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 QUIZ2 EXAM QPE1 10 July 2022 IBA
Subject Name :	2022 July: IIT M DIPLOMA QUIZ2 EXAM QPE1
Creation Date :	2022-07-06 19:08:52
Duration :	120
Total Marks :	655
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 :	6406538799
Group Maximum Duration :	0
Group Minimum Duration :	90
Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	655
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

Maths 2

Section Id :	64065322062
Section Number :	1

Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	8
Number of Questions to be attempted :	8
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 :	64065349907
Question Shuffling Allowed :	No

Question Number : 1 Question Id : 640653349578 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 :

6406531160843. ✔ Yes

6406531160844. ✖ No

Sub-Section Number :	2
Sub-Section Id :	64065349908
Question Shuffling Allowed :	Yes

Question Number : 2 Question Id : 640653349579 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Select Question

Choose the correct options.

Options :

6406531160845. ✔ The row reduced echelon form of an $n \times n$ orthogonal matrix is the identity matrix of order n.

6406531160846. ✔ Suppose that A is a non-zero $m \times n$ matrix such that the vectors in $\mathbb{R}^m$ corresponding to the columns of A are mutually orthonormal with respect to the usual inner product of $\mathbb{R}^m$. Then $A^TA = I$, where I is the identity matrix of order n.

6406531160847. ✖ The trace of an $n \times n$ orthogonal matrix is 0.

6406531160848. ✖ Suppose A is a non-zero $m \times n$ matrix such that the vectors in $\mathbb{R}^m$ corresponding to the columns of A are mutually orthogonal with respect to the usual inner product of $\mathbb{R}^m$. Then AA^T is a diagonal matrix of order m.

Question Number : 3 Question Id : 640653349588 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Select Question

An inner product on a vector space V is a function $\langle \cdot, \cdot \rangle : V \times V \to \mathbb{R}$ 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: $\langle v_1 + v_2, v_3 \rangle = \langle v_1, v_3 \rangle + \langle v_2, v_3 \rangle$.

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

Condition 4: $\langle cv_1, v_2 \rangle = c\langle v_1, v_2 \rangle$

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

$$\langle \cdot, \cdot \rangle : V \times V \to \mathbb{R}$$
$$\langle (x_1, x_2), (y_1, y_2) \rangle = x_1 y_1 - x_1 y_2 - x_2 y_1 + x_2 y_2.$$

Which of the following are satisfied by the above function?

Options :

6406531160859. ✖ Condition 1 is satisfied.

6406531160860. ✔ Condition 2 is satisfied.

6406531160861. ✔ Condition 3 is satisfied.

6406531160862. ✔ Condition 4 is satisfied.

Question Number : 4 Question Id : 640653349590 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Select Question

Let U be a subspace of the vector space $\mathbb{R}^3$ and suppose $\{(1, 0, 1), (0, 1, 2)\}$ is a basis of U. Then which of the following subsets of $\mathbb{R}^3$ are appropriate candidates for the affine subspaces of $\mathbb{R}^3$ such that the corresponding vector subspace is U?

Options :

6406531160867. ✖ $\{(x, y, z) \mid x + 2y + z = 2, x, y, z \in \mathbb{R}\}$

6406531160868. ✖ $\{(x, y, z) \mid x + 2y + z = 1, x, y, z \in \mathbb{R}\}$

6406531160869. ✖ $\{(x, y, z) \mid x - 2y - z = 0, x, y, z \in \mathbb{R}\}$

6406531160870. ✖ $\{(x, y, z) \mid x - 2y - z = 1, x, y, z \in \mathbb{R}\}$

6406531160871. ✔ $\{(x, y, z) \mid x + 2y - z = 2, x, y, z \in \mathbb{R}\}$

6406531160872. ✔ $\{(x, y, z) \mid x + 2y - z = 0, x, y, z \in \mathbb{R}\}$

Sub-Section Number : 3

Sub-Section Id : 64065349909

Question Shuffling Allowed : Yes

Question Number : 5 Question Id : 640653349587 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 us consider the following matrices:

$$A = \begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix}, B = \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}, C = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

Consider the following pairs of matrices :

- Pair I: A, B
- Pair II: A, C
- Pair III: B, C

Choose the correct option from the following.

Options :

6406531160855. ✔ Only the matrices in Pair I are similar matrices.

6406531160856. ✖ All the pairs consist of similar matrices.

6406531160857. ✖ Only the matrices in Pair III are similar matrices.

6406531160858. ✖ None of these pairs consist of similar matrices.

Sub-Section Number : 4

Sub-Section Id : 64065349910

Question Shuffling Allowed : Yes

Question Number : 6 Question Id : 640653349589 Question Type : MSQ Is Question

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

Correct Marks : 1

Question Label : Multiple Select Question

A norm on a vector space V is a function

$$\|\cdot\| : V \to \mathbb{R}$$

$$x \mapsto \|x\|$$

satisfying the following conditions:

Condition 1: $\|x+y\| \leq \|x\| + \|y\|$ for all $x, y \in V$.
Condition 2: $\|cx\| = |c|\|x\|$ for all $c \in \mathbb{R}$ and for all $x \in V$.
Condition 3: $\|x\| \geq 0$ for all $x \in V$; $\|x\|=0$ if and only if $x = 0$.

Consider a function $\|\cdot\| : \mathbb{R}^3 \to \mathbb{R}$ defined as

$$\|(x_1, x_2, x_3)\| = |x_1 + x_2 + x_3|$$

on the vector space $\mathbb{R}^3$.
Which of the following are satisfied by the above function?

Options :

6406531160863. ✔ Condition 1 is satisfied.

6406531160864. ✔ Condition 2 is satisfied.

6406531160865. ✖ Condition 3 is satisfied.

6406531160866. ✖ None of these conditions are satisfied.

Sub-Section Number : 5

Sub-Section Id : 64065349911

Question Shuffling Allowed : No

Question Id : 640653349580 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (7 to 12)

Question Label : Comprehension

Let T be a linear transformation from $\mathbb{R}^3$ to $\mathbb{R}^2$ defined as $T(x, y, z) = (x + y - z, y + z)$. Let A be the matrix representation of T with respect to the basis $\beta = \{(1, 1, 0), (0, 1, 1), (1, 0, 1)\}$ for the domain and the basis $\gamma = \{(1, 1), (1, 0)\}$ for the codomain.

$$A = \begin{bmatrix} a & b & c \\ d & e & f \end{bmatrix}$$

Let $S = \{(x, y, z) \mid x = mz, y = nz; x, y, z \in \mathbb{R}\}$ be the nullspace of the T.

Answer the subquestions based on the given data.

Sub questions

Question Number : 7 Question Id : 640653349581 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 value of *d* – *a* ?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Question Number : 8 Question Id : 640653349582 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 value of *e* – *b*?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

-4

Question Number : 9 Question Id : 640653349583 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 value of $f - c$?

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 : 640653349584 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 value of m?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 11 Question Id : 640653349585 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 value of *n*?

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 : 640653349586 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

Find out the nullity 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 :	64065349912
Question Shuffling Allowed :	No

Question Id : 640653349591 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (13 to 22)

Question Label : Comprehension

Suppose two publication houses (publication house A and publication house B) have organized a sale of their books. Both of them publish three types of books: novels, poetry collections and collections of short stories. The selling price (in (hundreds) ₹) of these three types of books in publication houses A and B are given as follows:

	Novels	Poetry collections	Collections of short stories
Publication house A	1	2	5
Publication house B	3	3	3

Table: Q2M2T1

The publication houses announced that in order to avail these special sale prices, customers have to buy equal number of novels, equal number of poetry collection, and equal number of collection of short stories from each of the publication houses (i.e., if a customer buys x number of novels, y number of poetry collections and z number of collection of short stories from Publication house A; then they have to buy exactly x number of novels, y number of poetry collections and z number of collection of short stories from Publication house B, to avail the benefit of the sale). So there is a map taking the tuple consisting of the number of books of each type bought (Novels, Poetry collections, Collection of short stories) to the prices paid by customers who availed the sale to each of the publication houses, which yields a linear transformation (T) from $\mathbb{R}^3$ to $\mathbb{R}^2$ (where the first and second co-ordinates of the image denotes the prices paid to publication house A and publication house B, respectively).

Answer the subquestions using the above information.

Sub questions

Question Number : 13 Question Id : 640653349592 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

If A is the matrix representation of T with respect to the basis $\{(1,0,0),(0,1,0),(0,0,1)\}$ for $\mathbb{R}^3$ and to the basis $\{(1,0),(0,1)\}$ for $\mathbb{R}^2$, then A is

Options :

6406531160873. ✖ $\begin{bmatrix}1 & 3\\2 & 3\\5 & 3\end{bmatrix}$

6406531160874. ✔ $\begin{bmatrix}1 & 2 & 5\\3 & 3 & 3\end{bmatrix}$

6406531160875. ✖ $\begin{bmatrix}1 & 3 & 5\\2 & 3 & 3\end{bmatrix}$

6406531160876. ✖ $\begin{bmatrix}1 & 0 & 1\\0 & 1 & 0\end{bmatrix}$

Question Number : 14 Question Id : 640653349593 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

We apply the sequence of row operations on A, as follows:

- Step 1: $R_2 - 3R_1$
- Step 2: $-\frac{1}{3}R_2$
- Step 3: $R_1 - 2R_2$

Applying this row operations in the given order, the matrix B is derived. Let

$$B = \begin{bmatrix}a & b & c\\d & e & f\end{bmatrix}$$

What is the value 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 : 15 Question Id : 640653349594 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

We apply the sequence of row operations on A, as follows:

- Step 1: $R_2 - 3R_1$
- Step 2: $-\frac{1}{3}R_2$
- Step 3: $R_1 - 2R_2$

Applying this row operations in the given order, the matrix B is derived. Let

$$B = \begin{bmatrix} a & b & c \\ d & e & f \end{bmatrix}$$

What is the value of d ?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Question Number : 16 Question Id : 640653349595 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

We apply the sequence of row operations on A, as follows:

- Step 1: $R_2 - 3R_1$
- Step 2: $-\frac{1}{3}R_2$
- Step 3: $R_1 - 2R_2$

Applying this row operations in the given order, the matrix B is derived. Let

$$B = \begin{bmatrix} a & b & c \\ d & e & f \end{bmatrix}$$

What is the value of c ?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

-3

Question Number : 17 Question Id : 640653349596 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 {(*l*, *m*, *n*)} is a basis of *ker*(*T*), then

Find the value of *l* if *n* is 1.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Question Number : 18 Question Id : 640653349597 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 {(*l*, *m*, *n*)} is a basis of *ker*(*T*), then

Find the value of *m* if *n* is 1.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

-4

Question Number : 19 Question Id : 640653349598 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 $\beta = \{v_1, v_2\}$ be the orthonormal basis of the row space obtained by using the GramSchmidt process (with respect to usual inner product) applied on the ordered basis of the row space given by the first row and the second row of the matrix A. If

$$v_2 = \frac{1}{\sqrt{195}}(b, c, d)$$

What is the value of $\|30v_1\|$?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

30

Question Number : 20 Question Id : 640653349599 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 $\beta = \{v_1, v_2\}$ be the orthonormal basis of the row space obtained by using the GramSchmidt process (with respect to usual inner product) applied on the ordered basis of the row space given by the first row and the second row of the matrix A. If

$$v_2 = \frac{1}{\sqrt{195}}(b, c, d)$$

What is the value of b?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

11

Question Number : 21 Question Id : 640653349600 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 $\beta = \{v_1, v_2\}$ be the orthonormal basis of the row space obtained by using the GramSchmidt process (with respect to usual inner product) applied on the ordered basis of the row space given by the first row and the second row of the matrix A. If

$$v_2 = \frac{1}{\sqrt{195}}(b, c, d)$$

What is the value of c?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

7

Question Number : 22 Question Id : 640653349601 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 $\beta = \{v_1, v_2\}$ be the orthonormal basis of the row space obtained by using the GramSchmidt process (with respect to usual inner product) applied on the ordered basis of the row space given by the first row and the second row of the matrix A. If

$$v_2 = \frac{1}{\sqrt{195}}(b, c, d)$$

What is the value of d?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

-5

Statistics 2

Section Id :	64065322063
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 Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	64065349913
Question Shuffling Allowed :	No

Question Number : 23 Question Id : 640653349602 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 :

6406531160886. ✔ Yes

6406531160887. ✖ No

Question Number : 24 Question Id : 640653349603 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 ($F_X(x)$)	$E[X]$	$\mathrm{Var}(X)$
Uniform(A) $A=\{a,a+1,\dots,b\}$	$\frac{1}{n}$, $x=k$ $n=b-a+1$ $k=a,a+1,\dots,b$	$\begin{cases}0 & x<0\\ \frac{k-a+1}{n} & k\le x<k+1\\ & k=a,a+1,\dots,b-1,b\\ 1 & x\ge n\end{cases}$	$\frac{a+b}{2}$	$\frac{n^2-1}{12}$
Bernoulli(p)	$\begin{cases}p & x=1\\ 1-p & x=0\end{cases}$	$\begin{cases}0 & x<0\\ 1-p & 0\le x<1\\ 1 & x\ge 1\end{cases}$	p	$p(1-p)$
Binomial(n,p)	${}^nC_k p^k(1-p)^{n-k}$, $k=0,1,\dots,n$	$\begin{cases}0 & x<0\\ \sum_{i=0}^{k} {}^nC_i p^i(1-p)^{n-i} & k\le x<k+1\\ & k=0,1,\dots,n\\ 1 & x\ge n\end{cases}$	np	$np(1-p)$
Geometric(p)	$(1-p)^{k-1}p$, $k=1,\dots,\infty$	$\begin{cases}0 & x<0\\ 1-(1-p)^k & k\le x<k+1\\ & k=1,\dots,\infty\end{cases}$	$\frac{1}{p}$	$\frac{1-p}{p^2}$
Poisson(λ)	$\frac{e^{-\lambda}\lambda^k}{k!}$, $k=0,1,\dots,\infty$	$\begin{cases}0 & x<0\\ e^{-\lambda}\sum_{i=0}^{k}\frac{\lambda^i}{i!} & k\le x<k+1\\ & k=0,1,\dots,\infty\end{cases}$	λ	λ

Continuous random variables:

Distribution	PDF ($f_X(k)$)	CDF ($F_X(x)$)	$E[X]$	$\mathrm{Var}(X)$
Uniform$[a,b]$	$\frac{1}{b-a}$, $a \le x \le b$	$\begin{cases} 0 & x \le a \\ \frac{x-a}{b-a} & a < x < b \\ 1 & x \ge b \end{cases}$	$\frac{a+b}{2}$	$\frac{(b-a)^2}{12}$
Exp(λ)	$\lambda e^{-\lambda x}$, $x > 0$	$\begin{cases} 0 & x \le 0 \\ 1-e^{-\lambda x} & x > 0 \end{cases}$	$\frac{1}{\lambda}$	$\frac{1}{\lambda^2}$
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)	$\frac{\Gamma(\alpha+\beta)}{\Gamma(\alpha)\Gamma(\beta)} x^{\alpha-1}(1-x)^{\beta-1}$ $0 < x < 1$		$\frac{\alpha}{\alpha+\beta}$	$\frac{\alpha\beta}{(\alpha+\beta)^2(\alpha+\beta+1)}$

1. **Markov's inequality:** Let X be a discrete random variable taking non-negative values with a finite mean μ. Then,
$$P(X \ge c) \le \frac{\mu}{c}$$

2. **Chebyshev's inequality:** Let X be a discrete random variable with a finite mean μ and a finite variance σ^2. Then,
$$P(|\, X - \mu \,| \ge k\sigma) \le \frac{1}{k^2}$$

3. **Weak Law of Large numbers:** Let $X_1, X_2, \ldots, X_n \sim$ iid X with $E[X] = \mu, \mathrm{Var}(X) = \sigma^2$.
Define sample mean $\overline{X} = \frac{X_1 + X_2 + \ldots + X_n}{n}$. Then,
$$P(|\overline{X} - \mu| > \delta) \le \frac{\sigma^2}{n\delta^2}$$

4. **Using CLT to approximate probability:** Let $X_1, X_2, \ldots, X_n \sim$ iid X with $E[X] = \mu$, $\mathrm{Var}(X) = \sigma^2$.
Define $Y = X_1 + X_2 + \ldots + X_n$. Then,
$$\frac{Y - n\mu}{\sqrt{n}\sigma} \approx \text{Normal}(0,1).$$

Options :

6406531160888. ✔ Useful Data has been mentioned above.

6406531160889. ✖ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number : 2

Sub-Section Id : 64065349914

Question Shuffling Allowed : Yes

Question Number : 25 Question Id : 640653349615 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 a random variable X with the following PMF:

X	0	1	2	3
$p_X(x)$	1/8	1/4	1/8	1/2

Find the moment generating function of X.

Options :

6406531160904. ✖ $M_X(\lambda) = \frac{1}{4}e^{-\lambda} + \frac{1}{8}e^{-2\lambda} + \frac{1}{2}e^{-3\lambda}$

6406531160905. ✖ $M_X(\lambda) = \frac{1}{8} + \frac{1}{4}e^{\lambda} + \frac{1}{8}e^{2\lambda} + \frac{1}{2}e^{3\lambda}$

6406531160906. ✔ $M_X(\lambda) = \frac{1}{8} + \frac{1}{4}e^{-\lambda} + \frac{1}{8}e^{-2\lambda} + \frac{1}{2}e^{-3\lambda}$

6406531160907. ✖ $M_X(\lambda) = \frac{1}{4}e^{\lambda} + \frac{1}{8}e^{2\lambda} + \frac{1}{2}e^{3\lambda}$

Sub-Section Number : 3

Sub-Section Id : 64065349915

Question Shuffling Allowed : Yes

Question Number : 26 Question Id : 640653349630 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 $X_1, X_2, \ldots, X_{50} \sim$ i.i.d. Poisson(2) and let $Y = \sum_{i=1}^{50} X_i$. Using Central Limit theorem, find the value of $P(Y > 50)$.

Options :

6406531160931. ✔ $1 - F_z(-5)$

6406531160932. ✖ $1 - F_z(5)$

6406531160933. ✖ $F_z(-0.5)$

6406531160934. ✖ $1 - F_z(-0.5)$

Sub-Section Number :	4
Sub-Section Id :	64065349916
Question Shuffling Allowed :	Yes

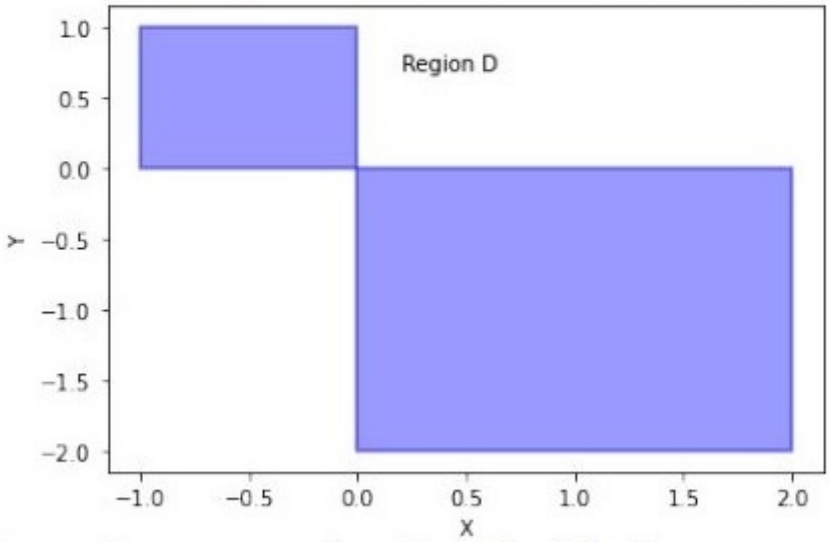
Question Number : 27 Question Id : 640653349616 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Select Question

Suppose random variables X and Y are uniformly distributed over the region D, where

$$D = \{(x, y) : [0, 2] \times [0, -2] \cup [-1, 0] \times [0, 1]\}$$



Choose the correct options from the following:

Options :

6406531160908. ✖ $$f_{XY}(x, y) = \begin{cases} 4, & 0 < x < 2, -2 < y < 0 \\ 1, & -1 < x < 0, 0 < y < 1 \\ 0, & \text{otherwise} \end{cases}$$

6406531160909. ✔ $$f_{XY}(x, y) = \begin{cases} \frac{1}{5}, & x, y \in D \\ 0, & \text{otherwise} \end{cases}$$

6406531160910. ✔ $f_{Y|X=1}(-1) = 0.5$

6406531160911. ✖ $f_{Y|X=1}(-1) = 0$

6406531160912. ✖ $f_{Y|X=1}(-1) = 0.625$

Sub-Section Number : 5

Sub-Section Id : 64065349917

Question Shuffling Allowed : No

Question Id : 640653349608 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Calculator : None Response Time : N.A

Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (28 to 30)

Question Label : Comprehension

Consider a sample 0, 1, 0, 1, 1, 1, 0, 1, 0, 1 from Bernoulli(0.5) distribution.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 28 Question Id : 640653349609 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

Compute empirical distribution of the sample.

Options :

6406531160893. ✖ $p(0) = 0.3, p(1) = 0.7$

6406531160894. ✔ $p(0) = 0.4, p(1) = 0.6$

6406531160895. ✖ $p(0) = 0.6, p(1) = 0.4$

6406531160896. ✖ $p(0) = 0.7, p(1) = 0.3$

Question Number : 29 Question Id : 640653349610 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

Compute distribution mean. Enter the answer correct to one decimal place.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0.5

Question Number : 30 Question Id : 640653349611 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

Compute sample mean. Enter the answer correct to one decimal place.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0.6

Question Id : 640653349612 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No 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 continuous random variable with PDF

$$f_X(x) = \begin{cases} 2/3, & 0 < x < 1 \\ 1/3, & 2 < x < 3 \\ 0, & \text{otherwise} \end{cases}$$

Based on the above data, answer the given subquestions.

Sub questions

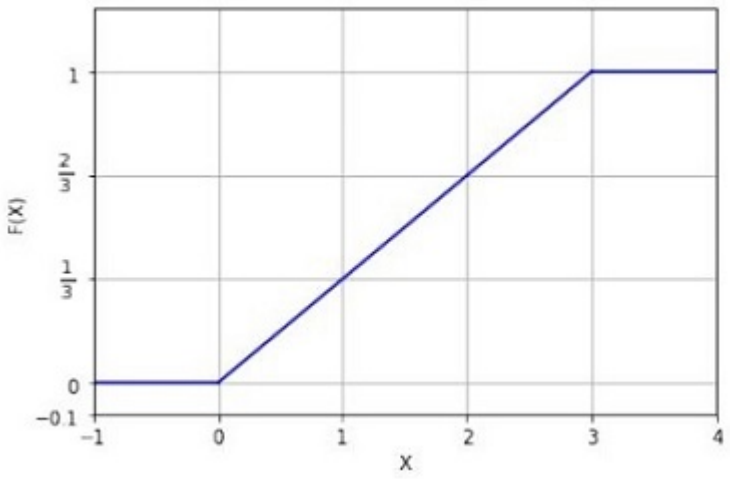
Question Number : 31 Question Id : 640653349613 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

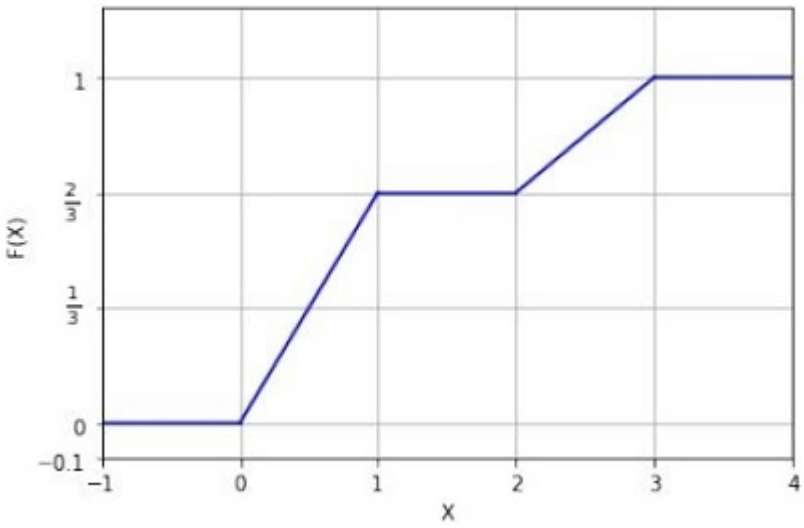
Question Label : Multiple Choice Question

Which among the following represent the cumulative distribution function (CDF) of X?

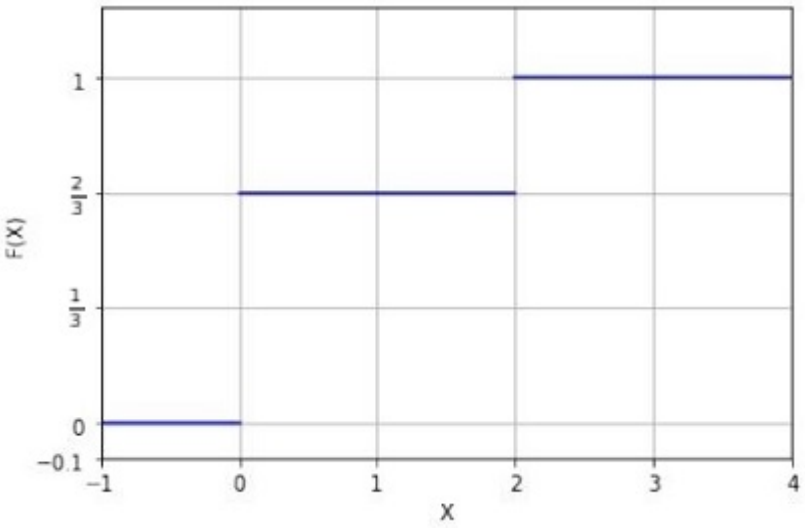
Options :



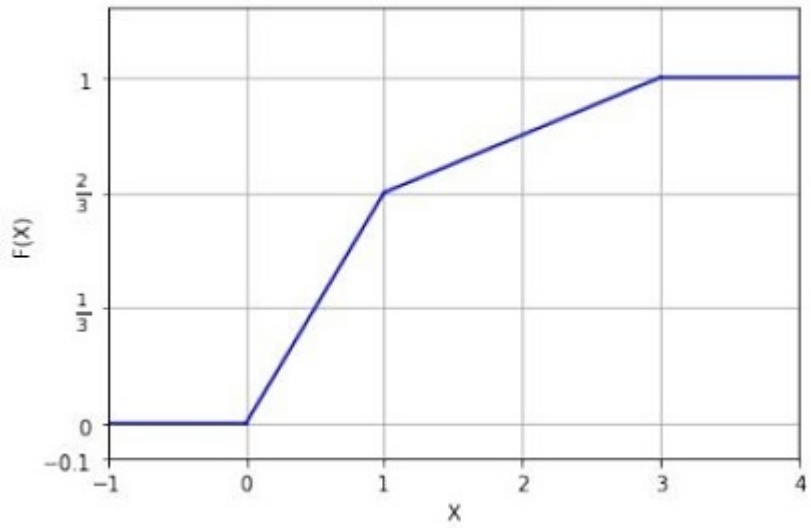
6406531160899. ✖



6406531160900. ✔



6406531160901. ✖



6406531160902.

Question Number : 32 Question Id : 640653349614 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

Find the value of P(X ≤ 2.5). 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 :

0.81 to 0.85

Sub-Section Number :	6
Sub-Section Id :	64065349918
Question Shuffling Allowed :	No

Question Id : 640653349604 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (33 to 35)

Question Label : Comprehension

Let the random variables X and Y have the following joint density function:

$$f_{XY}(x,y) = \begin{cases} 1 & \text{for } 0 \le x < 1\ ,\ 0 \le y < 1 \\ 0 & \text{otherwise} \end{cases}$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 33 Question Id : 640653349605 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

Calculate $P\left(0 < X < \frac{1}{2}, \frac{1}{4} < Y < \frac{1}{2}\right)$.

Enter the 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 :

0.125

Question Number : 34 Question Id : 640653349606 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

Find $P\left(0 < X < \frac{1}{2}\right)$. Enter the answer correct to one decimal place.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0.5

Question Number : 35 Question Id : 640653349607 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 $P(X < 2Y)$. Enter the answer correct to two decimal places.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0.75

Sub-Section Number :	7
Sub-Section Id :	64065349919
Question Shuffling Allowed :	No

Question Id : 640653349624 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (36 to 37)

Question Label : Comprehension

Consider a sample of i.i.d. random variables ($X_1, X_2, \ldots, X_n$), where each of the X_i's follows Uniform(−0.5, 0.5) distribution.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 36 Question Id : 640653349625 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

Compute the expected value and variance of sample mean, $\overline{X} = \frac{X_1 + \ldots + X_n}{n}$.

Options :

6406531160921. ✖ $E[\overline{X}] = 0$ and $\text{Var}[\overline{X}] = 0$

6406531160922. ✖ $E[\overline{X}] = 0$ and $\text{Var}[\overline{X}] = \frac{1}{12}$

6406531160923. ✖ $E[\overline{X}] = \frac{1}{2}$ and $\text{Var}[\overline{X}] = \frac{1}{n}$

6406531160924. ✔ $E[\overline{X}] = 0$ and $\text{Var}[\overline{X}] = \frac{1}{12\,n}$

Question Number : 37 Question Id : 640653349626 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 minimum value of n such that probability that the sample mean, $\overline{X}$ is within 0.2 of the distribution mean is at least 0.9 using Weak Law of Large numbers.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

21

Question Id : 640653349627 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (38 to 39)

Question Label : Comprehension

Let X be a continuous uniform random variable on $[0, 1]$ and $Y = \frac{1}{X}$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 38 Question Id : 640653349628 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 probability density function of Y.

Options :

6406531160926. ✖ $f_Y(y) = 1 - \frac{1}{y}$, for $0 \leq y < \infty$

6406531160927. ✖ $f_Y(y) = 1 - \frac{1}{y}$, for $1 \leq y < \infty$

6406531160928. ✖ $f_Y(y) = \frac{1}{y^2}$, for $0 \leq y < \infty$

6406531160929. ✔ $f_Y(y) = \frac{1}{y^2}$, for $1 \leq y < \infty$

Question Number : 39 Question Id : 640653349629 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 P($Y \leq 2$). Enter the answer correct to one decimal place.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0.5

Sub-Section Number :	8
Sub-Section Id :	64065349920
Question Shuffling Allowed :	No

Question Id : 640653349617 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (40 to 41)

Question Label : Comprehension

30% of the total players in IPL 2022 are uncapped (i.e., they have not played any international games) and 70% are capped (i.e., they have played at least 1 international game). Suppose the runs scored by the capped players is Normal(60, 25) and the runs scored by the uncapped players is Normal(55,36).

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 40 Question Id : 640653349618 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 distribution of runs of a randomly chosen player.

Options :

6406531160913. ✖ $\frac{3}{25\sqrt{2\pi}}\exp\left(\frac{-(y-60)^2}{50}\right)+\frac{1}{15\sqrt{2\pi}}\exp\left(\frac{-(y-55)^2}{72}\right)$

6406531160914. ✔ $\frac{7}{50\sqrt{2\pi}}\exp\left(\frac{-(y-60)^2}{50}\right)+\frac{1}{20\sqrt{2\pi}}\exp\left(\frac{-(y-55)^2}{72}\right)$

6406531160915. ✖ $\frac{3}{25\sqrt{2\pi}}\exp\left(\frac{-(y-60)^2}{50}\right)+\frac{7}{15\sqrt{2\pi}}\exp\left(\frac{-(y-55)^2}{72}\right)$

6406531160916. ✖ $\frac{7}{25\sqrt{2\pi}}\exp\left(\frac{-(y-60)^2}{50}\right)+\frac{1}{15\sqrt{2\pi}}\exp\left(\frac{-(y-55)^2}{72}\right)$

Question Number : 41 Question Id : 640653349619 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 a randomly selected player scored 60 runs, what is the probability that the selected candidate is a capped player? 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 :

0.77 to 0.82

Question Id : 640653349620 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (42 to 44)

Question Label : Comprehension

Suppose the time to failure of device *A* is exponentially distributed with parameter α. Suppose the time to failure of device *B* is exponentially distributed with parameter β. Let *X* and *Y* denote the time to failure of Devices *A* and *B*, respectively. The joint pdf of *X* and *Y* is given by

$$f_{XY}(x,y) = \begin{cases} ke^{-(4x+5y)} & \text{if } x > 0, y > 0 \\ 0 & \text{otherwise} \end{cases}$$

Sub questions

Question Number : 42 Question Id : 640653349621 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 :

20

Question Number : 43 Question Id : 640653349622 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

Find the value of $\alpha + \beta$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

9

Question Number : 44 Question Id : 640653349623 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 Device *B* will last longer when compared to Device *A*.

Enter the answer correct to two decimal places.

$$\underline{\text{Hint:}}\ \text{Use}\ \int_a^b e^{nx}\,dx = \left.\frac{e^{nx}}{n}\right|_a^b$$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.42 to 0.46

CT

Section Id :	64065322064
Section Number :	3
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 :	64065349921
Question Shuffling Allowed :	No

Question Number : 45 Question Id : 640653349631 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 :

6406531160935. ✔ Yes

6406531160936. ✖ No

Question Number : 46 Question Id : 640653349632 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	CityTown	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

Options :

6406531160937. ✔ Useful Data has been mentioned above.

6406531160938. ✖ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number : 2

Sub-Section Id : 64065349922

Question Shuffling Allowed : Yes

Question Number : 47 Question Id : 640653349633 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

Let **D** = { 'a' : {'a': 5, 'b' : 4}, 'b': 1}, then the value of **D**['b'] is 4.

Options :

6406531160939. ✖ TRUE

6406531160940. ✔ FALSE

Question Number : 48 Question Id : 640653349634 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

If 'x' is a key of dictionary **D**, then the value of **D**['x'] can be 'x'.

Options :

6406531160941. ✔ TRUE

6406531160942. ✖ FALSE

Sub-Section Number : 3

Sub-Section Id : 64065349923

Question Shuffling Allowed : Yes

Question Number : 49 Question Id : 640653349635 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 'x' and 'y' are the only two keys of dictionary **D** and **L** = **keys**(**D**) then

Options :

6406531160943. ✖ L = ['x', 'y']

6406531160944. ✖ L = ['y', 'x']

6406531160945. ✔ L = either ['x', 'y'] or ['y', 'x']

Question Number : 50 Question Id : 640653349637 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 **timeList** be a list of pairs containing information about trains associated with a station **stn**. Specifically, each element in this list is a pair: [*Arrival*, *Departure*] (pair of arrival and departure time). If the arrival or departure time is empty, it is represented as "None". What does **count** represent at the end of the execution of the following pseudocode?

```
count = 0
foreach x in timeList{
    if(first(x) != "None" and last(x) != "None"){
        count = count + 1
    }
}
```

Options :

6406531160950. ✖ Number of trains for which **stn** is a starting station

6406531160951. ✖ Number of trains for which **stn** is an ending station

6406531160952. ✖ Number of trains for which **stn** is either a starting or an ending station

6406531160953. ✔ Number of trains for which **stn** is neither a starting nor an ending station

Sub-Section Number : 4

Sub-Section Id : 64065349924

Question Shuffling Allowed : Yes

Question Number : 51 Question Id : 640653349638 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

A word is said to be "Vowel Rich" if the word has at least three distinct vowels. Let **isRich** be a procedure that takes a row **X** from the "Words" table as input and returns True if the word in row **X** is a Vowel Rich otherwise returns False. Choose the correct code fragment to complete the procedure **isRich** .

```
Procedure isRich(X)
    vDict = {}
    i = 1, A = ''
    while(i <= X.LetterCount){
        A = ith letter in X.Word
        ************************
        **  Fill the code     **
        ************************
        i = i + 1
    }
    if(length(keys(vDict)) >= 3){
        return(True)
    }
    return(False)
End isRich
```

Options :

6406531160954. ✔

```
if(A is a vowel){
    vDict[A] = True
}
```

6406531160955. ✖

```
if(A is a vowel){
    vDict[A] = True
}
else{
    vDict[A] = False
}
```

6406531160956. ✖

```
if(A is a vowel){
    vDict[A] = vDict[A] + 1
}
```

```
if(A is a vowel){
    vDict[A] = False
}
else{
    vDict[A] = True
}
```

6406531160957. ✖

Sub-Section Number : 5

Sub-Section Id : 64065349925

Question Shuffling Allowed : Yes

Question Number : 52 Question Id : 640653349640 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 the increasing order of sequence numbers from top to bottom. What will **L** represent at the end of the execution?

```
L = []
A = "None"
Read the first row X in Table 1
A = X.PartOfSpeech
Move X to Table 2
while(Table 1 has more rows){
    Read the first row Y in Table 1
    if(Y.PartOfSpeech == "Noun"){
        if(A == "Adjective"){
            L = L ++ [Y.Word]
        }
    }
    A = Y.PartOfSpeech
    Move Y to Table 2
}
```

Options :

6406531160962. ✔ List of nouns that appear immediately after an adjective

6406531160963. ✖ List of adjectives that appear immediately after a noun

6406531160964. ✖ List of nouns that appear immediately before an adjective

6406531160965. ✖ List of adjectives that appear immediately before a noun

Question Number : 53 Question Id : 640653349642 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

Two trains are called "Opposite Trains" if they stop at the same set of stations but in the reverse order. **isOpposite(N1, N2)** returns True if trains with train numbers **N1** and **N2** are "Opposite Trains" and False otherwise.

trains is a dictionary with train number as key mapped to a list of stations which that train runs through. For example, **trains** = { 12281: ["Bhubaneswar","Balasore", "Adra", "Varanasi", "Kanpur", "New Delhi"],.....}. In this example, the train with train number 12281 starts from Bhubaneswar and reaches New Delhi via Balasore, Adra, Varanasi, and Kanpur in the given order.

Choose the correct code fragment to complete the procedure.

```
Procedure isOpposite(N1, N2)
    L1 = trains[N1]
    L2 = trains[N2]
    if(length(L1) != length(L2)){
        return(False)
    }
    **********************
    * Fill the code      *
    **********************
    if(L1 == []){
        return(True)
    }
    else{
        return(False)
    }

End isOpposite
```

Options :

6406531160970. ✔

```
while(L1 != [] and first(L1) == last(L2)){
    L1 = rest(L1)
    L2 = init(L2)
}
```

```
while(L2 != [] and first(L2) == last(L1)){
    L1 = rest(L1)
    L2 = init(L2)
}
```

6406531160971. ✖

```
while(L1 == [] and first(L1) == last(L2)){
    L1 = rest(L1)
    L2 = init(L2)
}
```

6406531160972. ✖

```
while(L2 == [] and first(L2) == last(L1)){
    L1 = rest(L1)
    L2 = init(L2)
}
```

6406531160973. ✖

Question Number : 54 Question Id : 640653349643 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 given pseudocode is executed using the "Words" dataset. **C** stores the number of nouns which have at least one adjective adjacent to it. Choose the correct code fragment to complete the pseudocode.

```
A = [], N = [], C = 0
while(Table 1 has more rows){
    Read the first row X in Table 1
    if(X.PartOfSpeech == "Adjective"){
        A = A ++ [X.SeqNo]
    }
    if(X.PartOfSpeech == "Noun"){
        N = N ++ [X.SeqNo]
    }
    Move X to Table 2
}
**********
* Fill the code *
**********
```

Options :

```
foreach Y in N{
    if(member(A, Y - 1) or member(A, Y + 1)){
        C = C + 1
    }
}
```

6406531160974. ✔

```
foreach Y in N{
    if(member(A, Y - 1) and member(A, Y + 1)){
        C = C + 1
    }
}
```

6406531160975. ✖

```
foreach Y in A{
    if(member(N, Y - 1) or member(N, Y + 1)){
        C = C + 1
    }
}
```

6406531160976. ✖

6406531160977. ✖

```
foreach Y in A{
    if(member(N, Y - 1) and member(N, Y + 1)){
        C = C + 1
    }
}
```

Sub-Section Number : 6

Sub-Section Id : 64065349926

Question Shuffling Allowed : Yes

Question Number : 55 Question Id : 640653349636 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Select Question

Let **D** be a dictionary, then which of the following is(are) a valid value(s) of **D**? It is a Multiple Select Question (MSQ).

Options :

6406531160946. ✔ {'x' : {'y' : 3, 'x' : 2}, 'y' : {'x' : 3, 'y' : 4}}

6406531160947. ✖ {'x' : {'y' : 3, 'y' : 2}, 'y' : {'x' : 3, 'x' : 2}}

6406531160948. ✔ {'x' : {'x' : 2}, 'y' : {'y' : 4}}

6406531160949. ✔ {'x' : {3: 'y'}, 'y' : {2 : 'z'}}

Sub-Section Number : 7

Sub-Section Id : 64065349927

Question Shuffling Allowed : Yes

Question Number : 56 Question Id : 640653349639 Question Type : MSQ Is Question

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

Correct Marks : 3

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 the list of medal type associated with the player. 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          medalDict[X.Name] = medalDict[X.Name] ++ [X.Medal]
6      }
7      else{
8          medalDict[X.Name] = [X.Medal]
9      }
10     Move X to Table 2
11 }
```

Options :

6406531160958. ✖ Line 1: Incorrect initialization of **medalDict**

6406531160959. ✖ Line 4: Incorrect conditional statement

6406531160960. ✖ Line 5: The current statement should be replaced by

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

6406531160961. ✔ No mistakes

Sub-Section Number : 8

Sub-Section Id : 64065349928

Question Shuffling Allowed : Yes

Question Number : 57 Question Id : 640653349641 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Select Question

Consider the given procedure **isInorder**. Let **Loi** be a list of distinct positive integers. Choose the correct option(s) for which **isInOrder(Loi)** will return True. It is a Multiple Select Question (MSQ) .

```
Procedure isInOrder(L1)
    A = True, L = L1
    while(length(L) >= 2){
        if(first(L) < first(rest(L))){
            A = False
        }
        L = rest(L)
    }

    B = True, L = L1
    while(length(L) >= 2){
        if(first(L) > first(rest(L))){
            B = False
        }
        L = rest(L)
    }
    return(not A and not B)
End isInOrder
```

Options :

6406531160966. ✖ Elements of **Loi** are in ascending order

6406531160967. ✖ Elements of **Loi** are in descending order

6406531160968. ✖ Elements of **Loi** are either in ascending or in descending order

6406531160969. ✔ Elements of **Loi** are neither in ascending nor in descending order

Question Number : 58 Question Id : 640653349644 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Select Question

Let **medalDict** be a dictionary with player's name as a key mapped to the list of medals associated with the player from the "Olympics" dataset. For example **medalDict** = {"xyz" : ["Silver", "Gold", "Gold"], ... }. In this example, the player xyz has won one Silver and two Gold medals.

At the end of the execution, **repeatCount(medalDict)** returns the number of players who have won at least one medal more than one time. 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 repeatCount(medalDict)
2      count = 0
3      foreach player in keys(medalDict){
4          tempDict = {}
5          foreach medal in medalDict[player]{
6              if(iskey(tempDict, medal)){
7                  count = count + 1
8                  exitloop
9              }
10             else{
11                 tempDict[medal] = True
12             }
13         }
14     }
15     return(count)
16 End repeatCount
```

Options :

6406531160978. ✖ Line 2: Incorrect initialization of **count**

6406531160979. ✖ Line 6: Incorrect conditional statement

6406531160980. ✖ Line 11: The current statement should be replaced by `count = 1`

6406531160981. ✔ No mistakes

Sub-Section Number :	9
Sub-Section Id :	64065349929
Question Shuffling Allowed :	No

Question Id : 640653349645 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (59 to 60)

Question Label : Comprehension

Let **Z** be a row in the "Words" table. Use the procedure given below for answering the given subquestions.

```
Procedure updateDict(Z, Dict)
    i = 1, x = ''
    while(i <= Z.LetterCount){
        x = ith letter of Z.Word
        if(not isKey(Dict, x)){
            Dict[x] = 1
        }
        else{
            Dict[x] = Dict[x] + 1
        }
        i = i + 1
    }
    return(Dict)
End updateDict
```

Sub questions

Question Number : 59 Question Id : 640653349646 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

Let **Z.***Word* be "honesty". What will be the value of **alphaDict**['e'] at the end of the execution of the following pseudocode using the procedure mentioned in the main question?

```
alphaDict = {'t':2, 'c':1, 'e':1}
alphaDict = updateDict(Z, alphaDict)
```

NOTE: Enter your answer to the nearest integer.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 60 Question Id : 640653349647 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

The following pseudocode is executed using the "Words" dataset and the procedure **updateDict** mentioned in the main data.

```
D = {}
while(Table 1 has more rows){
    Read the first row X in Table 1
    D = updateDict(X, D)
    Move X to Table 2
}
```

At the end of the execution of above pseudocode, let 'a' be a letter from the "Words" dataset, then **D**['a'] will be

Options :

6406531160983. ✔ The frequency count of 'a' in the dataset.

6406531160984. ✖ Number of words in which 'a' is present.

6406531160985. ✖ Number of sentences in which 'a' is present.

6406531160986. ✖ List of words in which 'a' is present.

Sub-Section Number : 10

Sub-Section Id : 64065349930

Question Shuffling Allowed : No

Question Id : 640653349648 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (61 to 63)

Question Label : Comprehension

The following pseudocode is executed using the "Scores" dataset. At the end of the execution, **medalList** should store the list of sequence numbers of the students who have scored at least 200 total marks and have scored more than 80 at least in two subjects. Answer the given subquestions based on the pseudocode.

```
1  medalList = [], A = False, sCount = 0
2  while(Table 1 has more rows){
3      Read the first row X in Table 1
4      A = s200[X.SeqNo]
5      sCount = nSub(X.SeqNo)
6      if(A and sCount >= 2){
7          medalList = medalList ++ [X.SeqNo]
8      }
9      Move X to Table 2
10 }
```

Sub questions

Question Number : 61 Question Id : 640653349649 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Select Question

Which of the following statement(s) is(are) true about **s200** based on the given pseudocode? It is a Multiple Select Question (MSQ).

Options :

6406531160987. ✖ **s200** is a procedure which accepts the sequence number of a student and returns True if the student has scored at least 200 total marks otherwise returns False.

6406531160988. ✔ **s200** is a dictionary with sequence numbers of students mapped to True if the student has scored at least 200 total marks otherwise mapped to False.

6406531160989. ✖ **s200** is a dictionary with sequence numbers of students mapped to False if the student has scored at least 200 total marks otherwise mapped to True.

6406531160990. ✖ **s200** is a procedure which accepts the sequence number of a student and returns False if the student has scored at least 200 total marks otherwise returns True.

Question Number : 62 Question Id : 640653349650 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Select Question

Which of the following statement(s) is(are) true about **nSub** based on the given pseudocode? It is a Multiple Select Question (MSQ).

Options :

6406531160991. ✖ **nSub** is a procedure which accepts the sequence number of a student and returns True if the student has scored more than 80 marks at least in two subjects otherwise returns False.

6406531160992. ✔ **nSub** is a procedure which accepts the sequence number of a student and returns the number of subjects in which the student has scored more than 80 marks.

6406531160993. ✖ **nSub** is a dictionary with sequence numbers of students mapped to the number of subjects in which the student has scored more than 80 marks.

6406531160994. ✖ **nSub** is a procedure which accepts the sequence number of a student and returns False if the student has scored more than 80 marks at least in two subjects otherwise returns True.

Question Number : 63 Question Id : 640653349651 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

Let **M, P,** and **C** be the lists of the sequence numbers of the students who have scored more than 80 marks in Mathematics, Physics, and Chemistry respectively. If **n** is the sequence number of a student then choose the correct implementation of **nSub**?

Options :

```
Procedure nSub(n)
    count = 0
    if(member(M, n)){
        count = count + 1
    }
    if(member(P, n)){
        count = count + 1
    }
    if(member(C, n)){
        count = count + 1
    }
    return(count)
End nSub
```

6406531160995. ✔

```
Procedure nSub(n)
    count = 0
    if(member(M, n)){
        count = count + 1
    }
    if(member(P, n)){
        count = count + 1
    }
    if(member(C, n)){
        count = count + 1
    }
    if(count >= 2){
        return(True)
    }
    return(False)
End nSub
```

6406531160996. ✖

6406531160997. ✖

```
nSub = {}
while(Table 1 has more rows){
    Read the first row X from Table 1
    count = 0
    if(member(M, X.SeqNo)){
        count = count + 1
    }
    if(member(P, X.SeqNo)){
        count = count + 1
    }
    if(member(C, X.SeqNo)){
        count = count + 1
    }
    if(count >= 2){
        nSub[SeqNo] = True
    }
    Move X to Table 2
}
```

```
nSub = {}
while(Table 1 has more rows){
    Read the first row X from Table 1
    count = 0
    if(member(M, X.SeqNo)){
        count = count + 1
    }
    if(member(P, X.SeqNo)){
        count = count + 1
    }
    if(member(C, X.SeqNo)){
        count = count + 1
    }
    nSub[X.SeqNo] = count
    Move X to Table 2
}
```

6406531160998.

DBMS

Section Id : 64065322065

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 :	64065349931
Question Shuffling Allowed :	No

Question Number : 64 Question Id : 640653349652 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 "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 :

6406531160999. ✔ Yes

6406531161000. ✖ No

Sub-Section Number :	2
Sub-Section Id :	64065349932
Question Shuffling Allowed :	Yes

Question Number : 65 Question Id : 640653349657 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 statements.

Statement 1: Minimum arity of a node is defined as the arity of the tree.

Statement 2: Arity of the Binary Search Tree is 1.

Options :

6406531161017. ✖ Statement 1 is correct, statement 2 is wrong.

6406531161018. ✖ Statement 1 is wrong, statement 2 is correct.

6406531161019. ✖ Both the statements are correct.

6406531161020. ✔ Both the statements are wrong.

Question Number : 66 Question Id : 640653349663 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 relation **EmployeeReview** is defined as **EmployeeReview**$(EmpID,\ Name,\ HireDate,\ Reviewer,\ Grade)$ with the functional dependencies set

$$\mathcal{F} = \{EmpID \rightarrow HireDate, Name$$
$$Reviewer \rightarrow Grade$$
$$EmpID \rightarrow Grade\}$$

According to which of the following rules, $EmpID \rightarrow \{HireDate, Name, Grade\}$ holds?

Options :

6406531161031. ✖ Decomposition

6406531161032. ✔ Union

6406531161033. ✖ Pseudo-transitivity

6406531161034. ✖ Augmentation

Question Number : 67 Question Id : 640653349669 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 statements:

1. HyperText Transfer Protocol (HTTP) is used for communication with the Web server
2. HTTP provides formatting, hypertext link, and image display features.
3. The HTTP protocol is connectionless.

Choose the correct option.

Options :

6406531161055. ✖ Statements 1 & 2 are correct.

6406531161056. ✖ Statements 2 & 3 are correct.

6406531161057. ✔ Statements 1 & 3 are correct.

6406531161058. ✖ All the statements are correct.

Sub-Section Number :	3
Sub-Section Id :	64065349933
Question Shuffling Allowed :	Yes

Question Number : 68 Question Id : 640653349654 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 tables **Name** and **Rule** shown in the Table 2 and Table 3 respectively.

Name
1. Augmentation
2. Complementation
3. Replication
4. Transitivity

Table 2: **Name**

Rule
A. If $X \rightarrow\rightarrow Y$ and $Z \subseteq W$, then $WX \rightarrow\rightarrow YZ$.
B. If $X \rightarrow\rightarrow Y$ and $Y \rightarrow\rightarrow Z$, then $X \rightarrow\rightarrow (Z - Y)$
C. If $X \rightarrow\rightarrow Y$, then $X \rightarrow\rightarrow (R - (X \cup Y))$.
D. If $X \rightarrow Y$, then $X \rightarrow\rightarrow Y$ but the reverse is not true

Table 3: **Rule**

Which among the following is the correct matching of **Name** and **Rule**?

Options :

6406531161005. ✖ 1-A, 2-D, 3-C, 4-B

6406531161006. ✖ 1-B, 2-A, 3-D, 4-C

6406531161007. ✔ 1-A, 2-C, 3-D, 4-B

6406531161008. ✖ 1-A, 2-C, 3-B, 4-D

Question Number : 69 Question Id : 640653349656 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 relational schema **Faculty** $(fid, fname, address, experience, designation, salary)$, where the domains of all the attributes consist of atomic values. Consider the following functional dependencies for the relation **Faculty**.

$$\mathcal{F} = \{$$
$$fid \rightarrow fname, address, experience, designation,$$
$$designation \rightarrow salary,$$
$$experience \rightarrow designation$$
$$\}$$

What is the highest normal form of the above relational schema **Faculty**?

Options :

6406531161013. ✖ 1NF

6406531161014. ✔ 2NF

6406531161015. ✖ 3NF

6406531161016. ✖ BCNF

Question Number : 70 Question Id : 640653349666 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 relation **CAR**(*LicenseNo, EngineSerialNo, Model, Year*) and the following functional dependencies set

$$\mathcal{F} = \{LicenseNo, EngineSerialNo \rightarrow Model,$$
$$EngineSerialNo \rightarrow Year$$
$$Model, Year \rightarrow EngineSerialNo\}$$

If the relation **CAR** is decomposed into two relations **C1** and **C2**, which of the following is a lossless decomposition?

Options :

6406531161043. ✖ $\mathbf{C1}(LicenseNo,\ EngineSerialNo,\ Model),\ \mathbf{C2}(Model,\ Year)$

6406531161044. ✔ $\mathbf{C1}(LicenseNo,\ EngineSerialNo,\ Model),\ \mathbf{C2}(EngineSerialNo,\ Year)$

6406531161045. ✖ $\mathbf{C1}(LicenseNo,\ EngineSerialNo),\ \mathbf{C2}(Model,\ Year)$

6406531161046. ✖ $\mathbf{C1}(LicenseNo,\ EngineSerialNo,\ Year),\ \mathbf{C2}(LicenseNo,\ Year)$

Question Number : 71 Question Id : 640653349667 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 $\mathbf{R}(A,\ B,\ C,\ D,\ E)$ with the following functional dependency sets

$\mathcal{F} = \{A \rightarrow BCD, CD \rightarrow E, BC \rightarrow AE\}$

Which of the following is the correct canonical cover of the set of functional dependencies $\mathcal{F}$ that occur in the relation $\mathbf{R}$?

Options :

6406531161047. ✖ $A \rightarrow BD, CD \rightarrow E, BC \rightarrow AE$

6406531161048. ✖ $A \rightarrow D, CD \rightarrow E, BC \rightarrow E$

6406531161049. ✖ $A \rightarrow C, D \rightarrow E, BC \rightarrow AE$

6406531161050. ✔ $A \rightarrow BCD, CD \rightarrow E, BC \rightarrow A$

Question Number : 72 Question Id : 640653349670 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 table **profile** shown in table 5:

Name	Salary
Data Engg	55000
Data Sci.	75000
Data Arch.	75000
App Dev	40000
JAVA Dev	30000
Programmer	60000

Table 5: **profile**

Choose the correct output table when the following query is executed.

```
UPDATE profile
SET salary = salary + 5000
WHERE name LIKE 'Data%' or 'X' = 'X'
```

Options :

6406531161059. ✖

Name	Salary
Data Engg	55000
Data Sci.	75000
Data Arch.	75000
App Dev	45000
JAVA Dev	35000
Programmer	65000

6406531161060. ✖

Name	Salary
Data Engg	55000
Data Sci.	75000
Data Arch.	75000
App Dev	40000
JAVA Dev	30000
Programmer	60000

6406531161061. ✔

Name	Salary
Data Engg	60000
Data Sci.	80000
Data Arch.	80000
App Dev	45000
JAVA Dev	35000
Programmer	65000

Name	Salary
Data Engg	60000
Data Sci.	80000
Data Arch.	80000
App Dev	40000
JAVA Dev	30000
Programmer	60000

6406531161062.

Sub-Section Number : 4

Sub-Section Id : 64065349934

Question Shuffling Allowed : Yes

Question Number : 73 Question Id : 640653349668 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 table **employee** inside the database **organization**. Table **employee** has the data as shown in table 4:

eid	edept	ename	esalary
5	Acc	Abhijeet	720000
6	Mar	Shahid	608000
7	Sales	Shab	200000
8	Mar	Meenakshi	336000
9	Sales	Dj	528000
10	Mar	Sashi	432000
11	Acc	Rekha	3080000
12	HR	Joseph	1822504
13	HR	Arif	3037504

Table 4: **employee**

How many rows will be fetched and display by the Python code given below?

```
import os
import sys
import psycopg2

conn = None
try:
    conn = psycopg2.connect(database = 'organization', user = 'postgres',
    password = 'passwrd',host = 'localhost',port = '5432')

    cur=conn.cursor()
    cur.execute('select * from employee where esalary > 500000')
    result = cur.fetchmany()
    for i in result:
        print(i)
    cur.close()
except (Exception, psycopg2.DatabaseError) as error:
        print(error)
finally:
    if conn is not None:
        conn.close()
```

Options :

6406531161051. ✔ 1

6406531161052. ✖ 2

6406531161053. ✖ 3

6406531161054. ✖ 4

Sub-Section Number : 5

Sub-Section Id : 64065349935

Question Shuffling Allowed : Yes

Question Number : 74 Question Id : 640653349664 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Select Question

Consider a **CourseSection** relation having the attributes (*Course, Section, Instructor, RoomNo, Time*) with the following set of FDs:

$\mathcal{F} = \{Course, Section, Time \rightarrow RoomNo, Instructor$
$Course, Section, Instructor \rightarrow RoomNo, Time\}$

Which among the following is/are candidate key for the relation **CourseSection**?

Options :

6406531161035. ✔ *{Course, Section, Time}*

6406531161036. ✔ *{Course, Section, Instructor}*

6406531161037. ✖ *{Instructor, RoomNo}*

6406531161038. ✖ *{Course, Section, Time, Instructor}*

Sub-Section Number : 6

Sub-Section Id : 64065349936

Question Shuffling Allowed : Yes

Question Number : 75 Question Id : 640653349653 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Select Question

Consider the table **R** shown in the Table 1

X	Y	Z
a	b	d
a	c	e
a	c	d
a	b	e

Table 1: **R**

Which among the following holds true for the given table?

Options :

6406531161001. ✖ X → Y

6406531161002. ✔ X →→ Y

6406531161003. ✔ X → → Z

6406531161004. ✖ Y → Z

Question Number : 76 Question Id : 640653349655 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Select Question

Consider a relational schema **BankAccount***(Name, AadharNo, AccountNo,ContactNo)* with the following functional dependencies:

$$\mathcal{F} = \{$$
$$Name \rightarrow AadharNo,$$
$$AadharNo \rightarrow AccountNo,$$
$$AccountNo \rightarrow ContactNo,$$
$$ContactNo \rightarrow Name$$
$$\}$$

Above relation **BankAccount** is decomposed into three smaller relations. **BankAccount1**(*Name, AadharNo*), **BankAccount2**(*AadharNo, AccountNo*) and **BankAccount3**(*AccountNo,ContactNo*).

Based on the given information, which among the following is incorrect?

Options :

6406531161009. ✖ The number of super keys for relation **BankAccount** are 15.

6406531161010. ✔ The decomposition of **BankAccount** is lossy.

6406531161011. ✖ AccountNo → ContactNo is preserved in the decomposed relations.

6406531161012. ✔ ContactNo → Name is not preserved in the decomposed relations.

Question Number : 77 Question Id : 640653349665 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Select Question

Consider the relation $\mathbf{R}$ $\{P, Q, R, S, T\}$ with the following set of FDs:

$$\mathbf{X} = \{P \rightarrow R, T \rightarrow S, PQ \rightarrow R, R \rightarrow QS\}$$
$$\mathbf{Y} = \{P \rightarrow QR, T \rightarrow S, R \rightarrow Q, Q \rightarrow S\}$$

Which of the following statement(s) is/are correct?

Options :

6406531161039. ✖ Both X covers Y and Y covers X

6406531161040. ✖ X covers Y

6406531161041. ✔ Y covers X

6406531161042. ✖ Neither X covers Y nor Y covers X

Sub-Section Number : 7

Sub-Section Id : 64065349937

Question Shuffling Allowed : Yes

Question Number : 78 Question Id : 640653349658 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 the maximum level of a complete binary search tree is 5, then what is the maximum number of nodes?

NOTE: Enter your answer to the nearest integer.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

63

Sub-Section Number : 8

Sub-Section Id : 64065349938

Question Shuffling Allowed : No

Question Id : 640653349659 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (79 to 81)

Question Label : Comprehension

Answer the given subquestions on the basis of the following data.

Consider a magnetic disk with 8 platters, 2 surfaces/platter, 1024 tracks/surface, 2048 sectors/track, and 512 bytes/sector. The disk rotates with 6000 revolutions per minute.

Sub questions

Question Number : 79 Question Id : 640653349660 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 is the capacity of the disk?

Options :

6406531161022. ✔ 16 GB

6406531161023. ✖ 32 GB

6406531161024. ✖ 32 MB

6406531161025. ✖ 16 MB

Question Number : 80 Question Id : 640653349661 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 sectors?

NOTE: Enter your answer to the nearest integer.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

25

Question Number : 81 Question Id : 640653349662 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

Given that the rotational speed of the disk is 6000 revolutions per minute. Consider the seek time is 3ms. What will be the rotational latency?

Options :

6406531161027. ✖ 10 sec

6406531161028. ✖ 5 sec

6406531161029. ✖ 10 ms

6406531161030. ✔ 5 ms

PDSA

Section Id :	64065322066
Section Number :	5
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	15
Number of Questions to be attempted :	15

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 :	64065349939
Question Shuffling Allowed :	No

Question Number : 82 Question Id : 640653349671 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 " 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 :

6406531161063. ✔ Yes

6406531161064. ✖ No

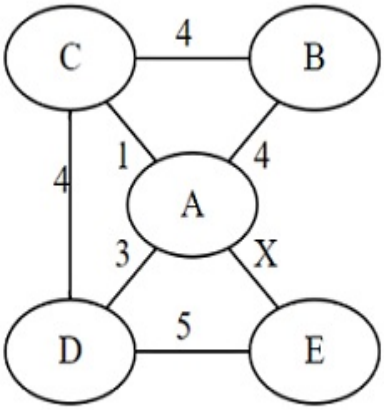
Sub-Section Number :	2
Sub-Section Id :	64065349940
Question Shuffling Allowed :	Yes

Question Number : 83 Question Id : 640653349674 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 graph G.



Choose a value for x that will maximize the number of minimum cost spanning trees [MCSTs] for graph G. The number of minimum cost spanning trees [MCSTs] of G for this value of x is_____.

Options :

6406531161073. ✖ 1

6406531161074. ✖ 3

6406531161075. ✔ 4

6406531161076. ✖ 5

Question Number : 84 Question Id : 640653349677 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

A Priority-Queue is implemented as a Min-Heap. Initially, the Min-Heap is `[7, 8, 11, 15, 20, 27]`. Two new elements 9 and 5 are inserted in the given Min-Heap in that order. Min-Heap after the insertion of the elements is_____.

Options :

6406531161086. ✖ `[5, 7, 8, 9, 20, 27, 11, 15]`

6406531161087. ✔ `[5, 7, 9, 8, 20, 27, 11, 15]`

6406531161088. ✖ `[5, 7, 9, 8, 11, 20, 27, 15]`

6406531161089. ✖ `[5, 7, 8, 9, 11, 15, 20, 27]`

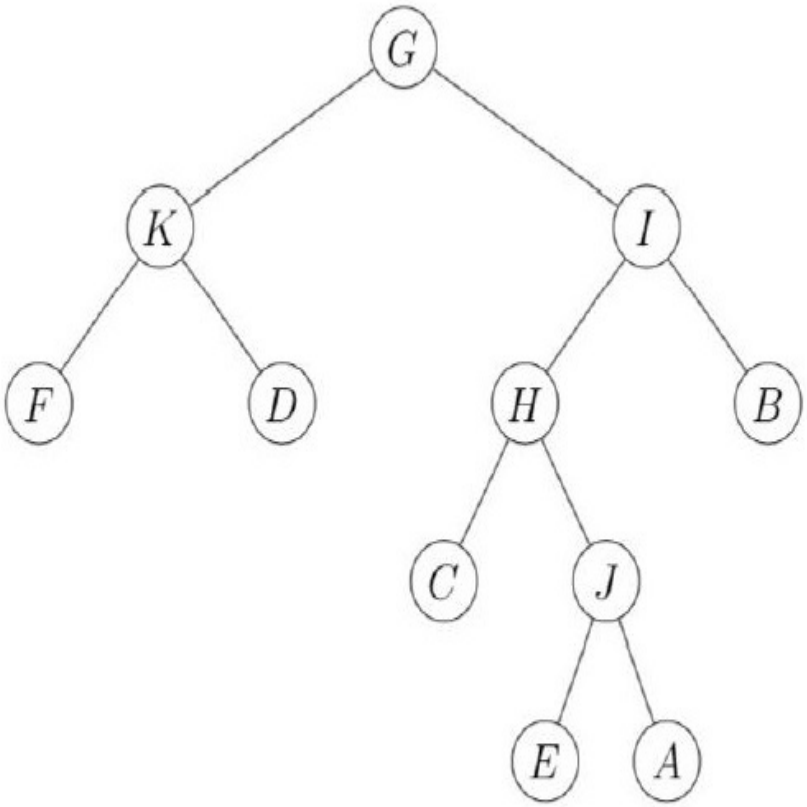
Question Number : 85 Question Id : 640653349678 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following class for tree nodes in the given tree.

```
class Node:
    def __init__(self, value = None):
        self.value = value
        self.left = None
        self.right = None
```




```
def traversal(t):
    if t != None:
        traversal(t.left)
        traversal(t.right)
        print(t.value, end = ' ')
traversal(root) #'root' is the reference of the root node of the given tree.
```

Which of the following order will be printed by the given code-snippet?

Options :

6406531161090. ✖ F D K C E J A H B I G

6406531161091. ✖ F K D G C H E J A I B

6406531161092. ✔ F D K C E A J H B I G

6406531161093. ✖ F D K C E J A H I B G

Question Number : 86 Question Id : 640653349680 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 one of the following **can not** be a possible sequence of elements in the path from the root to any leaf in a binary search tree?

Options :

6406531161095. ✖ 70, 60, 20, 50, 30, 46

6406531161096. ✔ 50, 10, 36, 40, 31, 46

6406531161097. ✖ 20, 75, 58, 30, 55, 46

6406531161098. ✖ 60, 10, 40, 50, 42, 46

Question Number : 87 Question Id : 640653349684 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

	Recurrence Relation		Complexity
A	$T(n) = 2T(n/8) + O(n)$	1	$O(logn)$
B	$T(n) = 4T(n/4) + O(n)$	2	$O(n)$
C	$T(n) = T(n-1) + O(n)$	3	$O(nlogn)$
D	$T(n) = T(n/2) + O(1)$	4	$O(n^2)$

Select the correct match of recurrence relation with corresponding complexity.

Options :

6406531161105. ✖ A-2, B-4, C-3, D-1

6406531161106. ✔ A-2, B-3, C-4, D-1

6406531161107. ✖ A-2, B-3, C-1, D-4

6406531161108. ✖ A-3, B-2, C-4, D-1

Sub-Section Number : 3

Sub-Section Id : 64065349941

Question Shuffling Allowed : Yes

Question Number : 88 Question Id : 640653349681 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

Which of the following is the correct length of codes for the character set S = {A, B, C, D, E, F}, generated using the Huffman algorithm for given frequencies?

Character	A	B	C	D	E	F
Frequency	13	30	6	35	2	11

Options :

6406531161099. ✖ A-3, B-3, C-5, D-1, E-5, F-4

6406531161100. ✖ A-3, B-2, C-5, D-2, E-5, F-4

6406531161101. ✖ A-3, B-3, C-5, D-2, E-5, F-4

6406531161102. ✔ A-3, B-2, C-5, D-1, E-5, F-4

Sub-Section Number : 4

Sub-Section Id : 64065349942

Question Shuffling Allowed : Yes

Question Number : 89 Question Id : 640653349673 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Select Question

Which of the following statement(s) is/are **true**?

Options :

6406531161069. ✔ 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.

6406531161070. ✖ Given a graph where weights of all edges are unique, there is always a unique shortest path from a source to destination in such a graph.

6406531161071. ✔ Bellman-Ford and Floyd-Warshall's algorithm can calculate the shortest path correctly if the graph has negative edge weights but does not have negative weight cycles.

6406531161072. ✖ The time complexity of Floyd-Warshall is $O(V^2)$, where V is the number of vertices in the graph.

Question Number : 90 Question Id : 640653349675 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Select Question

Let $G = (V,E)$ be an undirected connected graph with more than two vertices where each edge has a distinct weight, and e is a particular edge of G. Which of the following statement(s) is/are always **true** about the minimum cost spanning trees (MCSTs) of G ?

Options :

6406531161077. ✖ If e is the lightest weight edge of some cycle in G, then MCST of G includes e

6406531161078. ✔ If *e* is the heaviest weight edge of some cycle in *G*, then MCST of *G* excludes *e*

6406531161079. ✖ If *e* is the heaviest weight edge in *G*, then MCST of *G* excludes *e*

6406531161080. ✔ If *e* is the lightest weight edge in *G*, then MCST of *G* includes *e*

Question Number : 91 Question Id : 640653349676 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Select Question

Which of the following statement(s) is/are **true**?

Options :

6406531161081. ✔ The smallest element in a max-heap is always at a leaf node

6406531161082. ✖ The smallest element in a max-heap is always at the lowest level

6406531161083. ✔ The second-largest element in a max-heap is always a child of the root node

6406531161084. ✖ Finding a minimum element in max-heap takes *O(logn)* time

6406531161085. ✔ Insert a new element in max-heap takes *O(logn)* time in worst case

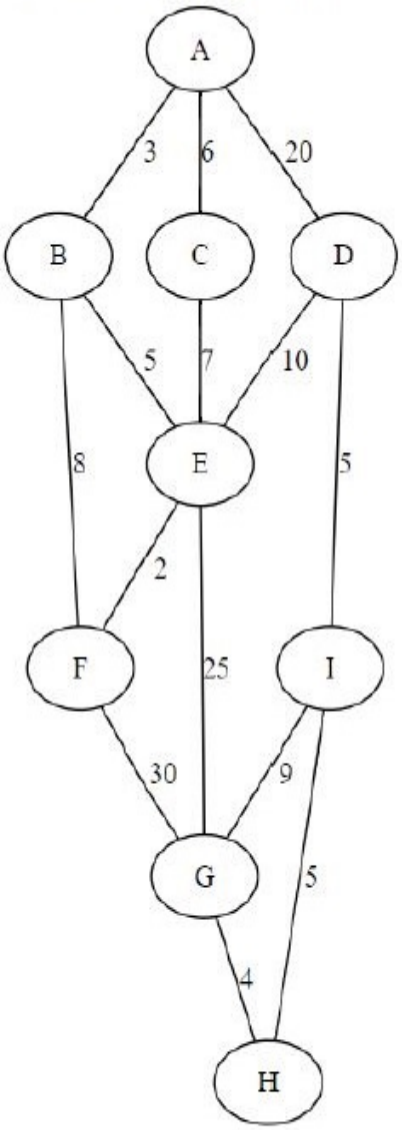
Sub-Section Number :	5
Sub-Section Id :	64065349943
Question Shuffling Allowed :	Yes

Question Number : 92 Question Id : 640653349672 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Select Question

Consider the following graph.



Apply Dijkstra's algorithm from vertex `A` in the given graph. Which of the following statement(s) is/are **true**?

Options :

6406531161065. ✔ If `A` is the 1st visited vertex, then The 5th visited marked vertex is `F`

6406531161066. ✖ The shortest path cost from `A` to `G` is 33

6406531161067. ✔ There is exactly one path with minimum cost from `A` to `F`

6406531161068. ✔ More than one path with the same minimum cost are available from A to G

Sub-Section Number : 6

Sub-Section Id : 64065349944

Question Shuffling Allowed : Yes

Question Number : 93 Question Id : 640653349679 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

While inserting the elements 60, 20, 68, 10, 45, 50, 30, 47, and 85 in an empty binary search tree (BST) in the sequence shown, the height of the created binary search tree is_____. Assume that the height of the empty tree is 0.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

5

Question Number : 94 Question Id : 640653349682 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

Meetings M1, M2, ..., M11 are to be conducted in a single available meeting room. The table below gives the start and end times of these meetings. If any activity finishes at time T, then other activities can be started at time T or afterward. What is the maximum number of meetings that can be held in the meeting room without conflicts?

	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11
Start	5	4	8	9	12	7	5	3	4	1	8
End	7	5	10	11	14	9	8	5	9	3	13

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

6

Question Number : 95 Question Id : 640653349683 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

In a list L, two elements L[i] and L[j] form an **inversion** if L[i] > L[j] and i < j. The total number of inversions in L = [2, 7, 6, 1, 5] is_____

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

6

Sub-Section Number : 7

Sub-Section Id : 64065349945

Question Shuffling Allowed : No

Question Id : 640653349685 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (96 to 97)

Question Label : Comprehension

Consider the following function that takes a list `L` of distinct integers and an integer `k` ($1 \leq k \leq len(L)$) as input.

```
1  #lower and upper argument represent lower index and upper index of L
   respectively
2  def mystery(L, lower, upper, k):
3      if (k > 0 and k <= upper - lower + 1):
4          pos = partition(L, lower, upper)
5          if (pos - lower == k - 1):
6              return L[pos]
7          if (pos - lower > k - 1):
8              return mystery(L, lower, pos - 1, k)
9          else:
10             return mystery(L, pos + 1, upper, k - pos + lower - 1)
```

In line 3, `partition` function treats the first element of `L` as a pivot and rearranges the list so that all elements less than or equal to the pivot are in the left part of the list, and all elements greater than the pivot are in the right part. In addition, it moves the pivot so that the pivot is the last element of the left part. The function returns the index of pivot in the list L.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 96 Question Id : 640653349686 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 does function `mystery` return?

Options :

6406531161109. ✖ The smallest value in `L` that is greater than `k`.

6406531161110. ✖ The largest value in `L` that is less than or equal to `k`.

6406531161111. ✖ The k^{th} largest element in `L`.

6406531161112. ✔ The k^{th} smallest element in `L`.

Question Number : 97 Question Id : 640653349687 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 `T(n)` denote the worst-case running time for the given function `mystery`, where `n` is the length of `L`. The asymptotic expression for `T(n)` is_____. Consider that the running time for `partition` function is $O(n)$.

Options :

6406531161113. ✖ $O(\log n)$

6406531161114. ✖ $O(n)$

6406531161115. ✖ $O(n \log n)$

6406531161116. ✔ $O(n^2)$

AppDev-1

Section Id :	64065322067
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 Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	64065349946
Question Shuffling Allowed :	No

Question Number : 98 Question Id : 640653349688 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 "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 :

6406531161117. ✔ Yes

6406531161118. ✖ No

Sub-Section Number :	2
Sub-Section Id :	64065349947
Question Shuffling Allowed :	Yes

Question Number : 99 Question Id : 640653349689 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Select Question

Consider the Python file and a template given below.

Python file: app.py

```
from flask import Flask, url_for, redirect, render_template
app = Flask(__name__)

@app.route("/<name>/")
def index1(name):
    return "Hi" + " " + name + "!" + " " + "This is your home page."

@app.route("/first_index/<string:name>")
def index2(name):
    if name == "XYZ":
        return redirect(url_for("index1", name = "XYZ"))
    else:
        return redirect( url_for("index3"))

@app.route("/second_index")
def index3():
    return render_template("index.html")

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

Template file: index.html

```
<!DOCTYPE html>
<html lang="en">
<head>
    <title>My Document</title>
</head>
<body>
  <h2> You are on the incorrect page.</h2>
  <a href="{{ url_for("index1", name="ABC") }}">Go back</a>
</body>
</html>
```

If the above flask application is running locally on the URL ‘http://127.0.0.1:5000’, which of the following statements is/are true about the above code snippet?

Options :

6406531161119. ✖ For the endpoint '/XYZ/', the browser will show 'Not Found' error.

6406531161120. ✔ On clicking the link "Go back" in "index.html", the browser will render: Hi ABC! This is your home page.

6406531161121. ✔ For the endpoint '/first_index/XYZ', the browser will redirect to the URL for the function index3, i.e., '/second_index'.

6406531161122. ✖ For the endpoint '/first_index/ABC', the browser will redirect to the URL for the function 'index3' i.e., '/second_index'.

Sub-Section Number : 3

Sub-Section Id : 64065349948

Question Shuffling Allowed : Yes

Question Number : 100 Question Id : 640653349690 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

A flask application is given below.

```
from flask import Flask, jsonify

app = Flask(__name__)

Gadgets = [
            {"tech":"Smartwatch, Digital camera"},
            {"mobile":"Headphones, Speakers"},
            {"Laptop":"Keyboard, Mouse"}
          ]

@app.route("/home", methods=["GET"])
def func1():
return jsonify({"The list of gadgets": Gadgets})

@app.route("//")
def rest_lists():
return {
         "Restaurant 1" : "Hotel Alpine",
         "Restaurant 2" : "Maurya Vihar",
         "Restaurant 3" : "Royal Garden"
       }

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

If the above flask application is running locally on the URL 'http://127.0.0.1:5000', which of the following statement is true about the above flask application?

Options :

6406531161123. ✔ For the endpoint "/", The content type of the response is 'application/json'

6406531161124. ✖ For the endpoint '/home', the application returns:

```
"The list of gadgets":
    {
        "tech":"Smartwatch, Digital camera",
        "mobile":"Headphones, Speakers",
        "Laptop":"Keyboard, Mouse"
    }
```

6406531161125. ✖ None of the endpoints, i.e., '/' or '/home' can be considered as access URIs of an API.

For the endpoint '/home', the application returns:

```
"The list of gadgets":
    {
      "tech": "Smartwatch, Digital camera"
    },
    {
      "mobile": "Headphones, Speakers"
    },
    {
      "Laptop": "Keyboard, Mouse"
    }
```

6406531161126.

Question Number : 101 Question Id : 640653349692 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 table “production” in SQLite database given below:

Manufacturer	Product	Quantity	Cost
Industry A	Biscuits	3	100
Industry B	Shoes	2	500
Industry A	Chocolate	10	200
Industry C	Pen	20	50
Industry B	Shirts	5	700
Industry D	Beverages	30	150
Industry C	Notebook	40	250

What will be the output of the SQL query given below?

```
SELECT Manufacturer, COUNT(*)
FROM production
WHERE Quantity>10
GROUP BY Manufacturer
HAVING COUNT(*)=2;
```

Options :

6406531161131. ✖

```
Manufacturer|COUNT(*)
Industry D |1
```

6406531161132. ✔

```
Manufacturer|COUNT(*)
Industry C |2
```

6406531161133. ✖

```
Manufacturer|COUNT(*)
Industry C |2
Industry D |1
```

6406531161134. ✖

```
Manufacturer|COUNT(*)
Industry C |1
Industry D |2
```

Question Number : 102 Question Id : 640653349693 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 table “employee” given below. The model class “Employee” corresponds to table “employee” in the database.

id	first_name	last_name	email
1	Ruhil	Verma	verma@gmail.com
2	Monica	gulati	manisha@gmail.com
3	Sandeep	Sharma	sharma@gmail.com
4	Taapsi	Uma	uma@gmail.com

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

```
>>> user1= Employee.query.filter_by(first_name="Monica").first()
>>> user1.first_name= "Manisha"
>>> db.session.commit()
>>> emp = Employee.query.all()
>>> for emp1 in emp:
...print(first_name)
```

Options :

6406531161135. ✖

```
Ruhil
Monica
Sandeep
Taapsi
```

6406531161136. ✖

```
Ruhil
Sandeep
Taapsi
```

6406531161137. ✖

```
Ruhil
Manisha
Sandeep
Taapsi
```

6406531161138. ✔ None of these

Question Number : 103 Question Id : 640653349696 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 is the correct Python object representation of the given SQL query with declarative_base() class.

```
CREATE TABLE "Items" (
"ID"   INTEGER,
"name" TEXT,
"cost" INTEGER,
PRIMARY KEY("ID" AUTOINCREMENT)
)
```

Options :

6406531161147. ✖

```
Base = declarative_base()
class User(Base):
     __tablename__ = "User"
     ID = Column(Integer, primary_key = True, autoincrement = True)
     name = Column(String)
     cost = Column(Integer)
```

6406531161148. ✔

```
Base = declarative_base()
class Items(Base):
    __tablename__ = "Items"
    ID = Column(Integer, primary_key = True, autoincrement = True)
    name = Column(String)
    cost = Column(Integer)
```

6406531161149. ✖

```
Base = declarative_base()
class Items(Base):
    __tablename__ = "Items"
    Item_ID = Column(Integer, primary_key = True, autoincrement =
True)
    Item_name = Column(String)
    Item_cost = Column(Integer)
```

6406531161150. ✖

```
Base = declarative_base()
class Items(Base):
    __tablename__ = "Items"
    cost = Column(Integer, primary_key = True, autoincrement = True)
    name = Column(String)
    ID = Column(Integer)
```

Question Number : 104 Question Id : 640653349698 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

If the below flask application is running locally on the URL: 'http://127.0.0.1:5000', what will be rendered by the browser?

Python file: main.py

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

@app.route('/')
def home():
my_course = ['App1', 'App2', 'python', 'Data science',
             'Database', 'machine learning']

return render_template('index.html', list=my_course)

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

Template: index.html

```
<html>
  <head>
    <title>template file</title>
  </head>
  <body>
    {% macro display(list) %}
       {% for course in list %}
          <p>{{ course }}</p>
       {% endfor %}
    {% endmacro %}
    {{ display(list) }}
   </body>
</html>
```

Options :

6406531161155. ✖

```
['App1',

'App2',

'python',

'Data science',

'Database',

'machine learning']
```

6406531161156. ✖

```
['App1', 'App2', 'python', 'Data science', 'Database',

'machine learning']
```

6406531161157. ✔

```
App1

App2

python

Data science

Database

machine learning
```

6406531161158. ✖

```
App1 App2 python Data science Database machine learning
```

Question Number : 105 Question Id : 640653349700 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 table “table_A” in SQLite database.

	ID	First_Name	Last_Name	Course
	Filter	Filter	Filter	Filter
1	1	Raj	R	Java
2	2	Riya	Z	Java
3	3	Sam	sundar	Java
4	4	praneeth	k	Java
5	5	Kunal	T	Python
6	6	vimal	singh	Python
7	7	sethu	J	Python
8	8	liza	G	C++
9	9	shylla	chopra	C++

What will be the output of the following SQL query?

```
SELECT Course, count(ID) AS No_Of_Students
FROM table_A GROUP BY Course
ORDER BY No_Of_Students ASC;
```

Options :

6406531161163. ✖

	Course	No_Of_Students
1	Python	1
2	Java	1
3	Java	1
4	Java	1
5	C++	1
6	Java	1
7	Python	1
8	C++	1
9	Python	1

6406531161164. ✖

	Course	No_Of_Students
1	Python	1
2	C++	1
3	Python	1
4	Java	1
5	C++	1
6	Java	1
7	Java	1
8	Java	1
9	Python	1

6406531161165. ✖

	Course	No_Of_Students
1	Java	4
2	Python	3
3	C++	2

6406531161166. ✔

	Course	No_Of_Students
1	C++	2
2	Python	3
3	Java	4

Question Number : 106 Question Id : 640653349702 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 HTML file with embedded JavaScript.

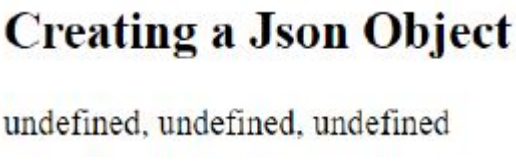
Filename: index.html

```
<!DOCTYPE html>
<html>
  <body>
    <h2>Creating a Json Object </h2>
    <p id="jsonobj"></p>
    <script>
       const txt = '{"name":"icecream","type":"cup",
"flavor":"vanilla"}'
       const obj = JSON.parse(txt);
       document.getElementById("jsonobj").innerHTML = obj.name + ", "
       + obj.flavor + ", " + obj.type;
    </script>
  </body>
</html>
```

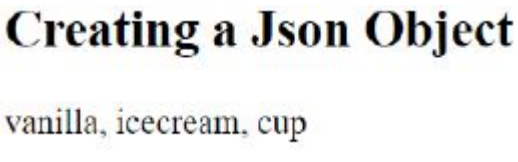
How will the browser render the above HTML file?

Options :

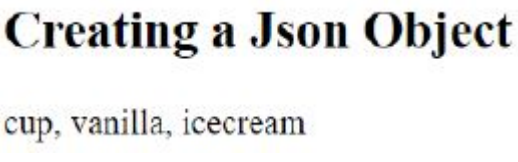
6406531161171. ✖



6406531161172. ✖



6406531161173. ✖



Creating a Json Object

6406531161174. ✔ icecream, vanilla, cup

Sub-Section Number : 4

Sub-Section Id : 64065349949

Question Shuffling Allowed : Yes

Question Number : 107 Question Id : 640653349691 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 statements given below.

Statement 1: APIs usually contain SDKs, but SDKs do not contain APIs.

Statement 2: The SDKs contains the group of tools that help developers to use a different product or services.

Which of the following is correct in the context of statements given above?

Options :

6406531161127. ✖ Both statement 1 and 2 are correct.

6406531161128. ✖ Statement 1 is correct, 2 is incorrect.

6406531161129. ✖ Both statement 1 and 2 are incorrect.

6406531161130. ✔ Statement 1 is incorrect, 2 is correct.

Question Number : 108 Question Id : 640653349695 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 a situation, where a developer wants to create his own customized application and wants to deploy it for the end users. For that, he wants a development environment that consists of some programming language execution environment, an operating system, a web server and a database, such that he can build, compile and run his programs without worrying about the servers, storage, and networking. Which of the following service models he would prefer in order to do so?

Options :

6406531161143. ✖ SaaS

6406531161144. ✔ PaaS

6406531161145. ✖ IaaS

6406531161146. ✖ None of these

Question Number : 109 Question Id : 640653349699 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 table 'flowers' in SQLite database.

ID ▾1	Name	color
Filter	Filter	Filter
1	Jasmine	white
2	Rose	pink
3	Lily	pink
4	Lotus	pink
5	Red rose	red

What will be the output of the following SQL query?

```
Select count(ID), Name, color from flowers
group by color HAVING count(color)<2;
```

Options :

6406531161159. ✖

count(ID)	Name	color
3	Rose	pink

6406531161160. ✖

count(ID)	Name	color
1	red rose	red
1	Jasmine	white

6406531161161. ✖

count(ID)	Name	color
3	Rose	pink
1	red rose	red
1	Jasmine	white

6406531161162. ✔

count(ID)	Name	color
1	Red rose	red
1	Jasmine	white

Question Number : 110 Question Id : 640653349701 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

Match the following based on the memory hierarchy of computer.

Parameters	Storage element
1. Highest Latency	a. HDD
2. Lowest Density	b. Register
3. Lowest Throughput	c. DRAM
	d. SSD
	e. SRAM

Options :

6406531161167. ✖ 1 - e, 2 - b, 3 - d

6406531161168. ✖ 1 - a, 2 - b, 3 - c

6406531161169. ✔ 1 - a, 2 - b, 3 - a

6406531161170. ✖ 1 - b, 2 - c, 3 - d

Sub-Section Number : 5

Sub-Section Id : 64065349950

Question Shuffling Allowed : Yes

Question Number : 111 Question Id : 640653349694 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 HTML document given below:

```
<!DOCTYPE html>
<html>
    <head>
        <style>
            [id~=out] {
              border: 10px solid red;
            }

            [class~=out]{
                border: 5px solid yellow;
            }
        </style>
    </head>
    <body>
        <h2>Hello World!</h2>
        <h1 id="out">Hey!</h1>
        <p id="out-text">My name is Fred.</p>
        <p class="outcontent">I am learning to develop
applications.</p>
        <p id ="out"> Are you also willing to learn?</p>
        <p class="out">Welcome to the world of Application
development!</p>
        <h3>Have a nice day!!</h3>
    </body>
</html>
```

Which of the following statements is true for the above HTML document when rendered by the

browser?

Options :

6406531161139. ✖ The headings, i.e., 'Hello World!' and 'Hey!', both will have red border color.

6406531161140. ✔ The paragraph with class='out', will get a yellow color border.

6406531161141. ✖ The paragraph with id='out' will get a yellow color border.

6406531161142. ✖ The two paragraphs with contents, 'My name is Fred.' and 'I am learning to develop applications.', will both get a red color border and yellow color border.

Question Number : 112 Question Id : 640653349697 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 PyHTML program. Identify the corresponding HTML file which will be generated on running the PyHTML code.

```
from pyhtml import *
my_html = html(head(title("Quiz 2")),
               body(h2("Second level heading"),
                    div("This is my first div"),
                    p("Paragraph1"),
                    p("Paragraph2")
                    )
              )
output = my_html.render()
print(output)
```

Options :

6406531161151. ✔

```
<!DOCTYPE html>
<html>
  <head>
     <title>Quiz 2</title>
  </head>
  <body>
     <h2>Second level heading</h2>
     <div>This is my first div</div>
     <p>Paragraph1</p>
     <p>Paragraph2</p>
  </body>
</html>
```

6406531161152. ✖

```
<!DOCTYPE html>
<html>
  <head>
     <h2>Second level heading</h2>
  </head>
  <body>
     <title>Quiz 2</title>
     <div>This is my first div</div>
     <p>Paragraph1</p>
     <p>Paragraph2</p>
  </body>
</html>
```

6406531161153. ✖

```
<!DOCTYPE html>
<html>
  <head>
     <title>Quiz 2</title>
     <div>This is my first div</div>
  </head>
  <body>
     <h2>Second level heading</h2>
     <p>Paragraph1</p>
     <p>Paragraph2</p>
  </body>
</html>
```

6406531161154. ✖

```
<!DOCTYPE html>
<html>
  <head>
     <title>Quiz 2</title>
  </head>
  <body>
     <h2>Second level heading</h2>
     <div>This is my first div
     <p>Paragraph1</p>
     <p>Paragraph2</p>
     </div>
  </body>
</html>
```

Question Number : 113 Question Id : 640653349703 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 two software packages A and B. The average processing time of the package A is TA(n) = 0.001n milliseconds and the average processing time of the package B is $TB(n) = 500\sqrt{n}$ milliseconds, where n is the number of records being processed. Which of the given software packages A and B should be chosen to process data collections, containing 10^8 records?

Options :

6406531161175. ✔ Package A

6406531161176. ✖ Package B

6406531161177. ✖ Both A and B will take same time

6406531161178. ✖ Both A and B will infinite time to process records

Question Number : 114 Question Id : 640653349704 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 code snippet:

```
from flask import Flask
from flask_restful import Resource, Api, reqparse, fields,
marshal_with

app = Flask('__main__')
api = Api(app)

parser = reqparse.RequestParser()
parser.add_argument("Id")
parser.add_argument("name")
parser.add_argument("email")

out_fields = {
    "Id": fields.Integer,
    "name": fields.String
}

class MyApi(Resource):
    def get(self):
        info = parser.parse_args()
        return {"Identity": info['Id'] , "Name": info['name'],
"E-mail": info['email']}

    @marshal_with(out_fields)
    def post(self):
        info = parser.parse_args()
        return info

api.add_resource(MyApi, '/myinfo')

app.run(debug = True)
```

If the application is running locally on the URL: "http://127.0.0.1:5000", What will be the output on the terminal for command:

```
curl -X POST -H "Content-Type: application/json"
     -d "{\"Id\":3, \"name\":\"user_1\", \"email\":
\"user_1@gmail.com\"}" http://127.0.0.1:5000/myinfo
```

Options :

6406531161179. ✖

```
{
    "Identity": "3",
    "Name": "user_1",
    "E-mail": "user_1@gmail.com"
}
```


6406531161180. ✔


```
{
    "Id": 3,
    "name": "user_1"
}
```


6406531161181. ✖


```
{
    "Id": "3",
    "name": "user_1"
}
```


6406531161182. ✖


```
{
    "name": "user_1",
    "email": "user_1@gmail.com"
}
```


MLF

Section Id :	64065322068
Section Number :	7
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	12
Number of Questions to be attempted :	12
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 :	64065349951
Question Shuffling Allowed :	No

Question Number : 115 Question Id : 640653349705 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 "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 :

6406531161183. ✔ Yes

6406531161184. ✖ No

Sub-Section Number :	2
Sub-Section Id :	64065349952
Question Shuffling Allowed :	Yes

Question Number : 116 Question Id : 640653349711 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

The matrix $A = \begin{bmatrix} 4 & 1 & -1 \\ 1 & 2 & 1 \\ 1 & -1 & 2 \end{bmatrix}$ is

Options :

6406531161203. ✔ positive definite

6406531161204. ✖ positive semi-definite

6406531161205. ✖ negative definite

6406531161206. ✖ negative semi-definite

Sub-Section Number : 3

Sub-Section Id : 64065349953

Question Shuffling Allowed : Yes

Question Number : 117 Question Id : 640653349710 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 singular value decomposition of matrix $A = \begin{bmatrix} 1 & -1 & 3 \\ 3 & 3 & 1 \end{bmatrix}$ is

Options :

6406531161199. ✔ $\begin{bmatrix} \frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}} \\ \frac{1}{\sqrt{2}} & \frac{-1}{\sqrt{2}} \end{bmatrix} \begin{bmatrix} 4 & 0 & 0 \\ 0 & \sqrt{6} & 0 \end{bmatrix} \begin{bmatrix} \frac{\sqrt{3}}{\sqrt{6}} & 0 & \frac{\sqrt{3}}{\sqrt{6}} \\ \frac{-\sqrt{2}}{\sqrt{6}} & \frac{-\sqrt{2}}{\sqrt{6}} & \frac{\sqrt{2}}{\sqrt{6}} \\ \frac{-\sqrt{1}}{\sqrt{6}} & \frac{-2}{\sqrt{6}} & \frac{1}{\sqrt{6}} \end{bmatrix}$

6406531161200. ✖ $\begin{bmatrix} \frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}} \\ \frac{1}{\sqrt{2}} & \frac{-1}{\sqrt{2}} \end{bmatrix} \begin{bmatrix} 4 & 0 & 0 \\ 0 & \sqrt{8} & 0 \end{bmatrix} \begin{bmatrix} \frac{\sqrt{3}}{\sqrt{6}} & 0 & \frac{\sqrt{3}}{\sqrt{6}} \\ \frac{-\sqrt{2}}{\sqrt{6}} & \frac{-\sqrt{2}}{\sqrt{6}} & \frac{\sqrt{2}}{\sqrt{6}} \\ \frac{-\sqrt{1}}{\sqrt{6}} & \frac{-2}{\sqrt{6}} & \frac{1}{\sqrt{6}} \end{bmatrix}$

6406531161201. ✖

$$\begin{bmatrix} \frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}} \\ \frac{1}{\sqrt{2}} & \frac{-1}{\sqrt{2}} \end{bmatrix} \begin{bmatrix} 5 & 0 & 0 \\ 0 & \sqrt{6} & 0 \end{bmatrix} \begin{bmatrix} \frac{\sqrt{3}}{\sqrt{6}} & 0 & \frac{\sqrt{3}}{\sqrt{6}} \\ \frac{-\sqrt{2}}{\sqrt{6}} & \frac{-\sqrt{2}}{\sqrt{6}} & \frac{\sqrt{2}}{\sqrt{6}} \\ \frac{-\sqrt{1}}{\sqrt{6}} & \frac{-2}{\sqrt{6}} & \frac{1}{\sqrt{6}} \end{bmatrix}$$

$$\begin{bmatrix} \frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}} \\ \frac{1}{\sqrt{2}} & \frac{-1}{\sqrt{2}} \end{bmatrix} \begin{bmatrix} 5 & 0 & 0 \\ 0 & \sqrt{8} & 0 \end{bmatrix} \begin{bmatrix} \frac{\sqrt{3}}{\sqrt{6}} & 0 & \frac{\sqrt{3}}{\sqrt{6}} \\ \frac{-\sqrt{2}}{\sqrt{6}} & \frac{-\sqrt{2}}{\sqrt{6}} & \frac{\sqrt{2}}{\sqrt{6}} \\ \frac{-\sqrt{1}}{\sqrt{6}} & \frac{-2}{\sqrt{6}} & \frac{1}{\sqrt{6}} \end{bmatrix}$$

6406531161202. ✖

Sub-Section Number : 4

Sub-Section Id : 64065349954

Question Shuffling Allowed : Yes

Question Number : 118 Question Id : 640653349706 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Select Question

If $v_1, v_2, \cdots, v_{n-1}, v_n \in R^n$ are orthonormal vectors, then which of the following statements is/are true?

Options :

6406531161185. ✔ $v_i^T v_j = 0,\ 1 \leq i \leq n,\ 1 \leq j \leq n,$ and $i \neq j.$

6406531161186. ✔ $v_i^T v_i = 1,\ 1 \leq i \leq n.$

6406531161187. ✔ Matrix formed by the vectors $v_1, v_2, v_3, \cdots, v_n$ is always orthogonal.

6406531161188. ✖ Matrix formed by the vectors $v_1, v_2, v_3, \cdots, v_n$ is always symmetric.

Question Number : 119 Question Id : 640653349707 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Select Question

Which of the following is/are eigenvectors of the matrix $A = \begin{bmatrix} 5 & 1+i \\ -1+i & 6 \end{bmatrix}$?
Note: This is a MSQ question.

Options :

6406531161189. ✔ $\begin{bmatrix} 1 \\ \frac{-1+i}{2} \end{bmatrix}, \begin{bmatrix} 1 \\ 1-i \end{bmatrix}$

6406531161190. ✖ $\begin{bmatrix} 1 \\ \frac{-1+2i}{2} \end{bmatrix}, \begin{bmatrix} 1 \\ 1-i \end{bmatrix}$

6406531161191. ✔ $\begin{bmatrix} 1+i \\ -1 \end{bmatrix}, \begin{bmatrix} 1 \\ 1-i \end{bmatrix}$

6406531161192. ✖ $\begin{bmatrix} 1 \\ \frac{-1-2i}{2} \end{bmatrix}, \begin{bmatrix} 1 \\ 1-i \end{bmatrix}$

Question Number : 120 Question Id : 640653349708 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Select Question

Let A be a $n \times n$ Hermitian matrix. Suppose $A = UDU^*$, all the diagonal entries of a diagonal matrix D are 1. Then which of the following statements is/are true about hermitian matrix A?

Options :

6406531161193. ✔ A is the identity matrix.

6406531161194. ✖ A can be a matrix other than identity matrix.

6406531161195. ✔ Any vector in $v \in C^n$ is an eignevector of A with eigenvalue of 1.

6406531161196. ✖ Not all vectors in $v \in C^n$ will be eigen vectors of A.

6406531161197. ✔ $A = D$

Question Number : 121 Question Id : 640653349712 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Select Question

Which of the following statements are correct?

Options :

6406531161207. ✔ Every positive definite matrix is invertible.

6406531161208. ✔ A diagonal matrix with positive entries is positive definite.

6406531161209. ✔ A symmetric with positive determinant is not necessarily positive definite.

6406531161210. ✔ If matrix S is positive definite then S^{-1} may also be positive definite.

Sub-Section Number :	5
Sub-Section Id :	64065349955
Question Shuffling Allowed :	Yes

Question Number : 122 Question Id : 640653349709 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 matrix $A = \begin{bmatrix} -1 \\ 2 \\ 2 \end{bmatrix}$. Suppose the eigenvalues of AA^T are a, b, c respectively. Then the value of $a + b + c$ is.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

9

Question Number : 123 Question Id : 640653349717 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

We need to find the optimal value of the objective function $f(x, y, z) = log(xyz) + xyz$. We start with $X_0 = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$. If $X_1 = \begin{bmatrix} i \\ j \\ k \end{bmatrix}$ using the gradient descent algorithm and using $\eta = 1$, then what is the absolute value of $|i + j + k|$? Enter the answer up to 2 decimals accuracy.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

7.5 to 8.5

Question Number : 124 Question Id : 640653349718 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

It is known that for some function, $f(0) = 1$, $f'(x) = -cos(x)e^{sin(x)}$, and $f''(x) = sin(x)e^{sin(x)} + (cos(x))^2 e^{sin(x)}$. What is the value of $f(1)$ using taylor series expansion. Use second order approximation (up to $f''(x)$) starting with $x = 0$ and $nd = 1$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.4 to 0.6

Question Number : 125 Question Id : 640653349719 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

We need to find the cheapest cylindrical container to hold 1000m^3 of water. The cost of top and bottom circular base is twice that of material used for side of cylinder. Suppose if 1m^2 area of side cost 1000 rupees. Top and bottom base costs 2000 rupees each, then what is the value of radius of cylinder such that we get minimum cost?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

3.1 to 3.8

Sub-Section Number :	6
Sub-Section Id :	64065349956
Question Shuffling Allowed :	No

Question Id : 640653349713 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (126 to 128)

Question Label : Comprehension

Consider the data points x_1, x_2, x_3 to answer the given subquestions.

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

Sub questions

Question Number : 126 Question Id : 640653349714 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

Calculate the mean vector of the data points x_1, x_2, x_3 and write the summation of all elements of mean vector obtained.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Question Number : 127 Question Id : 640653349715 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 $C = \frac{1}{3}\sum_{i=1}^{3}(x_i - \bar{x})(x_i - \bar{x})^T$
for the data points x_1, x_2, x_3 is calculated.
Find the trace of C.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

1.3 to 1.5

Question Number : 128 Question Id : 640653349716 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

Project data points x_1, x_2, x_3 onto a one dimensional space using PCA. Let z_1, z_2, z_3 denotes the projection of x_1, x_2, x_3 respectively. Calculate the summation of all elements of z_2

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Java

Section Id : 64065322069

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 :	64065349957
Question Shuffling Allowed :	No

Question Number : 129 Question Id : 640653349720 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 "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 :

6406531161217. ✔ Yes

6406531161218. ✖ No

Sub-Section Number :	2
Sub-Section Id :	64065349958
Question Shuffling Allowed :	Yes

Question Number : 130 Question Id : 640653349721 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 Address implements Cloneable{
    private String city;
    private int pinCode;
    // constructor here to instantiate city, pinCode
    public void setCity(String c){
        city = c;
    }
}
class Temple implements Cloneable{
    private Address adr;
    private String tempName;
    // constructor here to instantiate adr, tempName
    public Address getAddress(){
        return adr;
    }
    public void setTempName(String t){
      tempName = t;
    }
    public Temple clone() throws CloneNotSupportedException{
        Temple t = (Temple) super.clone();
        return t;
    }
    //Overrides the method toString()
    // to return tempName + ":"+ city + ":" + pinCode;
}
public class Main{
    public static void main(String[] args){
        Temple t1 = new Temple(new Address("Madurai", 625001), "Meenakshi temple");
        try{
            Temple t2 = t1.clone();
            t2.setTempName("Golden temple");
            t2.getAddress().setCity("Amritsar");
            System.out.println(t1);
            System.out.println(t2);
        }
        catch(CloneNotSupportedException e){
            System.out.println("Cloning not supported");
        }
    }
}
```

What will the output be?

Options :

6406531161219. ✖
```
Meenakshi temple:Madurai:625001
Golden temple:Amritsar:625001
```

6406531161220. ✔
```
Meenakshi temple:Amritsar:625001
Golden temple:Amritsar:625001
```

6406531161221. ✖
```
Golden temple:Amritsar:625001
Golden temple:Amritsar:625001
```

6406531161222. ✖
```
Meenakshi temple:Madurai:625001
Golden temple:Madurai:625001
```

Question Number : 131 Question Id : 640653349722 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 Test{
    public static void main(String[] args){
        var bill_march = new LinkedHashMap<String, Integer>();
        bill_march.put("suresh", 100);
        bill_march.put("mukesh", 150);
        bill_march.put("ganesh", 80);
        bill_march.put("pranay", 200);
        var bill_april = new LinkedHashMap<String, Integer>();
        bill_april.put("suresh", 200);
        bill_april.put("mukesh", 100);
        bill_april.put("ganesh", 100);
        bill_april.put("pranay", 100);
        var totalBill = new LinkedHashMap<String, Integer>();

        for(Map.Entry<String, Integer> e : bill_march.entrySet())
            totalBill.put(e.getKey(), e.getValue());

        for(Map.Entry<String, Integer> e : bill_april.entrySet())
            totalBill.merge(e.getKey(), e.getValue(), (x, y) -> y + x);

        System.out.println(totalBill);
    }
}
```

Choose the correct option.

Options :

6406531161223. ✖ It generates runtime exception: `NullPointerException`

6406531161224. ✖ It generates the output:
`suresh=100, mukesh=150, ganesh=80, pranay=200`

6406531161225. ✖ It generates the output:
`suresh=200, mukesh=100, ganesh=100, pranay=100`

6406531161226. ✔ It generates the output:
`suresh=300, mukesh=250, ganesh=180, pranay=300`

Question Number : 132 Question Id : 640653349724 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.

```
public class ArrayOperations{
  public <T extends Comparable> T min(T[] arr){
    // code for finding the minimum
  }
  public <T extends Number> T sum(T[] arr){
    // code for finding the sum of elements
  }
  public <T> int count(T[] arr){
    // code for finding the count of elements
  }
}
```

What is the class ArrayOperations converted to after type erasure?

Options :

6406531161231. ✖

```
public class ArrayOperations{
  public Object min(Object[] arr){
    // code for finding the minimum
  }
  public Number sum(Number[] arr){
    // code for finding the sum of elements
  }
  public int count(Object[] arr){
   // code for finding the count of elements
  }
}
```

6406531161232. ✖

```
public class ArrayOperations{
  public Object min(Object[] arr){
    // code for finding the minimum
  }
  public Object sum(Object[] arr){
    // code for finding the sum of elements
  }
  public int count(Object[] arr){
    // code for finding the count of elements
  }
}
```

6406531161233. ✔

```
public class ArrayOperations{
  public Comparable min(Comparable[] arr){
    // code for finding the minimum
  }
  public Number sum(Number[] arr){
    // code for finding the sum of elements
  }
  public int count(Object[] arr){
    // code for finding the count of elements
  }
}
```

```
public class ArrayOperations{
  public Comparable min(Comparable[] arr){
    // code for finding the minimum
  }
  public Integer sum(Integer[] arr){
    // code for finding the sum of elements
  }
  public int count(Object[] arr){
    // code for finding the count of elements
  }
}
```

6406531161234. ✖

Question Number : 133 Question Id : 640653349727 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 program.

```
import java.util.stream.*;
import java.util.*;
class Order{
    private String Id;
    private double amount;
    public Order(String id, double amt){
        this.Id = id;
        this.amount = amt;
    }
    public double getAmount(){
        return amount;
    }
}
public class Test{
    public static void main(String[] args){
        var oList = new ArrayList<Order>();     //LINE 1
        oList.add(new Order("A0000", 1000.0));
        oList.add(new Order("A0001", 600.0));
        oList.add(new Order("A0002", 1200.0));
        oList.add(new Order("A0003", 900.0));
        var elements = oList.stream()
                            .filter((x) -> x.getAmount() > 900)
                            .count();           //LINE 2

        System.out.println(elements);          //LINE 3
    }
}
```

Choose the correct option.

Options :

6406531161243. ✖ It generates compiler error at `LINE 1` and `LINE 2`

6406531161244. ✖ It compiles without any error but generates `NullPointerException` at `LINE 1` and `LINE 2`

6406531161245. ✖ It compiles without any error but generates `NullPointerException` at `LINE 2` and `LINE 3`

6406531161246. ✔ It generates the output:
2

6406531161247. ✖

It generates the output:
3

Question Number : 134 Question Id : 640653349729 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 Example{
    ArrayList<Integer> list1 = new ArrayList<Integer>();
    ArrayList<Integer> list2 = new ArrayList<Integer>();
    public boolean property(int num) {
        //return true if num is prime otherwise return false
    }
    public void iterateList(ArrayList<Integer> inputlist) {
        Iterator<Integer> it = inputlist.iterator();
        while (it.hasNext()) {
            int element=it.next();
            if(element%2==0) {
                list1.add(element);
            }
            else {
                if(property(element))
                    it.remove();
                else
                    list2.add(element);
            }
        }
        System.out.println(list1+"\n"+list2);
    }
}
public class IteratorTest {
    public static void main(String[] args) {
        ArrayList<Integer> list = new ArrayList<Integer>();
        for (int i = 2; i < 15; i++)
            list.add(i);
        Example obj = new Example();
        obj.iterateList(list);
    }
}
```

What will the output be?

Options :

6406531161252. ✔
```
[2, 4, 6, 8, 10, 12, 14]
[9]
```

6406531161253. ✖
```
[9]
[2, 4, 6, 8, 10, 12, 14]
```

6406531161254. ✖
```
[2, 4, 6, 8, 10, 12, 14]
[3, 5, 7, 9, 11, 13]
```

6406531161255. ✖
```
[3, 5, 7, 9, 11, 13]
[2, 4, 6, 8, 10, 12, 14]
```

Question Number : 135 Question Id : 640653349730 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 MapEx {
    TreeMap<String, String> map=new TreeMap<String, String>();
    public void addToMap(String key,String value){
        map.put(key, _____________);                    //LINE-1
    }
    public static void main(String[] args) {
        MapEx obj=new MapEx();
        obj.addToMap("India", "Sachin");
        obj.addToMap("India", "Sehwag");
        obj.addToMap("Sri Lanka","Hasaranga");
        obj.addToMap("Sri Lanka", "Asalanka");
        for(Map.Entry<String, String> entry:obj.map.entrySet()) {
            System.out.println(entry.getKey()+"-->"+entry.getValue());
        }
    }
}
```

Choose the correct option to fill in the blank in LINE-1 so that the output is:

```
India--> Sachin Sehwag
Sri Lanka--> Hasaranga Asalanka
```

Options :

6406531161256. ✖ `map.getDefault(key, "")+" "+value`

6406531161257. ✔ `map.getOrDefault(key, "")+" "+value`

6406531161258. ✖ `map.putOrDefault(key, "")+" "+value`

6406531161259. ✖ map.getOrDefault(key)+" "+value

Question Number : 136 Question Id : 640653349731 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.

```
class InvalidIndexException extends Exception{
    public InvalidIndexException() {
        super("invalid exception");
    }
}
public class Main {
    public static void getSubString(String a, int s, int e)
                        throws StringIndexOutOfBoundsException  {
        try {
            if(s > e)
                throw new InvalidIndexException();
            else
                System.out.println(a.substring(s, e));
        }
        catch(InvalidIndexException ie) {
            StringIndexOutOfBoundsException ne;
            ne = new StringIndexOutOfBoundsException("string index out of bound");
            ne.initCause(ie);
            throw ne;
        }
    }
    public static void main(String[] args) {
        try {
            getSubString("Java program", 5, 0);
        }
        catch(StringIndexOutOfBoundsException se) {
            System.out.println(se.getMessage());
            System.out.println(se.getCause().getMessage());
        }
    }
}
```

What will the output be?

Options :

6406531161260. ✔
string index out of bound
invalid exception

6406531161261. ✖
invalid exception
string index out of bound

6406531161262. ✖
string index out of bound
null

6406531161263. ✖
string index out of bound
string index out of bound

Question Number : 137 Question Id : 640653349732 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.

```
class AssertPositive{
    public static boolean assertPos(int a){
        assert a > 0: "a should not be negative";    //LINE-1
        return true;
    }
}
class AssertNonZero{
    public static boolean assertNonZero(int b){
        assert b != 0: "b should not be zero";     //LINE-2
        return true;
    }
}
public class AssertionTest {
    public static void main(String[] args) {
        int a = -1;
        int b = 0;
        int result = 0;

        if (AssertPositive.assertPos(a) && AssertNonZero.assertNonZero(b))
            result = a - b;     //LINE-3
        System.out.println(result);
    }
}
```

Choose the most appropriate option regarding the code when executed as:
`java -ea:AssertNonZero AssertionTest`

Options :

6406531161264. ✖ LINE-1 gives AssertionError

6406531161265. ✔ LINE-2 gives AssertionError

6406531161266. ✖ LINE-3 gives AssertionError

6406531161267. ✖ This program generates the output:
-1

Question Number : 138 Question Id : 640653349734 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.

A.java:

```
package com.pack1;
public class A {
    private void getShow() {                //METHOD-1
        System.out.println("Show with no param");
    }
    public void getShow(int x) {            //METHOD-2
        System.out.println("Show with int param");
    }
    void getShow(String y) {                //METHOD-3
        System.out.println("Show with string param");
    }
    protected void getShow(Object z) {      //METHOD-4
        System.out.println("Show with Object param");
    }
}
```

B.java:

```
package com.pack1;
public class B {
}
```

C.java:

```
package com.pack2;
import com.pack1.A;
public class C extends A{
}
```

Choose the correct option with respect to METHODs 1, 2, 3 and 4 inside class A

Options :

6406531161272. ✖ Class B can access METHODs 1, 2 and 4
Class C can access METHODs 1, 2 and 4

6406531161273. ✔ Class B can access METHODs 2, 3 and 4
Class C can access METHODs 2, 4

6406531161274. ✖

Class B can access METHODs 1, 2, 3 and 4
Class C can access METHODs 1, 2 and 4

6406531161275. ✖ Class B and C both can access all the four methods.

Question Number : 139 Question Id : 640653349735 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.

```
class Test{
    public static void method1() throws Exception {
        System.out.println(10/0);
    }
    public static void method2() throws Throwable {
        try {
            method1();
        }
        catch(Exception e) {
            System.out.println("caught in method2()");
            throw e;
        }
    }
}
public class Example {
    public static void main(String[] args) throws Throwable {
        try {
            Test.method2();
        }
        catch(Exception e) {
            System.out.println("caught in main");
        }
    }
}
```

Choose the correct option.

Options :

6406531161276. ✖

This program generates the output:

```
caught in main
caught in method2()
```

6406531161277. ✖

This program generates the output:

```
caught in method2()
```

6406531161278. ✔

This program generates the output:

```
caught in method2()
caught in main
```

6406531161279. ✖ This program terminates abnormally due to unhandled exceptions.

Sub-Section Number : 3

Sub-Section Id : 64065349959

Question Shuffling Allowed : Yes

Question Number : 140 Question Id : 640653349728 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.*;
public class Example {
    public static void main(String[] args) {
        ArrayList<String> list = new ArrayList<String>();
        list.add("Java");
        list.add("Programming language");
        list.add("IITM");
        list.add("Chennai");
        *****CODE BLOCK*****
        for(String str:list) {
            set1.add(str);
            set2.add(str);
        }
        for(String str:set1) {
            System.out.print(str+" ");
        }
        System.out.println();
        for(String str:set2) {
            System.out.print(str+" ");
        }
    }
}
```

Choose the correct option(s) to fill in CODE BLOCK so that the program always generates the following output:

```
Java Programming language IITM Chennai
Chennai IITM Java Programming language
```

Options :

6406531161248. ✖
```
Set<String> set1 = new TreeSet<String>();
Set<String> set2 = new LinkedHashSet<String>();
```

6406531161249. ✔
```
Set<String> set1 = new LinkedHashSet<String>();
Set<String> set2 = new TreeSet<String>();
```

6406531161250. ✖
```
Set<String> set1 = new HashSet<String>();
Set<String> set2 = new TreeSet<String>();
```

6406531161251. ✖
```
Set<String> set1 = new LinkedHashSet<String>();
Set<String> set2 = new HashSet<String>();
```

Sub-Section Number : 4

Sub-Section Id : 64065349960

Question Shuffling Allowed : Yes

Question Number : 141 Question Id : 640653349723 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Select Question

Which of the following statements can count the number of integers between 50 and 100 that are not divisible by 2?

Options :

6406531161227. ✔
```
Stream.iterate(50, n -> n + 1).limit(50).filter(n -> n % 2 != 0)
.count();
```

6406531161228. ✖
```
Stream.iterate(50, n -> n + 1).filter(n -> n % 2 != 0)
.count();
```

6406531161229. ✔
```
Stream.iterate(50, n-> n <100, n -> n + 1).filter(n -> n % 2 != 0)
.count();
```

6406531161230. ✖
```
Stream.filter(50, n-> n <100, n -> n + 1).iterate(n -> n % 2 == 0)
.count();
```

Question Number : 142 Question Id : 640653349725 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Select Question

The code given below should print `true` if the sum of elements of the array is positive, else `false`. Identify the header(s) for function `checkSum` (at `LINE 1`) such that the code prints either true or false, based on value of the `sum`.

```
interface Summable{
    public double sum();
}
class ArrayOperations<T extends Number> implements Summable{
    // instance variables and constructors here
    private T[] arr;
    public ArrayOperations(T[] y){
      this.arr = y;
    }
    public double sum(){ //Finds the sum of elements in arr
      double sum = 0;
      for(T x : arr){
        sum = sum + x.doubleValue();
      }
      return sum;
    }
}

public class Test {
    //LINE 1 {
      if(ob.sum() > 0){
        return true;
      }
      return false;
    }
    public static void main(String[] args){
        Double[] r = {12.3, 14.6, 34.5, 67.0};
        ArrayOperations<Double> d = new ArrayOperations<Double>(r);
        System.out.println(checkSum(d));
    }
}
```

Options :

6406531161235. ✔ `public static <T extends Summable> boolean checkSum(T ob)`

6406531161236. ✔ `public static boolean checkSum(Summable ob)`

6406531161237. ✖ `public static boolean checkSum(T ob)`

6406531161238. ✖ `public static <T> boolean checkSum(T ob)`

Question Number : 143 Question Id : 640653349726 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Select Question

Consider the following program.

```
class ComplexNumber<T extends Number>{
    private T a;
    private T b;
    public ComplexNumber(T a_val, T b_val){
        a = a_val;
        b = b_val;
    }
    public T get_a() {
        return a;
    }
    public T get_b() {
        return b;
    }
    public ComplexNumber<Double> subtract(____LINE 1____) {
        ComplexNumber<Double> c1 = new ComplexNumber<>(0.0, 0.0);
        c1.a = this.a.doubleValue() - c.get_a().doubleValue();
        c1.b = this.b.doubleValue() - c.get_b().doubleValue();
        return c1;
    }
}
public class Test{
    public static void main(String args[]) {
        ComplexNumber<Integer> c1 = new ComplexNumber<Integer>(5,6);
        ComplexNumber<Integer> c2 = new ComplexNumber<Integer>(3,2);
        ComplexNumber<Double> c3 = c1.subtract(c2);
        System.out.println(c3.get_a() + "," + c3.get_b());
    }
}
```

Choose all the options which can be used in place of LINE 1 so that the code outputs the difference between two complex numbers.

Options :

6406531161239. ✔ `ComplexNumber<T> c`

6406531161240. ✖ `ComplexNumber<Number> c`

6406531161241. ✔ `ComplexNumber<?> c`

6406531161242. ✖ `ComplexNumber<Object> c`

Question Number : 144 Question Id : 640653349733 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Select Question

Consider the three Java programs given below.

Student.java:

```
package college;
public class Student {
    private String name, college;
    public Student(String name, String college) {
        this.name = name; this.college = college;
    }
    public String getName() {
        return name;
    }
    public String toString() {
        return name+" "+college;
    }
}
```

Student.java:

```
package dance;
public class Student {
    String name, type;
    public Student(String name, String type) {
        this.name = name; this.type = type;
    }
    public String getType() {
        return type;
    }
    public String toString() {
        return name+" "+type;
    }
}
```

Test.java:

```
package pack3;
public class Test {
    public static void main(String[] args) {
        ******CODE BLOCK******
        System.out.println(obj1);
        System.out.println(obj2);
        System.out.println(obj3);
    }
}
```

Choose the correct option(s) to fill in the CODE BLOCK so that the output is:

```
Sam IITM
Sam Traditional
Ram Traditional
```

Options :

6406531161268. ✔

```
var obj1 = new college.Student("Sam", "IITM");
var obj2 = new dance.Student(obj1.getName(), "Traditional");
var obj3 = new dance.Student("Ram", obj2.getType());
```

6406531161269. ✖

```
var obj1 = new Student("Sam", "IITM");
var obj2 = new Student(obj1.getName(), "Traditional");
var obj3 = new Student("Ram", obj2.getType());
```

6406531161270. ✔

```
college.Student obj1 = new college.Student("Sam", "IITM");
dance.Student obj2 = new dance.Student(obj1.getName(), "Traditional");
dance.Student obj3 = new dance.Student("Ram", obj2.getType());
```

6406531161271. ✖

```
Student obj1 = new college.Student("Sam", "IITM");
Student obj2 = new dance.Student(obj1.getName(), "Traditional");
Student obj3 = new dance.Student("Ram", obj2.getType());
```

AppDev-2

Section Id :	64065322070
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 Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	64065349961
Question Shuffling Allowed :	No

Question Number : 145 Question Id : 640653349736 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 "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 :

6406531161280. ✔ Yes

6406531161281. ✖ No

Sub-Section Number :	2
Sub-Section Id :	64065349962
Question Shuffling Allowed :	Yes

Question Number : 146 Question Id : 640653349739 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">
    <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;
            this.refreshes = Number(sessionStorage.refreshes) % 3 - 1;
        }

        else {
            this.data = sessionStorage.data + "prefix";
            this.refreshes = Number(sessionStorage.refreshes) % 3 + 1;
        }

        sessionStorage.data = this.data;
        sessionStorage.refreshes = this.refreshes;
    }
})
```

Say you open the file “index.html” in the browser, and enter the text “iitm” in the text box shown (after removing the existing text from the input box), and click on the button with the text “Click Me”. After that, you refresh the page twice. What will be the text shown in the text input box, and the value of the “refreshes” placeholder, respectively?

Options :

6406531161290. ✖ suffixiitmsuffix, -2

6406531161291. ✖ suffixsuffixiitmsuffix, -2

6406531161292. ✔ suffixsuffixiitmsuffix, -3

6406531161293. ✖ suffixiitmsuffix, -3

Question Number : 147 Question Id : 640653349741 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

Suppose you are organizing a ceremony to award the startup companies who have progressed considerably well in the past few years. You have received a lot of registrations. The committee has decided to shortlist the companies based on the following 2 criteria:

1. The company must have a website
2. The company must have a capital of more than 40000

Fill in the **code1** & **code2**, which can be used in Vuex Store to update the “awardees” state variable with the objects of those companies who satisfy the above-mentioned criteria.

```
const store = new Vuex.Store({
    state : {
        companies : [
            {
                name : 'sample1',
                website : 'sample1.com',
                capital : 50000
            },
            {
                name : 'sample2',
                website : null,
                capital : 75000
            },
            {
                name : 'sample3',
                website : 'sample3.com',
                capital : 42000
            },
            {
                name : 'sample4',
                website : 'sample4.com',
                capital : 38000
            },
        ],
        awardees : []
    },

    mutations : {
        update_final(state, minimum) {

            for (company of state.companies)
                code2
        }
    },
    actions : {
        send_task : function (context) {
            code1
        }
    }
})
```

Options :

6406531161298. ✖

code1: this.$store.commit("update_final", 40000);
code2: if (company.website != null && company.capital > minimum)
state.awardees.push(company)

6406531161299. ✖

code1: context.commit("update_final", 40000);
code2: if (company.website != null && capital > minimum)
awardees.push(company)

```
code1: this.$store.commit("update_final", 40000);
code2: if (company.website != null && capital > minimum)
           awardees.push(company)
```

6406531161300. ✖

```
code1: context.commit("update_final", 40000);
code2: if (company.website != null && company.capital > minimum)
           state.awardees.push(company)
```

6406531161301. ✔

Question Number : 148 Question Id : 640653349749 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 running in a browser environment.

```
async function FetchFunct(ApiUrl) {
  const response = await fetch(ApiUrl).catch(() => {
    throw new Error('Network Error')
  })

  if (response) {
    if (response.ok) {
      const data = await response.json().catch(() => {
        throw new Error('Unexpected Error')
      })
      if (data) {
        return data
      }
    } else {
      throw new Error(response.statusText)
    }
  }
}
Const url = 'dummyUrl'
FetchFunct(url)
  .then((data) => {
    console.log(data)
  })
  .catch((err) => {
    console.log(err.message)
  })
```

Consider the 'dummyUrl' returns the HTML as payload. What will be logged on to the console?

Options :

6406531161330. ✖ Network Error

6406531161331. ✔ Unexpected Error

6406531161332. ✖ Not Found

6406531161333. ✖ None of these

Question Number : 149 Question Id : 640653349750 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:

```
<body>
   <div id="app">
     <router-view></router-view>
   </div>
   <script src="app.js" type="module"></script>
   <script src="https://cdn.jsdelivr.net/npm/vue@2/dist/vue.js"></script>
   <script src="https://unpkg.com/vue-router@2.0.0/dist/vue-router.js"></script>
 </body>
```

app.js:

```
const Create = {
  template: `<div>{{message}}</div>`,
  computed: {
    message() {
      return this.$route.query.update
        ? 'This is create page'
        : 'This is update page'
    },
  },
}
const router = new VueRouter({
  routes: [{ path: '/', component: Create }],
})

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

Suppose the application is running on "http://127.0.0.1:8080". What will be the value of message property of Create component for "http://127.0.0.1:8080/#/?update=true" ?

Options :

6406531161334. ✔ This is create page

6406531161335. ✖ This is update page

6406531161336. ✖ null

6406531161337. ✖ None of these

Question Number : 150 Question Id : 640653349751 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:

```
<body>
    <div id="app">
      <router-view></router-view>
    </div>
    <script src="app.js" type="module"></script>
    <script src="https://cdn.jsdelivr.net/npm/vue@2/dist/vue.js"></script>
    <script src="https://unpkg.com/vue-router@2.0.0/dist/vue-router.js"></script>
  </body>
```

app.js:

```
const home = { template: `<div> This is home page</div>`, name: 'home' }
const profile = {
  template: `<div> This is profile page of {{this.$route.params.name}}</div>`,
}
const user = {
  template: `<div> Welcome {{this.$route.params.name}}
  <div><router-view></router-view></div>
  </div>`,
}
const router = new VueRouter({
  routes: [
    { path: '/', component: home },
    {
      path: '/user/:name',
      component: user,
      children: [
        { path: '', component: home },
        { path: 'home', component: home },
        { path: 'profile', component: profile },
      ],
    },
  ],
})

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

Suppose the application is running on "http://127.0.0.1:8080". What will be displayed by the browser for "http://127.0.0.1:8080/#/user/mohan/profile"?

Options :

6406531161338. ✔ Welcome mohan

This is profile page of mohan

6406531161339. ✖ Welcome

This is profile page of mohan

6406531161340. ✖ Welcome mohan

This is profile page of

6406531161341. ✖ Welcome mohan

Question Number : 151 Question Id : 640653349752 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:

```
<body>
    <div id="app">
      <router-view></router-view>
    </div>
    <script src="app.js" type="module"></script>
    <script src="https://cdn.jsdelivr.net/npm/vue@2/dist/vue.js"></script>
    <script src="https://unpkg.com/vue-router@2.0.0/dist/vue-router.js"></script>
  </body>
```

app.js:

```
const home = { template: `<div> This is home page</div>`, name: 'home' }
const profile = {
  template: `<div> This is profile page of {{this.$route.params.name}}</div>`,
}
const user = {
  template: `<div> Welcome {{this.$route.params.name}}
  <div><router-view></router-view></div>
  </div>`,
}
const router = new VueRouter({
  routes: [
    { path: '/', component: home },
    {
      path: '/user/:name',
      component: user,
      children: [
        { path: '', component: home },
        { path: 'home', component: home },
        { path: 'profile', component: profile },
      ],
    },
  ],
})

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

What will be displayed by the browser for "http://127.0.0.1:8080/#/user/mohan"?

Options :

6406531161342. ✖ Welcome mohan

This is home page of mohan

6406531161343. ✔ Welcome mohan

This is home page

6406531161344. ✖ Welcome

This is home page

6406531161345. ✖ Welcome

This is home page of mohan

Sub-Section Number : 3

Sub-Section Id : 64065349963

Question Shuffling Allowed : Yes

Question Number : 152 Question Id : 640653349737 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() {
   let a = await new Promise(r => r(2 && 4)).catch(e => e);
   let b = await new Promise((res, rej) => {
       if (a <= 2) res(a && 5);
       else rej(5 && a);
   }).catch(e => e);
   console.log(a, b);
}
test();
```

Options :

6406531161282. ✖ 1 1

6406531161283. ✔ 4 4

6406531161284. ✖ 2 5

6406531161285. ✖ 4 5

Question Number : 153 Question Id : 640653349738 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.

```
new Promise((reject, resolve) => {

    function test (input1, input2, data) {
        let obj = {
            input1 : input1,
            input2 : input2
        }

        if (data.find(el => el.input1 == obj.input1 && el.input2 != obj.input2))
            resolve("Element Found")
        else
            reject("Element Missing")
    }

    data = [{'input1' : 4, 'input2' : 'input2'}]
    test(4, 4, data)

}).then(data => console.log("Test failed !!", data)
).catch(error => console.log("Test Passed !!", error))
```

Options :

6406531161286. ✖ Test Passed !! Element Missing

6406531161287. ✖ Test Failed !! Element Found

6406531161288. ✖ Test Failed !! Element Missing

6406531161289. ✔ Test Passed !! Element Found

Question Number : 154 Question Id : 640653349740 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;
            this.refreshes = Number(sessionStorage.refreshes) % 3 - 1;
        }

        else {
            this.data = sessionStorage.data + "prefix";
            this.refreshes = Number(sessionStorage.refreshes) % 3 + 1;
        }

        sessionStorage.data = this.data;
        sessionStorage.refreshes = this.refreshes;
    }
})
```

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

Options :

6406531161294. ✔ suffixsuffixsuffixundefinedprefix, NaN

6406531161295. ✖ suffixsuffixsuffixundefinedprefix, -3

6406531161296. ✖ suffixsuffixundefinedprefix, NaN

6406531161297. ✖ suffixsuffixundefinedprefix, -3

Question Number : 155 Question Id : 640653349748 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 running in a browser environment.

```
function PromiseConstructor(t) {
  return new Promise((res, rej) => {
    setTimeout(() => {
      res(t)
    }, t * 1000)
  })
}
async function test() {
  const x1 = await PromiseConstructor(1)
  console.log(2)
  const x2 = await PromiseConstructor(3)
  console.log(x1)
  console.log(x2)
}
test()
console.log(4)
```

What will be logged on to the console in (value, t) format, where “t” represents the approximate

time in seconds (from the start of the execution of the program), and “value” represents the output value logged on to the console. For example: If 2 is logged on to console after 5 seconds, answer is (2, 5).

Options :

6406531161326. ✖
(4, 0)
(2, 0)
(1, 0)
(3, 0)

6406531161327. ✖
(4, 0)
(2, 1)
(1, 1)
(3, 3)

6406531161328. ✖
(4, 0)
(2, 1)
(1, 3)
(3, 3)

6406531161329. ✔
(4, 0)
(2, 1)
(1, 4)
(3, 4)

Sub-Section Number : 4

Sub-Section Id : 64065349964

Question Shuffling Allowed : Yes

Question Number : 156 Question Id : 640653349742 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Select Question

Which of the following statement(s) is/are true regarding GraphQL and REST API?

Options :

6406531161302. ✖ GraphQL is always better than an API, irrespective of the nature, scale and function of an application.

6406531161303. ✔ GraphQL can be used with every programming language, which is capable of making HTTP requests.

6406531161304. ✔ It is possible to cache the responses of REST API endpoints.

6406531161305. ✖ All of these

Question Number : 157 Question Id : 640653349743 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Select Question

Which of the following statement(s) is/are correct regarding Vuex?

Options :

6406531161306. ✔ Vuex provides a common solution to the parent component to the child component communication and vice-versa.

6406531161307. ✖ The usage of global variables over Vuex makes it easier to track the state changes.

6406531161308. ✔ Vuex is preferred in cases where multiple views depend on the same state.

6406531161309. ✖ Only the direct child components (not the descendants) have access to the Vuex store.

Question Number : 158 Question Id : 640653349746 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Select Question

Which of the following is correct regarding JWT?

Options :

6406531161318. ✔ It is used as an access token to share information between two parties.

6406531161319. ✔ It contains encoded JSON data.

6406531161320. ✖ It contains encoded XML data.

6406531161321. ✖ Only payload, encoded in base64 format, is contained in JWT web token.

Question Number : 159 Question Id : 640653349747 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Select Question

Which of the following is true regarding CORS?

Options :

6406531161322. ✔ It allows servers to indicate which origins can load the resource from the server.

6406531161323. ✖ It allows the client to indicate from which server it can load resource.

6406531161324. ✔ Enabling CORS is not required for same origin request.

6406531161325. ✖ All of these

Sub-Section Number : 5

Sub-Section Id : 64065349965

Question Shuffling Allowed : Yes

Question Number : 160 Question Id : 640653349744 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Select Question

Which of the following statement(s) is/are false regarding PWA and SPA?

Options :

6406531161310. ✔ The idea of an SPA is to improve the SEO aspects of the web application.

6406531161311. ✖ A web application manifest provides the information required for a web app to be downloaded and presented to the user in a native like experience.

6406531161312. ✖ It is the service worker that helps a PWA serve cached contents of a page, when offline.

6406531161313. ✔ Both gmail.com and amazon.in are examples of SPA.

Question Number : 161 Question Id : 640653349745 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Select Question

Which of the following statement(s) is/are false regarding token based authentication?

Options :

6406531161314. ✖ The token generated generally expires after a certain time period, and this time period can also be customized according to the application requirements.

6406531161315. ✔ The client must send the token with the first request to authenticate, and need not send the token in the subsequent requests.

6406531161316. ✖ The fetch calls to a flask API will fail due to the CORS error by default.

6406531161317. ✔ If using flask-security for achieving token based authentication, all the API endpoints are protected by default.

MLT

Section Id :	64065322071
Section Number :	10
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	19
Number of Questions to be attempted :	19
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 : 64065349966

Question Shuffling Allowed : No

Question Number : 162 Question Id : 640653349753 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 "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 :

6406531161346. ✔ Yes

6406531161347. ✖ No

Sub-Section Number : 2

Sub-Section Id : 64065349967

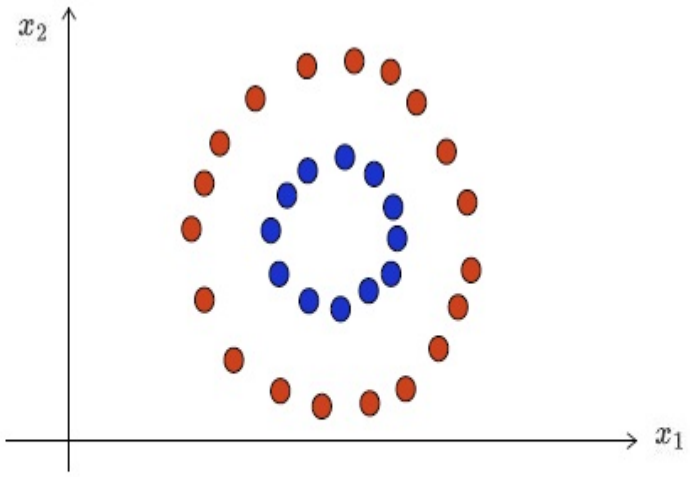
Question Shuffling Allowed : Yes

Question Number : 163 Question Id : 640653349754 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 dataset in 2D space for a binary classification problem. The red and blue points belong to two different classes:



Each data-point is of the form (x_1, x_2). A logistic regression classifier with weight vector $\mathbf{w}$ has been learnt on this data which perfectly separates these two classes. Which of the following could be the feature vector $\mathbf{x}$ that was used?

Hint: The equation of a circle centered at (a, b) and radius r is given by $(x_1 - a)^2 + (x_2 - b)^2 = r^2$

Options :

6406531161348. ✖ $\begin{bmatrix} 1 \\ x_1 \\ x_2 \end{bmatrix}$

6406531161349. ✔ $\begin{bmatrix} 1 \\ x_1 \\ x_2 \\ x_1^2 \\ x_2^2 \end{bmatrix}$

6406531161350. ✖ $\begin{bmatrix} 1 \\ x_1^2 \\ x_2^2 \end{bmatrix}$

6406531161351. ✖ $\begin{bmatrix} x_1 \\ x_2 \\ x_1^2 \\ x_2^2 \end{bmatrix}$

Question Number : 164 Question Id : 640653349756 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

A logistic regression model is being trained on a dataset of size $2n$. The first n data-points belong to class-1 and the rest in class-0. Note that we are talking about the true label here.

$$\text{Class-1} = \{x_1, \cdots, x_n\}$$
$$\text{Class-0} = \{x_{n+1}, \cdots, x_{2n}\}$$

The probability output by the model at any step in the training process is given by:

$$P(y = 1 \mid x_i) = p_i$$

Which of the following expressions is the loss of the model?

NOTE: We use the binary cross entropy loss for logistic regression. Labels are 1 and 0 for the two classes.

Options :

6406531161356. ✔ $\sum_{i=1}^{n} -\log p_i + \sum_{i=n+1}^{2n} -\log(1-p_i)$

6406531161357. ✖ $\sum_{i=1}^{2n} -\log p_i$

6406531161358. ✖ $\sum_{i=1}^{2n} -\log(1-p_i)$

6406531161359. ✖ $\sum_{i=1}^{2n} -p_i \log p_i$

Question Number : 165 Question Id : 640653349758 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 the weight update rule for logistic regression using gradient descent if you are given the following information:

- w is a m dimensional vector of weights
- X is a feature matrix of shape $n \times m$
- y is a n dimensional label vector
- α is the learning rate
- σ is the sigmoid function

Options :

6406531161364. ✔ $$w := w - \alpha X^T \left[\sigma(Xw) - y\right]$$

6406531161365. ✖ $$w := w + \alpha X^T \left[\sigma(Xw) - y\right]$$

6406531161366. ✖ $$w := w - \alpha X^T \left[Xw - y\right]$$

6406531161367. ✖ $$w := w + \alpha X^T \left[Xw - y\right]$$

6406531161368. ✖ $$w := w - \alpha X \left[\sigma(Xw) - y\right]$$

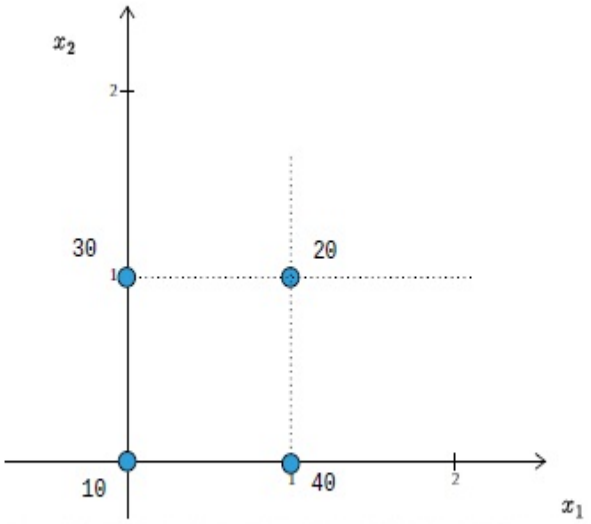
6406531161369. ✖ $$w := w + \alpha X \left[Xw - y\right]$$

Question Number : 166 Question Id : 640653349760 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

In a binary classification problem, consider the following distribution of data-points from the training data on the unit-square.



For instance, 20 data-points have the feature vector $[1, 1]^T$. The labels for these points is not important now. Which of the following Naive Bayes models would be the best choice for this dataset? Select the most appropriate option.

Options :

6406531161373. ✔ Bernoulli NB

6406531161374. ✖ Categorical NB

6406531161375. ✖ Multinomial NB

6406531161376. ✖ Gaussian NB

Question Number : 167 Question Id : 640653349761 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

$x = [x_1, x_2, x_3]^T$ is a feature vector and y represents the label in a binary classification problem. Which of the following equations represents the "naive" assumption used in the Naive Bayes algorithm?

Options :

6406531161377. ✖ $P(x, y) = P(y) \cdot P(x \mid y)$

6406531161378. ✖ $P(x) = P(x_1) \cdot P(x_2) \cdot P(x_3)$

6406531161379. ✖

$$P(y \mid x) = \frac{P(y) \cdot P(x \mid y)}{P(x)}$$

6406531161380. ✔ $P(x \mid y) = P(x_1 \mid y) \cdot P(x_2 \mid y) \cdot P(x_3 \mid y)$

Question Number : 168 Question Id : 640653349775 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

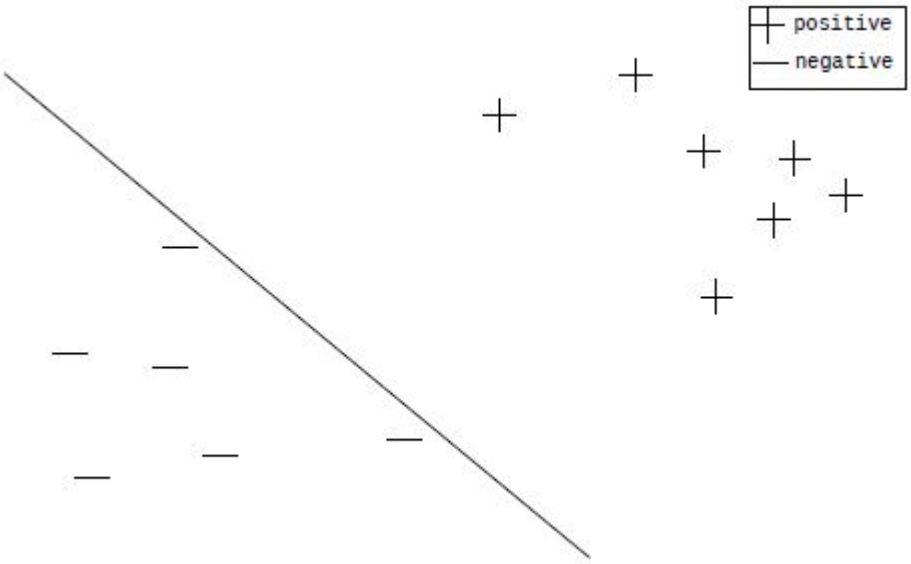
Correct Marks : 2

Question Label : Multiple Choice Question

Which of the following could be the decision boundary learned by a hard-margin SVM? Choose the most appropriate option.

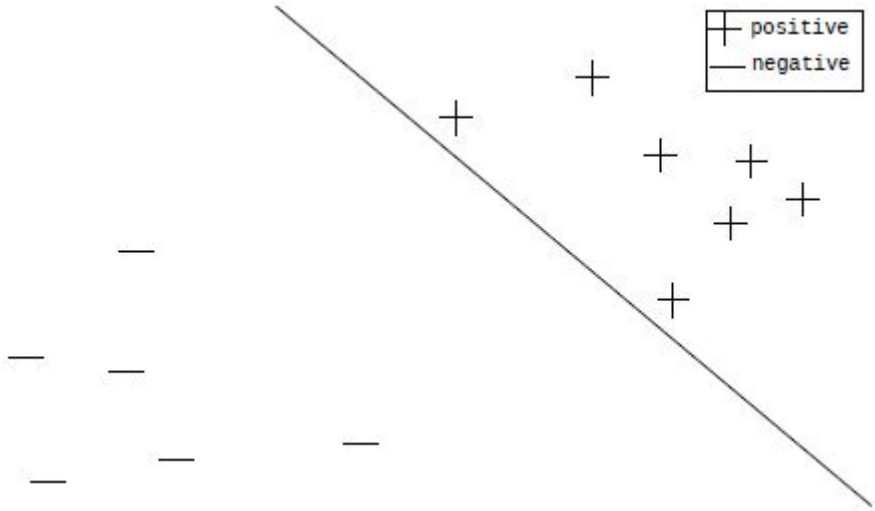
NOTE: The dataset is the same for all four options.

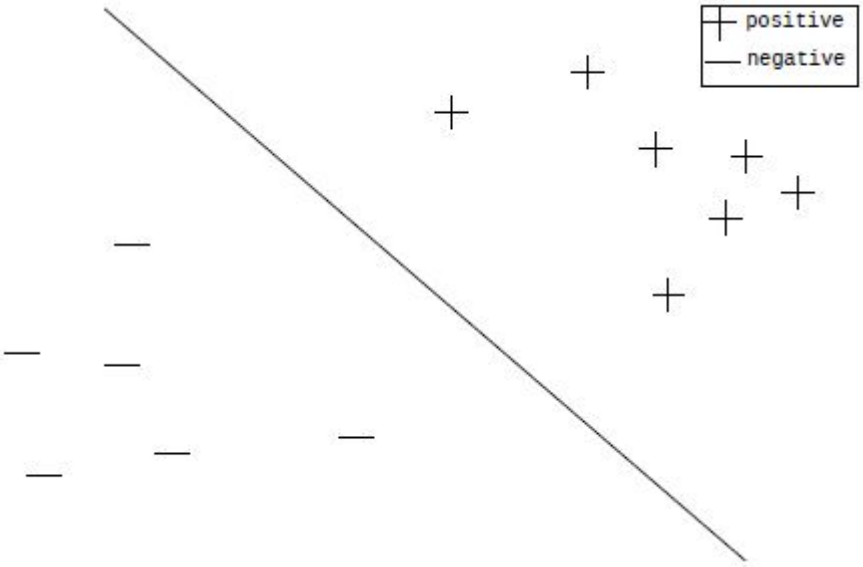
Options :



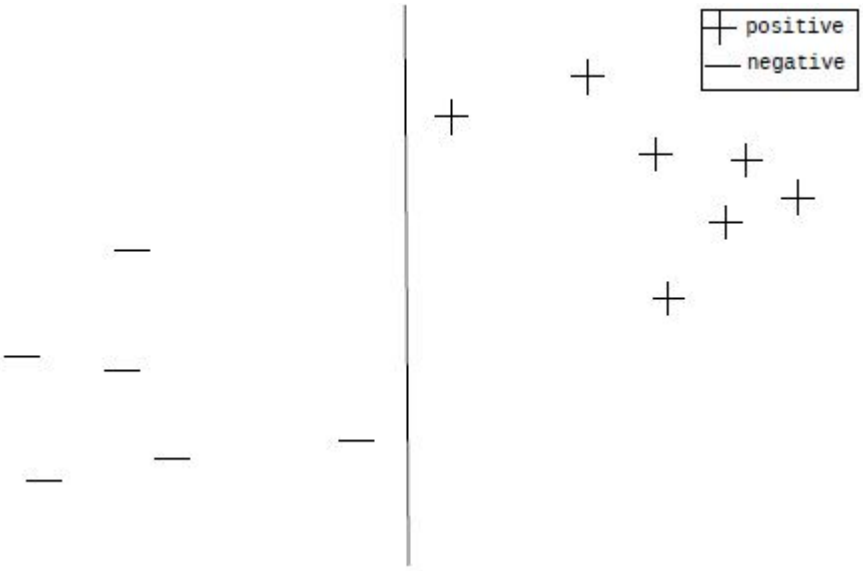
6406531161406. ✖

6406531161407. ✖





6406531161408. ✔



6406531161409. ✖

Question Number : 169 Question Id : 640653349777 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

Given a training dataset $D = \left\{(x_i, y_i)\right\}_{i=1}^{n}$, which of the following are the constraints of the optimization problem for a hard-margin SVM, for $1 \leq i \leq n$? w is the weight vector b is the bias of the model. Note that x_i corresponds to the i^{th} feature vector and $y_i \in \{-1, 1\}$.

Options :

6406531161411. ✖ $y_i(w^T x_i + b) = 1$

6406531161412. ✖ $w^T x_i + b = 1$

6406531161413. ✖ $w^T x_i + b \geq 1$

6406531161414. ✔ $y_i(w^T x_i + b) \geq 1$

Sub-Section Number :	3
Sub-Section Id :	64065349968
Question Shuffling Allowed :	Yes

Question Number : 170 Question Id : 640653349757 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Select Question

A logistic regression model has been trained on a dataset in a binary classification setup. It is now tested on two separate datasets, each having 14 data-points, 7 from each class. The binary cross-entropy loss of the **same model** on the two test-datasets is L_1 and L_2. It is also given that the classification accuracy of the model on both these test-datasets is 100%. Now consider the images of the two test datasets along with the decision boundary of the model:

Image for L_1:

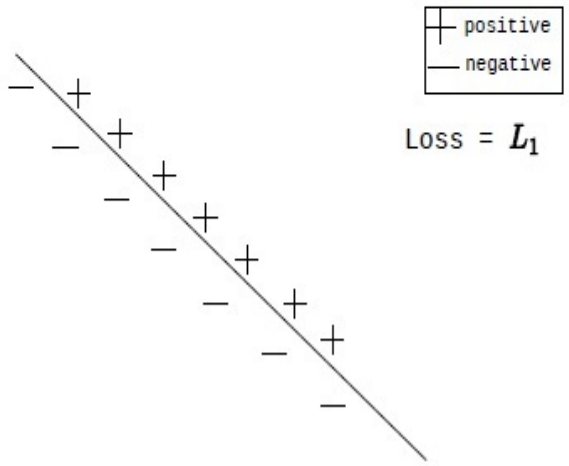
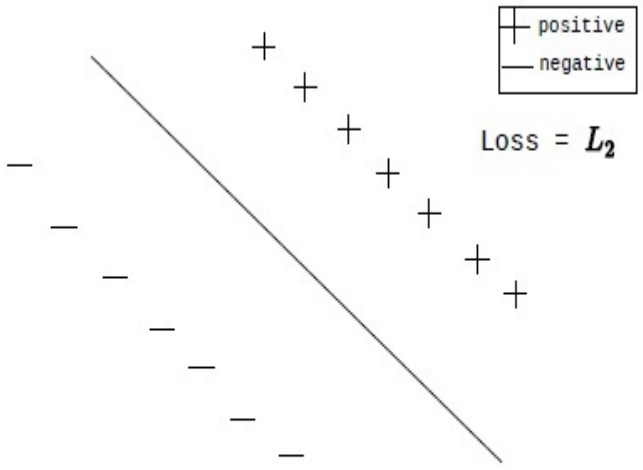


Image for L_2:



Which of the following statements are true? Assume that the loss is computed mathematically to arbitrary precision. For example, 10^{-20} is not rounded off to 0. The label is 1 for the positive class and 0 for the negative class.

Options :

6406531161360. ✖ The loss of both the models is equal to 0. That is, $L_1 = L_2 = 0$.

6406531161361. ✔ $L_1 > L_2$

6406531161362. ✖ $L_1 < L_2$

6406531161363. ✖ $L_1 = L_2$

Question Number : 171 Question Id : 640653349774 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Select Question

Which of the following could be the vector of probabilities output by a softmax regression model for **5** classes? Note that the options are independent of each other.

Options :

6406531161402. ✔ $[0.2 \quad 0.2 \quad 0.2 \quad 0.2 \quad 0.2]$

6406531161403. ✔ $[0.8 \quad 0.05 \quad 0.05 \quad 0.05 \quad 0.05]$

6406531161404. ✖ $[0.4 \quad 0.5 \quad 0.3 \quad 0.2 \quad 0.1]$

6406531161405. ✖ $[1 \quad 1 \quad 1 \quad 1 \quad 1]$

Sub-Section Number :	4
Sub-Section Id :	64065349969
Question Shuffling Allowed :	Yes

Question Number : 172 Question Id : 640653349767 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

You are given a training dataset of 100 data-points for a regression task. You wish to use a k-NN regressor, with $k = 10$.

$d(\mathbf{x_i}, \mathbf{x_j})$ is a function that returns the distance between two points $\mathbf{x_i}$ and $\mathbf{x_j}$. Calling d on a pair of points corresponds to a single distance computation.

If you want to predict the label of a new test point, how many distances would you have to compute?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

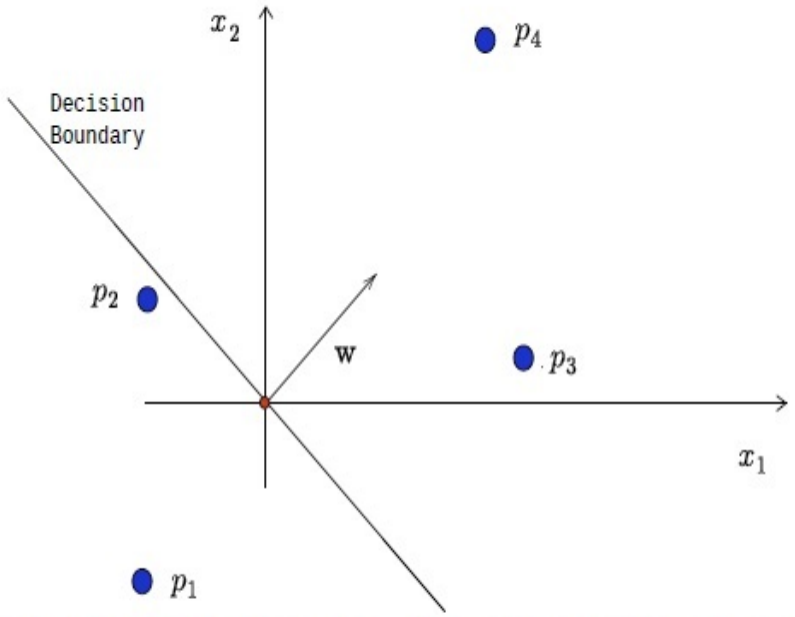
Sub-Section Number :	5
Sub-Section Id :	64065349970
Question Shuffling Allowed :	Yes

Question Number : 173 Question Id : 640653349755 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

A logistic regression model has been trained for a binary classification problem with labels 0 and 1. The weight vector and the corresponding decision boundary are displayed in the figure given below:



Now, the model is tested on four points. The probability corresponding to the i^{th} data-point x_i returned by the logistic regression model is given as follows:

$$P(y = 1 \mid x_i) = p_i$$

We don't know the true labels for any of the four points. We are only talking about the predicted probabilities here. No dummy features were used during the training phase. So, both the weight vector and the feature vector have only two components. Which of the following relationships is correct?

Options :

6406531161352. ✔ $p_1 < p_2 < p_3 < p_4$

6406531161353. ✖ $p_1 > p_2 > p_3 > p_4$

6406531161354. ✖ $p_3 < p_4 < p_2 < p_1$

6406531161355. ✖ $p_1 > p_2$ and $p_4 > p_3$

Question Number : 174 Question Id : 640653349759 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 logistic regression model that is trained on videos to detect objectionable content. Videos with objectionable content belong to the positive class (label **1**). Harmless videos belong to the negative class (label **0**).

A good detector should be able to correctly identify almost all videos that are objectionable. If it incorrectly classifies even a single video that has inappropriate content in it, that could have serious consequences, as millions of people might end up watching it. In this process the detector may classify some harmless videos as belonging to the positive class. But that is a price we are willing to pay.

How should we choose the threshold (for inference) of this logistic regression model?

Options :

6406531161370. ✔ The threshold should be a low value.

6406531161371. ✖ The threshold should be a high value.

6406531161372. ✖ The performance of the classifier is independent of the threshold.

Sub-Section Number :	6
Sub-Section Id :	64065349971
Question Shuffling Allowed :	Yes

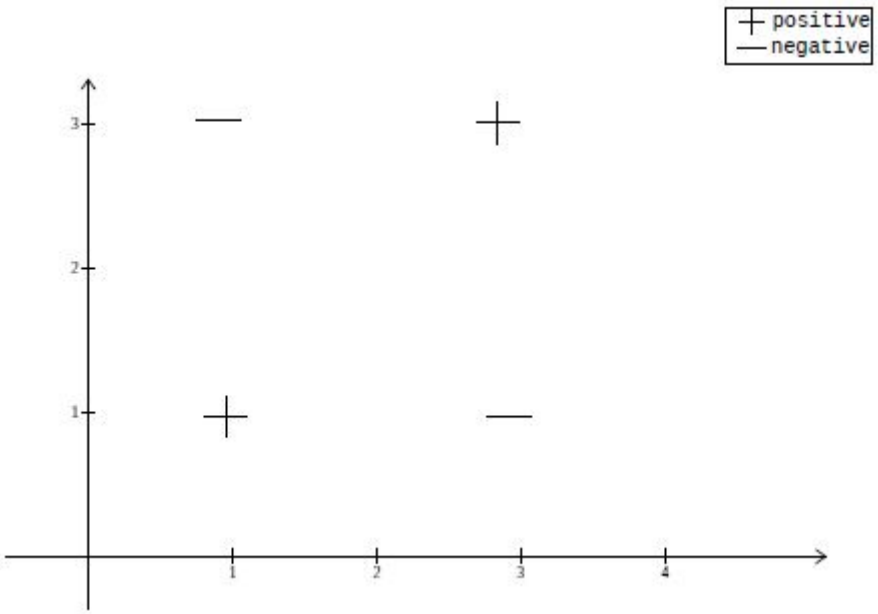
Question Number : 175 Question Id : 640653349778 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Select Question

Consider a binary classification task that has 2 features. Assume that we train a soft-margin, linear SVM (decision boundary is a line in 2D space). We know nothing about the distribution of points in the training set. The points need not be linearly separable.

This model is now tested on the following dataset that has four points.



What are the possible values of the accuracy of the model? All options are independent of each other. Assume that the decision boundary of the model does not pass through any one of the four points.

Options :

6406531161415. ✖ 0

6406531161416. ✔ 0.25

6406531161417. ✔ 0.5

6406531161418. ✔ 0.75

6406531161419. ✖ 1

Sub-Section Number : 7

Sub-Section Id : 64065349972

Question Shuffling Allowed : Yes

Question Number : 176 Question Id : 640653349776 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

An SVM model that has been trained for a binary classification task has the following weight vector and bias:

$$w = \begin{bmatrix} 5 \\ 7 \end{bmatrix}, \quad b = -35$$

This model is tested on a dataset with 10 samples as given below. Here, $x = \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$ is a feature vector and y is the true label.

x_1	x_2	y
8	1	1
10	5	1
4	4	1
1	1	1
-1	2	1
4	1	-1
3	6	-1
2	2	-1
1	2	-1
-1	1	-1

Compute the accuracy of the model on this dataset. Enter your answer between 0 and 1.

Hint: The Cartesian coordinate system was named after Rene Descartes.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.69 to 0.71

Sub-Section Number : 8

Sub-Section Id : 64065349973

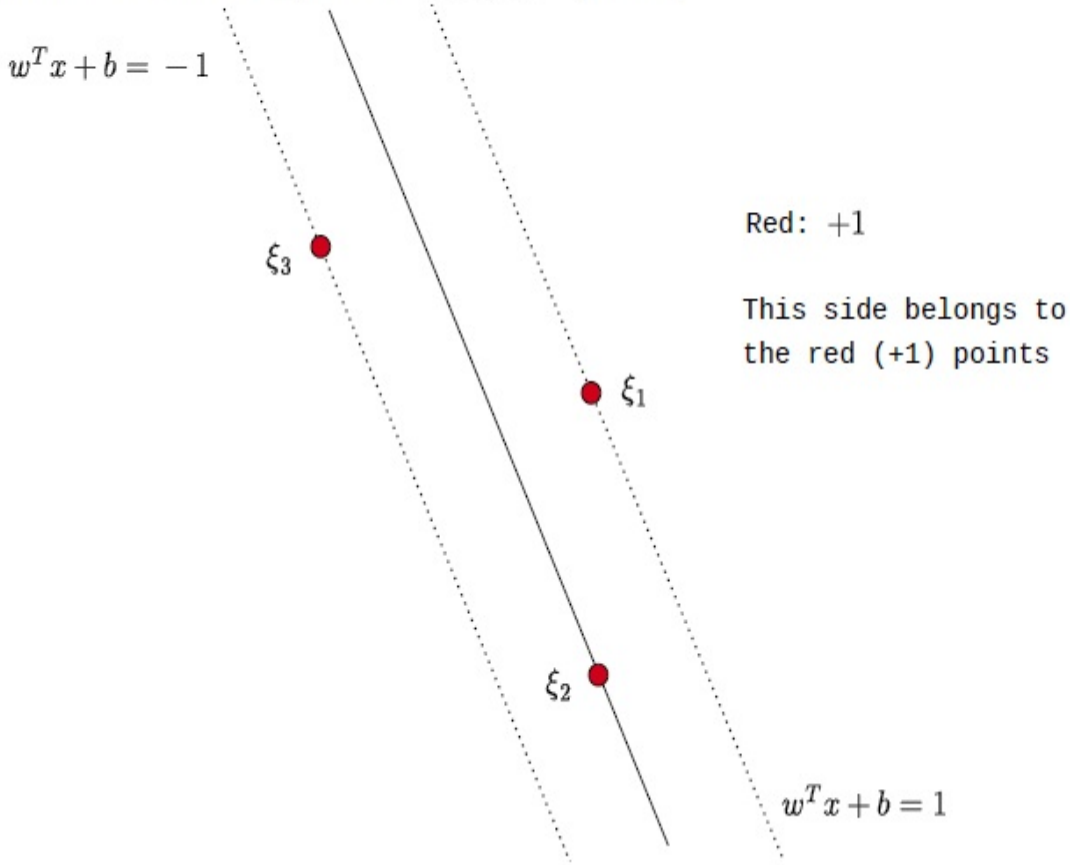
Question Shuffling Allowed : No

Question Id : 640653349779 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (177 to 179)

Question Label : Comprehension

Consider a soft-margin, linear SVM that has been trained on a dataset. A subset of three data-points from the positive class (red) from this training dataset is shown below. The decision boundary (solid line) and the bounding planes (dotted lines) are also displayed here. The slack variables for these three points are ξ_1, ξ_2, ξ_3 respectively.



Based on the above data, answer the given subquestions.

Sub questions

Question Number : 177 Question Id : 640653349780 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 value of ξ_1?
Your answer should be
a non-negative integer.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Question Number : 178 Question Id : 640653349781 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 value of ξ_2?
Your answer should be
a non-negative integer.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 179 Question Id : 640653349782 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 value of ξ_3?

Your answer should be
a non-negative integer.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

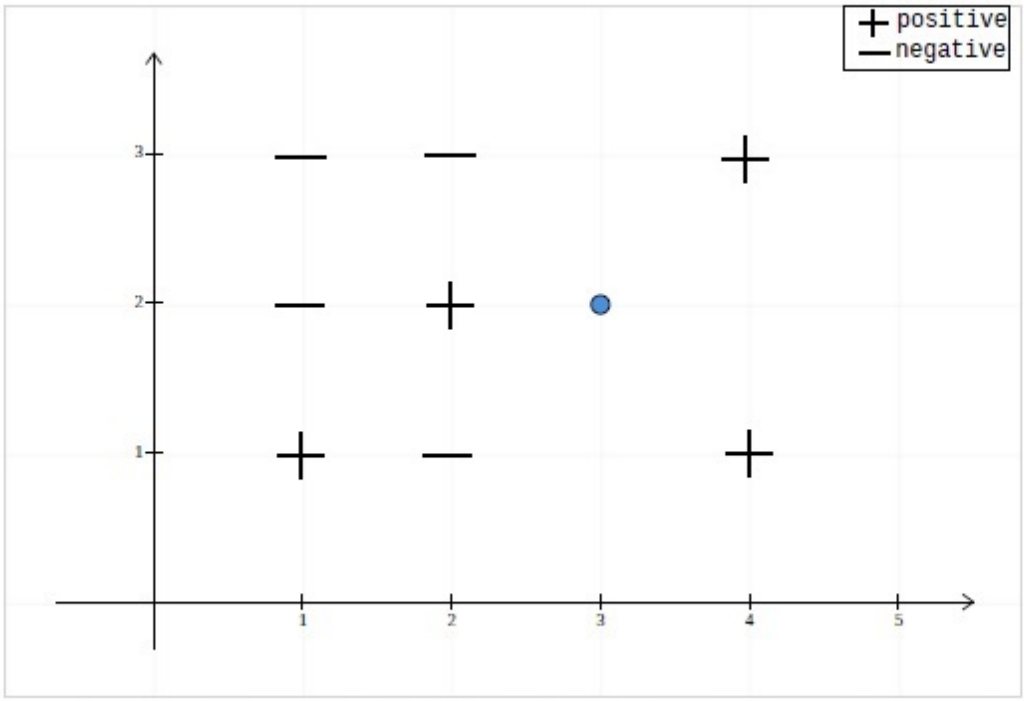
Sub-Section Number :	9
Sub-Section Id :	64065349974
Question Shuffling Allowed :	No

Question Id : 640653349768 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (180 to 181)

Question Label : Comprehension

Consider the following binary classification task for which we use a k-NN classifier using the **Manhattan distance metric**.



All points are located at integer coordinates. If the test point (blue) is $(3, 2)$, answer the given subquestions:

Sub questions

Question Number : 180 Question Id : 640653349769 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 is the predicted label of the test point if k = 1? The label is 1 for the positive class and –1 for the negative class.

Options :

6406531161386. ✔ 1

6406531161387. ✖ -1

Question Number : 181 Question Id : 640653349770 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Select Question

How many points are at a distance of **2** from the test point?

Note:

(1) We use the Manhattan distance.

(2) We want those points that are exactly **2** units away from the test point.

Options :

6406531161388. ✔ 2 points from the positive class

6406531161389. ✖ 3 points from the positive class

6406531161390. ✖ 2 points from the negative class

6406531161391. ✔ 3 points from the negative class

Sub-Section Number : 10

Sub-Section Id : 64065349975

Question Shuffling Allowed : No

Question Id : 640653349771 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (182 to 183)

Question Label : Comprehension

Consider a softmax regression model for a multi-class classification problem that has 10 classes and 20 features. Classes are numbered as $1, 2, \cdots, 10$. There are no dummy features as that is taken care of by the bias term.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 182 Question Id : 640653349772 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 is the dimension of the weight matrix W?

Options :

6406531161392. ✔ 20×10

6406531161393. ✖ 10×10

6406531161394. ✖ 20×20

6406531161395. ✖ 20×1

6406531161396. ✖ 10×1

Question Number : 183 Question Id : 640653349773 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 does the 3^{rd} column of the matrix W represent?

Options :

6406531161397. ✔ It is the vector of weights corresponding to the 3^{rd} class.

6406531161398. ✖ The features corresponding to the 3^{rd} training example.

6406531161399. ✖ The matrix W is of size 20×1 and doesn't have a 3^{rd} column.

6406531161400. ✖ The matrix W is of size 10×1 and doesn't have a 3^{rd} column.

6406531161401. ✖ It is the vector of weights corresponding to the 3^{rd} feature.

Sub-Section Number : 11

Sub-Section Id : 64065349976

Question Shuffling Allowed : No

Question Id : 640653349762 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (184 to 187)

Question Label : Comprehension

Consider a binary classification problem. The training-data has several features out of which we have access to only two binary features (x_1, x_2). The labels are 1 and 2 for the two classes. The training dataset has the following distribution of points:

Feature	Number of points	True label
$(0,0)$	30	1
$(0,0)$	10	2
$(0,1)$	10	1
$(0,1)$	40	2
$(1,0)$	30	1
$(1,0)$	10	2
$(1,1)$	10	1
$(1,1)$	50	2

The table is to be parsed as follows. The first row of the table states that there are 30 points from class 1 that have $x_1 = 0, x_2 = 0$. A Bernoulli Naive Bayes model is fit for this data with the following matrix of probabilities:

$$\begin{bmatrix} w_{11} & w_{12} \\ w_{21} & w_{22} \end{bmatrix}$$

Each entry in this matrix can be understood as follows. For $i, j \in \{1, 2\}$:

$$w_{ij} = P(x_i = 1 \mid y = j)$$

You can ignore smoothing. For all questions, report the answer up to two decimal places. Do not round-up or round-down the answer.
For example, if you get a value of 0.37914, just report 0.37.

NOTE: If the last row of the table is not clear: for feature vector (1, 1) in class-2, there are fifty points.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 184 Question Id : 640653349763 Question Type : SA Calculator : None

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

Correct Marks : 1.5

Question Label : Short Answer Question

What is the value of w_{11}?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.49 to 0.51

Question Number : 185 Question Id : 640653349764 Question Type : SA Calculator : None

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

Correct Marks : 1.5

Question Label : Short Answer Question

What is the value of w_{12}?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.53 to 0.55

Question Number : 186 Question Id : 640653349765 Question Type : SA Calculator : None

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

Correct Marks : 1.5

Question Label : Short Answer Question

What is the value of w_{21}?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.24 to 0.26

Question Number : 187 Question Id : 640653349766 Question Type : SA Calculator : None

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

Correct Marks : 1.5

Question Label : Short Answer Question

What is the value of w_{22}?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.80 to 0.82

MLP

Section Id :	64065322072
Section Number :	11
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	20
Number of Questions to be attempted :	20
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 :	64065349977
Question Shuffling Allowed :	No

Question Number : 188 Question Id : 640653349783 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 "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 :

6406531161423. ✔ Yes

6406531161424. ✖ No

Sub-Section Number :	2
Sub-Section Id :	64065349978
Question Shuffling Allowed :	Yes

Question Number : 189 Question Id : 640653349798 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

Which of the following vectorizer techniques can help to convert a large collection of text documents to a matrix?

Options :

6406531161468. ✖ CountVectorizer

6406531161469. ✔ HashingVectorizer

6406531161470. ✖ Both CountVectorizer and HashingVectorizer

6406531161471. ✖ None of these

Sub-Section Number : 3

Sub-Section Id : 64065349979

Question Shuffling Allowed : Yes

Question Number : 190 Question Id : 640653349784 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 is the output of the following block of code?

```
from sklearn.metrics import confusion_matrix
y_true = [0,2,0,2]
y_pred = [0, 0, 2, 0]
confusion_matrix(y_true, y_pred)
```

Options :

6406531161425. ✔
```
array([[1, 1],
       [2, 0]])
```

6406531161426. ✖
```
array([[2, 0],
       [1, 1]])
```

6406531161427. ✖
```
array([[1, 1],
       [0, 2]])
```

6406531161428. ✖
```
array([[0, 2],
       [0, 2]])
```

Question Number : 191 Question Id : 640653349785 Question Type : MCQ Is Question

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

Correct Marks : 2

Question Label : Multiple Choice Question

Which of the following options represent the output score for the following block of code ?

```
from sklearn.linear_model import RidgeClassifier
X=[[0, 1],[0, 1]]
y=[[0,1],[0,1]]
clf = RidgeClassifier().fit(X, y)
clf.score(X, y)
```

Options :

6406531161429. ✖ 0.0

6406531161430. ✔ 1.0

6406531161431. ✖ -1.0

6406531161432. ✖ 0.5

Question Number : 192 Question Id : 640653349790 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 options below represent the correct method to preprocess class labels in multi-class setup?

Options :

6406531161439. ✖

```
from sklearn.datasets import make_multilabel_classification as clf
def plot_2d(ax, n_labels=1, n_classes=3, length=50):
    X, Y, p_c, p_w_c = clf(
        n_samples=150,
        n_features=2,
        n_labels=n_labels,
        return_distributions=True,
        random_state32,
    )
```

6406531161440. ✖

```
from sklearn.datasets import make_multilabel_classification
from sklearn.multioutput import MultiOutputClassifier
from sklearn.linear_model import LogisticRegression
# Apply multi-label classification and logistic regression
X, y = make_multilabel_classification(n_classes=3, random_state=0)
clf = MultiOutputClassifier(LogisticRegression()).fit(X, y)
```

6406531161441. ✔
```
from sklearn.preprocessing import LabelBinarizer
# Using LabelBinarizer transformation
# to convert the class label to multi-class
y = np.array(['apple', 'pear', 'apple', 'orange'])
y_dense = LabelBinarizer().fit_transform(y)
# Note: The resulting label vector has shape of (n, k)
```

6406531161442. ✖ None of these

Question Number : 193 Question Id : 640653349794 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Which of the following options will be the output of the following code block?

```
from sklearn.feature_extraction.text import TfidfVectorizer
corpus = [
    'This is the first document.',
    'And is this the second one?',
    ]
vectorizer = TfidfVectorizer()
X = vectorizer.fit_transform(corpus)
vectorizer.get_feature_names_out()
```

Options :

6406531161455. ✔ array(['and', 'document', 'first', 'is', 'one', 'second', 'the', 'this'], dtype=object)

6406531161456. ✖ array(['and', 'document', 'first', 'is', 'one', 'the', 'second', 'the', 'this', '?', '.'], dtype=object)

6406531161457. ✖

array(['and', 'first', 'is', 'meanwhile', 'one', 'second', 'text', 'the', 'third', 'this'], dtype=object)

6406531161458. ✖ array(['first', 'is', 'text', 'the', 'this', '?'], dtype=object)

Question Number : 194 Question Id : 640653349795 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

Assume that X is a feature matrix with shape (1000,5) and y is the label vector with two classes: 0 and 1. Assume that 730 examples of training data belong to class 0. What will be the output of the following code?

```
base_clf = DummyClassifier(strategy='most_frequent')
base_clf.fit(X,y)
print(base_clf.score(X,y))
```

Options :

6406531161459. ✖ 0.65

6406531161460. ✔ 0.73

6406531161461. ✖ 0.37

6406531161462. ✖ None of these

Question Number : 195 Question Id : 640653349800 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

Rakesh is solving a regression problem with a KNN model. He has considered k = 3 for his model. Based on the graph shown below, what would you suggest him out of the following options?

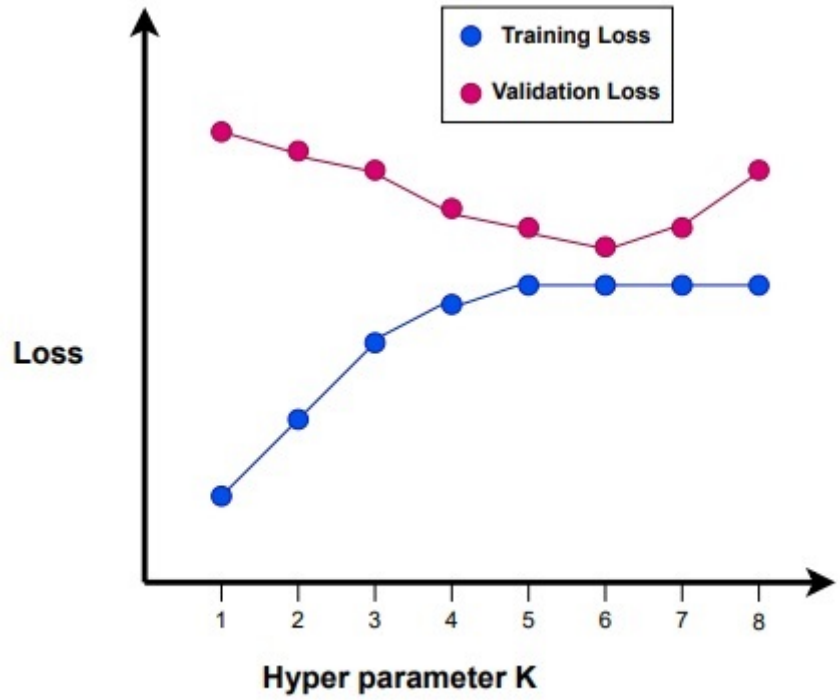


Figure: 3

Options :

6406531161476. ✔ His model is suffering from overfitting. So, he should increase the value of k.

6406531161477. ✖ His model is suffering from underfitting. So, he should increase the value of k.

6406531161478. ✖ His model is suffering from overfitting. So, he should decrease the value of k.

6406531161479. ✖ His model is suffering from underfitting. So, he should decrease the value of k.

6406531161480. ✖ No suggestions, Rakesh has already chosen the best value of k.

Question Number : 196 Question Id : 640653349806 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

/1 penalty in LinearSVC classifier leads to coef_vectors which are-

Options :

6406531161494. ✖ dense.

6406531161495. ✔ sparse.

6406531161496. ✖ Unique class labels.

6406531161497. ✖ /1 penalty can’t be set via a parameter in LinearSVC.

Sub-Section Number : 4

Sub-Section Id : 64065349980

Question Shuffling Allowed : Yes

Question Number : 197 Question Id : 640653349786 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Which of the following options will be the possible output for the given block of code?

```
from sklearn.linear_model import Perceptron
X = [[2, 2], [2, 4], [4,4], [4, 2]]
y = [1, 2, 1, 2]
clf = Perceptron(tol = None, random_state=0)
clf.fit(X, y)
print(clf.score(X, y))
```

Options :

6406531161433. ✖ 1

6406531161434. ✖ 0

6406531161435. ✔ 0.5

6406531161436. ✖ 0.40

Question Number : 198 Question Id : 640653349791 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Which of the following options represent the correct output of the following code?

```
import numpy as np
from sklearn.preprocessing import LabelBinarizer
y = np.array(['Rajni', 'Amitabh', 'Rajni', 'Mithun'])
y_dense = LabelBinarizer().fit_transform(y)
print(y_dense)
```

Options :

6406531161443. ✖

```
[[1]
 [0]
 [1]]
```

6406531161444. ✖

```
[[0 0 0 1]
 [1 0 0 0]
 [0 0 1 0]
 [0 1 0 0]]
```

6406531161445. ✖

```
[[1]
 [1]
 [1]
 [0]]
```

6406531161446. ✔

```
[[0 0 1]
 [1 0 0]
 [0 0 1]
 [0 1 0]]
```

Question Number : 199 Question Id : 640653349792 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

Based on the given receiver operating characteristic curves in Figure 2, answer which of the following statements are TRUE ?

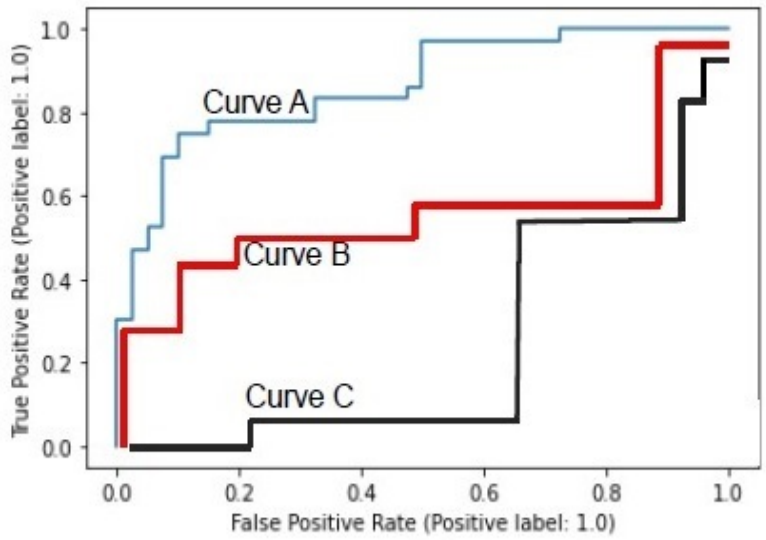


Figure 2: ROC curves

Options :

6406531161447. ✖ The classifier shown in 'Curve B' is better than the other two classifiers.

6406531161448. ✔ The classifier shown in 'Curve A' is better than the other two classifiers.

6406531161449. ✖ The classifier shown in 'Curve C' is better than the other two classifiers.

6406531161450. ✖ All 3 curves demonstrate 3 classifiers of the same quality.

Question Number : 200 Question Id : 640653349793 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 a text classification task, which one of the following code snippets will be better suitable than the others?

Options :

6406531161451. ✖
```
from sklearn.naive_bayes import MultimodalNB
mnb = MultimodalNB()
mnb.fit(X_train, y_train)
```

6406531161452. ✔
```
from sklearn.naive_bayes import ComplementNB
cnb = ComplementNB()
cnb.fit(X_train, y_train)
```

```
from sklearn.naive_bayes import GaussianNB
gnb = GaussianNB()
gnb.fit(X_train, y_train)
```

6406531161453. ✖

```
from sklearn.naive_bayes import BernoulliNB
bnb = BernoulliNB()
bnb.fit(X_train, y_train)
```

6406531161454. ✖

Question Number : 201 Question Id : 640653349796 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 will be the correct output of the code snippet given below?

```
from sklearn.neighbors import KNeighborsClassifier
X = [[2,3], [5,6], [10,11], [15,16],[20,21]]
y = [0, 0, 1, 1, 2]
neigh = KNeighborsClassifier(n_neighbors=3)
neigh.fit(X, y)
print(neigh.predict([[8,9]]))
```

Options :

6406531161463. ✔ 0

6406531161464. ✖ 1

6406531161465. ✖ 2

6406531161466. ✖ None

Question Number : 202 Question Id : 640653349801 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 is the output of the following block of code?

```
import numpy as np
from sklearn.pipeline import make_pipeline
from sklearn.preprocessing import StandardScaler
X = np.array([[2, 4], [4, 2]])
y = np.array([-1, 1])
from sklearn.svm import SVC
clf = make_pipeline(StandardScaler(), SVC(kernel='linear'))
clf.fit(X, y)
print(clf.predict([[-2,2]]))
```

Options :

6406531161481. ✖ array[1]

6406531161482. ✖ array[3]

6406531161483. ✖ array[2]

6406531161484. ✔ array[-1]

Question Number : 203 Question Id : 640653349805 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 snippet and mark the correct output.

```
from sklearn.svm import SVC
import numpy as np
X = np.array([[-1, -1], [-2, -2], [1, 1], [2, 2]])
y = np.array([-1, -1, 1, 1])
clf = SVC(kernel='linear')
clf.fit(X, y)
print(clf.n_support_)
```

Options :

6406531161490. ✖ [-1,1]

6406531161491. ✖ [-1,-1,1,1]

6406531161492. ✔ [1,1]

6406531161493. ✖ [2,2]

Sub-Section Number :	5
Sub-Section Id :	64065349981
Question Shuffling Allowed :	Yes

Question Number : 204 Question Id : 640653349799 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Select Question

Which of the following code blocks will correctly train a large scale regression model using partial_fit, if shape of X_train,Y_train are given as (8000,900,10) and (8000,900) respectively. Note that the dataset has been transformed into batches of size 900 each?

Options :

6406531161472. ✖
```
from sklearn.linear_model import SGDRegressor
regressor = SGDRegressor(random_state=10)
for i in range(X_train.shape[[0]]):
    X_batch, Y_batch = X_train[i], Y_train[i]
    regressor.partial_fit(X_batch, Y_batch)
```

6406531161473. ✔
```
from sklearn.linear_model import SGDRegressor
regressor = SGDRegressor(random_state=10)
for i in range(Y_train.shape[0]):
    X_batch, Y_batch = X_train[i], Y_train[i]
    regressor.partial_fit(X_batch, Y_batch)
```

6406531161474. ✖
```
from sklearn.linear_model import SGDRegressor
regressor = SGDRegressor(random_state=10)
for i in range(Y_train.shape[[0]]):
    X_batch, Y_batch = X_train[i], Y_train[i]
    regressor.partial_fit(X_batch, Y_batch)
```

```
from sklearn.linear_model import SGDRegressor
regressor = SGDRegressor(random_state=10)
for i in range(X_train.shape[0]):
    X_batch, Y_batch = X_train[i], Y_train[i]
    regressor.partial_fit(X_batch, Y_batch)
```

6406531161475. ✔

Sub-Section Number : 6

Sub-Section Id : 64065349982

Question Shuffling Allowed : Yes

Question Number : 205 Question Id : 640653349797 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 will be the output of the following code snippet?
(Hint: Pairwise method Computes the pairwise distances.)

```
from sklearn.metrics import DistanceMetric
dist = DistanceMetric.get_metric('manhattan')
X = [[5, 6,],[3,2],
     [4, 5,]]
print(dist.pairwise(X).max())
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

6

Sub-Section Number : 7

Sub-Section Id : 64065349983

Question Shuffling Allowed : No

Question Id : 640653349787 Question Type : COMPREHENSION Sub Question Shuffling

Allowed : No Group Comprehension Questions : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (206 to 207)

Question Label : Comprehension

Based on the confusion matrix of a specific dataset (MNIST) given in Figure 1, answer the given subquestions.

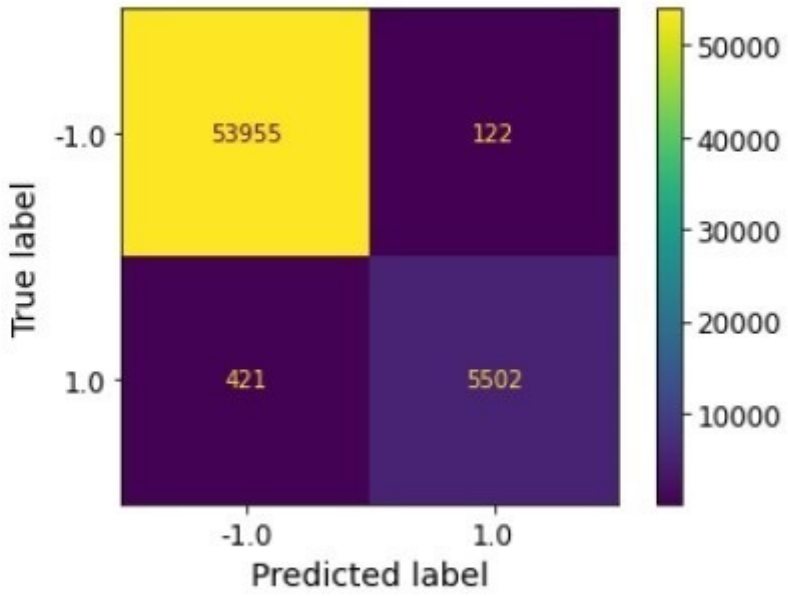


Figure 1: MNIST dataset confusion matrix

Sub questions

Question Number : 206 Question Id : 640653349788 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1.5

Question Label : Short Answer Question

Calculate the precision value (up to 3 decimal places) from the confusion matrix.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.970 to 0.980

Question Number : 207 Question Id : 640653349789 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1.5

Question Label : Short Answer Question

Calculate the recall value (up to 3 decimal places) from the confusion matrix.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.925 to 0.935

Sub-Section Number :	8
Sub-Section Id :	64065349984
Question Shuffling Allowed :	No

Question Id : 640653349802 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (208 to 209)

Question Label : Comprehension

Prashant wrote the following code to train the data shown in the following Figure :

```
from sklearn.svm import SVC
import numpy as np
X_train = np.array([[5, 7],
                    [6, 5],
                    [7, 7],
                    [7, 6],
                    [7, 5],
                    [3, 7],
                    [4, 5],
                    [3, 1],
                    [2, 4],
                    [1, 3]])
y_train=np.array([0,0,0,0,0,1,1,1,1,1])

clf = SVC(kernel='linear')
clf.fit(X_train, y_train)
print(clf.support_vectors_)
```

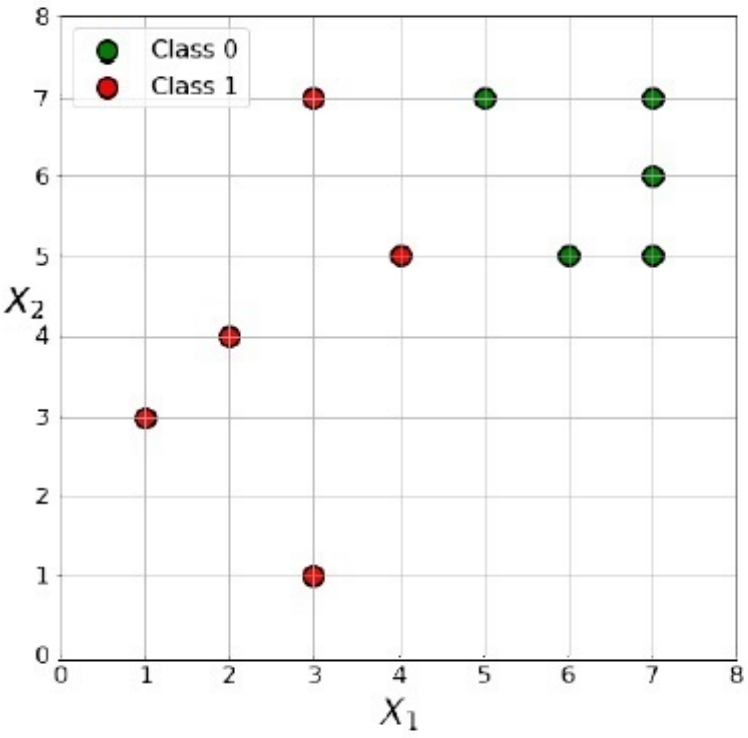


Figure: 4

Sub questions

Question Number : 208 Question Id : 640653349803 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 is the output that Prashant will get?

Options :

6406531161485. ✖ Indices of support vectors.

6406531161486. ✖ Number of support vectors.

6406531161487. ✖ Weights assigned to the features when kernel="linear"

6406531161488. ✔ ndarray of support vectors.

Question Number : 209 Question Id : 640653349804 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

Enter the output of the following block of code.

```
from sklearn.svm import SVC
SVC_classifier = SVC(kernel='linear')
clf = SVC_classifier.fit(X_train,y_train)
print(len(clf.support_vectors_))
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

4

BDM

Section Id :	64065322073
Section Number :	12
Section type :	Online
Mandatory or Optional :	Mandatory

Number of Questions :	21
Number of Questions to be attempted :	21
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 :	64065349985
Question Shuffling Allowed :	No

Question Number : 210 Question Id : 640653349807 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 "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 :

6406531161498. ✔ Yes

6406531161499. ✖ No

Sub-Section Number :	2
Sub-Section Id :	64065349986
Question Shuffling Allowed :	Yes

Question Number : 211 Question Id : 640653349808 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

Which of these situations is likely to cause high bargaining power of suppliers?

Options :

6406531161500. ✖ Many customers with low brand loyalty

6406531161501. ✔ A few large suppliers dominate the market

6406531161502. ✖ Many alternative sources of supply

6406531161503. ✖ None of these

Question Number : 212 Question Id : 640653349809 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

What is the main purpose of Porter’s Five Forces Model?

Options :

6406531161504. ✖ Manage product portfolios

6406531161505. ✖ Inform investment appraisal decisions

6406531161506. ✖ Decide which product to launch

6406531161507. ✔ Analyse competition in a market

Question Number : 213 Question Id : 640653349810 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

In Porter's five forces model, what is meant by the term 'substitute'?

Options :

6406531161508. ✔ A substitute is an alternative product or service that performs the same function for the consumer

6406531161509. ✖ A substitute refers to an alternative manufacturing process

6406531161510. ✖ A substitute is a rival firm offering the same products

6406531161511. ✖ A substitute is something else consumers would rather spend their money on

Question Number : 214 Question Id : 640653349811 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

Given the information in the following table, what is the current ratio?

Head	Amount
Cash balance	Rs. 15,000
Trade receivables	Rs. 35,000
Inventory	Rs. 40,000
Trade Payables	Rs. 24,000
Overdraft	Rs. 6,000

Options :

6406531161512. ✖ 3.75:1

6406531161513. ✔ 3:1

6406531161514. ✖ 1:3

6406531161515. ✖ 1:3.75

Question Number : 215 Question Id : 640653349813 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 a company launched a product, its price was Rs.10,000 per unit. After a couple of months, the price of the product was set to Rs. 8,000 per unit. Currently, the product sells at Rs. 5,000 per unit. Then what pricing strategy has the company adopted?

Options :

6406531161520. ✔ Skimming

6406531161521. ✖ Penetration pricing

6406531161522. ✖ Peak-load pricing

6406531161523. ✖ Psychological pricing

Question Number : 216 Question Id : 640653349814 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

Milo has some new competition in the sales of dresses for Diwali. To prevent the competition from being sustainable, Milo puts a notice in the window advertising a half-price sale. What tactic is Milo using here?

Options :

6406531161524. ✖ None of these

6406531161525. ✖ Psychological pricing

6406531161526. ✔ Destroyer pricing

6406531161527. ✖ Bundle pricing

Question Number : 217 Question Id : 640653349816 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

Which of the following is not a fixed cost?

Options :

6406531161532. ✖ Monthly rent of Rs. 1000 contractually specified in a one-year lease

6406531161533. ✖ An insurance premium of Rs. 50 per year paid last month

6406531161534. ✖ A lawyer's retainer of Rs. 500 per year

6406531161535. ✔ None of these

Question Number : 218 Question Id : 640653349820 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

Demand is inelastic when

Options :

6406531161549. ✔ A leftward shift of the supply curve raises the total revenue

6406531161550. ✖ The good in question has close substitutes

6406531161551. ✖ The smaller angle between the vertical axis and the demand curve is less than 45 degrees

6406531161552. ✖ Large shifts in the supply curve lead to only small changes in price

Question Number : 219 Question Id : 640653349821 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

Producers' total revenue will decrease if

Options :

6406531161553. ✖ The price rises and demand is inelastic

6406531161554. ✖ Income increases and the good is a normal good

6406531161555. ✔ The price rises and demand is elastic

6406531161556. ✖ Income falls and the good is an inferior good

Question Number : 220 Question Id : 640653349822 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

If a fall in the price of item-A increases the quantity demanded of item-B, then which of the

following statements is correct

Options :

6406531161557. ✖ A and B are substitutes

6406531161558. ✔ A and B are complements

6406531161559. ✖ B is a substitute for A, but A is a complement to B

6406531161560. ✖ A is a substitute for B, but B is a complement to A

Question Number : 221 Question Id : 640653349823 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

Last year, Mr. X achieved the title “Richest Man in Asia” for the first time and his happiness was Z utils. This year, Mr. X retained the title of “Richest Man in Asia” and his happiness is Y utils. If Z>Y, then this is an example of what?

Options :

6406531161561. ✖ Positive marginal utility

6406531161562. ✔ Diminishing marginal utility

6406531161563. ✖ Diminishing marginal return

6406531161564. ✖ None of these

Question Number : 222 Question Id : 640653349824 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

If total utility increases, marginal utility _____

Options :

6406531161565. ✖ Must increase

6406531161566. ✖ Must decrease

6406531161567. ✖ Must be increasing at an increasing rate

6406531161568. ✔ None of these

Sub-Section Number : 3

Sub-Section Id : 64065349987

Question Shuffling Allowed : Yes

Question Number : 223 Question Id : 640653349812 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Multiple Select Question

Which of the following transactions will improve the quick ratio (choose all that are applicable)?

Options :

6406531161516. ✔ Sale of goods for cash

6406531161517. ✔ Issue of new shares for cash

6406531161518. ✖ Storage of goods in inventory

6406531161519. ✖ None of these

Question Number : 224 Question Id : 640653349815 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Multiple Select Question

Which of the following are Implicit costs for a firm (choose all that is applicable)?

Options :

6406531161528. ✖ The cost of worker wages and salaries

6406531161529. ✖ The cost paid for leasing a building for production

6406531161530. ✖ The cost paid for production supplies

6406531161531. ✔ The cost of wages foregone by the owner of the firm

Question Number : 225 Question Id : 640653349817 Question Type : MSQ Is Question

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

Correct Marks : 1

Question Label : Multiple Select Question

Economies and diseconomies of scale explain why the

Options :

6406531161536. ✖ Short-run average fixed cost curve declines so long as output increases

6406531161537. ✖ Marginal cost curve must intersect the minimum point of the firm's average total cost curve

6406531161538. ✔ Long-run average total cost curve is typically U-shaped

6406531161539. ✖ Short-run average variable cost curve is U-Shaped

Question Number : 226 Question Id : 640653349825 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Multiple Select Question

Suppose a customer who purchases only two goods is making a utility-maximizing choice and the price of one of the goods increases. What will happen (choose all that are applicable)?

Options :

6406531161569. ✔ The consumer's purchasing power will decrease

6406531161570. ✖ The consumer's total utility will increase

6406531161571. ✖ The consumer's money income will increase

6406531161572. ✖ None of these

Sub-Section Number : 4

Sub-Section Id : 64065349988

Question Shuffling Allowed : Yes

Question Number : 227 Question Id : 640653349818 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

Kumbak is hungry and has decided to eat roti at his mess. His total joy after eating the first roti is 20 happiness points. He is still hungry and so he eats another roti, and the total happiness increases to 25 happiness points. Kumbak is still hungry and eats two more roties. His third roti makes his total happiness points as 27. His fourth roti makes it 29 points. Then, suddenly his friend Lakshman enters the mess and decides to join him. So Kumbak decides to eat a fifth and sixth roti which makes his happiness points become 23. Then what is the marginal utility at Kumbak's ideal number of roties?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Sub-Section Number :	5
Sub-Section Id :	64065349989
Question Shuffling Allowed :	Yes

Question Number : 228 Question Id : 640653349819 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Select Question

The consumption basket of a person for Month-1 and Month-2 is provided in the table below. Given this information, if the income for the person has changed from Rs. 8000 in Month-1 to Rs. 10000 in Month-2, then which of the following statements are true with respect to income elasticity (choose all those that are applicable)?

Item	% Of Income Spent for Item in Month-1	% Of Income Spent for Item in Month-2
A	12	20
B	8	10
C	10	8
D	9	16
E	5	2
F	13	10
G	32	19
H	11	14

Options :

6406531161541. ✔ Item A is a “normal good”

6406531161542. ✖ Item A is a “necessity good”

6406531161543. ✔ Item A is a “luxury good”

6406531161544. ✖ Item A is an “inferior good”

6406531161545. ✖ Item G is a “normal good”

6406531161546. ✖ Item G is a “necessity good”

6406531161547. ✖ Item G is a “luxury good”

6406531161548. ✔ Item G is an “inferior good”

Sub-Section Number : 6

Sub-Section Id : 64065349990

Question Shuffling Allowed : Yes

Question Number : 229 Question Id : 640653349826 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0.5

Question Label : Multiple Select Question

If gross profit = net profit + x, which of the following statements is/ are true? (select all that is applicable)

Options :

6406531161573. ✖ “X” includes variable cost

6406531161574. ✖ “X” includes cost of goods sold (e.g.: building, equipment, etc.)

6406531161575. ✔ “X” includes cost of expenses (e.g.: operating, interest, taxes, etc.)

6406531161576. ✖ None of these

Sub-Section Number :	7
Sub-Section Id :	64065349991
Question Shuffling Allowed :	Yes

Question Number : 230 Question Id : 640653349827 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0.5

Question Label : Multiple Choice Question

When the Marginal Utility is 0

Options :

6406531161577. ✔ Total utility is maximum

6406531161578. ✖ Total utility is minimum

6406531161579. ✖ Total utility continues to rise

6406531161580. ✖ None of these

Business Analytics

Section Id :	64065322074
Section Number :	13
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	9
Number of Questions to be attempted :	9
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 : 64065349992

Question Shuffling Allowed : No

Question Number : 231 Question Id : 640653349828 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 "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 :

6406531161581. ✔ Yes

6406531161582. ✖ No

Sub-Section Number : 2

Sub-Section Id : 64065349993

Question Shuffling Allowed : Yes

Question Number : 232 Question Id : 640653349829 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 you conduct a chi-squared test of independence on the categorical variables cities and brand preferences at the significance level 0.05. You obtain a p-value of 0.07. What will you conclude?

Options :

6406531161583. ✖ Reject the null hypothesis and conclude that the categorical variables are

independent

6406531161584. ✖ Reject the null hypothesis and conclude that the categorical variables are not independent

6406531161585. ✔ Fail to reject the null hypothesis and conclude that the categorical variables are independent

6406531161586. ✖ Fail to reject the null hypothesis and conclude that the categorical variables are not independent

Question Number : 233 Question Id : 640653349833 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

There are 4 business units. Using the DEA, you solve the LP for all the four business units and find the efficiencies for these units. The efficiency is denoted by E. For these units, E1 = 0.83, E2 = 1, E3 = 0.57, E4 = 0.91. Which of these units are efficient?

Options :

6406531161590. ✖ Unit 1

6406531161591. ✔ Unit 2

6406531161592. ✖ Unit 3

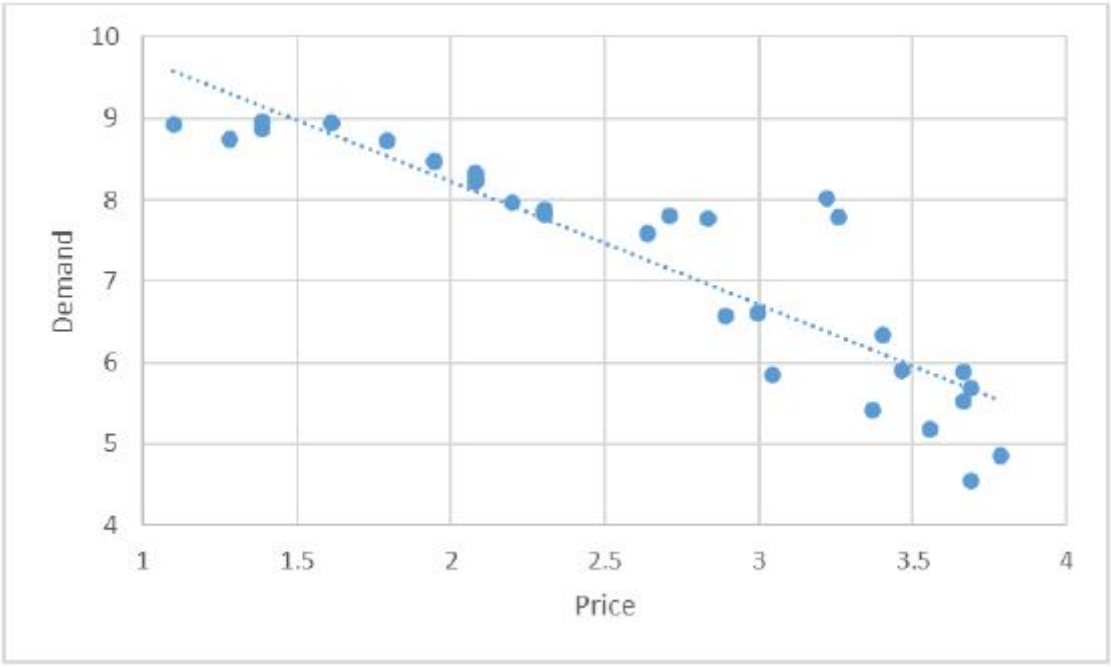
6406531161593. ✖ Unit 4

Question Number : 234 Question Id : 640653349835 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

You construct a linear regression on a price-demand dataset and observe the following trend.



After observing the above figure, choose which of the following statements are true?

Options :

6406531161598. ✖ The intercept and the slope of this regression are both negative

6406531161599. ✖ The intercept and the slope of this regression are both positive

6406531161600. ✖ The intercept is negative and the slope is positive

6406531161601. ✔ The intercept is positive and the slope is negative

Sub-Section Number : 3

Sub-Section Id : 64065349994

Question Shuffling Allowed : Yes

Question Number : 235 Question Id : 640653349834 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Select Question

You solve the primal of a linear program with maximization objective, three decision variables and two constraints of the less than or equal to type. Non-negativity restrictions apply on the decision variables. After solving the linear program, you find that the first constraint is binding (lhs = rhs) and the second constraint is not binding (lhs < rhs). Which of the following statements are correct?

Options :

6406531161594. ✔ There are two decision variables in the dual

6406531161595. ✔ The dual variable corresponding to the second constraint is zero

6406531161596. ✖ There are three decision variables in the dual

6406531161597. ✖ The dual variable corresponding to the first constraint is zero

Sub-Section Number : 4

Sub-Section Id : 64065349995

Question Shuffling Allowed : Yes

Question Number : 236 Question Id : 640653349830 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

You have estimated the demand to follow the following relationship: $D(p) = 60 - 5 * p$. 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 :

5.9 to 6.1

Question Number : 237 Question Id : 640653349831 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

In a multiple linear regression with 4 explanatory variables, you find that R-squared value is 0.7. The number of observations is 25. What is the value of adjusted R-squared?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.62 to 0.66

Question Number : 238 Question Id : 640653349832 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

You are conducting a multiple linear regression with sales as the dependent variable. Price, quantity and rating score are the independent variables. In order to calculate the VIF for the variable rating score, you implement a linear regression with rating score as the dependent variable and other variables as independent variables and obtain R-squared of 0.3. What is the VIF for the variable rating score?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

1.38 to 1.44

Sub-Section Number :	5
Sub-Section Id :	64065349996
Question Shuffling Allowed :	No

Question Id : 640653349836 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (239 to 241)

Question Label : Comprehension

Please use the confusion matrix below to answer the given subquestions.

Sample = 100	Predicted (No)	Predicted (Yes)
Actual (No)	35	15
Actual (Yes)	5	45

Sub questions

Question Number : 239 Question Id : 640653349837 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

The accuracy of the classification model according to the confusion matrix is:_____

Hint: Enter your answer in %. If your answer is 12%, just enter 12

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

80

Question Number : 240 Question Id : 640653349838 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

The precision of the model with respect to the class (Yes) is: _____

Hint: Enter your answer in %. If your answer is 12%, just enter 12

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

75

Question Number : 241 Question Id : 640653349839 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

The recall of the model with respect to class (Yes) is: _____

Hint: Enter your answer in %. If your answers is 12%, just enter 12

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

90

System Commands

Section Id :	64065322075
Section Number :	14
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	17
Number of Questions to be attempted :	17
Section Marks :	100
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 : 64065349997

Question Shuffling Allowed : No

Question Number : 242 Question Id : 640653349840 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 "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 :

6406531161605. ✔ Yes

6406531161606. ✖ No

Sub-Section Number : 2

Sub-Section Id : 64065349998

Question Shuffling Allowed : Yes

Question Number : 243 Question Id : 640653349841 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

What is the output of the following bash script?

```
n=1234
counter=0
ans=0
while [ $n -gt 0 ]
do
  counter=$(( $n % 10 ))
  ans=$(( $ans * 10 + $counter ))
  n=$(( $n / 10 ))
done
echo $((ans+n))
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

4321

Sub-Section Number :	3
Sub-Section Id :	64065349999
Question Shuffling Allowed :	Yes

Question Number : 244 Question Id : 640653349848 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 is the expected output of the following command.

```
find . -type d -name '* *' | wc -l
```

Options :

6406531161637. ✖ Gives the total number of directories in the current working directory.

6406531161638. ✔ Gives the total number of directories with space in their name in the current

working directory.

6406531161639. ✖ Gives the total number of files with space in their name in the current working directory.

6406531161640. ✖ Gives the total number of directories with a dot in their name in the current working directory.

Question Number : 245 Question Id : 640653349854 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 command can be used to search for a blank line in a file named `file1`?

Options :

6406531161660. ✖ `$ grep \n file1`

6406531161661. ✖ `$ grep " " file1`

6406531161662. ✔ `$ grep "^$" file1`

6406531161663. ✖ `$ grep "\n" file1`

Sub-Section Number :	4
Sub-Section Id :	64065350000
Question Shuffling Allowed :	Yes

Question Number : 246 Question Id : 640653349842 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

The below text is the contents of the file `mycpuinfo`.

```
processor    : 0
vendor_id    : GenuineIntel
cpu family    : 6
model        : 126
model name    : Intel(R) Core(TM) i5-1035G1 CPU @ 1.00GHz
stepping    : 5
microcode    : 0xb0
cpu MHz        : 1200.000
cache size    : 6144 KB
physical id    : 0
siblings    : 8
core id        : 0
cpu cores    : 4
apicid        : 0
initial apicid    : 0
fpu        : yes
fpu_exception    : yes
cpuid level    : 27
wp        : yes
flags        : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36
clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm
constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmperf tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl vmx est tm2 ssse3 sdbg
fma cx16 xtpr pdcm pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb invpcid_single ssbd ibrs ibpb
stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid ept_ad fsgsbase tsc_adjust
sgx bmi1 avx2 smep bmi2 erms invpcid avx512f avx512dq rdseed adx smap avx512ifma
clflushopt intel_pt avx512cd sha_ni avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves
split_lock_detect dtherm ida arat pln pts hwp hwp_notify hwp_act_window hwp_epp
hwp_pkg_req avx512vbmi umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni
avx512_bitalg avx512_vpopcntdq rdpid sgx_lc fsrm md_clear flush_l1d arch_capabilities
vmx flags    : vnmi preemption_timer posted_intr invvpid ept_x_only ept_ad ept_1gb
flexpriority apicv tsc_offset vtpr mtf vapic ept vpid unrestricted_guest vapic_reg vid
ple pml ept_mode_based_exec tsc_scaling
bugs        : spectre_v1 spectre_v2 spec_store_bypass swapgs itlb_multihit srbds
mmio_stale_data
bogomips    : 2380.80
clflush size    : 64
cache_alignment    : 64
address sizes    : 39 bits physical, 48 bits virtual
power management:
```

Select the command that will print the number of CPU cores on the system. The number of CPU cores is given in the text as a value to the key "cpu cores". Thus, your output should be "4".

Note: Use of `grep` command's option:

```
-o, --only-matching
    Print only the matched (non-empty) parts of a matching
    line, with each such part on a separate output line.
```

Options :

6406531161608. ✖

```
grep cpu mycpuinfo
```

6406531161609. ✖

```
grep -o "cpu cores" mycpuinfo
```

6406531161610. ✔
```
grep "cpu cores" mycpuinfo | egrep -o "[[:digit:]]+"
```

6406531161611. ✖
```
grep -o "cpu cores" mycpuinfo | egrep -o "[[:digit:]]+"
```

Question Number : 247 Question Id : 640653349843 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

What is the output of the following script if the input to stdin is `45.53`?

```
read var

function operate()
{
  temp=$1
  temp=${temp%.*}
  echo $temp
}

echo $( operate $var )
```

Options :

6406531161612. ✖ 0

6406531161613. ✖ 53

6406531161614. ✔ 45

6406531161615. ✖ 1

6406531161616. ✖ 45.53

Question Number : 248 Question Id : 640653349845 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

```
sed -n '/[[:digit:]]\{3\}/ p' myfile
```

What does the above command do?

Note: Use of `sed` command option:

```
-n, --quiet, --silent
  suppress automatic printing of pattern space,i.e. print only the matched lines.
```

Options :

6406531161623. ✖ Prints the line having only three digits.

6406531161624. ✖ Prints the line having at least three digits.

6406531161625. ✔ Prints the line having three consecutive digits.

6406531161626. ✖ Prints the line having at most two consecutive digits.

Question Number : 249 Question Id : 640653349860 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

When the command `ls -l` is run on the current directory, the output obtained is

```
-rw-r--r--  1 user  group   0 Nov 30 11:08 rand1.txt
-rw-r--r--  1 user  group   0 Nov 29 11:08 rand2.txt
-rw-r--r--  1 user  group   0 Nov 29 11:08 rand3.md
-rw-r--r--  1 user  group   0 Nov 28 11:08 rand4.awk
-rwxr-xr-x 1 user  group   0 Nov 10 14:03 script.sh
-rwxr-xr-x 1 user  group  1 Nov 30 20:44 test.sh
```

What is the correct output format for this bash script?

```
for line in `ls`; do
        details=`ls -l $line`
        echo $line: ${details:4:6}
done
```

Options :

6406531161686. ✖

```
rand1.txt: {details:4:6}
rand2.txt: {details:4:6}
rand3.txt: {details:4:6}
rand4.txt: {details:4:6}
script.sh: {details:4:6}
test.sh: {details:4:6}
```

6406531161687. ✖

```
rand1.txt: r-
rand2.txt: r-
rand3.txt: r-
rand4.txt: r-
script.sh: r-
test.sh: r-
```

6406531161688. ✖

```
rand1.txt: -r
rand2.txt: -r
rand3.txt: -r
rand4.txt: -r
script.sh: xr
test.sh: xr
```

6406531161689. ✔

```
rand1.txt: r--r--
rand2.txt: r--r--
rand3.txt: r--r--
rand4.txt: r--r--
script.sh: r-xr-x
test.sh: r-xr-x
```

6406531161690. ✖

```
rand1.txt: -r--r-
rand2.txt: -r--r-
rand3.txt: -r--r-
rand4.txt: -r--r-
script.sh: xr-xr-
test.sh: xr-xr-
```

Sub-Section Number : 5

Sub-Section Id : 64065350001

Question Shuffling Allowed : Yes

Question Number : 250 Question Id : 640653349846 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

What will the below command print?

```
awk 'arr[$0] != 1 {arr[$0]++; print;}' myfile
```

Options :

6406531161627. ✖ Second occurrences of duplicate lines.

6406531161628. ✖ Distinct lines in the alphabetically sorted order.

6406531161629. ✔ Distinct lines in the order of first occurrence.

6406531161630. ✖ The lines that are present more than once.

Question Number : 251 Question Id : 640653349849 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

Here is a part of information from AWK manual,

```
gsub(r, s [, t])  For each substring matching the regular  expres-
                  sion r in the string t, substitute the string s,
                  and return the number of substitutions.  If t is
                  not  supplied,  use $0.  An & in the replacement
                  text is replaced with the text that was actually
                  matched.  Use \& to get a literal &.  (This must
                  be typed as "\\&";
```

The contents of the file `myfile` are given below

```
Ram
Laila
Ahmed
Ragav
Peter
```

What will be the output after running the below command?

```
awk '{
    gsub(/.*/, NR":&");
    print $0;
}' myfile
```

Options :

6406531161641. ✔

```
1:Ram
2:Laila
3:Ahmed
4:Ragav
5:Peter
```

6406531161642. ✖

```
NR:Ram
NR:Laila
NR:Ahmed
NR:Ragav
NR:Peter
```

6406531161643. ✖

1:
2:
3:
4:
5:

1:&
2:&
3:&
4:&
5:&

6406531161644.

Sub-Section Number : 6

Sub-Section Id : 64065350002

Question Shuffling Allowed : Yes

Question Number : 252 Question Id : 640653349844 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 7

Question Label : Multiple Select Question

Consider a regular list as shown in the sample input, that is stored in a single line in the file `mylist`.

Select the sed script to pretty print this list such that in the output the first and the last line have the starting and the ending brackets, and the elements of the list are printed between the first and the last lines, one element on each line indented by a tab. The elements should be printed in the same order from top to bottom as they appear in the list from left to right.

Note: The tab and newline characters are specified by `\t` and `\n` respectively.

Sample Input

```
[1,2,3,4]
```

Sample Output

```
[
    1,
    2,
    3,
    4
]
```

Options :

6406531161617. ✔

```
sed 's/\[/\[\n\t/g' mylist |
sed 's/\]/\n]/' |
sed 's/,/,\n\t/g'
```

6406531161618. ✖

```
sed 's/\[/\[\t\n/g' mylist |
sed 's/\]/\n]/' |
sed '/^[[:blank:]]/ s/,/,\t\n/'
```

6406531161619. ✔

```
sed 's/\[/\[\n\t/g' mylist |
sed 's/\]/\n]/' |
sed '/^[[:blank:]]/ s/,/,\n\t/g'
```

6406531161620. ✖

```
sed 's/\[/\[\n\t/g' mylist |
sed 's/\]/\n]/' |
sed '/^[[:blank:]]/ s/,/,\n\t/'
```

6406531161621. ✖

```
sed 's/\[/\[\t\n/g' mylist |
sed 's/\]/\n]/' |
sed '/^[[:blank:]][[:blank:]]*/ s/,/,\t\n/'
```

6406531161622. ✖

```
sed 's/\[/\[\t\n/g' mylist |
sed 's/\]/\n]/' |
sed 's/,/,\t\n/g'
```

Sub-Section Number : 7

Sub-Section Id : 64065350003

Question Shuffling Allowed : Yes

Question Number : 253 Question Id : 640653349847 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 6

Question Label : Multiple Select Question

Select all the commands that prints the from line `4` to line `7` of file `myfile` (line 4 and 7 incluuded).
Assume that the `myfile` contains at least 7 lines.

Options :

6406531161631. ✔

```
head -7 myfile | tail -4
```

6406531161632. ✖

```
tail -4 myfile | tail -7
```

6406531161633. ✔

```
sed -n '4,7 p' myfile
```

6406531161634. ✖

```
sed -n '4-7 p' myfile
```

6406531161635. ✔

```
awk 'NR >= 4 && NR <= 7 {print;}' myfile
```

6406531161636. ✔

```
awk '{if(NR>=4 && NR <=7){print;}}' myfile
```

Question Number : 254 Question Id : 640653349853 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 6

Question Label : Multiple Select Question

Consider a file `/home/user/script` that exists currently on the system. Below commands are run to create links.

```
mkdir /home/user/links/
ln /home/user/script /home/user/links/script_link
ln /home/user/links/script_link /home/user/links/script_link_link
```

Which of the following statements are **true** ?

Options :

6406531161655. ✔ The link `script_link` will be accessible even if it is moved to different directory within the file system.

6406531161656. ✔ Files `script_link` and `script` will have the same inode number.

6406531161657. ✖ If we create a copy of the file `script`, the copy will also be linked automatically from the file `script_link`.

6406531161658. ✖ If the file `script_link` is deleted, the file `script_link_link` will be inaccessible.

6406531161659. ✖ If the files `script` and `script_link` both are deleted, the file `script_link_link` will be inaccessible.

Question Number : 255 Question Id : 640653349855 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 6

Question Label : Multiple Select Question

The following bash script performs some operation. This script is run with some command line arguments. The command line argument values contains only alphanumeric characters.

```
#!bin/bash
args=0
for i in "$@"; do
  args=$((args+1))
done;
echo $args
```

Which of the following bash scripts is an will give the same output as the above script?

Options :

6406531161664. ✖

```
#!bin/bash
echo $$
```

6406531161665. ✔

```
#!bin/bash
echo $#
```

6406531161666. ✔

```
#!bin/bash
echo $@ | awk 'END{print NF}'
```

6406531161667. ✔

```
#!bin/bash
echo $@ | wc -w
```

Question Number : 256 Question Id : 640653349856 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 6

Question Label : Multiple Select Question

Which of the following commands will print the lines that do not start with `#`, `'` or `//`.

Hint: `grep` / `egrep` command option use:

```
-v, --invert-match
              Invert the sense of matching, to select non-matching
              lines.
```

Options :

6406531161668. ✖ `egrep -v "^#|^'|^\//" code.txt`

6406531161669. ✔ `grep -v "^#\|^'\|^\/\/" code.txt`

6406531161670. ✔ `egrep -v "^#|^'|^\/\/" code.txt`

6406531161671. ✖ `grep -v "^#\|^'\|^\//" code.txt`

6406531161672. ✖ `egrep -v "^#|^'|^//" code.txt`

6406531161673. ✖ `grep -v "^#\|^'\|^//" code.txt`

Sub-Section Number : 8

Sub-Section Id : 64065350004

Question Shuffling Allowed : No

Question Id : 640653349850 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (257 to 258)

Question Label : Comprehension

Consider the AWK script and answer the given subquestions

```
BEGIN {
    FS=","
    OFS=":"
}
{
    sum = 0
    for (i=1; i<=NF; i++) {
        if ($i - /^[-+]?[[:digit:]]+\.?[[:digit:]]*$/) {
            sum += $i
        }
        else {
            print "Invalid data"
            exit 1
        }
    }
    print sum
}
```

Sub questions

Question Number : 257 Question Id : 640653349851 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Select Question

Select all the correct statement(s) with respect to the given AWK script.

Options :

6406531161645. ✔ The fields in the input to the script are comma(,) separated.

6406531161646. ✖ The number of field can be at most `5`.

6406531161647. ✔ If any of the field values is `.123` then `Invalid data` will be printed.

6406531161648. ✔ If any of the field values is `+-1.123` then `Invalid data` will be printed.

6406531161649. ✔ if any of the fields contain an alphabet then `Invalid data` will be printed.

6406531161650. ✖ The fields in the input to the script are colon(`:`) separated.

Question Number : 258 Question Id : 640653349852 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

Select the output of the AWK script on the input given below.

```
1,2,3
1.1,2.1,3.1
-1.1,2.1,3.1
+1.1,2.1,3.1
a,b,2
.1,89,1
```

Options :

6406531161651. ✖
```
Invalid data
```

6406531161652. ✔
```
6
6.3
4.1
6.3
Invalid data
```

6406531161653. ✖

```
6
6.3
4.1
6.3
2
Invalid data
```

6406531161654. ✖

```
6
6.3
4.1
6.3
2
1
```

Sub-Section Number : 9

Sub-Section Id : 64065350005

Question Shuffling Allowed : No

Question Id : 640653349857 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (259 to 260)

Question Label : Comprehension

Consider a bash script named `runAll.sh` written for some purpose located in the current working directory.

Note that in the current working directory:

- The scripts are named with extension `.sh` and no other files or directory use this extension. But the file/directory names may contain the string `sh` in their name.
- There can be spaces/tabs in the files/directory names in the current working directory.
- Some of the bash scripts(including `runAll.sh`) may not have execute permissions set on them.

The options are same in the subquestions, the answers are different based on the intended purpose.

Based on the above data, answer the given subquestions

Sub questions

Question Number : 259 Question Id : 640653349858 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 8

Question Label : Multiple Select Question

Purpose of `runAll.sh` - to execute all the bash scripts in the current working directory **only once** (excluding `runAll.sh`).

Select the option(s) below which has the correct script `runAll.sh` along with the command to run this script successfully always as intended.

Options :

6406531161674. ✖

runAll.sh

```
pat="\.sh$"
for name in *; do
        if [[ $name =~ $pat ]]; then
         bash "$name"
        fi
done
```

Command(s) to run the script

```
$ bash runAll.sh
```

runAll.sh

```
for name in *.sh; do
        if [ "$0" != "$name" ]; then
                bash $name
        fi
done
```

Command(s) to run the script

```
$ bash runAll.sh
```

6406531161675. ✖

runAll.sh

```
for name in ./*.sh; do
        if [ "$0" != "$name" ]; then
                bash "$name"
        fi
done
```

Command(s) to run the script

```
$ bash runAll.sh
```

6406531161676. ✖

6406531161677. ✔

runAll.sh

```
for name in ./*.sh; do
        if [ "$0" != "$name" ]; then
                bash "$name"
        fi
done
```

Command(s) to run the script

```
$ chmod u+x runAll.sh
$ ./runAll.sh
```

runAll.sh

```
for name in ./*.sh; do
        if [ "./runAll.sh" != $name ]; then
                bash "$name"
        fi
done
```

Command(s) to run the script

```
$ ./runAll.sh
```

6406531161678. ✖

runAll.sh

```
for name in *.sh; do
        if [ runAll.sh != "$name" ]; then
                bash "$name"
        fi
done
```

Command(s) to run the script

```
$ bash runAll.sh
```

6406531161679. ✔

Question Number : 260 Question Id : 640653349859 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

Purpose of `runAll.sh` - to execute all the bash scripts(excluding `runAll.sh`) in the current working directory **only twice**, irrespective of the number of times `runAll.sh` is executed.

Select the option(s) below which has the correct script `runAll.sh` along with the command to run this script successfully always as intended.

Options :

runAll.sh

```
pat="\.sh$"
for name in *; do
        if [[ $name =~ $pat ]]; then
         bash "$name"
        fi
done
```

Command(s) to run the script

```
$ bash runAll.sh
```

6406531161680. ✖

runAll.sh

```
for name in *.sh; do
        if [ "$0" != "$name" ]; then
                bash $name
        fi
done
```

Command(s) to run the script

```
$ bash runAll.sh
```

6406531161681. ✖

runAll.sh

```
for name in ./*.sh; do
        if [ "$0" != "$name" ]; then
                bash "$name"
        fi
done
```

Command(s) to run the script

```
$ bash runAll.sh
```

6406531161682. ✔

runAll.sh

```
for name in ./*.sh; do
        if [ "$0" != "$name" ]; then
                bash "$name"
        fi
done
```

Command(s) to run the script

```
$ chmod u+x runAll.sh
$ ./runAll.sh
```

6406531161683. ✖

runAll.sh

```
for name in *.sh; do
        if [ runAll.sh != $name ]; then
                bash "$name"
        fi
done
```

Command(s) to run the script

```
$ chmod u+x runAll.sh
$ ./runAll.sh
```

6406531161684. ✖

6406531161685. ✖

runAll.sh

```
for name in *.sh; do
        if [ runAll.sh != "$name" ]; then
                bash "$name"
        fi
done
```

Command(s) to run the script

```
$ bash runAll.sh
```