653521119 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

Consider the Java code given below.

```
import java.util.*;
class LocationException extends Exception{
    public LocationException(String str) {
        super(str);
    }
}
class Fresher{
    String name, pre_location;
    //Constructor to initialize the instance variables
}
class Kipro{
    Map<String, String> map = new HashMap<String, String>();
    public Kipro() {
        map.put("Hyderabad", "100 fresher jobs");
        map.put("Chennai", "175 fresher jobs");
    }
    void recruit(Fresher f) throws LocationException {
        if(map.get(f.pre_location) == null)
            throw new LocationException("No jobs");
        else
            System.out.println(map.get(f.pre_location));
    }
}
public class ExceptionTest {
    public static void main(String[] args) {
        Fresher f1 = new Fresher("ABC", "Hyderabad");
        Fresher f2 = new Fresher("XYZ", "Bangalore");
        Kipro k = new Kipro();
        try {
            k.recruit(f1);
            k.recruit(f2);
        }
        catch (LocationException e) {
            System.out.println(e.getMessage());
        }
    }
}
```

Choose the correct option.

Options :

This program generates the output:

No jobs

6406531736948. ✘ 100 fresher jobs

This program generates the output:

100 fresher jobs

6406531736949. ✓ No jobs

This program generates the output:

No jobs

6406531736950. ✘ 175 fresher jobs

6406531736951. ✘ The program terminates due to unhandled exception(s).

AppDev2

Section Id : 64065333937

Section Number : 9

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 Yes

Clear Response :

Maximum Instruction Time : 0

Sub-Section Number : 1

Sub-Section Id : 64065373955

| | |
|-------------------------------------|------|
| Question Shuffling Allowed : | No |
| Is Section Default? : | null |

Question Number : 132 Question Id : 640653521122 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 : MODERN APPLICATION DEVELOPMENT 2"

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 :

6406531736960. ✓ YES

6406531736961. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 64065373956

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 133 Question Id : 640653521126 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

Fill in code1 & code2, which can be used in Vuex Store to update the "below_average" state variable with the objects of those students who have scored less than 55 marks.

```
const store= new Vuex.Store({
  state:{ 
    student_total:0,
    students:[
      {
        name : 'Akshay',
        marks : 52
      },
      {
        name : 'Vishwajeet',
        marks : 78
      },
      {
        name : 'Sonali',
        marks : 43
      }
    ],
    below_average:[]
  },
  code1:{
    belowAverageStudents(state){
      code2
    },
  }
})
```

Options :

code1: mutations
code2: students.forEach(student=>{
 if(student.marks < 55)
 below_average.push(student)
})

6406531736974. *

6406531736975. *

code1: actions

```
code2: state.students.forEach(student=>{
    if(student.mark < 55)
        below_average.toppers.push(student)
})
```

code1: actions

```
code2: context.students.forEach(student=>{
    if(student.marks < 55)
        context.below_average.push(student)
})
```

6406531736976. ✘

code1: mutations

```
code2: state.students.forEach(student=>{
    if(student.marks < 55)
        state.below_average.push(student)
})
```

6406531736977. ✓

Question Number : 134 Question Id : 640653521128 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 false regarding PWAs and SPAs in the context of web?

Options :

6406531736982. ✘ A PWA is a web application that can be installed to a device's home screen.

6406531736983. ✓ An SPA is a web application that allows a user to interact with the app as usual even when offline.

6406531736984. ✘ A PWA must have service workers installed on the client.

6406531736985. ✘ YouTube is an example of a PWA.

Question Number : 135 Question Id : 640653521133 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

Consider the below javascript code.

```
async function customFetch(url) {
  try {
    console.log(url)
    const res = await fetch(url)
    if (!res.ok) {
      throw new Error(`HTTP Error: ${res.status}`)
    }
    try {
      const data = await res.json()
      console.log(data)
    } catch {
      throw new Error('Data is not JSON serializable')
    }
  } catch {
    throw new Error('Network Error')
  }
}
customFetch('https://example.com/api/users/23').catch((err) => {
  console.error(err)
})
```

Suppose the API URL "<https://example.com/api/users/23>" throws a 404 error.

What will be logged on to the console, except the URL?

Options :

6406531737002. ✘ HTTP Error: 404

6406531737003. ✘ Data is not JSON serializable

6406531737004. ✓ Network Error

6406531737005. ✘ None of these

Sub-Section Number : 3

Sub-Section Id : 64065373957

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 136 Question Id : 640653521125 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 the following Vue application with markup "index.html" and javascript file "app.js".

index.html:

```
<div id = "app">
  <my-comp>
    <template v-slot:first = "slotProps">
      This is from {{slotProps.user.name1}} template
    </template>

    <template v-slot:default = "slotProps">
      This is from {{slotProps.user.name3}} template
    </template>

    <template v-slot:second = "slotProps">
      This is from {{slotProps.user.name2}} template
    </template>
  </my-comp>
</div>
<script src = "app.js"> </script>
```

app.js:

```
Vue.component("myComp", {
  template : `<div>
    <p>
      <slot v-bind:user="user">
      </slot>
    </p>

    <p>
      <slot name = "first" v-bind:user="user">
      </slot>
    </p>
  </div>
  `,
  data : function () {
    return {
      user : {
        'name1' : "Abhi's",
        'name2' : "Dev's",
        'name3' : "Sonali's",
      }
    }
  }
})

const app = new Vue({
  el : "#app",
})
```

Options :

6406531736970. ✖ This is from template

This is from template

6406531736971. ✖ This is from Abhi's template

This is from Dev's template

This is from Sonali's template

6406531736972. ✖ This is from Abhi's template

This is from Sonali's template

6406531736973. ✓ This is from Sonali's template

This is from Abhi's template

Question Number : 137 Question Id : 640653521130 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 the following javascript program, and predict the output, if executed.

```
var x = 20;

const y = {
  x : 40,
  func : function(x) {
    console.log("Value is:", x)
  }
}

const z = {
  x : 40,
  func : () => {
    console.log("Value is:", x)
    y.func.call(this)
  }
}

z.func.apply(y)
```

Options :

6406531736990. ✖ Value is: 40

Value is: undefined

6406531736991. ✘ Value is: 40

Value is: 20

6406531736992. ✘ Value is: 20

Value is: 40

6406531736993. ✓ Value is: 20

Value is: undefined

Question Number : 138 Question Id : 640653521131 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 the below javascript code, and predict the output, if executed?

```
const runScored = (score) => {
    score > 100 ? true : false
}

const teamSelector = (run) => {
    return new Promise((res, rej) => {
        if (runScored(run)) {
            res('In the team')
        } else {
            rej('Out of the team')
        }
    })
}

teamSelector(100)
    .then((res) => {
        console.log(res)
    })
    .catch((res) => {
        console.log(res)
    })
}
```

Options :

6406531736994. ✘ In the team

6406531736995. ✓ Out of the team

6406531736996. ✗ Will throw an error

6406531736997. ✗ None of these

Question Number : 139 Question Id : 640653521132 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 the below javascript code, and predict the output, if executed?

```
const proGen = (t) => {
  return new Promise((res, rej) => {
    setTimeout(() => {
      if (t > 5) {
        rej('Disqualified')
      } else {
        res('Qualified')
      }
    }, t * 1000)
  })
}

async function decider() {
  const res1 = await proGen(3)
  console.log(res1)
  const res2 = await proGen(6)
  console.log(res2)
  console.log('Decision Over')
}
decider().catch((data) => {
  console.log(data)
})
console.log('Decision Started')
```

Options :

6406531736998. ✗ Decision Started

Qualified

Disqualified

Decision Over

6406531736999. ✘ Qualified

Disqualified

Decision Over

6406531737000. ✓ Decision Started

Qualified

Disqualified

6406531737001. ✘ None of these

Question Number : 140 Question Id : 640653521134 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 the below javascript code.

```
async function customFetch(url) {
  try {
    console.log(url)
    const res = await fetch(url)
    if (!res.ok) {
      throw new Error(`HTTP Error: ${res.status}`)
    }
    try {
      const data = await res.json()
      console.log(data)
    } catch {
      throw new Error('Data is not JSON serializable')
    }
  } catch {
    throw new Error('Network Error')
  }
}
customFetch('https://example.com/api/users/23').catch((err) => {
  console.error(err)
})
```

Suppose the API URL "<https://example.com/api/users/23>" returns a valid HTML output.

What will be logged on to console, except the URL?

Options :

6406531737006. ✘ HTTP Error: 404

6406531737007. ✘ Data is not JSON serializable

6406531737008. ✓ Network Error

6406531737009. ✘ None of these

Question Number : 141 Question Id : 640653521135 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 the following Vue app with markup “index.html” and javascript file “app.js”.

index.html:

```
<body>
  <div id="app">
    <router-view></router-view>
  </div>
  <script
src="https://cdn.jsdelivr.net/npm/vue@2/dist/vue.js"></script>
  <script
src="https://unpkg.com/vue-router@3/dist/vue-router.js"></script>
  <script src="app.js"></script>
</body>
```

app.js:

```
const Home = { template: `<div> Hello World </div>` }
const Error = { template: `<div> Page Not Found</div>` }
const Profile = {
  template: `<div>
    <div v-if='user'>
      Name: {{user.name}}, State: {{user.state}}
    </div>
    <div v-else>
      Unknown User
    </div>
  </div>`,
  data() {
    return {
      users: [
        { id: '1', name: 'Narendra', state: 'UP' },
        { id: '2', name: 'Abhishek', state: 'Delhi' },
      ],
    }
  },
},
```

```

computed: {
  user() {
    user = this.users.find((usr) => {
      return usr.id == this.$route.params.id
    })
    return user
  },
},
}

const routes = [
  { path: '/', component: Home },
  { path: '/profile/:id', component: Profile },
  { path: '*', component: Error },
]

const router = new VueRouter({
  routes,
})

new Vue({
  el: '#app',
  router,
})

```

Suppose the application is running on port 8080. What will be rendered inside router-view for the URL "<http://127.0.0.1:8080/#/profile>"?

Options :

6406531737010. ✓ Page Not Found

6406531737011. ✗ Name: Narendra, State: UP

6406531737012. ✗ Name: Abhishek, State: Delhi

6406531737013. ✗ Unknown User

Question Number : 142 Question Id : 640653521138 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 the following application with markup “index.html” and javascript file “app.js”.

index.html:

```
<body>
  <div id="app">
    <router-view></router-view>
  </div>
  <script
src="https://cdn.jsdelivr.net/npm/vue@2/dist/vue.js"></script>
  <script
src="https://unpkg.com/vue-router@3/dist/vue-router.js"></script>
  <script src="app.js"></script>
</body>
```

app.js:

```
const Home = { template: `<div> Hello World </div>` }
const DetailsError = { template: `<div> Details not found </div>` }
const PersonalInfo = {
  template: `<div>
    Name: {{user?user.name:'Unknown'}},
    State: {{user?user.state:'Unknown'}}</div>`,
  data() {
    return {
      users: [
        { id: '1', name: 'Narendra', state: 'UP' },
        { id: '2', name: 'Abhishek', state: 'Delhi' },
      ],
    }
  },
  computed: {
    user() {
      user = this.users.find((usr) => {
        return usr.id == this.$route.params.id
      })
      return user
    }
  }
}
```

```

    },
},
}

const ProfessionalInfo = {
  template: `<div> This is professional Info </div>`,
}

const Profile = {
  template: `<div>
<div>Welcome User</div>
<div><router-view></router-view></div>
</div>`,
}

const routes = [
  { path: '/', component: Home },
  {
    path: '/profile/:id',
    component: Profile,
    children: [
      {
        path: 'personal',
        component: PersonalInfo,
      },
      {
        path: 'professional',
        component: ProfessionalInfo,
      },
      { path: '**', component: DetailsError },
    ],
  },
]
]

const router = new VueRouter({
  routes,
})

new Vue({
  el: '#app',
  router,
})

```

Suppose the application is running on port 8080. What will be rendered inside the router-view component of div element with ID “app”, when a user visits the URL [“http://127.0.0.1:8080/#/profile/2/personal”?](http://127.0.0.1:8080/#/profile/2/personal)

Options :

6406531737022. ❌ Welcome User

Name: Unknown, State: Unknown

6406531737023. ❌ Welcome User

Name: Narendra, State: UP

6406531737024. ✅ Welcome User

Name: Abhishek, State: Delhi

6406531737025. ✘ None of these

| | |
|-------------------------------------|-------------|
| Sub-Section Number : | 4 |
| Sub-Section Id : | 64065373958 |
| Question Shuffling Allowed : | Yes |
| Is Section Default? : | null |

Question Number : 143 Question Id : 640653521124 Question Type : MCQ Is Question

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

Correct Marks : 4.5

Question Label : Multiple Choice Question

Consider the following Vue application with markup “index.html” and javascript file “app.js”.

index.html:

```
<div id = "app">
  <input v-model = "data" />
  <p> Number of refreshes: {{refreshes}} </p>
  <button @click = "do_something"> Click Me</button>
</div>
<script src = "app.js"> </script>
```

app.js:

```
const a = new Vue({
  el : '#app',
  data : {
    data : "",
    refreshes : 0,
  },
  methods: {
    do_something() {
      if (isNaN(this.refreshes)) this.refreshes = 0;
      if (this.data.length % 2) {
        sessionStorage.data = "prefix" + this.data;
        sessionStorage.refreshes = this.refreshes * 2 + 1;
      }
      else {
        sessionStorage.data = this.data + "suffix";
        sessionStorage.refreshes = this.refreshes * 2 - 1;
      }
    }
  },
  mounted : function () {
    if (sessionStorage.data) {
      this.data = "suffix" + sessionStorage.data.slice(1, 5);
      this.refreshes = Number(sessionStorage.refreshes) % 3 - 1;
    }
    else {
      this.data = sessionStorage.data + "prefix";
      this.refreshes = Number(sessionStorage.refreshes) % 3 + 1;
    }
    if (isNaN(this.refreshes)) this.refreshes = 2;
    sessionStorage.data = this.data;
    sessionStorage.refreshes = this.refreshes;
  }
})
```

Say you open the file “index.html” in the browser, and enter the text “study” in the text box shown (after removing the existing text from the input box, if any). After that, you refresh the page twice. What be the text shown in the text input box, and the value of the “refreshes” placeholder, respectively?

Options :

6406531736966. ✘ suffixndef, 0

6406531736967. ✘ suffixndef, -1

6406531736968. ✓ suffixuffi, 0

6406531736969. ✘ suffixuffi, -1

Question Number : 144 Question Id : 640653521129 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 4.5

Question Label : Multiple Choice Question

Consider the following javascript program, and predict the output, if executed.

```
async function test(x) {
    let a = await new Promise(r => r(4 && x || 9)).catch(e => e);
    let b = await new Promise((res, rej) => {
        if (a > 2) res(8 || a && 5);
        else rej(5 && a);
    }).catch(e => e);
    console.log(a, b);
    return (5 && a)
}
test(7).then(
    rej => console.log("Promise rejected with the answer", rej),
    res => console.log("Promise resolved with the answer", res)
).then(data => {
    console.log("New value:", data);
    return "Promise"
}).catch(e => {
    throw new Error("Error 1")
}).finally(data => {
    console.log("New Value:", data);
    return "15"
}).then(data => console.log("New Value:", data))
).finally(() => console.log("End of Program"));
```

Options :

6406531736986. ✘ 7 8

Promise rejected with the answer 8

New value: undefined

New Value: Promise

New Value: 15

End of Program

6406531736987. ✘ End of Program

7 8

Promise rejected with the answer 7

New value: undefined

New Value: undefined

New Value: Promise

6406531736988. ✓ 7 8

Promise rejected with the answer 7

New value: undefined

New Value: undefined

New Value: Promise

End of Program

6406531736989. ✗ 7 8

Promise rejected with the answer 5

New value: undefined

New Value: Promise

New Value: 15

End of Program

Question Number : 145 Question Id : 640653521136 Question Type : MCQ Is Question

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

Correct Marks : 4.5

Question Label : Multiple Choice Question

Consider the following Vue app with markup “index.html” and javascript file “app.js”.

index.html:

```
<body>
  <div id="app">
    <router-view></router-view>
  </div>
  <script
src="https://cdn.jsdelivr.net/npm/vue@2/dist/vue.js"></script>
  <script
src="https://unpkg.com/vue-router@3/dist/vue-router.js"></script>
  <script src="app.js"></script>
</body>
```

app.js:

```
const Home = { template: `<div> Hello World </div>` }
const Error = { template: `<div> Page Not Found</div>` }
const Profile = {
  template: `<div>
    <div v-if='user'>
      Name: {{user.name}}, State: {{user.state}}
    </div>
    <div v-else>
      Unknown User
    </div>
  </div>`,
  data() {
    return {
      users: [
        { id: '1', name: 'Narendra', state: 'UP' },
        { id: '2', name: 'Abhishek', state: 'Delhi' },
      ],
    }
  },
},
```

```

computed: {
  user() {
    user = this.users.find((usr) => {
      return usr.id == this.$route.params.id
    })
    return user
  },
},
}

const routes = [
  { path: '/', component: Home },
  { path: '/profile/:id', component: Profile },
  { path: '*', component: Error },
]

const router = new VueRouter({
  routes,
})

new Vue({
  el: '#app',
  router,
})

```

Suppose the application is running on port 8080. What will be rendered inside router-view for the URL "<http://127.0.0.1:8080/#/profile/5>"?

Options :

6406531737014. ❌ Page Not Found

6406531737015. ❌ Name: Narendra, State: UP

6406531737016. ❌ Name: Abhishek, State: Delhi

6406531737017. ✓ Unknown User

Question Number : 146 Question Id : 640653521137 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 4.5

Question Label : Multiple Choice Question

Consider the following application with markup “index.html” and javascript file “app.js”.

index.html:

```
<body>
  <div id="app">
    <router-view></router-view>
  </div>
  <script
src="https://cdn.jsdelivr.net/npm/vue@2/dist/vue.js"></script>
  <script
src="https://unpkg.com/vue-router@3/dist/vue-router.js"></script>
  <script src="app.js"></script>
</body>
```

app.js:

```
const Home = { template: `<div> Hello World </div>` }
const DetailsError = { template: `<div> Details not found </div>` }
const PersonalInfo = {
  template: `<div>
    Name: {{user?user.name:'Unknown'}},
    State: {{user?user.state:'Unknown'}}
  </div>`,
  data() {
    return {
      users: [
        { id: '1', name: 'Narendra', state: 'UP' },
        { id: '2', name: 'Abhishek', state: 'Delhi' },
      ],
    }
  },
  computed: {
    user() {
      user = this.users.find((usr) => {
        return usr.id == this.$route.params.id
```

```

        })
      return user
    },
  }
}

const ProfessionalInfo = {
  template: `<div> This is professional Info </div>`,
}

const Profile = {
  template: `<div>
<div>Welcome User</div>
<div><router-view></router-view></div>
</div>`,
}

const routes = [
  { path: '/', component: Home },
  {
    path: '/profile/:id',
    component: Profile,
    children: [
      {
        path: 'personal',
        component: PersonalInfo,
      },
      {
        path: 'professional',
        component: ProfessionalInfo,
      },
      { path: '*', component: DetailsError },
    ],
  },
]
]

const router = new VueRouter({
  routes,
})

new Vue({
  el: '#app',
  router,
})

```

Suppose the application is running on port 8080. What will be rendered inside the router-view component of div element with ID “app”, when the user visits the URL [“http://127.0.0.1:8080/#/profile/3/personal”?](http://127.0.0.1:8080/#/profile/3/personal)

Options :

6406531737018. ✓ Welcome User

Name: Unknown, State: Unknown

6406531737019. ✗ Welcome User

Name: Narendra, State: UP

6406531737020. ✗ Welcome User

Name: Abhishek, State: Delhi

6406531737021. ✘ None of these

| | |
|-------------------------------------|-------------|
| Sub-Section Number : | 5 |
| Sub-Section Id : | 64065373959 |
| Question Shuffling Allowed : | Yes |
| Is Section Default? : | null |

Question Number : 147 Question Id : 640653521123 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 statement(s) is/are false regarding promise chain in javascript language?

Options :

6406531736962. ✘ A promise chain may consist of a number of “then” blocks.

6406531736963. ✓ A “finally” block always comes at the end of the promise chain.

6406531736964. ✓ Every “catch” block must always be preceded by a “then” block.

6406531736965. ✘ The “finally” block always gets executed, irrespective of the promise outcome.

| | |
|-------------------------------------|-------------|
| Sub-Section Number : | 6 |
| Sub-Section Id : | 64065373960 |
| Question Shuffling Allowed : | Yes |
| Is Section Default? : | null |

Question Number : 148 Question Id : 640653521127 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 statement(s) is/are true regarding web storage APIs?

Options :

6406531736978. ✓ The data saved in local storage has no expiration time, unlike session storage

(except in private browsing).

6406531736979. ✘ Both the local storage and session storage return the same object for site loaded over HTTP and HTTPS.

6406531736980. ✘ The data saved in local storage is synced across the devices.

6406531736981. ✓ The data saved in session storage gets cleared as soon as the page session ends.

MLT

| | |
|---|-------------|
| Section Id : | 64065333938 |
| Section Number : | 10 |
| Section type : | Online |
| Mandatory or Optional : | Mandatory |
| Number of Questions : | 15 |
| Number of Questions to be attempted : | 15 |
| Section Marks : | 100 |
| 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 : | 64065373961 |
| Question Shuffling Allowed : | No |
| Is Section Default? : | null |

Question Number : 149 Question Id : 640653521139 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 TECHNIQUES"

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 :

6406531737026. ✓ YES

6406531737027. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 64065373962

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 150 Question Id : 640653521140 Question Type : MCQ Is Question

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

Correct Marks : 5

Question Label : Multiple Choice Question

Consider that the three weight vectors \mathbf{w}_1 , \mathbf{w}_2 , and \mathbf{w}_3 are learned for a six-dimensional dataset using a linear regression model or regularized linear regression model (Not in any particular order).

$$\mathbf{w}_1 = [0.5, 0, 0.25, 0, 0, -0.14]$$

$$\mathbf{w}_2 = [0.8, -0.23, 0.45, 0.2, 0.31, -0.54]$$

$$\mathbf{w}_3 = [0.24, -0.03, 0.1, 0.02, 0.09, -0.14]$$

Select the most appropriate match for these weight vectors.

Options :

6406531737028. ✗ $\mathbf{w}_1 \rightarrow$ Linear regression, $\mathbf{w}_2 \rightarrow$ Ridge regression, $\mathbf{w}_3 \rightarrow$ Lasso

6406531737029. ✘ $\mathbf{w}_1 \rightarrow$ Ridge regression, $\mathbf{w}_2 \rightarrow$ Linear regression, $\mathbf{w}_3 \rightarrow$ Lasso

6406531737030. ✘ $\mathbf{w}_1 \rightarrow$ Lasso, $\mathbf{w}_2 \rightarrow$ Ridge regression, $\mathbf{w}_3 \rightarrow$ Linear regression

6406531737031. ✓ $\mathbf{w}_1 \rightarrow$ Lasso, $\mathbf{w}_2 \rightarrow$ Linear regression, $\mathbf{w}_3 \rightarrow$ Ridge regression

Question Number : 151 Question Id : 640653521141 Question Type : MCQ Is Question

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

Correct Marks : 5

Question Label : Multiple Choice Question

Consider a binary classification dataset (classes are 0 and 1) with two binary features

$f_1, f_2 \in \{0, 1\}$. A Naive Bayes classifier is learned and the estimated parameters are given as:

$$P(f_1 = 1|y = 0) = 0.2$$

$$P(f_2 = 1|y = 0) = 0.5$$

$$P(f_1 = 1|y = 1) = 0.6$$

$$P(f_2 = 1|y = 1) = 0.4$$

If a data point $[1, 0]$ is predicted in class 0 by this classifier, what will be the possible values for the estimate of $P(y = 1)$? Assume that tie-breaking goes to class zero. Values in the options are correct to two decimal places.

Options :

6406531737032. ✓ $(0, 0.22]$

6406531737033. ✘ $[0.22, 1)$

6406531737034. ✘ $(0, 0.29]$

6406531737035. ✘ $[0.29, 1)$

Question Number : 152 Question Id : 640653521142 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 5

Question Label : Multiple Choice Question

Is the following statement true or false:

If $p_i^y = 0$ for $y = 0$, then $p_i^y = 1$ for $y = 1$. Here, p_j^y denotes the estimate of the probability that j^{th} feature value is 1 given that label is y ($P(f_j = 1|y)$).

Options :

6406531737036. ✘ TRUE

6406531737037. ✓ FALSE

Question Number : 153 Question Id : 640653521143 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 5

Question Label : Multiple Choice Question

A linear regression model trained on a dataset $X \in \mathbb{R}^{d \times n}$ achieves zero training error for any label vector y . Which of the following options will necessarily hold true? Here I denotes an identity matrix of an appropriate size.

Options :

6406531737038. ✘ $XX^T = I$

6406531737039. ✓ $X^T(XX^T)^{-1}X = I$

6406531737040. ✘ $(XX^T)^{-1}Xy$ is a vector of all ones

6406531737041. ✘ $(XX^T)^{-1}Xy$ is a vector of all zeros

Sub-Section Number :

3

Sub-Section Id :

64065373963

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 154 Question Id : 640653521144 Question Type : MSQ Is Question

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

Correct Marks : 7 Selectable Option : 0

Question Label : Multiple Select Question

Consider the following three models for a one-dimensional dataset:

Model 1: $y = w_1x_1$

Model 2: $y = w_1^2x_1$

Model 3: $y = w_1^2x_1 + w_2x_1$

Select all the correct options. Assume that we have access to sufficiently large data points.

Options :

6406531737042. ✓ There may be some datasets for which model 1 performs better than model 2.

6406531737043. ✗ There may be some datasets for which model 2 performs better than model 1.

6406531737044. ✗ There may be some datasets for which model 3 performs better than model 1.

6406531737045. ✓ There may be some datasets for which model 3 performs better than model 2.

6406531737046. ✓ Model 1 and Model 3 perform equally well on all datasets.

Question Number : 155 Question Id : 640653521145 Question Type : MSQ Is Question

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

Correct Marks : 7 Selectable Option : 0

Question Label : Multiple Select Question

Let w be the solution of the linear regression model and \tilde{w} be the projection of w on the linear subspace spanned by the data points. Which of the following relationship is true?

Options :

6406531737047. ✓ training error for w = training error for \tilde{w}

6406531737048. ✓ $w = \tilde{w}$

6406531737049. ✘ training error for w ≠ training error for \tilde{w}

Question Number : 156 Question Id : 640653521146 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 7 Selectable Option : 0

Question Label : Multiple Select Question

Consider the following statement:

MAP estimate for linear regression weights w is equivalent to ridge regression.

Which of the following conditions make the above statement true?

Options :

6406531737050. ✘ Prior for w is Laplace distribution with zero mean.

6406531737051. ✓ Prior for w is $N(0, \gamma^2 I)$.

6406531737052. ✘ $y_i|x_i \sim N(0, \sigma^2 I)$

6406531737053. ✓ $y_i|x_i \sim N(w^T x_i, \sigma^2)$

Sub-Section Number : 4

Sub-Section Id : 64065373964

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 157 Question Id : 640653521147 Question Type : SA Calculator : None

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

Correct Marks : 6

Question Label : Short Answer Question

Suppose you want to use a Naive Bayes classifier to predict the gender (male or female) of a person based on two features: their height (f_1) and whether their age is above 20 (f_2). Assume that the features f_1 and f_2 are conditionally independent given the gender of the person, and that the variances of the height distributions $P(f_1|y = \text{male})$ and $P(f_1|y = \text{female})$ are equal. How many parameters are required to classify a new example using this Naive Bayes classifier?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

6

Question Number : 158 **Question Id :** 640653521148 **Question Type :** SA **Calculator :** None

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

Correct Marks : 6

Question Label : Short Answer Question

Consider a Naive Bayes model is trained on the following data matrix X of shape (d, n) and corresponding label vector y :

$$X = \begin{bmatrix} 1 & 1 & 0 \\ 0 & 1 & 0 \end{bmatrix} \quad y = [0, 1, 0]^T$$

Assume that \hat{p} and $\hat{p}_j^{y_i}$ are estimates for $P(y = 1)$ and $P(f_j = 1|y = y_i)$, respectively. Here, $f_i; i = 1, 2$ is the i^{th} feature. These parameters are estimated using MLE. If a test point has label 0, what will be the probability that the point is $[0, 0]^T$?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0.5

Question Number : 159 Question Id : 640653521149 Question Type : SA Calculator : None

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

Correct Marks : 6

Question Label : Short Answer Question

Gaussian kernel regression with parameter $\sigma^2 = 1/2$ was applied to the following dataset with two features:

$$X = \begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & 0 \end{bmatrix} \quad y = [2.1, 1, 2, 1.2]^T$$

The weight vector can be written as $w = \phi(X)\alpha$, where ϕ is the transformation mapping corresponding to the kernel. The vector α is given by $[2.1, -2.1, 3, 0]^T$ which is obtained as $(K)^{-1}y$, where K is the kernel matrix. What will be the prediction for point $[1, 1]^T$?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Sub-Section Number : 5

Sub-Section Id : 64065373965

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 160 Question Id : 640653521150 Question Type : SA Calculator : None

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

Correct Marks : 7

Question Label : Short Answer Question

Suppose we have a binary classification dataset with 1000 data points, consisting of 600 points belonging to class 0 and 400 points belonging to class 1. If we use a k -nearest neighbor (k -NN) model with $k = 900$ to predict the class labels of the data points, how many data points will be classified correctly?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

600

Sub-Section Number : 6

Sub-Section Id : 64065373966

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653521151 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 : (161 to 163)

Question Label : Comprehension

Suppose we have 1000 training examples and want to compute the 10-fold Cross-Validation error. This error is calculated as the average of the errors obtained from n_1 iterations of the Cross-Validation process. Each iteration involves training a model on a subset of size n_2 of the training data and evaluating its performance on a disjoint subset of size n_3 .

Based on the above data, answer the given subquestions

Sub questions

Question Number : 161 Question Id : 640653521152 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 appropriate value of n_1 ?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

10

Question Number : 162 **Question Id :** 640653521153 **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 appropriate value of n_2 ?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

900

Question Number : 163 **Question Id :** 640653521154 **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 appropriate value of n_3 ?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

Sub-Section Number :

7

Sub-Section Id :

64065373967

Question Shuffling Allowed :

No

Is Section Default? :

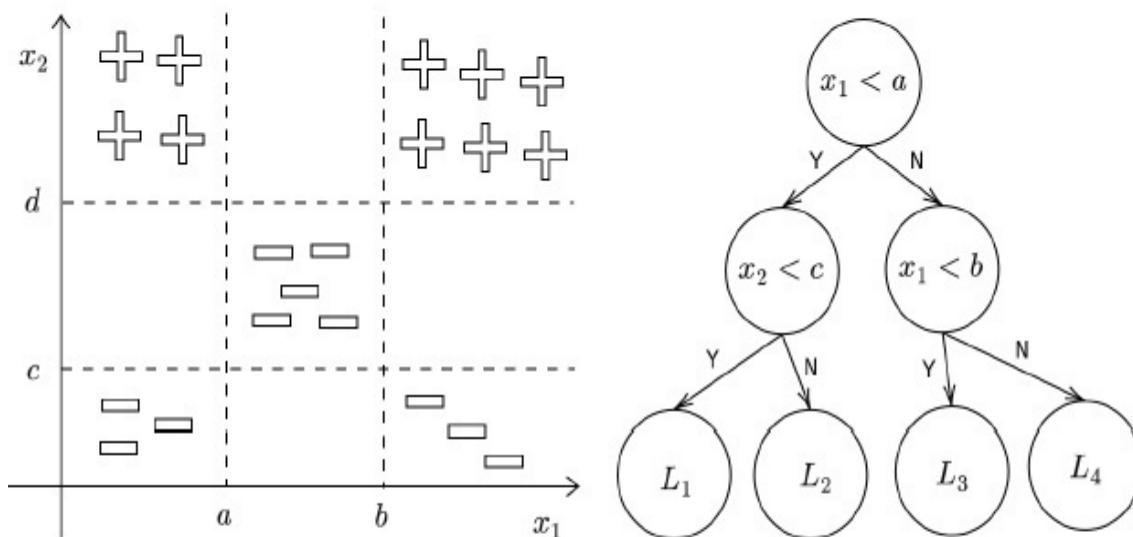
null

Question Id : 640653521155 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

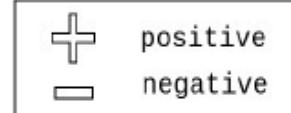
Question Numbers : (164 to 170)

Question Label : Comprehension

Consider the following training dataset for a binary classification problem on the left and some decision tree for it on the right. The labels lie in the set $\{+1, -1\}$.



Both features are positive: $x_1 > 0$
 $x_2 > 0$



L_1, L_2, L_3, L_4 are leaves. The four dotted lines $x_1 = a, x_1 = b, x_2 = c, x_2 = d$ are drawn for your reference. Both features x_1 and x_2 are positive. Our focus will only be on the first quadrant. Use \log_2 for all entropy calculations. Calculate all intermediate quantities upto three decimal places.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 164 Question Id : 640653521156 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

What is the label of leaf L_2 ? Enter 1 or -1.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 165 Question Id : 640653521157 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

What is the label of leaf L_4 ? Enter 1 or -1.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 166 Question Id : 640653521158 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

Select all true statements regarding the decision boundary of the decision tree.

Options :

The dotted line $x_2 = d$ is **not** a part of the decision boundary. That is, not even a single point on $x_2 = d$ is a part of the decision boundary.
6406531737063. ✓

The entirety of the dotted line $x_1 = a$ is a part of the decision boundary. That is, every single point on the dotted line is a part of the decision boundary.
6406531737064. ✓

The entirety of the dotted line $x_2 = c$ is a part of the decision boundary. That is, every single point on the dotted line is a part of the decision boundary.
6406531737065. ✗

Only a finite segment of the dotted line $x_1 = b$ is a part of the decision boundary. That is, there are some points on the dotted line that are **not** a part of the decision boundary.
6406531737066. ✗

Question Number : 167 Question Id : 640653521159 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 entropy of the leaf L_3 ? Enter your answer correct to three decimal places.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Question Number : 168 **Question Id :** 640653521160 **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

What is the entropy of the leaf L_4 ? Enter your answer correct to three decimal places.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.90 to 0.93

Question Number : 169 **Question Id :** 640653521161 **Question Type :** SA **Calculator :** None

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

Correct Marks : 5

Question Label : Short Answer Question

What is the information gain for the entire tree? Use the following formula:

Information gain = Entropy at root – Weighted entropy of leaves

Enter your answer correct to three decimal places.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.58 to 0.62

Question Number : 170 Question Id : 640653521162 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

Is the following statement true or false:

The decision tree shown in the diagram is the "best" possible tree. That is, it achieves the greatest information gain from the root to the leaves.

Options :

6406531737070. ✘ TRUE

6406531737071. ✓ FALSE

Sub-Section Number : 8

Sub-Section Id : 64065373968

Question Shuffling Allowed : No

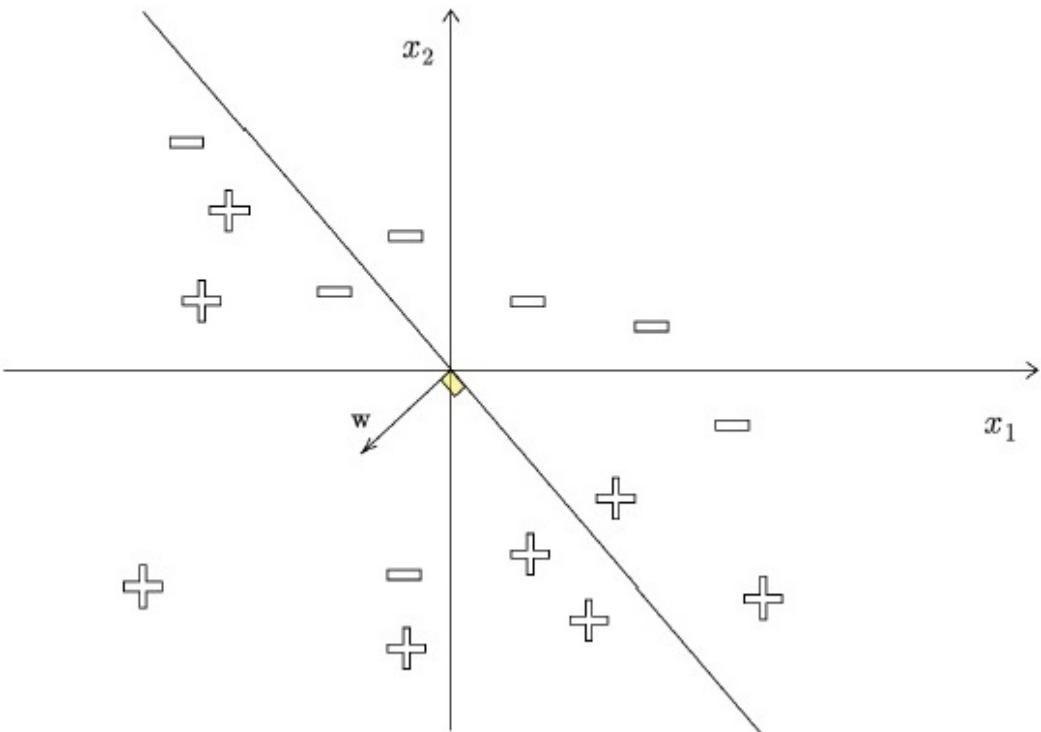
Is Section Default? : null

Question Id : 640653521163 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 : (171 to 172)

Question Label : Comprehension

Consider the following training dataset for a binary classification problem that has 15 data-points. The labels are in the set $\{+1, -1\}$. The symbol $+$ is a data-point with label $+1$ and $-$ is a data-point with label -1 .



w is the weight-vector corresponding to a linear classifier.

Based on the above data, answer the given subquestions

Sub questions

Question Number : 171 Question Id : 640653521164 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

How many points are misclassified by the classifier?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

Question Number : 172 Question Id : 640653521165 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

Consider another linear classifier with $\mathbf{w}' = 3\mathbf{w}$.

How many points are misclassified by this new classifier?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

5

MLP

Section Id : 64065333939

Section Number : 11

Section type : Online

Mandatory or Optional : Mandatory

Number of Questions : 25

Number of Questions to be attempted : 25

Section Marks : 50

Display Number Panel : Yes

Group All Questions : No

Enable Mark as Answered Mark for Review and Yes

Clear Response : Yes

Maximum Instruction Time : 0

| | |
|-------------------------------------|-------------|
| Sub-Section Number : | 1 |
| Sub-Section Id : | 64065373969 |
| Question Shuffling Allowed : | No |
| Is Section Default? : | null |

Question Number : 173 Question Id : 640653521166 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 PRACTICE"

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 :

6406531737074. ✓ YES

6406531737075. ✗ NO

| | |
|-------------------------------------|-------------|
| Sub-Section Number : | 2 |
| Sub-Section Id : | 64065373970 |
| Question Shuffling Allowed : | Yes |
| Is Section Default? : | null |

Question Number : 174 Question Id : 640653521167 Question Type : MSQ Is Question

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

Correct Marks : 1 Selectable Option : 0

Question Label : Multiple Select Question

Ashok has to train a logistic regression model on a dataset with gradient descent approach. Which of the following solvers can he use?

Options :

6406531737076. ❌ newton-cg

6406531737077. ❌ lbfgs

6406531737078. ❌ liblinear

6406531737079. ✓ sag

6406531737080. ✓ saga

Sub-Section Number : 3

Sub-Section Id : 64065373971

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 175 Question Id : 640653521168 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

Consider following code snippet:

```
from sklearn.utils.multiclass import type_of_target
import numpy as np
print(type_of_target(np.array([[0, 1], [1, 1]])))
print(type_of_target([1.0, 0.0, 3.0]))
print(type_of_target(['a', 'b', 'a']))
```

What will be the output of the above code snippet in the correct sequence?

Options :

‘multilabel-indicator’

‘multiclass’

6406531737081. ✓ ‘binary’

6406531737082. ❌

'multiclass'
'multiclass'
'binary'

'binary'
'multiclass'
'multilabel-indicator'

6406531737083. ✘

'multilabel-indicator'
'continuous'
'binary'

6406531737084. ✘

Question Number : 176 Question Id : 640653521169 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

Brajesh wrote following code snippet:

```
clf = Perceptron(max_iter=100,  
                  random_state=1729)
```

He learnt that every time he calls fit() method on 'clf', the parameters learnt from the previous training session (i.e. previous call to 'fit()') are lost. What should he change in code so that this problem is removed?

Options :

6406531737085. ✓ Set 'warm_start=True'

6406531737086. ✘ Combine training data from different training sessions

6406531737087. ✘ Set 'retain_parameters=True'

6406531737088. ✘ This problem can not be solved.

Question Number : 177 Question Id : 640653521170 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

Consider following variants of gradient descent algorithm:

1. full batch gradient descent
2. mini batch gradient descent
3. stochastic gradient descent

Which of the following variants of gradient descent can be implemented with SGDClassifier?

Options :

6406531737089. ✘ only 3

6406531737090. ✓ 1, 2 and 3

6406531737091. ✘ 1 and 2 only

6406531737092. ✘ 2 and 3 only

Question Number : 178 Question Id : 640653521174 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 we have a multi-class classification problem with n classes. Which of the following methods require exactly n classifiers to solve this problem?

Options :

6406531737105. ✓ OneVsRestClassifier

6406531737106. ✘ OneVsOneClassifier

6406531737107. ✘ OutputCodeClassifier

6406531737108. ✘ MultiOutputClassifier

Question Number : 179 Question Id : 640653521176 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

What might be the possible output of the following code:

```
from sklearn.feature_extraction.text import CountVectorizer
corpus = ["Hello Hello World great"]
vectorizer = CountVectorizer()
X = vectorizer.fit_transform(corpus)
print(X.toarray())
```

Options :

6406531737113. ✓ [1 2 1]

6406531737114. ✗ [1 2 3]

6406531737115. ✗ [0 1 1]

6406531737116. ✗ [1 1 1]

Question Number : 180 Question Id : 640653521177 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

Consider following code snippet:

```

import numpy as np
from sklearn.pipeline import Pipeline
from sklearn.impute import SimpleImputer
from sklearn.preprocessing import MinMaxScaler
from sklearn.linear_model import LinearRegression
steps = [
    ('imputer', SimpleImputer(missing_values=np.nan, strategy='mean')),
    ('scaler', MinMaxScaler()),
    ('model', LinearRegression())
]
pipe = Pipeline(steps = steps)

```

From the above code what pipe[1].fit_transform(X) does ? where X is a feature matrix

Options :

- 6406531737117. ✘ Replaces missing values with mean value of feature
- 6406531737118. ✓ Applies MinMaxScaling on the X
- 6406531737119. ✘ LinearRegression model fitting
- 6406531737120. ✘ None of these

Question Number : 181 Question Id : 640653521178 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

What might be the possible output of the following code:

```

from sklearn.metrics import mean_absolute_error
y_true = [3, -0.5, 2, 7]
y_pred = [2.5, 0.0, 2, 8]
mean_absolute_error(y_true, y_pred)

```

Options :

- 6406531737121. ✘ 0.00
- 6406531737122. ✓ 0.50
- 6406531737123. ✘ 0.72
- 6406531737124. ✘ 1.00

Question Number : 182 Question Id : 640653521179 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

What might be the possible output of the following code:

```
from sklearn.metrics import precision_score
y_true = [1,1,0,1,0,0,1,0,1]
y_pred = [0,1,0,1,0,1,1,1,1]
precision_score(y_true,y_pred)
```

Options :

6406531737125. ✘ 0.00

6406531737126. ✘ 0.33

6406531737127. ✓ 0.66

6406531737128. ✘ 0.99

Question Number : 183 Question Id : 640653521181 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

Mention TRUE or FALSE: Feature scaling does not impact KNN model performance

Options :

6406531737133. ✘ TRUE

6406531737134. ✓ FALSE

Question Number : 184 Question Id : 640653521182 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

By using all features of a dataset accuracy score of 100% is achieved on the training set, but accuracy score of 70% on test set, which of the following statements is most relevant?

Options :

6406531737135. ❌ Model is underfitting

6406531737136. ✓ Model is overfitting

6406531737137. ❌ Nothing, the model is perfect

Question Number : 185 Question Id : 640653521185 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 code snippets correctly sets up a RandomizedSearchCV object to perform hyperparameter tuning on a RandomForestClassifier with the following parameters to be tested:

- Number of estimators: 50, 100, 150
- Maximum depth of the tree: 5, 10, 15
- Minimum number of samples to enable a split: 2, 4, 6

Options :

```
rfc = RandomForestClassifier(random_state=0)
param_distributions = {'n_estimators': [50, 100, 150],
                      'max_depth': [5, 10, 15],
                      'min_samples_split': [2, 4, 6]}
randomized_search = RandomizedSearchCV(rfc,
                                         param_distributions=param_distributions,
                                         cv=5)
```

6406531737147. ❌

```
rfc = RandomForestClassifier(random_state=0)
param_distributions = ['n_estimators': [50, 100, 150],
                       'max_depth': [5, 10, 15],
                       'min_samples_split': [2, 4, 6]}
randomized_search = RandomizedSearchCV(rfc,
                                         param_distributions=param_distributions,
                                         cv=5)
```

6406531737148. ❌

```
rfc = RandomForestClassifier(random_state=0)
param_distributions = {'n_estimators': {50, 100, 150},
                      'max_depth': {5, 10, 15},
                      'min_samples_split': {2, 4, 6}}
randomized_search = RandomizedSearchCV(rfc,
                                         param_distributions=param_distributions,
                                         cv=5)
```

6406531737149. ✘

```
rfc = RandomForestClassifier(random_state=0)
param_distributions = {'n_estimators': [50, 100, 150],
                      'max_depth': [5, 10, 15],
                      'min_samples_split': [2, 4, 6]}
randomized_search = RandomizedSearchCV(rfc,
                                         param_distributions=param_distributions, cv=5)
```

6406531737150. ✓

Question Number : 186 Question Id : 640653521186 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

Decision Trees are prone to:

Options :

6406531737151. ✘ Low bias, low variance

6406531737152. ✘ High bias, low variance

6406531737153. ✓ Low bias, high variance

6406531737154. ✘ High bias, high variance

Question Number : 187 Question Id : 640653521189 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

Consider the following code. How many DecisionTreeClassifier models will be trained internally?

```
from sklearn.ensemble import BaggingRegressor
from sklearn.model_selection import GridSearchCV
param_grid = [ {'max_depth':range(1, 20, 2)}]
gs = GridSearchCV(DecisionTreeClassifier(), param_grid, cv = 10)
gs.fit(X,y)
```

Options :

6406531737165. ✘ 1000

6406531737166. ✘ 20

6406531737167. ✘ 10000

6406531737168. ✓ 100

6406531737169. ✘ 90

Sub-Section Number : 4

Sub-Section Id : 64065373972

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 188 Question Id : 640653521171 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

The precision-recall curve

Options :

6406531737093. ✓ plots a graph with precision value on X-axis and recall value on Y-axis

6406531737094. ✓ computes precision-recall pairs for different probability thresholds

6406531737095. ✘ computes precision-recall pairs for one singular probability threshold

6406531737096. ✘ plots a graph with recall value on X-axis and precision value on Y-axis

Question Number : 189 Question Id : 640653521172 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

Consider a classification dataset with 98% negative samples and 2% positive samples. A model is trained on this data, which of the following evaluation metrics are suitable for measuring effectiveness of this model:

Options :

6406531737097. ✘ accuracy

6406531737098. ✓ precision

6406531737099. ✓ recall

6406531737100. ✓ F-1 score

Question Number : 190 Question Id : 640653521173 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

Consider following code snippet:

```
from sklearn.naive_bayes import MultinomialNB  
estimator = MultinomialNB()  
estimator.fit(X, y)
```

where X and y are training data.

Options :

6406531737101. ✘ MultinomialNB is best suited when feature matrix X contains text data and not the word counts.

6406531737102. ✓ MultinomialNB is best suited when feature matrix X contains word counts for text data.

6406531737103. ✘ The MultinomialNB classifier is suitable for classification with continuous features.

6406531737104. ✘ None of these

Question Number : 191 Question Id : 640653521175 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 option(s) are correct regarding regularization?

Options :

6406531737109. ✓ It is a technique used to minimize the adjusted loss function and avoid overfitting.

6406531737110. ✗ It increases the bias and variance of the training model

6406531737111. ✓ Elastic net regularization is a combination of L1 and L2 regularization both.

6406531737112. ✗ It controls the number of passes a training dataset takes in an algorithm.

Question Number : 192 Question Id : 640653521180 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 are true? (Multiple options may be correct.)

Options :

6406531737129. ✓ KNN models with low values of K produces complex decision boundaries.

6406531737130. ✓ KNN models with high values of K produces smooth decision boundaries.

6406531737131. ✗ In KNN models K does not impact the decision boundaries.

6406531737132. ✗ None of these

Question Number : 193 Question Id : 640653521184 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

Fill in the missing parameter value in the following estimator that can be used to classify the data

```
from sklearn.svm import SVC  
clf = SVC(kernel = _____)  
clf.fit(X, y)
```

Options :

6406531737143. ✓ 'poly',

6406531737144. ✗ 'lasso'

6406531737145. ✓ 'rbf',

6406531737146. ✗ 'scale'

Question Number : 194 Question Id : 640653521187 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 is/are correct?

Options :

6406531737155. ✗ Decision trees are prone to underfitting.

6406531737156. ✗ By increasing the 'max_depth' parameter in 'DecisionTreeClassifier', the tree is likely to underfit

6406531737157. ✗ By increasing the 'min_samples_leaf' parameter in 'DecisionTreeClassifier', the tree is likely to overfit.

6406531737158. ✗ By increasing the 'min_samples_split' parameter in 'DecisionTreeClassifier', the tree is likely to overfit.

6406531737159. ✗ By increasing the 'ccp_alpha' parameter in 'DecisionTreeClassifier', the tree is likely to overfit.

6406531737160. ✓ None of these

| | |
|-------------------------------------|-------------|
| Sub-Section Number : | 5 |
| Sub-Section Id : | 64065373973 |
| Question Shuffling Allowed : | Yes |
| Is Section Default? : | null |

Question Number : 195 Question Id : 640653521183 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 options are true for regularization parameter C in sklearn.svm.SVC ?

Options :

6406531737138. ❌ Large value of the regularization parameter C will overfit the training set and complex decision boundaries will form.

6406531737139. ✓ Large value of the regularization parameter C will underfit the training set and smooth decision boundaries will form.

6406531737140. ✓ Small value of the regularization parameter C will overfit the training set and complex decision boundaries will form.

6406531737141. ❌ Small value of the regularization parameter C will underfit the training set and smooth decision boundaries will form.

6406531737142. ❌ None of these

Question Number : 196 Question Id : 640653521190 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

Consider the following block of code:

```

from sklearn.datasets import load_breast_cancer
from sklearn.tree import DecisionTreeClassifier
from sklearn.model_selection import train_test_split
X,y = load_breast_cancer(as_frame = True,
                         return_X_y = True)
X_train,X_test,y_train,y_test = train_test_split(X,y,
                                                test_size = 0.2,
                                                random_state = 1)
clf = DecisionTreeClassifier(min_samples_split = 5,
                             min_samples_leaf = 3,
                             random_state = 5)
clf.fit(X_train, y_train)
print(clf.score(X_test, y_test))

```

In which of the following scenarios, the split will NOT be made at node N?

Options :

6406531737170. ❌ Number of samples at node N = 10. If it is split, it will result in 4 nodes in the left child and 6 nodes in the right child.

6406531737171. ❌ Number of samples at node N = 6. If it is split, it will result in 3 nodes in the left child and 3 nodes in the right child.

6406531737172. ✓ Number of samples at node N = 12. If it is split, it will result in 2 nodes in the left child and 10 nodes in the right child.

6406531737173. ✓ Number of samples at node N = 4. If it is split, it will result in 3 nodes in the left child and 1 node in the right child.

Sub-Section Number : 6

Sub-Section Id : 64065373974

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 197 Question Id : 640653521188 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 the following code with respect to some feature matrix X and target vector y:

```

from sklearn.datasets import load_wine
from sklearn.tree import DecisionTreeClassifier
from sklearn.model_selection import train_test_split

X_train,X_test,y_train,y_test = train_test_split(X,y,
                                                test_size = 0.10,
                                                random_state = 12)

clf = DecisionTreeClassifier(max_depth = 6,
                             min_samples_split = 2,
                             min_samples_leaf=3,
                             random_state = 81)

clf.fit(X_train, y_train)
print(clf.score(X_train, y_train))

```

Assume that the output of the above code is 0.852. If we increase the value of the parameter ‘max_depth’, which of the following is more likely to happen?:

Options :

6406531737161. ✓ The output score is likely to increase.

6406531737162. ✗ The output score is likely to decrease.

6406531737163. ✗ The change in ‘max_depth’ is not likely to have any effect on the output.

6406531737164. ✗ If we increase the value of ‘max_depth’ beyond 6, the code will throw an error, as the max_depth can not be more than the product of ‘min_samples_split’ and ‘min_samples_leaf’.

BDM

| | |
|--|-------------|
| Section Id : | 64065333940 |
| Section Number : | 12 |
| Section type : | Online |
| Mandatory or Optional : | Mandatory |
| Number of Questions : | 11 |
| Number of Questions to be attempted : | 11 |
| Section Marks : | 15 |
| 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 : | 64065373975 |
| Question Shuffling Allowed : | No |
| Is Section Default? : | null |

Question Number : 198 Question Id : 640653521191 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 : BUSINESS DATA MANAGEMENT"

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 :

6406531737174. ✓ YES

6406531737175. ✗ NO

| | |
|-------------------------------------|-------------|
| Sub-Section Number : | 2 |
| Sub-Section Id : | 64065373976 |
| Question Shuffling Allowed : | Yes |
| Is Section Default? : | null |

Question Number : 199 Question Id : 640653521193 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 1

Question Label : Multiple Choice Question

When marginal utility of an item for a customer is greater than the per unit price of an item, the customer will ideally/theoretically: (select the most appropriate answer)

Options :

6406531737180. ✘ stop buying the item

6406531737181. ✓ keep buying the item

6406531737182. ✘ buy more of competitor's item

6406531737183. ✘ marginal utility does not impact buying decisions

Question Number : 200 Question Id : 640653521195 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 1

Question Label : Multiple Choice Question

Ravi's demand for product X increased by 5% when his income decreased by 2%. Product X is _____ for Ravi.

Options :

6406531737188. ✘ a luxury

6406531737189. ✓ an inferior good

6406531737190. ✘ a normal good

6406531737191. ✘ a substitute good

Question Number : 201 Question Id : 640653521198 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 1

Question Label : Multiple Choice Question

The demand curve has a negative slope because of:

Options :

6406531737201. ✓ the law of diminishing utility

6406531737202. ✗ the law of supply

6406531737203. ✗ the law of demand

6406531737204. ✗ the law of increasing opportunity cost

6406531737205. ✗ the law of decreasing opportunity cost

Question Number : 202 Question Id : 640653521201 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 1

Question Label : Multiple Choice Question

For a customer with fixed income to maximize utility, he should buy each good in amounts such that:

Options :

6406531737217. ✗ marginal utility of each good is maximized

6406531737218. ✗ total utility is same for each good

6406531737219. ✗ marginal utility per rupee spent is maximized for each good

6406531737220. ✓ marginal utility per rupee spent is the same for each good

Sub-Section Number : 3

Sub-Section Id : 64065373977

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 203 Question Id : 640653521200 Question Type : MSQ Is Question

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

Time : 0

Correct Marks : 1 Selectable Option : 0

Question Label : Multiple Select Question

Why is the quick ratio a more rigorous test of short-term solvency than the current ratio? (Choose all that are applicable)

Options :

6406531737213. ✘ The quick ratio eliminates prepaid expenses for the numerator
6406531737214. ✓ The quick ratio considers only cash and marketable securities as current assets
6406531737215. ✘ The quick ratio eliminates prepaid expenses for the denominator
6406531737216. ✓ The quick ratio eliminates inventories from the numerator

Sub-Section Number : 4

Sub-Section Id : 64065373978

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 204 Question Id : 640653521192 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 is a source of survey data? (select all that is applicable)

Options :

6406531737176. ✓ Market research data

6406531737177. ✘ Stock market data

6406531737178. ✘ Rainfall data

6406531737179. ✓ Consumer pyramid data

Question Number : 205 Question Id : 640653521194 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

Luxury goods are characterized by: (select all that apply)

Options :

6406531737184. ✓ high income elasticity of demand

6406531737185. ✘ an increase in income leads to an decrease in demand

6406531737186. ✓ an increase in income leads to an increase in demand

6406531737187. ✗ low income elasticity of demand

Question Number : 206 Question Id : 640653521196 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

When marginal utility is _____, total utility _____: (select all that apply)

Options :

6406531737192. ✗ negative, increases

6406531737193. ✓ negative, decreases

6406531737194. ✓ positive, increases

6406531737195. ✗ positive, decreases

6406531737196. ✓ zero, is maximum

6406531737197. ✗ zero, is minimum

6406531737198. ✗ maximum, is zero

6406531737199. ✗ minimum, is zero

Sub-Section Number : 5

Sub-Section Id : 64065373979

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 207 Question Id : 640653521199 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

If the current ratio is 2:1 and the Quick ratio is 1.5:1, then which of the following is/are true? (Select all that are applicable)

Options :

6406531737206. ✓ Current assets are 2 times the liability

6406531737207. ✗ Liability is 2 times the current assets

6406531737208. ✓ Stocks is 0.5 times the liability

6406531737209. ✗ Liability is 0.5 times Stocks

6406531737210. ✓ Current assets are greater than stocks

6406531737211. ✗ Stocks are greater than current assets

6406531737212. ✗ None of these

Sub-Section Number : 6

Sub-Section Id : 64065373980

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 208 Question Id : 640653521197 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

A firm has annual sales turnover of INR 95,00,000/- . Its total current liabilities sum up to INR 3,00,00,000/- . It has INR 15,00,000/- as accounts receivable. Calculate the firm's debtor days (round the answer to 2 decimal places).

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

57.00 to 58.00

| | |
|---|-------------|
| Section Id : | 64065333941 |
| Section Number : | 13 |
| Section type : | Online |
| Mandatory or Optional : | Mandatory |
| Number of Questions : | 8 |
| Number of Questions to be attempted : | 8 |
| Section Marks : | 20 |
| 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 : | 64065373981 |
| Question Shuffling Allowed : | No |
| Is Section Default? : | null |

Question Number : 209 Question Id : 640653521202 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 : BUSINESS ANALYTICS](#)"

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 :

640651737221. ✓ YES

6406531737222. ✘ NO

| | |
|-------------------------------------|-------------|
| Sub-Section Number : | 2 |
| Sub-Section Id : | 64065373982 |
| Question Shuffling Allowed : | Yes |
| Is Section Default? : | null |

Question Number : 210 Question Id : 640653521203 Question Type : MSQ Is Question

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

Correct Marks : 1 Selectable Option : 0

Question Label : Multiple Select Question

Latent demand in a demand-response curve is the area obtained when?

Options :

6406531737223. ✓ Price is reduced below the identified optimal price

6406531737224. ✘ Price is increased beyond the identified optimal price

6406531737225. ✘ The optimal price is increased beyond the maximum available price

6406531737226. ✘ Quantity is reduced below the identified optimal quantity

6406531737227. ✘ Quantity is increased beyond the identified maximum quantity

Question Number : 211 Question Id : 640653521211 Question Type : MSQ Is Question

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

Correct Marks : 1 Selectable Option : 0

Question Label : Multiple Select Question

You solve the primal of a linear program with a maximization objective, three decision variables and two constraints of the less than or equal to type. Non-negativity restrictions apply to the decision variables. After solving the linear program, you find that the first constraint is not binding ($LHS < RHS$) and the second constraint is binding ($LHS = RHS$). Which of the following statements is/are correct?

Options :

6406531737241. ✘ There are three decision variables in the dual

6406531737242. ✘ The dual variable corresponding to the second constraint is zero

6406531737243. ✓ There are two decision variables in the dual formulation

6406531737244. ✓ The dual variable corresponding to the second constraint is non-zero

Question Number : 212 Question Id : 640653521216 Question Type : MSQ Is Question

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

Time : 0

Correct Marks : 1 Selectable Option : 0

Question Label : Multiple Select Question

In Multiple Linear Regression, the "R" represents _____ (choose all those that are applicable)

Options :

6406531737248. ✘ Correlation between the dependent variable and all independent variables

6406531737249. ✓ Correlation between the actual and predicted values of the dependent variable

6406531737250. ✘ Correlation between the predicted value of the dependent variable and the actual value of the independent variable

6406531737251. ✘ Correlation between the errors

6406531737252. ✘ Correlation between the actual and predicted value of any given independent variable

6406531737253. ✘ Correlation between the actual value of the dependent variable and the predicted value of the errors

6406531737254. ✘ None of these

Sub-Section Number : 3

Sub-Section Id : 64065373983

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653521204 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 : (213 to 217)

Question Label : Comprehension

The price and demand for a product are provided in Table 1. The linear regression model is fit for this data in excel, and the output is given in Table 2. Using this information, answer the given subquestions.

| Price | Demand |
|-------|--------|
| 10 | 9703 |
| 15 | 4701 |
| 20 | 2284 |
| 25 | 2137 |
| 30 | 1036 |
| 35 | 503 |
| 40 | 144 |
| 45 | 111 |
| 50 | 54 |

Table-1

| Regression Model Parameter | Value |
|------------------------------|---------|
| R-Squared | 0.7084 |
| Observations | 9 |
| Intercept | 8125 |
| Co-efficient (Beta-1) | -194.27 |
| S.E of Intercept | 1538.44 |
| S.E of Co-efficient (Beta-1) | 47.10 |

Table-2

Sub questions

Question Number : 213 Question Id : 640653521205 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

What is the total market size?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

Question Number : 214 Question Id : 640653521206 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

What is the satiating price for the price-demand data based on the fitted model (*Note: If your answer is in decimal, enter it rounded to two decimal places. For example, if your answer is "10.256", enter it as "10.26"*)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

41.60 to 42.00

Question Number : 215 Question Id : 640653521207 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

What is the elasticity of the (regression line) demand, when the price is Rs. 33 (round to two decimal places)? (*Note: If your answer is in decimal, enter it rounded to two decimal places. For example, if your answer is "10.256", enter it as "10.26"*)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

3.60 to 3.80

Question Number : 216 Question Id : 640653521208 Question Type : MSQ Is Question

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

Time : 0

Correct Marks : 1 Selectable Option : 0

Question Label : Multiple Select Question

At the price of Rs. 33, based on the elasticity (of the regression line)_____

Options :

6406531737231. ✓ Demand is elastic

6406531737232. ✗ Demand is inelastic

6406531737233. ✗ Demand indicates luxury item

6406531737234. ✗ Demand indicates inferior item

Question Number : 217 Question Id : 640653521209 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 1

Question Label : Multiple Choice Question

As the price moves to the satiating price, then elasticity _____?

Options :

6406531737235. ✗ Decreases

6406531737236. ✓ Increases

6406531737237. ✗ Remains the same

6406531737238. ✗ Increases then decreases

6406531737239. ✗ Decreases then increases

Sub-Section Number : 4

Sub-Section Id : 64065373984

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 218 Question Id : 640653521210 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

You have estimated the demand to follow the following relationship: $D(p) = 100 - p$. Now, you intend to maximize the revenue $R(p) = D(p)^* p$. You find the first derivative of $R(p)$ with respect to p , equate it to 0 and find p^* . What is the value of p^* ?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

49.9 to 50.1

Sub-Section Number : 5

Sub-Section Id : 64065373985

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653521212 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 : (219 to 221)

Question Label : Comprehension

A multiple linear regression model, as specified below is fit on a data set with 150 data points.

MLR Model: $Y = 2.1 + 1.4 * X_1 - 4.2 * X_2 + 0.5 * X_3 + \varepsilon$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 219 Question Id : 640653521213 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

How many degrees of freedom are present for the “Residuals” in the ANOVA Table?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

146

Question Number : 220 Question Id : 640653521214 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

How many degrees of freedom are present for the “Regression” in the ANOVA Table?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Question Number : 221 Question Id : 640653521215 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

How many total degrees of freedom are present for the fitted model in the ANOVA Table?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

149

Sub-Section Number : 6

Sub-Section Id : 64065373986

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653521217 **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 : (222 to 229)

Question Label : Comprehension

Company "ABC" manufacturer's product "X". Currently, the quality inspection of "X" is done manually through visual inspection. The aim of the quality inspection process is to identify defective products. From historical experience, manual visual inspection correctly identified 75% of defective items in any given batch of only defective items.

The management has decided to replace manual visual inspection with an automatic detection system (ADS). This ADS runs a logistic model in the background for classifying an item as defective or not-defective based on photos taken by a camera. To test the ADS, a sample of 100 units of X is taken. 30% of the sample contains defective items. The samples are passed through the ADS, and the system identifies 20% of the non-defective items as defective and 10% of the defective items as non-defective.

Using this information, answer the given subquestions.

Sub questions

Question Number : 222 Question Id : 640653521218 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

How many "True Positives" is ADS predicting?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

27

Question Number : 223 Question Id : 640653521219 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

How many "False Positives" is ADS predicting?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

14

Question Number : 224 Question Id : 640653521220 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

How many "True Negatives" is ADS predicting?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

56

Question Number : 225 Question Id : 640653521221 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

How many "False Negatives" is ADS predicting?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Question Number : 226 Question Id : 640653521222 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

What is the accuracy of the ADS? (*Note: Enter the answer as a numeric percentage value rounded to two decimal places without the % symbol. For example, if your answer is "10.256 %", enter it as "10.26"*)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

82.00 to 84.00

Question Number : 227 **Question Id :** 640653521223 **Question Type :** SA **Calculator :** None

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

Correct Marks : 1

Question Label : Short Answer Question

What is the precision of the ADS when predicting defective products? (*Note: Enter the answer as a numeric percentage value rounded to two decimal places without the % symbol. For example, if your answer is "10.256 %", enter it as "10.26"*)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

65.00 to 67.00

Question Number : 228 **Question Id :** 640653521224 **Question Type :** SA **Calculator :** None

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

Correct Marks : 1

Question Label : Short Answer Question

What is the recall of the ADS when predicting non-defective products? (*Note: Enter the answer as a numeric percentage value rounded to two decimal places without the % symbol. For example, if your answer is "10.256 %", enter it as "10.26"*)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

79.00 to 81.00

Question Number : 229 Question Id : 640653521225 Question Type : MSQ Is Question

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

Correct Marks : 1 Selectable Option : 0

Question Label : Multiple Select Question

Should ADS be implemented?

Options :

6406531737262. ✘ Yes, the precision of ADS in predicting defects is higher than the current manual visual inspection

6406531737263. ✘ No, the precision of ADS in predicting defects is lower than the current manual visual inspection

6406531737264. ✓ Yes, the recall of ADS in predicting defects is higher than the current manual visual inspection

6406531737265. ✘ No, the recall of ADS in predicting defects is lower than the current manual visual inspection

6406531737266. ✘ Yes, the precision of ADS in predicting non-defects is higher than the current manual visual inspection

6406531737267. ✘ No, the precision of ADS in predicting non-defects is lower than the current manual visual inspection

6406531737268. ✘ Yes, the recall of ADS in predicting non-defects is higher than the current manual visual inspection

6406531737269. ✘ No, the recall of ADS in predicting non-defects is lower than the current manual visual inspection

System Commands

| | |
|--|-------------|
| Section Id : | 64065333942 |
| Section Number : | 14 |
| Section type : | Online |
| Mandatory or Optional : | Mandatory |
| Number of Questions : | 13 |
| Number of Questions to be attempted : | 13 |
| Section Marks : | 100 |
| 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 : | 64065373987 |
| Question Shuffling Allowed : | No |
| Is Section Default? : | null |

Question Number : 230 Question Id : 640653521226 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: SYSTEM COMMANDS"

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 :

6406531737270. ✓ YES

6406531737271. ✗ NO

Sub-Section Number : 2**Sub-Section Id :** 64065373988**Question Shuffling Allowed :** Yes**Is Section Default? :** null**Question Number : 231 Question Id : 640653521227 Question Type : MCQ Is Question****Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0****Correct Marks : 6**

Question Label : Multiple Choice Question

```
for i in *; do
    # -d is an unary operator returns exit status 0
    # if the operand is a directory
    if [ -d "$i" ]; then
        mv "$i" "$i.d"
    fi
done
```

Choose the correct statement with respect to the above script.

Options :

6406531737272. ✓ The files in the current directory will not be renamed

6406531737273. ✗ The directories in the subdirectories of the current directory will be renamed

6406531737274. ✗ Only the empty directories will be renamed

6406531737275. ✗ The files are moved from the current directory to another directory with its name suffixed by ".d"

Question Number : 232 Question Id : 640653521235 Question Type : MCQ Is Question**Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0****Correct Marks : 6**

Question Label : Multiple Choice Question

Choose the command to find all occurrences of {{DATE}} in the file template and replace with the value of shell variable DATE in the file. Note that there may be spaces between {{ and DATE and DATE and }}.

Hint: The option -i in SED does the in-place replacement.

Options :

6406531737300. ❌ sed "s/{{DATE}}/\$DATE/g" template

6406531737301. ❌ sed -i 's/{{[]*DATE[]*}}/\$DATE/g' template

6406531737302. ✓ sed -i "s/{{[]*DATE[]*}}/\$DATE/g" template

6406531737303. ❌ sed -i "s/{{[]*DATE[]*}}/\$DATE/" template

Question Number : 233 Question Id : 640653521236 Question Type : MCQ Is Question

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

Correct Marks : 6

Question Label : Multiple Choice Question

The file 'dates.txt' has a list of dates in MM/DD/YYYY format. Which of the following commands can be used to convert it to YYYY-MM-DD format?

Hint: SED uses Basic Regular Expression Engine (BRE) by default.

Options :

6406531737304. ❌ sed 's/\([0-9]{2}\)\(\([0-9]{2}\)\)\(\([0-9]{4}\)\)/\3-\1-\2/' dates.txt

6406531737305. ❌ sed 's/([0-9]{2})/([0-9]{2})/([0-9]{4})/\3-\1-\2/' dates.txt

6406531737306. ❌ sed 's/(\([0-9]{2}\))\(\([0-9]{2}\)\)\(\([0-9]{4}\)\)/\4-\2-\1/' dates.txt

6406531737307. ✓ sed 's/(\([0-9]{2}\))\(\([0-9]{2}\)\)\(\([0-9]{4}\)\)/\3-\1-\2/' dates.txt

Question Number : 234 Question Id : 640653521237 Question Type : MCQ Is Question

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

Correct Marks : 6

Question Label : Multiple Choice Question

In a quoted CSV file, the fields are bound by double quotes. Given below is an example for quoted CSV file.

```
"Nasrin","Guindy, Chennai","12389"  
"Ram Kumar","Daryaganj, Delhi","09890"
```

Note that Daryaganj, Delhi is a single field inside the quotes CSV.

Write a SED script to convert the quoted CSV to Tab Separated Value file(TSV) and remove the quotes.

Assume that the field do not contain tabs or a single comma character. The tab character can be represented by \t

Options :

6406531737308. ❌ s/"/\t/g

```
s/"/\t/g
```

6406531737309. ✓ s/"/"/g

```
s/"/"/g
```

6406531737310. ❌ s/"/\t/g

```
s/,/\t/g
```

6406531737311. ❌ s/"/"/g

Question Number : 235 Question Id : 640653521242 Question Type : MCQ Is Question

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

Correct Marks : 6

Question Label : Multiple Choice Question

Which of the following commands will print the file while prepending the line number to the start of each line, irrespective of the data in the file?

Options :

6406531737328. ✘ `awk 'END {print NR,$0}' employee_details.txt`

6406531737329. ✘ `awk 'BEGIN{FS=","}{print NR,$1}' employee_details.txt`

6406531737330. ✓ `awk '{print NR,$0}' employee_details.txt`

6406531737331. ✘ `awk '{print $1,$0}' employee_details.txt`

Sub-Section Number : 3

Sub-Section Id : 64065373989

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 236 Question Id : 640653521228 Question Type : MCQ Is Question

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

Correct Marks : 7

Question Label : Multiple Choice Question

```
for i in *; do  
  
    ** MISSING COMMAND **  
  
    # -d is an unary operator returns exit status 0  
    # if the operand is a directory  
    if [ -d "$i" ]; then  
        mv "$i" "$i.d"  
    fi  
done
```

Select the missing command to make the above script to produce the same result on every execution. The file/directory names will be the same after the first and every other execution will be the same.

Hint: The option `-q` in grep will not print output only returns the exit status

Options :

No change required. The given script produces the same result on every execution.
6406531737276. ❌

6406531737277. ❌ `ls | grep -q ".d$" && continue`

6406531737278. ❌ `ls | grep -q "\.d$" && continue`

6406531737279. ✓ `echo "$i" | grep -q "\.d$" && continue`

Question Number : 237 Question Id : 640653521238 Question Type : MCQ Is Question

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

Correct Marks : 7

Question Label : Multiple Choice Question

```
awk '
    NR == FNR {
        arr[$0]++
    }
    NR != FNR && !arr[$0] {
        print $0
    }
' file_1 file_2
```

What does the output from the above command represent?

Options :

6406531737312. ✘ Line that present in file_1 and file_2

6406531737313. ✘ Line that present in file_1 but not in file_2

6406531737314. ✓ Line that present in file_2 but not in file_1

6406531737315. ✘ Line that present in file_1 or file_2; the first occurrence will be printed

Question Number : 238 Question Id : 640653521241 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 7

Question Label : Multiple Choice Question

Here are the top five lines of access log of a server.

```
103.47.219.249 -- [27/Jan/2022:00:01:11 +0530] "GET / HTTP/1.1" 301 429
"-- Mozilla/5.0 (Macintosh; Intel Mac OS X 10_11_6) AppleWebKit/601.7.7
(KHTML, like Gecko) Version/9.1.2 Safari/601.7.7"
54.209.123.136 -- [27/Jan/2022:00:01:18 +0530] "GET
/AlloyOnto/AlloyOnto.owl HTTP/1.1" 301 494 "-- Python-urllib/3.6"
54.209.123.136 -- [27/Jan/2022:00:01:18 +0530] "GET
/AlloyOnto/AlloyOnto.owl HTTP/1.1" 301 494 "-- Python-urllib/3.6"
54.209.123.136 -- [27/Jan/2022:00:01:19 +0530] "GET
/AlloyOnto/AlloyOnto.owl HTTP/1.1" 200 1410215 "-- Python-urllib/3.6"
54.209.123.136 -- [27/Jan/2022:00:01:19 +0530] "GET
/AlloyOnto/AlloyOnto.owl HTTP/1.1" 200 1410215 "-- Python-urllib/3.6"
```

Given the following AWK script is executed on the access log file. What is the expected output from the AWK script?

```
#!/usr/bin/awk -f

{
    datetime = $4 ":" $5
    time=substr(datetime, 14, 8)

    if ( time < "06:00:00" ) {
        if ( $1 in ip ) { ip[$1]++ }
        else { ip[$1]=1 }
    }
}

END {
    mx=0
    for (i in ip) {
        if (ip[i] > mx) {
            mx = ip[i]
            mxip = i
        }
    }
    print mxip
}
```

Options :

- 6406531737324. ❌ The IP address of the client that made most requests of all time
- 6406531737325. ❌ The IP address of the client that made the least requests from 6 am to midnight.
- 6406531737326. ✓ The IP address of the client that made most requests from midnight to 6 am.
- 6406531737327. ❌ The IP address of the client that made most requests from 6 am to midnight.

| | |
|-------------------------------------|-------------|
| Sub-Section Number : | 4 |
| Sub-Section Id : | 64065373990 |
| Question Shuffling Allowed : | Yes |
| Is Section Default? : | null |

Question Number : 239 Question Id : 640653521229 Question Type : MSQ Is Question

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

Correct Marks : 8 Selectable Option : 0

Question Label : Multiple Select Question

```
$ xargs --help | head -2
Usage: xargs [OPTION]... COMMAND [INITIAL-ARGS]...
Run COMMAND with arguments INITIAL-ARGS and more arguments read from
input.
```

```
$ ls -l
total 20
drwxrwxr-x  3 amit amit  4096 Feb 28 13:29 .
drwxr-xr-x 27 amit amit 12288 Feb 28 13:28 ..
-rw-rw-r--  1 amit amit     0 Feb 28 13:29 a
-rw-rw-r--  1 amit amit     0 Feb 28 13:29 b
-rw-rw-r--  1 amit amit     0 Feb 28 13:29 c
drwxrwxr-x  2 amit amit  4096 Feb 28 13:29 d
```

```
$ ls | xargs echo
a b c d
```

Select the command(s) to move the files a, b and c to the directory d in the current working directory.

Options :

6406531737280. ✓ mv a b c d

6406531737281. ✓ ls | xargs mv -t d

6406531737282. ✓ ls | sort | xargs mv

6406531737283. ✓ mv *

Question Number : 240 Question Id : 640653521239 Question Type : MSQ Is Question

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

Correct Marks : 8 Selectable Option : 0

Question Label : Multiple Select Question

```
awk '
{
    arr[$0]++
}
END {
    for (i in arr) {
        if (arr[i] > 2) {
            print i
        }
    }
}
' file_1 file_2 file_3
```

The above command prints a line under which condition?

Options :

6406531737316. ❌ If a line is present once in any two files

6406531737317. ✓ If a line is present in all three files

6406531737318. ✓ If a line is present in any two files and its total occurrence is at least 3

6406531737319. ❌ If a line is present in only one file but its total the occurrence is at most 2

Question Number : 241 Question Id : 640653521240 Question Type : MSQ Is Question

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

Correct Marks : 8 Selectable Option : 0

Question Label : Multiple Select Question

The structure of AWK blocks are provided below

```
pattern { procedure }
```

Which of the statement(s) are true regarding AWK.

Options :

6406531737320. ✓ BEGIN block will execute the script before reading the file.

6406531737321. ✓ The AWK script that only has a BEGIN block does not require file/stdin.

6406531737322. ✓ END block will execute once all the lines/records from the files/stdin are read.

6406531737323. ✓ The block without any pattern will execute for all the lines/records from files/stdin.

Sub-Section Number : 5

Sub-Section Id : 64065373991

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653521230 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 : (242 to 245)

Question Label : Comprehension

Assume the filenames will not have a colon (:) in it.

Use the console output to answer the given subquestions.

```

If F is - then read names from standard input
-k, --key=KEYDEF      sort via a key; KEYDEF gives location and
type

.....
-t, --field-separator=SEP  use SEP instead of non-blank to blank
transition
.....



$ grep -ric "print"
tools/example.sh:0
tools/upgrade.sh:12
tools/uninstall.sh:12
tools/install.sh:44
tools/autossh.sh:3

$ cat data
13118,21233,24423
29515,22595,27723
20753,2195,4761
29399,23451,23061
725,11432,26480

$ cat data | sort -t , -k 3 -n
20753,2195,4761
29399,23451,23061
13118,21233,24423
725,11432,26480
29515,22595,27723

```

Sub questions

Question Number : 242 Question Id : 640653521231 Question Type : MCQ Is Question

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

Correct Marks : 6

Question Label : Multiple Choice Question

```

$ grep -ric "print" |
  sort -nr -t : -k 2 |
  cut -d: -f1 |
  head -n 10

```

What will be the output from the above command represent?

Options :

6406531737284. ❌ Total number of *lines* have the string "print" in all files in the current and subdirectories

6406531737285. ❌ Total number of occurrences of "print" in all files in the current and subdirectories

6406531737286. ✓ Top 10 files that contains most number of lines have "print" among all files in the current and subdirectories

6406531737287. ❌ Top 10 files that contains the least number of lines have "print" among all files in the current and subdirectories

Question Number : 243 Question Id : 640653521232 Question Type : MCQ Is Question

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

Correct Marks : 7

Question Label : Multiple Choice Question

```
$ grep -ric "print" |  
  cut -d: -f2 |  
  while read n; do  
    count=${count:-0}  
    count=$((count + n))  
    echo $count  
  done | tail -n 1
```

What will be the output from the above command represent?

Options :

6406531737288. ✓ Total number of *lines* have the string "print" in all files in the current and subdirectories

6406531737289. ❌ Total number of *files* have the string "print" in the current and subdirectories

6406531737290. ❌ Total number of *occurrences* of "print" in all files in the current and subdirectories

6406531737291. ❌ Total number of *occurrences* of "print" in all files in the current directory

Question Number : 244 Question Id : 640653521233 Question Type : MSQ Is Question

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

Time : 0

Correct Marks : 6 Selectable Option : 0

Question Label : Multiple Select Question

```
$ grep -ric "print" |  
  cut -d: -f2 |  
  while read n; do  
    count=${count:-0}  
    count=$((count + n))  
    echo $count  
  done | tail -n 1
```

What will be the equivalent command(s) using AWK with respect to the provided data?

Options :

6406531737292. ✓

```
grep -ric "print" |  
  cut -d: -f2 |  
  awk '{c+=$1} END{print c}'
```

6406531737293. ✓

```
grep -ric "print" |  
  awk 'BEGIN{FS=":"} {c+=$2} END{print c}'
```

6406531737294. ✘

```
grep -ric "print" |  
  awk '{c+=$1} END{print c}'
```

6406531737295. ✘

```
grep -ric "print" |  
  awk 'BEGIN{FS=":"} {c=$2} END{print c}'
```

Question Number : 245 Question Id : 640653521234 Question Type : MSQ Is Question

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

Time : 0

Correct Marks : 6 Selectable Option : 0

Question Label : Multiple Select Question

```
$ grep -ric "print" |  
    cut -d: -f2
```

What will be the equivalent command(s) using SED with respect to the provided data?

Options :

6406531737296. ✓

```
grep -ric "print" |  
    sed 's/.*://'  
    # Assumption: no colon in the filename  
    # refer sample output
```

6406531737297. ✓

```
grep -ric "print" |  
    sed 's/[^:]*:[^:]*://'
```

6406531737298. ✘

```
grep -ric "print" |  
    sed 's/[^:]*:[^:]*:[^:]*//g'
```

6406531737299. ✘

```
grep -ric "print" |  
    sed 's/:.*//'
```