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 QUIZ1 EXAM QPG1 05 Jun 2022
Subject Name :	2022 Jun: IIT M DIPLOMA QUIZ1 EXAM QPG1
Creation Date :	2022-06-05 19:48:20
Duration :	240
Total Marks :	680
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 :	6406538772
Group Maximum Duration :	0
Group Minimum Duration :	90
Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	680
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 :	64065321867

Section Number :	1
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 :	64065348833
Question Shuffling Allowed :	No

Question Number : 1 Question Id : 640653345429 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 :

6406531148888. ✔ YES

6406531148889. ✖ NO

Sub-Section Number :	2
Sub-Section Id :	64065348834
Question Shuffling Allowed :	Yes

Question Number : 2 Question Id : 640653345430 Question Type : SA Calculator : None

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

Correct Marks : 2

Question Label : Short Answer Question

If $A+3I=0$, where A is a 2×2 matrix and I is the identity matrix of order 2, then find out the $det(A)$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

9

Question Number : 3 Question Id : 640653345431 Question Type : SA Calculator : None

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

Correct Marks : 2

Question Label : Short Answer Question

If matrix $A=\begin{bmatrix}3 & -3\\ -3 & 3\end{bmatrix}$ and $A^2=\lambda A$, then find the value of λ.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

6

Question Number : 4 Question Id : 640653345432 Question Type : SA Calculator : None

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

Correct Marks : 2

Question Label : Short Answer Question

If $\begin{bmatrix} a+4 & 3b \\ 8 & -6 \end{bmatrix} = \begin{bmatrix} 2a+2 & b+2 \\ 8 & a-8b \end{bmatrix}$, then find the value of $a+2b$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

4

Sub-Section Number : 3

Sub-Section Id : 64065348835

Question Shuffling Allowed : Yes

Question Number : 5 Question Id : 640653345433 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

If addition and scalar multiplication on $V = \mathbb{R}^2$ is defined as follows:

$$\textit{Addition: } (x_1, y_1) + (x_2, y_2) = (x_1 + x_2, y_1 + y_2); \quad (x_1, y_1), (x_2, y_2) \in V$$

$$\textit{Scalar multiplication: } c(x, y) = (x, cy); \ (x, y) \in V, \ c \in \mathbb{R}$$

Consider the following statements.

1. There exists an element 0 (called the zero vector of V) in V such that $0 + v = v, \ \forall \ v \in V$.
2. There exists a vector v' in V such that $v' + v = v + v' = 0, \ \forall \ v \in V$.
3. For each vector $v \in V$, $1v = v$.
4. For each vector of $v \in V$ and for each pair $a, b \in \mathbb{R}, (a + b)v = av + bv$.
5. For each vector of $a \in \mathbb{R}$ and for each pair $v_1, v_2 \in V, a(v_1 + v_2) = av_1 + av_2$.
6. For each vector of $v \in V$ and for each pair $a, b \in \mathbb{R}, (ab)v = a(bv)$.

Which of the above statements is not true with respect to the addition and scalar multiplication on $V = \mathbb{R}^2$ defined above? (Enter the serial number of the statement which is not true. If statement 2 is incorrect, then enter 2 as your answer.)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

4

Question Number : 6 Question Id : 640653345434 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

If $W = Span\{(1, 1, -1), (3, -2, 0), (5, 0, -2), (0, 5, -3)\}$, then find out the dimension of W.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 7 Question Id : 640653345435 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

Which of the following subsets are not a vector subspace of $\mathbb{R}^3$ with respect to usual addition and scalar multiplication ?

1) $W = \{(x, y, z) \mid x, y, z \in \mathbb{R}, \text{ and } x^2 = z^2\}$
2) $W = \{(x, y, z) \mid x, y, z \in \mathbb{R}, \text{ and } x = z\}$
3) $W = \{(x, y, z) \mid x, y, z \in \mathbb{R}, \text{ and } x = y + z\}$
4) $W = \{(x, y, z) \mid x, y, z \in \mathbb{R}, \text{ and } (x + 1) + (y - 1) + z = 0\}$

Enter the serial number of the subset which is not a vector subspace of $\mathbb{R}^3$ with respect to usual addition and scalar multiplication. (If the subset corresponding to serial number 2 is not a subspace, then enter 2 as your answer.)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Sub-Section Number : 4

Sub-Section Id : 64065348836

Question Shuffling Allowed : No

Question Id : 640653345436 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 : (8 to 9)

Question Label : Comprehension

Answer the given subquestions.

Sub questions

Question Number : 8 Question Id : 640653345437 Question Type : SA Calculator : None

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

Correct Marks : 2

Question Label : Short Answer Question

If S is a (non-empty) linearly independent subset of $\mathbb{R}^3$ (with respect to usual addition and scalar multiplication), then what can be the maximum possible cardinality of S?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Question Number : 9 Question Id : 640653345438 Question Type : SA Calculator : None

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

Correct Marks : 2

Question Label : Short Answer Question

If S is a (non-empty) linearly dependent subset of $\mathbb{R}^3$ (with respect to usual addition and scalar multiplication), then what can be the minimum possible cardinality of S?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Id : 640653345439 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 : (10 to 11)

Question Label : Comprehension

Consider the vector space $\mathbb{R}^3$ with respect to usual addition and scalar multiplication,

i.e.,

$$\textit{Addition: } (x_1, y_1, z_1) + (x_2, y_2, z_2) = (x_1 + x_2, y_1 + y_2, z_1 + z_2); \quad (x_1, y_1, z_1), (x_2, y_2, z_2) \in V$$

$$\textit{Scalar multiplication: } c(x, y, z) = (cx, cy, cz); \ (x, y, z) \in V, \ c \in \mathbb{R}$$

Suppose W_1 and W_2 are two vector subspaces of $\mathbb{R}^3$ (with respect to usual addition and scalar multiplication) defined as follows:

$$W_1 = \{(x, y, 0) \mid x, y \in \mathbb{R}\}$$

and

$$W_2 = \{(0, y, 0) \mid y \in \mathbb{R}\}$$

with usual addition and scalar multiplication,

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 10 Question Id : 640653345440 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

What is the dimension of $W_1 \cap W_2$?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 11 Question Id : 640653345441 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

What is the dimension of W_1?

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 :	64065348837
Question Shuffling Allowed :	Yes

Question Number : 12 Question Id : 640653345442 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

Choose the set of correct options.

Options :

6406531148900. ✔ If v and w are linearly independent, then $v + w$ and w are also linearly independent.

6406531148901. ✖ If $A^n = 0$ for some 2×2 matrix A and some non-zero natural number n, then A must be 0 (zero matrix of order 2).

6406531148902. ✔ If a homogeneous system of linear equations $Ax = 0$ has a non-zero solution, then it must have infinite number of solutions.

6406531148903. ✖ If $A^3 = I$ for some $n \times n$ matrix A, then it is not necessary that A^2 is an invertible matrix.

Sub-Section Number : 6

Sub-Section Id : 64065348838

Question Shuffling Allowed : No

Question Id : 640653345443 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 15)

Question Label : Comprehension

From the list of given terms find out the best possible options for each of the given subquestions:

1) Transpose of a matrix
2) Determinant
3) Closure with respect to addition
4) Closure with respect to scalar multiplication
5) Existence of additive inverse
6) Commutativity of addition
7) Associativity of addition
8) Spanning set
9) Linearly independent set
10) Basis

Sub questions

Question Number : 13 Question Id : 640653345444 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

$S = \{(1,0,1),(0,1,1),(1,1,0)\}$ is a _____ of $\mathbb{R}^3$.
(Enter 3 best possible options. Enter only the serial numbers of those options in increasing order without adding any comma or space in between them.) [Suppose your answer is 7, 8 and 10, then you should enter 7810]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

8910

Question Number : 14 Question Id : 640653345445 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 conditions that need to be checked to identify a subspace *W* of a vector space *V*:
_____. (Enter 2 best possible options. Enter only the serial numbers of those options in increasing order without adding any comma or space in between them.)
[Suppose your answer is 7 ans 8, then you should enter 78]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

34

Question Number : 15 Question Id : 640653345446 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

A spanning set of $\mathbb{R}^2$ with 2 elements must be a _____. (Enter 2 best possible options. Enter only the serial numbers of those options in increasing order without adding any comma or space in between them.) [Suppose your answer is 7 and 8, then you should enter 78]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

910

Sub-Section Number :	7
Sub-Section Id :	64065348839
Question Shuffling Allowed :	No

Question Id : 640653345447 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 : (16 to 19)

Question Label : Comprehension

Shubham bought 2 kg of potatoes and c kg of dal and 1 kg of wheat from a shop, and paid ₹80 to the shopkeeper. Sushmitha bought 4 kg of potatoes and 1 kg of dal and 2 kg of wheat, and paid ₹d to the shopkeeper. Subhasis bought 2 kg of potatoes, 1 kg of dal and 2 kg of wheat, and paid ₹80 to the shopkeeper. If $x_1(\neq 0)$ represents the price of 1 kg of potato and $x_2(\neq 0)$ represents the price of 1 kg of dal, and $x_3(\neq 0)$ represents the price of 1 kg of wheat, then answer the given subquestions.

Sub questions

Question Number : 16 Question Id : 640653345448 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 matrix representation to find x_1, x_2, and x_3 is

Options :

6406531148907. ✖ $\begin{bmatrix}2 & c & 1\\2 & 1 & 2\\4 & 1 & 2\end{bmatrix}\begin{bmatrix}x_1\\x_2\\x_3\end{bmatrix}=\begin{bmatrix}80\\d\\80\end{bmatrix}$

6406531148908. ✖ $\begin{bmatrix}2 & c & 1\\4 & 1 & 2\\2 & 1 & 2\end{bmatrix}\begin{bmatrix}x_1\\x_2\\x_3\end{bmatrix}=\begin{bmatrix}80\\80\\d\end{bmatrix}$

6406531148909. ✔ $\begin{bmatrix}2 & c & 1\\4 & 1 & 2\\2 & 1 & 2\end{bmatrix}\begin{bmatrix}x_1\\x_2\\x_3\end{bmatrix}=\begin{bmatrix}80\\d\\80\end{bmatrix}$

6406531148910. ✖ $\begin{bmatrix}4 & 1 & 2\\2 & c & 1\\2 & 1 & 2\end{bmatrix}\begin{bmatrix}x_1\\x_2\\x_3\end{bmatrix}=\begin{bmatrix}80\\d\\80\end{bmatrix}$

Question Number : 17 Question Id : 640653345449 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

If we try to find x_1, x_2, and x_3 using appropriate matrix representation by taking $c = 0.5$ and $d = 100$, then

Options :

6406531148911. ✖ We will find that the price of 1 kg potato is unique.

6406531148912. ✔ We will fail to find the price (as a numerical value) of 1 kg potato.

6406531148913. ✖ We will find that the price of 1 kg potato is ₹20.

6406531148914. ✖ We will find infinitely many values as the price of 1 kg potato.

Question Number : 18 Question Id : 640653345450 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

If we try to find x_1, x_2, and x_3 using appropriate matrix representation by taking $c = 2$ and $d \neq 160$, then which of the following options is always true?

Options :

6406531148915. ✖ $x_1 = x_3$

6406531148916. ✖ $x_1 = x_2$

6406531148917. ✔ $x_2 = x_3$

6406531148918. ✖ $x_1 = x_2 = x_3$

Question Number : 19 Question Id : 640653345451 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

If we try to find x_1, x_2, and x_3 using appropriate matrix representation by taking $c = 3$ and $d = 100$, then which of the following options is always true?

Options :

6406531148919. ✖ $x_1 = 12$, $x_2 = 20$ and $x_3 = 10$

6406531148920. ✖ $x_1 = x_2 = 24$ and $x_3 = 10$

6406531148921. ✔ $x_1 = 10$, $x_2 = 12$ and $x_3 = 24$

6406531148922. ✖ $x_1 = x_2 = x_3 = 10$

Statistics 2

Section Id :	64065321868
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 :	64065348840
Question Shuffling Allowed :	No

Question Number : 20 Question Id : 640653345452 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 :

6406531148923. ✔ Yes

6406531148924. ✖ No

Question Number : 21 Question Id : 640653345453 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) $A=\{a,a+1,\ldots,b\}$	$\frac{1}{n}, \quad x=k$ $n=b-a+1$ $k=a,a+1,\ldots,b$	$\begin{cases} 0 & x<0 \\ \frac{k-a+1}{n} & k\le x<k+1 \\ & k=a,a+1,\ldots,b-1,b \\ 1 & x\ge n \end{cases}$	$\frac{a+b}{2}$	$\frac{n^2-1}{12}$
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)	${}^nC_k p^k(1-p)^{n-k}$, $k=0,1,\ldots,n$	$\begin{cases} 0 & x<0 \\ \sum_{i=0}^{k} {}^nC_i p^i(1-p)^{n-i} & k\le x<k+1 \\ & k=0,1,\ldots,n \\ 1 & x\ge n \end{cases}$	np	$np(1-p)$
Geometric(p)	$(1-p)^{k-1}p$, $k=1,\ldots,\infty$	$\begin{cases} 0 & x<0 \\ 1-(1-p)^k & k\le x<k+1 \\ & k=1,\ldots,\infty \end{cases}$	$\frac{1}{p}$	$\frac{1-p}{p^2}$
Poisson(λ)	$\frac{e^{-\lambda}\lambda^k}{k!}$, $k=0,1,\ldots,\infty$	$\begin{cases} 0 & x<0 \\ e^{-\lambda}\sum_{i=0}^{k}\frac{\lambda^i}{i!} & k\le x<k+1 \\ & k=0,1,\ldots,\infty \end{cases}$	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,
$$P(|X - \mu| \ge k\sigma) \le \frac{1}{k^2}$$

Options :

6406531148925. ✔ Useful Data has been mentioned above

6406531148926. ✖ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number : 2

Sub-Section Id : 64065348841

Question Shuffling Allowed : No

Question Id : 640653345454 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 : (22 to 24)

Question Label : Comprehension

The joint probability mass function of two discrete random variables X and Y is given by

Y \ X	1	2	3
1	0.1	0.2	0.1
2	0.2	0.3	0.1

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 22 Question Id : 640653345455 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Find the distribution of $S = X + Y$.

Options :

6406531148927. ✖

s	2	3	4	5
$P(X+Y=s)$	0.1	0.3	0.5	0.1

6406531148928. ✔

s	2	3	4	5
$P(X+Y=s)$	0.1	0.4	0.4	0.1

6406531148929. ✖

s	1	2	3	4	5
$P(X+Y=s)$	0.1	0.2	0.1	0.5	0.1

6406531148930. ✖

s	1	2	3	4	5
$P(X+Y=s)$	0.1	0.2	0.1	0.4	0.2

Question Number : 23 Question Id : 640653345456 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Find the distribution of $Z_1 = \max(X, Y)$.

Options :

6406531148931. ✖

z_1	1	2	3
$P(\max(X,Y) = z_1)$	0.1	0.4	0.5

6406531148932. ✖

z_1	1	2	3
$P(\max(X,Y) = z_1)$	0.3	0.4	0.3

6406531148933. ✔

z_1	1	2	3
$P(\max(X,Y) = z_1)$	0.1	0.7	0.2

6406531148934. ✖

z_1	1	2	3
$P(\max(X,Y) = z_1)$	0.4	0.4	0.2

Question Number : 24 Question Id : 640653345457 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Find the distribution of $Z_2 = \min(X, Y)$.

Options :

6406531148935. ✔

z_2	1	2
$P(\min(X,Y) = z_2)$	0.6	0.4

6406531148936. ✖

z_2	1	2
$P(\min(X,Y) = z_2)$	0.4	0.6

6406531148937. ✖

z_2	1	2
$P(\min(X,Y) = z_2)$	0.9	0.1

6406531148938. ✖

z_2	1	2	3
$P(\min(X,Y)=z_2)$	0.3	0.5	0.2

Sub-Section Number : 3

Sub-Section Id : 64065348842

Question Shuffling Allowed : Yes

Question Number : 25 Question Id : 640653345458 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

A coin is biased so that the probability of obtaining a head is 0.75. The coin is tossed four times and number of heads obtained is given by *X*. Find Var(*X*). 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

Question Number : 26 Question Id : 640653345459 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

Let $f : \mathbb{R} \to \mathbb{R}$ be defined by

$$f(x) = \begin{cases} 0 & \text{for } -\infty < x < 0, \\ \frac{1}{4} & \text{for } 0 < x \leq 1, \\ \frac{3}{4x^2} & \text{for } 1 < x < \infty. \end{cases}$$

If a random variable X has the PDF $f(x)$, calculate $\mathrm{P}\left(-\frac{1}{2} < X < \frac{3}{2}\right)$. Enter the answer correct to one decimal place.

Hint: Use $\int_a^b \frac{1}{x^2}\,dx = \frac{1}{a} - \frac{1}{b}$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0.5

Question Number : 27 Question Id : 640653345460 Question Type : SA Calculator : None

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

Correct Marks : 2

Question Label : Short Answer Question

Let X be a discrete random variable with the following PMF and CDF:

$$p_X(x) = \begin{cases} a, & x = 1 \\ b, & x = 2 \\ c, & x = 3 \\ 0.3, & x = 4 \end{cases}$$

$$F_X(x) = \begin{cases} 0, & x < 1 \\ 0.2, & 1 \leq x < 2 \\ 0.6, & 2 \leq x < 3 \\ 0.7, & 3 \leq x < 4 \\ d, & x \geq 4 \end{cases}$$

Evaluate $a + b + c + d$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1.7

Sub-Section Number :	4
Sub-Section Id :	64065348843
Question Shuffling Allowed :	No

Question Id : 640653345461 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 29)

Question Label : Comprehension

Consider two random variables X and Y with Joint PMF given in Table 1.1.

Y \ X	0	1	2
0	$\frac{1}{12}$	$\frac{1}{8}$	$\frac{1}{24}$
1	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{8}$

Table 1.1: Joint PMF of X and Y

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 28 Question Id : 640653345462 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 options are true?

Options :

6406531148942. ✔ X and Y are independent random variables

6406531148943. ✖ X and Y are dependent random variables

6406531148944. ✔ $P(X \leq 1) = \frac{5}{6}$

6406531148945. ✖ $P(Y = 1|X = 2) = \frac{1}{4}$

Question Number : 29 Question Id : 640653345463 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

$$\frac{1}{P(X \leq 1, Y = 0) + P(X = 2, Y = 1)}.$$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Question Id : 640653345464 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 : (30 to 31)

Question Label : Comprehension

In a book store, there are two types of books (Type 1 and Type 2). Let X denote the number of books of Type 1 that is sold in a week. Let Y denote the number of books of Type 2 that is sold in a week. Suppose X and Y follows the Poisson distribution with parameters 2 and 3, respectively. Let Z denote the total number of books of Type 1 and Type 2 sold in a week. Assume that X and Y are independent.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 30 Question Id : 640653345465 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 options are true?

Options :

6406531148947. ✖ $(Y|Z=5) \sim \text{Binomial}\left(5, \frac{2}{5}\right)$.

6406531148948. ✔ $(X|Z=5) \sim \text{Binomial}\left(5, \frac{2}{5}\right)$.

6406531148949. ✖ $(X|Z=5) \sim \text{Binomial}\left(5, \frac{3}{5}\right)$.

6406531148950. ✔ $(Y|Z=5) \sim \text{Binomial}\left(5, \frac{3}{5}\right)$

Question Number : 31 Question Id : 640653345466 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Short Answer Question

Find the value of P($X = 1 \mid Z = 5$). 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 :

0.24 to 0.27

Question Id : 640653345468 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 : (32 to 33)

Question Label : Comprehension

Let X be a continuous random variable with the following PDF:

$$f_X(x) = \begin{cases} \frac{p}{x^2} & 1 \le x \le 5 \\ 0 & \text{otherwise} \end{cases}$$

Hint: Use $\int_{x=a}^{b} \frac{1}{x^2}\,dx = \frac{1}{a} - \frac{1}{b}$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 32 Question Id : 640653345469 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 so that $f_X(x)$ is a valid PDF. 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 :

1.25

Question Number : 33 Question Id : 640653345470 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Short Answer Question

Find the value of $P(X < 4 \mid X > 2)$.
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 :

0.82 to 0.84

Question Id : 640653345471 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 : (34 to 35)

Question Label : Comprehension

Let X denote the number of products delivered to a fixed destination using a drone. There are problems with either too many or too few products to the destination. Assume E[X] = 2000,Var(X) = 100.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 34 Question Id : 640653345472 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

Use Markov's inequality to find an upper bound on $P(X \geq 2040)$. 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 :

0.98 to 0.99

Question Number : 35 Question Id : 640653345473 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

Use Chebyshev's inequality to find a lower bound on $P(1988 < X < 2012)$. 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 :

0.30 to 0.31

Question Id : 640653345474 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

During an IPL cricket match, amount of time (in minutes) Jadeja bats follows the exponential distribution with an expected time of 50 minutes.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 36 Question Id : 640653345475 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

What is the probability that Jadeja will bat for more than 40 minutes? 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 :

0.44 to 0.46

Question Number : 37 Question Id : 640653345476 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 probability that Jadeja will bat for more than 60 minutes given that he has already batted for more than 40 minutes? Enter the answer correct to two decimal places.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.66 to 0.68

Sub-Section Number : 5

Sub-Section Id : 64065348844

Question Shuffling Allowed : Yes

Question Number : 38 Question Id : 640653345467 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

Steven and Selena throw a die each simultaneously. If the two numbers appearing on the dice are different, Steven will receive ₹300. If the numbers are same, Steven will pay ₹1200. Find the expected money that will be won by Steven.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

50

CT

Section Id : 64065321869

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 :	64065348845
Question Shuffling Allowed :	No

Question Number : 39 Question Id : 640653345477 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 :

6406531148959. ✔ YES

6406531148960. ✖ NO

Question Number : 40 Question Id : 640653345478 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

Item List

SV Stores — Srivatsan 1

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

Sun General — Vignesh 14

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

Big Bazaar — Sudeep 2

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

Options :

6406531148961. ✔ Useful Data has been mentioned above.

6406531148962. ✖ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number : 2

Sub-Section Id : 64065348846

Question Shuffling Allowed : Yes

Question Number : 41 Question Id : 640653345479 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

Kavya used a variable **minBillTotal** to find the minimum total bill amount using "Shopping Bills" dataset. There are many ways to initialize **minBillTotal**, choose the correct option(s). It is a Multiple Select Question (MSQ).

Options :

6406531148963. ✔ Pick any random card **X** from the dataset and initialize **minBillTotal** = **X**.*TotalBillAmount*

6406531148964. ✔ Pick the top card **X** from the dataset and initialize **minBillTotal** = **X**.*TotalBillAmount*

6406531148965. ✖ Initialize **minBillTotal** with any random value

6406531148966. ✖ Initialize **minBillTotal** with 0

Question Number : 42 Question Id : 640653345482 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 following pseudocode is executed using the "Library" dataset. At the end of the execution, **N** captures the name of a book written in a language other than English with the maximum number of pages, and **A** captures the number of pages in the book.

```
A = 0, N = "None"
while(Table 1 has more rows){
    Read the first row X in Table 1
    if(X.Language != "English" and X.Pages > A){
        A = X.Pages
        N = X.Name
    }
    Move X to Table 2
}
```

Assume that the rows of the table are shuffled in any random order, choose the correct option(s). It is a Multiple Select Question (MSQ).

Options :

6406531148975. ✖ There might be some change in the values of both **A** and **N**, based on the order of rows

6406531148976. ✔ There might be a change in the value of **N**, based on the order of rows

6406531148977. ✖ There will be NO change in the values of both **A** and **N,** based on the order of rows

6406531148978. ✖ There might be a change in the value of **A**, based on the order of rows

Question Number : 43 Question Id : 640653345487 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 following pseudocode is executed using the "Library" dataset. At the end of the execution, **A** captures the number of books which are published after 2010 or have less than the average number of pages. Assume that the variable **Avg** holds the value of the average number of pages of the books in the dataset. 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  A = 0
2  while(Table 1 has more rows){
3      Read the first row X in Table 1
4      C = False
5      if(X.Year > 2010){
6          C = True
7      }
8      if(X.Pages > Avg){
9          C = True
10     }
11     if(C){
12         A = 1
13     }
14     Move X to Table 2
15 }
```

Options :

6406531148996. ✖ Error in Line 5

6406531148997. ✔ Error in Line 8

6406531148998. ✖ Error in Line 9

6406531148999. ✔ Error in Line 12

6406531149000. ✖ No error in the code

Question Number : 44 Question Id : 640653345489 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 following pseudocode is executed using the "Shopping Bills" dataset. At the end of execution, **A** captures the lowest price of an item purchased from "Big Bazaar". But the pseudocode may have mistakes in one or more lines. Identify all such lines (if any). Assume that all statements not listed in the options below are free of errors. It is a Multiple Select Question (MSQ).

```
A = 0
while(Pile 1 has more cards){
    Read the top card X in Pile 1
    if(X.ShopName == "Big Bazaar"){
        temp = findItem(X)
        if(temp > A){
            A = temp
        }
    }
    Move X to Pile 2
}

Procedure findItem(Y)
    minPrice = 0
    while(Card Y has more items){
        Read an item Z from ItemList of card Y
        if(minPrice >= Z.Price ){
            minPrice = Z.Price
        }
        Remove Z from ItemList of card Y
    }
    return(minPrice)
End findItem
```

Options :

6406531149005. ✔ Line 1: Incorrect initialization of **A**

6406531149006. ✔ Line 6: Incorrect conditional statement

6406531149007. ✔ Line 14: Incorrect initialization of **minPrice**

6406531149008. ✖ Line 17: Incorrect conditional statement

6406531149009. ✖ There must be a re-initialization of **minPrice** before the return statement in procedure **findItem**

6406531149010. ✖ No error in the code

Question Number : 45 Question Id : 640653345490 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 following pseudocode is executed using the "Words" table. At the end of the execution, **C** captures the number of pairs of words where both the words have the same part of speech or

both words end with a full stop and have the same letter count. Choose the correct code fragment(s) to complete the pseudocode. It is a Multiple Select Question (MSQ).

```
C = 0
while(Table 1 has more rows){
    Read the first row X in Table 1
    Move X to Table 2
    while(Table 1 has more rows){
        Read the first row Y in Table 1
        Move Y to Table 3
        **********************
        *   Fill the code    *
        **********************
    }
    Move all rows from Table 3 to Table 1
}
```

Options :

```
if((X.PartOfSpeech == Y.PartOfSpeech) or (X.Word ends with a full stop and Y.Word ends with a full stop and X.LetterCount == Y.LetterCount)){
    C = C + 1
}
```

6406531149011. ✔

```
if(X.PartOfSpeech == Y.PartOfSpeech){
    C = C + 1
}
else{
    if(X.Word ends with a full stop and Y.Word ends with a full stop and X.LetterCount == Y.LetterCount){
        C = C + 1
    }
}
```

6406531149012. ✔

```
if(X.PartOfSpeech == Y.PartOfSpeech){
    C = C + 1
}
if(X.Word ends with a full stop and Y.Word ends with a full stop and X.LetterCount == Y.LetterCount){
    C = C + 1
}
```

6406531149013. ✖

```
if(X.PartOfSpeech == Y.PartOfSpeech){
    if(X.Word ends with a full stop and Y.Word ends with a full stop and
X.LetterCount == Y.LetterCount){
    C = C + 1
    }
}
```

6406531149014. ✖

Sub-Section Number : 3

Sub-Section Id : 64065348847

Question Shuffling Allowed : Yes

Question Number : 46 Question Id : 640653345480 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 following pseudocode is executed using the "Scores" dataset. What will **A** represent at the end of the execution?

```
A = 0
while(Table 1 has more rows){
    Read the first row X in Table 1
    if(X.Gender == 'M' and X.CityTown == "Chennai"){
        A = A + X.Mathematics
    }
    Move X to Table 2
}
```

Options :

6406531148967. ✖ Sum of Mathematics marks of students from Chennai

6406531148968. ✔ Sum of Mathematics marks of male students from Chennai

6406531148969. ✖ Sum of Mathematics marks of male students

6406531148970. ✖ Sum of Mathematics marks of male students not from Chennai

Question Number : 47 Question Id : 640653345481 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 following pseudocode is executed using the "Words" dataset. At the end of the execution, **A** captures the maximum letter count among words that are not nouns. Choose the correct code fragment to complete the pseudocode.

```
A = 0
while(Table 1 has more rows){
    Read the first row X in Table 1
    **********************
    *   Fill the code    *
    **********************
    Move X to Table 2
}
```

Options :

6406531148971. ✖

```
if(X.PartOfSpeech == "Noun" and X.LetterCount > A){
    A = X.LetterCount
}
```

6406531148972. ✖

```
if(X.PartOfSpeech != "Noun" and X.LetterCount < A){
    A = X.LetterCount
}
```

6406531148973. ✖

```
if(X.PartOfSpeech == "Noun" and X.LetterCount < A){
    A = X.LetterCount
}
```

6406531148974. ✔

```
if(X.PartOfSpeech != "Noun" and X.LetterCount > A){
    A = X.LetterCount
}
```

Sub-Section Number : 4

Sub-Section Id : 64065348848

Question Shuffling Allowed : Yes

Question Number : 48 Question Id : 640653345488 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. At the end of the execution, **A** captures the number of sentences with at least two nouns that have at most two vowels. Choose the correct code fragments to complete the pseudocode.

```
A = 0, C = 0
while(Table 1 has more rows){
    Read the first row X from Table 1
    if(X.PartOfSpeech == "Noun" and countVowels(X) <= 2){
        C = C + 1
    }
    if(X.Word ends with a full stop){
        if(C >= 2){
            *** Statement1 ***
        }
        *** Statement2 ***
    }
    Move X to Table 2
}

Procedure countVowels(Y)
    i = 1, B = 0
    while(i <= Y.LetterCount){
        if(ith letter of Y.Word is a vowel){
            B = B + 1
            *** Statement3 ***
        }
        *** Statement4 ***
    }
    return(B)
End countVowels
```

Options :

6406531149001. ✔ Statement1: A = A + 1

Statement2: C = 0

Statement3: Not required

Statement4: i = i + 1

6406531149002. ✖ Statement1: C = 0

Statement2: A = A + 1

Statement3: i = i + 1

Statement4: Not required

6406531149003. ✖ Statement1: C = 0

Statement2: A = A + 1

Statement3: Not required

Statement4: i = i + 1

6406531149004. ✖ Statement1: A = A + 1

Statement2: C = 0

Statement3: i = i + 1

Statement4: Not required

Sub-Section Number : 5

Sub-Section Id : 64065348849

Question Shuffling Allowed : Yes

Question Number : 49 Question Id : 640653345483 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** be a row in the "Words" table. Let **isShortVerb** be a procedure to find whether the word in the row **X** is a verb with letter count at most five. Choose the correct code fragment to complete the pseudocode.

```
Procedure isShortVerb(X)
    **********************
    *   Fill the code    *
    **********************
End isShortVerb
```

Options :

6406531148979. ✖

```
if(X.PartOfSpeech == "Verb"){
    return(True)
}
else{
    return(False)
}
```

```
if(X.PartOfSpeech == "Verb" and X.LetterCount <= 5){
    return(False)
}
else{
    return(True)
}
```

6406531148980. ✖

```
if(X.PartOfSpeech == "Verb" or X.LetterCount <= 5){
    return(True)
}
else{
    return(False)
}
```

6406531148981. ✖

```
if(X.PartOfSpeech == "Verb" and X.LetterCount <= 5){
    return(True)
}
else{
    return(False)
}
```

6406531148982. ✔

Question Number : 50 Question Id : 640653345484 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 long word is defined as a word having at least 6 letters. The given pseudocode is used to find the

average number of letters per word for long words from the "Words" dataset. Choose the correct code fragment to complete the pseudocode.

```
letterCount = 0, wordCount = 0, avgLetPerWord = 0
while(Table 1 has more rows){
    Read the first row X in Table 1
    **********************
    *   Fill the code    *
    **********************
}
avgLetPerWord = letterCount / wordCount
```

Options :

```
wordCount = wordCount + 1
if(X.LetterCount >= 6){
    letterCount = letterCount + X.LetterCount
}
Move X to Table 2
```

6406531148983. ✖

```
if(X.LetterCount >= 6){
    wordCount = wordCount + 1
    letterCount = letterCount + X.LetterCount
}
Move X to Table 2
```

6406531148984. ✔

```
if(X.LetterCount >= 6){
    wordCount = wordCount + 1
    letterCount = letterCount + X.LetterCount
    Move X to Table 2
}
```

6406531148985. ✖

```
if(X.LetterCount >= 6){
    letterCount = letterCount + X.LetterCount
    wordCount = wordCount + 1
}
```

6406531148986. ✖

Question Number : 51 Question Id : 640653345485 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 "Scores" dataset. What will **A** represent at the end of the execution?

```
A = 0
while(Table 1 has more rows){
    Read the first row X in Table 1
    B = True
    if(X.Physics >= 70){
        B = False
    }
    if(X.Chemistry >= 70){
        B = False
    }
    if(X.Mathematics >= 70){
        B = False
    }
    if(B){
        A = A + 1
    }
    Move X to Table 2
}
```

Options :

6406531148987. ✖ Number of students with all subject marks more than 70

6406531148988. ✖ Number of students with exactly one subject marks less than 70

6406531148989. ✔ Number of students with all subject marks less than 70

6406531148990. ✖ Number of students with all subject marks at least 70

Question Number : 52 Question Id : 640653345486 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 given pseudocode is executed using the "Scores" dataset. There is a hypothesis that if a

student performs well overall (i.e., scores at least total 180 marks), then he/she must have performed well in all the subjects (i.e., scored at least 60 marks in each subject). At the end of execution, **fracTrue** stores the fraction of students who satisfy this hypothesis. Choose the correct code fragment to complete the pseudocode.

```
countOverall = 0, countPerSub = 0
while(Table 1 has more rows){
    Read the first row X in Table 1
    if(X.Total >= 180) {
        **********************
        *   Fill the code    *
        **********************
    }
    Move X to Table 2
}
fracTrue = countPerSub / countOverall
```

Options :

6406531148991. ✖

```
if(X.Physics >= 60 and X.Chemistry >= 60 and X.Mathematics >= 60){
    countPerSub = countPerSub + 1
    countOverall = countOverall + 1
}
```

6406531148992. ✔

```
if(X.Physics >= 60 and X.Chemistry >= 60 and X.Mathematics >= 60){
    countPerSub = countPerSub + 1
}
countOverall = countOverall + 1
```

6406531148993. ✖

```
if(X.Physics >= 60 or X.Chemistry >= 60 or X.Mathematics >= 60){
    countPerSub = countPerSub + 1
}
countOverall = countOverall + 1
```

6406531148994. ✖

```
if(X.Physics >= 60 and X.Chemistry >= 60 and X.Mathematics >= 60){
    countOverall = countOverall + 1
}
countPerSub = countPerSub + 1
```

```
if(X.Physics >= 60 or X.Chemistry >= 60 or X.Mathematics >= 60){
    countOverall = countOverall + 1
}
countPerSub = countPerSub + 1
```

6406531148995. ✖

Sub-Section Number : 6

Sub-Section Id : 64065348850

Question Shuffling Allowed : Yes

Question Number : 53 Question Id : 640653345491 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 5

Question Label : Multiple Select Question

The following pseudocode is executed using the "Words" dataset. **A** counts the number of pairs of words which have equal number of vowels and consonants. But the pseudocode may have mistakes in one or more lines. Identify all such lines (if any). Assume that all statements not listed in the options below are free of errors. It is a Multiple Select Question (MSQ).

```
1  A = 0
2  while(Pile 1 has more cards){
3      Read the top card X from Pile 1
4      countV = 0, countC = 0
5      countV, countC = countSomething(X, countV, countC)
6      Move X to Pile 2
7      while(Pile 1 has more cards){
8          Read the top card Y from Pile 1
9          Move Y to Pile 3
10         countV1 = 0, countC1 = 0
11         countV1, countC1 = countSomething(Y, countV1, countC1)
12         if(countV == countV1 and countC != countC1){
13             A = A + 1
14         }
15     }
16     Move all cards from Pile 3 to Pile 2
17 }
18
19 Procedure countSomething(Z, B, C)
20     i = Z.LetterCount
21     while(i >= 1){
22         if(ith letter of Z.Word is vowel){
23             B = B + 1
24         }
25         else{
26             C = C + 1
27         }
28         i = i + 1
29     }
30     return([B, C])
31 End countSomething
```

Options :

6406531149015. ✖ Error in Line 5

6406531149016. ✖ Error in Line 11

6406531149017. ✔ Error in Line 12

6406531149018. ✔ Error in Line 16

6406531149019. ✖ Error in Line 20

6406531149020. ✖ Error in Line 22

6406531149021. ✔ Error in Line 28

6406531149022. ✖ Error in Line 30

6406531149023. ✖ No error in the code

Question Number : 54 Question Id : 640653345492 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 5

Question Label : Multiple Select Question

The following pseudocode is executed using the "Scores" dataset. At the end of the execution, **A** captures the number of female students who are above average in at least one subject. Assume that the variables **M**, **P** and **C** hold the average marks of the subjects Mathematics, Physics and Chemistry respectively. 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  A = 0
2  while(Table 1 has more rows){
3      Read the first row X from Table 1
4      if(CheckSomething(X, M, P, C)){
5          A = 1
6      }
7      Move X to Table 2
8  }
9
10 Procedure CheckSomething (Y, C1, C2, C3)
11     if(Y.Gender == 'F'){
12         if(Y.Mathematics > C1 and Y.Physics > C2 and Y.Chemistry > C3){
13             return(True)
14         }
15         else{
16             return(False)
17         }
18     }
19     else{
20         return(False)
21     }
22 End CheckSomething
```

Options :

6406531149024. ✖ Error in Line 4

6406531149025. ✔ Error in Line 5

6406531149026. ✖ Error in Line 11

6406531149027. ✔ Error in Line 12

6406531149028. ✖ Multiple *return(False)* in procedure **CheckSomething**

6406531149029. ✖ No error in the code

Intro to Python

Section Id :	64065321870
Section Number :	4
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 :	64065348851
Question Shuffling Allowed :	No

Question Number : 55 Question Id : 640653345493 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 "INTRODUCTION TO 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 :

6406531149030. ✔ YES

6406531149031. ✖ NO

Question Number : 56 Question Id : 640653345494 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

Useful Data

Presentation

There are two types of blocks that you would see in all the questions:

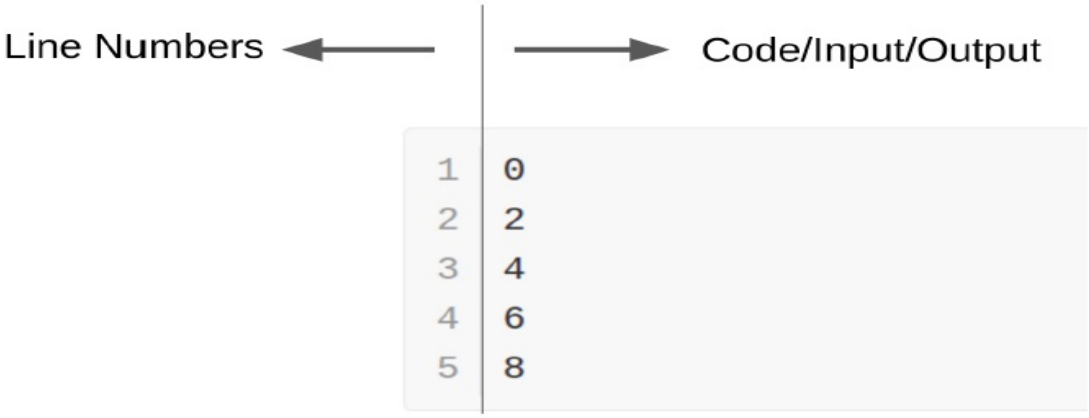
Code

```
1 for i in range(10):
2     if i % 2 == 0:
3         print(i)
```

Input or Output

```
1 0
2 2
3 4
4 6
5 8
```

In both the blocks, please note that the region to the left of the thin vertical line — `|` — corresponds to line-numbers. Do not confuse the line numbers with the content of the code or the input-output. Just to be clear:



Useful information

`range`

Sample behaviour of the `range` function:

- `range(5)` corresponds to the sequence `0, 1, 2, 3, 4`
- `range(1, 5)` corresponds to the sequence `1, 2, 3, 4`
- `range(1, 1)` is the empty sequence

`//` operator

`//` is the floor division operator. `5 // 2` is 2 and *not* 2.5

NAT → integer

For all NAT questions in this exam, the answer will always be an integer and not a float value. If the answer to a question is 18, then just enter that value. Do *not* enter 18.0

Options :

6406531149032. ✔ Useful Data has been mentioned above.

6406531149033. ✖ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number :	2
Sub-Section Id :	64065348852
Question Shuffling Allowed :	Yes

Question Number : 57 Question Id : 640653345496 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 n is a positive integer, then what is the value of `count` at the end of execution of the code given below?

```
n = int(input())
count = 0
for x in range(1, n + 1):
    for y in range(x + 1, n + 1):
        count = count + 1
```

Options :

6406531149038. ✖ n^2

6406531149039. ✖ $n(n+1)$

6406531149040. ✖ $\frac{n(n+1)}{2}$

6406531149041. ✔ $\frac{n(n-1)}{2}$

Sub-Section Number : 3

Sub-Section Id : 64065348853

Question Shuffling Allowed : Yes

Question Number : 58 Question Id : 640653345500 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 output of the following snippet of code? All words in the list `L` are in lower case.

```
L = ['good', 'done', 'eat', 'trim',
     'make', 'fake', 'ease', 'epic',
     'cage', 'list', 'top', 'pot']

# L[0][-1] is the last letter of the first word

counts = [ ]
count = 1
for i in range(1, len(L)):
    if L[i - 1][-1] == L[i][0]:
        count += 1
    else:
        counts.append(count)
        count = 1

counts.append(count)

print(counts)
```

Options :

6406531149051. ✖ `[4, 3, 2]`

6406531149052. ✖ `[5, 4]`

6406531149053. ✔ `[5, 4, 3]`

6406531149054. ✖ `[4, 3, 2, 1]`

Question Number : 59 Question Id : 640653345504 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

A programmer wishes to write a code that accepts a string `word` as input and compute a list `V` that stores the frequencies of occurrence of the vowels 'aeiou' in the string. Each element in `V` corresponds to the frequency of one of the vowels in the string:

- `V[0]` : frequency of 'a'
- `V[1]` : frequency of 'e'
- `V[2]` : frequency of 'i'
- `V[3]` : frequency of 'o'
- `V[4]` : frequency of 'u'

Study the two codes given below and determine their correctness for this task. A code is correct only if it is error-free and produces the correct output for any given input. You can assume that the input to the code will have only lower case letters.

Code-1

```
word = input()

V = [ ]
for i in range(5):
    V[i] = 0

vowels = 'aeiou'
for char in word:
    if char in vowels:
        index = vowels.index(char)
    V[index] += 1
```

Code-2

```
word = input()

V = [ ]
for i in range(5):
    V.append(0)

vowels = 'aeiou'
for char in word:
    if char in vowels:
        index = vowels.index(char)
    V[index] += 1
```

Hint: `'great'.index('e')` returns the value 2

Options :

6406531149063. ✖ Code-1 is correct and code-2 is incorrect

6406531149064. ✖ Code-1 is incorrect and code-2 is correct

6406531149065. ✖ Both codes are correct

6406531149066. ✔ Both are incorrect

Question Number : 60 Question Id : 640653345506 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 output of the following snippet of code?

```
code = ['# this is a python code',
        'x = 0',
        'print(x)',
        'for i in range(x):',
        '    x = x + i',
        'print(x)']

mod_code = [ ]
for line in code:
    if 'print' in line:
        # there is a single space between the middle quotes
        line = '#' + ' ' + line
    mod_code.append(line)

for line in mod_code:
    print(line)
```

Options :

6406531149073. ✔

```
# this is a python code
x = 0
# print(x)
for i in range(x):
    x = x + i
# print(x)
```

6406531149074. ✖

```
# this is a python code
x = 0
#print(x)
for i in range(x):
    x = x + i
#print(x)
```

6406531149075. ✖

```
# this is a python code
x = 0
print(x)
for i in range(x):
    x = x + i
print(x)
```

6406531149076.

```
# this is a python code
# x = 0
# print(x)
# for i in range(x):
#     x = x + i
# print(x)
```

Sub-Section Number : 4

Sub-Section Id : 64065348854

Question Shuffling Allowed : Yes

Question Number : 61 Question Id : 640653345495 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

A programmer likes to do certain activities depending on the time of the day and the prevailing weather conditions. He writes the following code that accepts two string variables `weather` and `time` as inputs and prints the corresponding `activity` as output.

```
1  weather = input()
2  time = input()
3
4  if weather == 'sunny':
5      if time == 'morning':
6          activity = 'read'
7      else:
8          activity = 'walk'
9
10 if weather == 'rainy':
11     activity = 'sleep'
12
13 if weather == 'cold':
14     if time == 'morning':
15         activity = 'read'
16     else:
17         activity = 'watch'
18
19 print(activity)
```

Which of the following statements about the code's execution are true? The options are independent of each other. That is, assume that each option corresponds to a separate execution of the code.

Hint: The Python interpreter processes the code from top to bottom.

Options :

6406531149034. ✔ If line-6 is executed, then line-8 will not be executed.

6406531149035. ✔ If line-11 is executed, then lines 14 to 17 will not be executed.

6406531149036. ✖ If line-8 is executed, the interpreter will directly jump to line-19 without even reading the remaining lines.

6406531149037. ✔ The interpreter evaluates at least three if conditions for any combinations of inputs.

Question Number : 62 Question Id : 640653345497 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 inputs for which this code will print the value `True` to the console. The input will only contain letters.

```
word = input()
x = 0
y = 0
for char in word:
    # z is in lower case in the if-block given below
    if 'a' <= char <= 'z':
        x += 1
    # Z is in upper case in the if-block given below
    if 'A' <= char <= 'Z':
        y += 1
if x > y:
    print(True)
else:
    print(False)
```

Options :

6406531149042. ✔ agaiN

6406531149043. ✖ giVEN

6406531149044. ✖ goodSHOW

6406531149045. ✔ erasE

Question Number : 63 Question Id : 640653345499 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 matrices `M` for which the following code prints `True` to the console.

```
# Look at the options for the value of M
n = len(M)

flag = True
for i in range(n):
    for j in range(n):
        if (i != j) and (M[i][j] != M[j][i]):
            flag = False

print(flag)
```

Options :

6406531149047. ✔ `[[1, 2, 3], [2, 5, 4], [3, 4, 6]]`

6406531149048. ✔ `[[1, 5, 3, 4], [5, 1, 4, 6], [3, 4, 2, 8], [4, 6, 8, 3]]`

6406531149049. ✖ `[[1, 2, 3], [0, 5, 4], [3, 4, 6]]`

6406531149050. ✖ `[[1, 5, 3, 6], [5, 1, 4, 6], [3, 4, 2, 8], [4, 6, 8, 3]]`

Question Number : 64 Question Id : 640653345502 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 `n` be some positive integer. `word` is some string. Both `n` and `word` are already defined. The following is a code snippet and the output produced by it.

Code

```
# n and word are already defined
out = '' # there is no space between the quotes

for i in range(n):
    out = out + word

print(out)
```

Output

```
kindkindkindkindkindkind
```

Select all possible values that the string `word` can take. Note that each option is associated with a different value of `n`.

Options :

6406531149056. ✔ kind

6406531149057. ✔ kindkind

6406531149058. ✔ kindkindkind

6406531149059. ✖ kindkindkindkind

6406531149060. ✖ kindkindkindkindkind

6406531149061. ✔ kindkindkindkindkindkind

Question Number : 65 Question Id : 640653345505 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

`M` is a matrix (list of lists) that has already been defined. The dimension of `M` is $m \times n$. Assume that both m and n are greater than or equal to 2. All the elements of `M` are integers.

```
# M is a matrix (list of lists) that has already beeen defined
n = len(M[0])

flag = True

for i in range(n):
    if M[0][i] - M[-1][i] != 1:
        flag = False

print(flag)
```

Select all correct options about the code given above.

Options :

6406531149067. ✖ This code will print `True` if each element in the last row of the matrix is one more than the corresponding element in the first row of the matrix.

6406531149068. ✔ This code will print `True` if each element in the first row of the matrix is one more than the corresponding element in the last row of the matrix.

6406531149069. ✖ This code will print `True` if each element in the last column of the matrix is one more than the corresponding element in the first column of the matrix.

6406531149070. ✖ This code will print `True` if each element in the first column of the matrix is one more than the corresponding element in the last column of the matrix.

6406531149071. ✖ This code will throw an error if the matrix is rectangular ($m \neq n$)

6406531149072. ✔ This code will NOT throw an error if the matrix is rectangular ($m \neq n$)

Sub-Section Number : 5

Sub-Section Id : 64065348855

Question Shuffling Allowed : Yes

Question Number : 66 Question Id : 640653345498 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

`L` is a non-empty list of distinct positive integers. That is:

- `L` has at least one element
- No two elements of `L` are the same

If the following snippet of code terminates without any error after a finite number of iterations of the while loop, what is the output produced by it?

Hint: `L.remove(x)` removes the leftmost occurrence of `x` in `L`.

```
# L is a non-empty list of distinct positive integers
# L has already been defined
val = 0
for x in L:
    val += x

while L != [ ]:
    for y in range(1, 11):
        if y in L:
            L.remove(y)
        else:
            L.append(y)

print(val)
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

55

Sub-Section Number : 6

Sub-Section Id : 64065348856

Question Shuffling Allowed : Yes

Question Number : 67 Question Id : 640653345501 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

`L` is a list of years. What is the output of the following snippet of code?

```
L = [1943, 2013, 2012, 1920,
     1957, 2010, 1985, 2018,
     1945, 1978, 2019, 1958,
     2009, 1909, 1939, 2021]

year_1 = 1900
year_2 = 2022
for year in L:
    if year < 2000:
        if year > year_1:
            year_1 = year
    else:
        if year < year_2:
            year_2 = year

print(year_2 - year_1)
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

24

Question Number : 68 Question Id : 640653345503 Question Type : SA Calculator : None

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

Correct Marks : 4

Question Label : Short Answer Question

The following code always accepts a positive even integer as input.

```
n = int(input())

f = n - 2
while (f > 0) and (n % f != 0):
    f = f - 2

print(f)
```

What is the output produced by the code if the input is 199999978?

Hint: 99999989 is a prime number

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 69 Question Id : 640653345507 Question Type : SA Calculator : None

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

Correct Marks : 4

Question Label : Short Answer Question

What is the output of the following snippet of code?

```python
a, b = 8, 28

if a < b:
    start = b
else:
    start = a

end = a * b

for x in range(start, end + 1):
    if (x % a == 0) and (x % b == 0):
        print(x)
        break
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

56

DBMS

Section Id :	64065321871
Section Number :	5
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	18
Number of Questions to be attempted :	18
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 : 64065348857

Question Shuffling Allowed : No

Question Number : 70 Question Id : 640653345508 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 :

6406531149078. ✔ YES

6406531149079. ✖ NO

Sub-Section Number : 2

Sub-Section Id : 64065348858

Question Shuffling Allowed : Yes

Question Number : 71 Question Id : 640653345509 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 levels of abstraction describes the information about the data stored in the database and the relationships among the data fields?

Options :

6406531149080. ✖ Physical level

6406531149081. ✔ Logical level

6406531149082. ✖ View level

6406531149083. ✖ None of these

Question Number : 72 Question Id : 640653345510 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

The ability to modify the physical schema without changing the logical schema is known as _____

Options :

6406531149084. ✖ Logical Data Independence

6406531149085. ✔ Physical Data Independence

6406531149086. ✖ View Data Independence

6406531149087. ✖ None of these

Question Number : 73 Question Id : 640653345511 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 is used for accessing and manipulating the data organized by the appropriate data model?

Options :

6406531149088. ✖ Data Definition Language

6406531149089. ✔ Data Manipulation Language

6406531149090. ✖ Data Control Language

6406531149091. ✖ Transaction Control Language

Question Number : 74 Question Id : 640653345517 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Consider the relation **student** shown in Table 8.

roll_no	name	house_name
1	John	Nilgiri
2	Ramesh	Nilgiri
3	Dilip	Arawali
4	Suresh	Shiwalik
5	Kiran	Udaygiri
6	Vijay	Nilgiri

Table 8: Relation **student**

Which of the following SQL command is used to provide INSERT authorization of the table **student** to **instructor**.

Options :

6406531149112. ✖
```
CREATE ROLE instructor;
GRANT INSERT ON instructor TO student;
```

6406531149113. ✖
```
CREATE ROLE instructor;
GRANT student INSERT TO instructor;
```

6406531149114. ✖
```
CREATE ROLE instructor;
GRANT ROLE INSERT ON student TO instructor;
```

6406531149115. ✔
```
CREATE ROLE instructor;
GRANT INSERT ON student TO instructor;
```

Question Number : 75 Question Id : 640653345519 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Consider the relational schema given below.
instructor$(id, name, dept\_name, salary)$

Choose the correct SQL command to create a view XYZ, by selecting two columns *name* and *dept_name* from the instructor relation. Select those instructors having names starting with 'S' and from the 'Music' department.

Options :

6406531149117. ✔
```
CREATE VIEW XYZ(name,dept_name) AS
SELECT name,dept_name from instructor
where name like 'S%' AND dept_name='Music'
```

6406531149118. ✖
```
CREATE VIEW XYZ(name,dept_name) TO
SELECT name,dept_name from instructor
where name like 'S%' AND dept_name='Music'
```

6406531149119. ✖
```
CREATE VIEW XYZ(name,dept_name) ON
SELECT name,dept_name from instructor
where name like 'S%' AND dept_name='Music'
```

6406531149120. ✖
```
CREATE VIEW XYZ(name,dept_name) AS
SELECT name,dept_name from instructor
where name like '%S' AND dept_name='Music'
```

Question Number : 76 Question Id : 640653345521 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 relations shown in Figure 1.

Customers

cid	cname	cage
C101	Stefen	30
C202	Jacob	36
C403	Nicolas	29
C204	Edward	40
C105	Stewart	27

Orders

oid	cid	amount
122	C101	40000
222	C202	20000
111	C403	30000
233	C403	25000

Figure 1: Relations **Customers** and **Orders**

Which of the following expressions will fetch the given tuple?

cname
Stefen

Options :

6406531149125. ✖ $\prod_{cname}(\sigma_{cage \leq 30 \ \wedge \ amount \leq 30000}(Customers \bowtie Orders))$

6406531149126. ✖ $\prod_{cname}(\sigma_{cage > 30 \ \vee \ amount > 30000}(Customers \bowtie Orders))$

6406531149127. ✔ $\prod_{cname}(\sigma_{cage \geq 30 \ \wedge \ amount > 30000}(Customers \bowtie Orders))$

6406531149128. ✖ $\prod_{cname}(\sigma_{cage \geq 30 \ \vee \ amount \leq 30000}(Customers \bowtie Orders))$

Sub-Section Number : 3

Sub-Section Id : 64065348859

Question Shuffling Allowed : Yes

Question Number : 77 Question Id : 640653345512 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 **R** shown in Table 1:

A	B	C
1	a	4
1	a	2
2	c	4
3	d	2
2	c	1

Table 1: Relation **R**

What is the output of the following relational algebra expression?

$\Pi_{x.B}(\sigma_{x.A=y.C}(\rho_x(R) \times \rho_y(R)))$

Options :

6406531149092. ✖

B
a
a
c
c
c
c

6406531149093. ✔

B
a
c

6406531149094. ✖

B
a
c
d

6406531149095. ✖

B
a
a
c
d
c

Question Number : 78 Question Id : 640653345513 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 **Product** shown in Table 3:

p_id	p_name	price
P1	Sunscreen cream	30
P2	Face Wash	40
P3	Tooth Paste	10
P4	Brush	20
P5	Comb	NULL
P6	Carry bag	0
P7	Olive Oil	NULL

Table 3: Relation **Product**

Identify the output for the following SQL statement.

```
SELECT AVG(price) FROM Product;
```

Options :

6406531149096. ✖ 14.29

6406531149097. ✖ 16.67

6406531149098. ✔ 20.00

6406531149099. ✖ 25.00

Question Number : 79 Question Id : 640653345514 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 **Player** shown in Table 4:

p_id	player_name	Age	goal_score
P1	Aabhi	32	49
P2	Naba	21	28
P3	Sam	19	22
P4	Lee	24	18
P5	Baba	23	31
P6	Karan	28	37
P7	Mahabir	25	32
P8	Aakash	20	42

Table 4: Relation **Player**

Result table:

p_id	player_name	Age	goal_score
P1	Aabhi	32	49
P6	Karan	28	37
P8	Aakash	20	42

Choose the correct SQL statement that will return the given resultant table.

Options :

6406531149100. ✖
```
SELECT * FROM Player
WHERE Age >= 20 AND
goal_score >=( SELECT AVG(goal_score) - MIN(goal_score) FROM Player)
```

6406531149101. ✖
```
SELECT * FROM Player
WHERE Age > 20 AND
goal_score >= (SELECT AVG(goal_score) FROM Player)
```

6406531149102. ✔
```
SELECT * FROM Player
WHERE Age >= 20 AND
goal_score >= (SELECT AVG(goal_score) FROM Player)
```

6406531149103. ✖
```
SELECT * FROM Player
WHERE Age >= 20 AND
goal_score >=( SELECT MAX(goal_score) - AVG(goal_score) FROM Player)
```

Question Number : 80 Question Id : 640653345516 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 **student** shown in Table 7.

roll_no	name	house_name
1	John	Nilgiri
2	Ramesh	Nilgiri
3	Dilip	Arawali
4	Suresh	Shiwalik
5	Kiran	Udaygiri
6	Vijay	Nilgiri

Table 7: Relation **student**

What will the output of the following query be?

```
SELECT e.name AS student_name
FROM student e,
        (SELECT house_name, COUNT(*) AS house_count
         FROM student
         GROUP BY house_name) AS dc
WHERE e.house_name = dc.house_name
AND dc.house_count>2
```

Options :

6406531149108. ✖

student_name
John
Ramesh

6406531149109. ✖

student_name
Ramesh
Dilip

6406531149110. ✔

student_name
John
Ramesh
Vijay

6406531149111. ✖

student_name
Vijay

Question Number : 81 Question Id : 640653345520 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 relational schemas given below.
customer(*c_id*, *c_name*, *contact_no*, *address*)
product(*p_id*, *p_name*, *product_type*, *price*)
order(*o_id*, *c_id*, *p_id*, *date*)

Table **order** having two foreign keys *c_id* and *p_id*.
Identify the appropriate "CREATE TABLE" statement for table **order**.

Options :

6406531149121. ✖

```
CREATE TABLE order(
varchar(10) o_id primary key,
varchar(10) c_id,
varchar(10) p_id,
DATE date,
FOREIGN KEY(c_id) REFERENCES customer,
FOREIGN KEY(p_id) REFERENCES product)
```

6406531149122. ✖

```
CREATE TABLE order(
o_id varchar(10) primary key,
c_id varchar(10),
p_id varchar(10),
date DATE,
FOREIGN KEY(p_id) REFERENCES customer,
FOREIGN KEY(c_id) REFERENCES product)
```

6406531149123. ✖

```
CREATE TABLE order(
o_id varchar(10),
c_id varchar(10) primary key,
p_id varchar(10),
date DATE,
FOREIGN KEY(c_id) REFERENCES customer,
FOREIGN KEY(p_id) REFERENCES product)
```

6406531149124. ✔

```
CREATE TABLE order(
o_id varchar(10) primary key,
c_id varchar(10),
p_id varchar(10),
date DATE,
FOREIGN KEY(c_id) REFERENCES customer,
FOREIGN KEY(p_id) REFERENCES product)
```

Sub-Section Number : 4

Sub-Section Id : 64065348860

Question Shuffling Allowed : Yes

Question Number : 82 Question Id : 640653345515 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 relations A and B shown in Table 5 and Table 6 respectively:

x	y
1	a
2	a
3	b
4	c
5	b

Table 5: Relation A

w	z
4	a
5	b
6	b
7	c
8	a
9	a
10	b

Table 6: Relation B

What will be the number of tuples in the resulting table?

```
SELECT y FROM A
UNION ALL
SELECT z FROM B
EXCEPT ALL
SELECT z FROM B
```

Options :

6406531149104. ✖ 0

6406531149105. ✖ 3

6406531149106. ✖ 4

6406531149107. ✔ 5

Question Number : 83 Question Id : 640653345522 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 relations shown in Figure 2.

Students

sname	course_id	sec_id
Sklivia	DBMS	A
James	Python	A
Shawn	Maths	C
Sklivia	Python	C
James	DBMS	B
Jass	DBMS	A
Shawn	Python	B

Course_Section

course_id	sec_id
DBMS	A
Python	C

Figure 2: Relations **Students** and **Course_Section**

What will the output of the operation **Students** ÷ **Course_Section** be?

Options :

6406531149129. ✖ James

6406531149130. ✖ Shawn

6406531149131. ✔ Sklivia

6406531149132. ✖ Jass

Question Number : 84 Question Id : 640653345523 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the following relational schema and answer the question that follows.

Account *(ac_no, branch_name, balance)*
Branch *(branch_name, address)*
Customer *(c_num, ac_no, branch_name, name, address)*

Which of the following queries is equivalent to the statement given below?

Find the name of those customers who have an account at the 'ICICI Bank' and an account balance more than 50000.

Options :

6406531149133. ✔ $\{T \mid \exists C \in Customer, \exists A \in Account\ (C.ac\ no = A.ac\ no \wedge C.branch\ name = \text{“}ICICIBank\text{”} \wedge A.balance > 50000 \wedge C.branch\ name = A.branch\ name \wedge T.name = C.name)\}$

6406531149134. ✖ $\{T \mid \exists C \in Customer, \exists A \in Account\ (C.ac\_no = A.ac\_no \vee C.branch\_name = \text{“}ICICIBank\text{”} \wedge A.balance > 50000 \vee C.branch\_name = A.branch\_name \wedge T.name = C.name)\}$

6406531149135. ✖ $\{T \mid \exists C \in Customer\ (C.ac\_no = A.ac\_no \wedge C.branch\_name = \text{“}ICICIBank\text{”} \vee A.balance > 50000)\}$

6406531149136. ✖ $\{T \mid \exists C \in Customer, \exists A \in Account\ (C.ac\_no = A.ac\_no \vee C.branch\_name = \text{“}ICICIBank\text{”} \vee A.balance > 50000 \vee C.branch\_name = A.branch\_name)\}$

Question Number : 85 Question Id : 640653345524 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the following E-R Diagram.

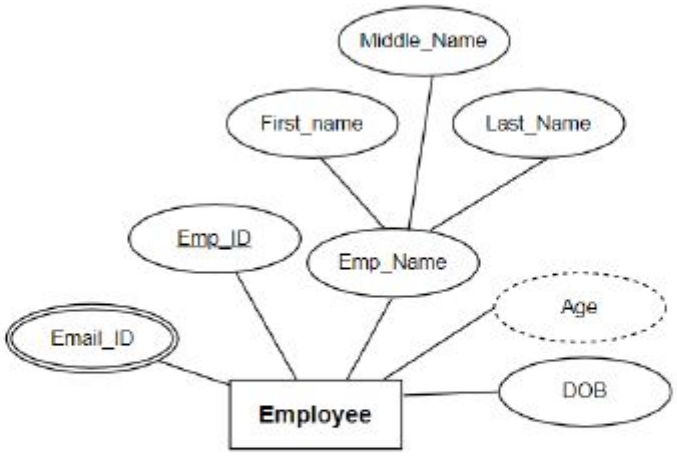
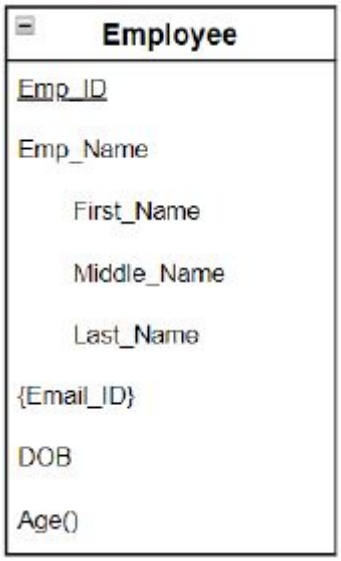


Figure 3: E-R Diagram

Which among the following is the equivalent of the given E-R diagram?

Options :

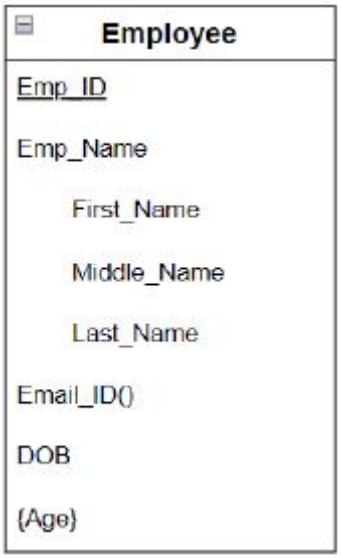
6406531149137. ✖



6406531149138. ✔

6406531149139. ✖

6406531149140. ✖



Sub-Section Number : 5

Sub-Section Id : 64065348861

Question Shuffling Allowed : Yes

Question Number : 86 Question Id : 640653345525 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 E-R diagram for a B.Sc. Degree Course Project database as given in Figure 4.

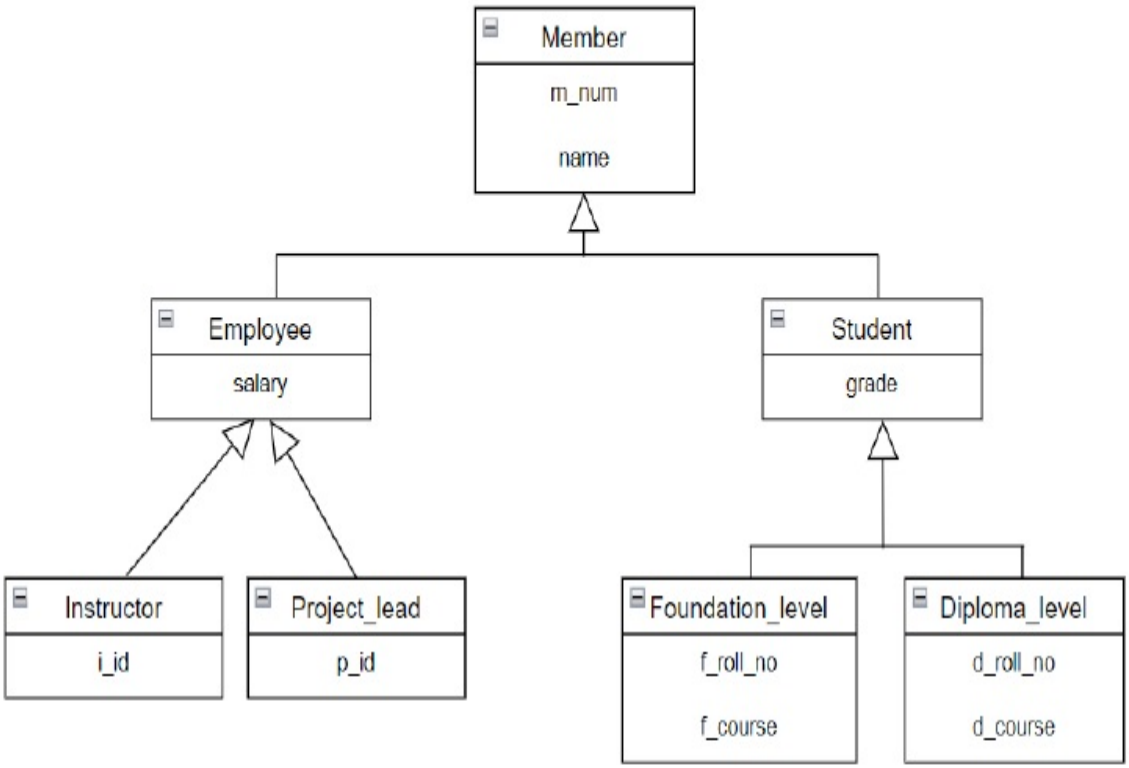


Figure 4: E-R Diagram

Which of the following statement describes the correct relation between the given entity sets?

Note:

- **Employee** and **Student** are disjoint specializations of **Member**.
- **Instructor** and **Project_lead** are overlapping specializations of **Employee**.
- **Foundation_level** and **Diploma_level** are disjoint specializations of **Student**.

Options :

6406531149141. ✔ Each member can be either an employee or a student or just a member of the degree project. However, a member cannot be an employee and a student at the same time.

6406531149142. ✖ Each employee can be an instructor or a project lead. However, an employee cannot be an instructor and a project lead at the same time.

6406531149143. ✖ Each student can be either a foundation_level student or a diploma_level student or both at the same time.

6406531149144. ✔ Each employee can be an instructor or a project lead or both at the same time.

6406531149145. ✖ Each member can be either an employee or a student or both at the same time.

Sub-Section Number : 6

Sub-Section Id : 64065348862

Question Shuffling Allowed : Yes

Question Number : 87 Question Id : 640653345518 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

Consider the two relations **student** and **mobile_no** shown in Table 9 and Table 10.

roll_no	name
1	Oliver
2	Jack
3	Harry
4	Thomas

Table 9: Relation **student**

roll_no	contact_no
1	123
2	456
2	131
3	251

Table 10: Relation **mobile_no**

What is the output of the below SQL query?

```
SELECT COUNT(s.roll_no)
FROM student AS s
NATURAL JOIN
mobile_no AS  m
```

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 :

4

PDSA

Section Id :	64065321872
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 :	64065348863
Question Shuffling Allowed :	No

Question Number : 88 Question Id : 640653345526 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 :

6406531149146. ✔ YES

6406531149147. ✖ NO

Sub-Section Number : 2

Sub-Section Id : 64065348864

Question Shuffling Allowed : Yes

Question Number : 89 Question Id : 640653345527 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

```
def fun(arr):
    n = len(arr)
    if n % 2 == 0:
        while n > 1:
            n = n // 4
            print(arr[n])
    else:
        for i in range(0,n):
            print(arr[i])
```

What is the worst case time complexity of the given function **fun** ?

Options :

6406531149148. ✔ $O(n)$

6406531149149. ✖ $O(n^2)$

6406531149150. ✖ $O(logn)$

6406531149151. ✖ $O(n^4)$

Question Number : 90 Question Id : 640653345528 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 will be the time complexity of **Insertion Sort** if the input list consists of `n` identical elements?

Options :

6406531149152. ✖ $O(\log n)$

6406531149153. ✔ $O(n)$

6406531149154. ✖ $O(n \log n)$

6406531149155. ✖ $O(n^2)$

Sub-Section Number :	3
Sub-Section Id :	64065348865
Question Shuffling Allowed :	Yes

Question Number : 91 Question Id : 640653345529 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 recurrence and time complexity for the worst case behaviour of **Quick Sort** ?

Options :

6406531149156. ✖ Recurrence is $T(n) = 2T(n-1) + O(n)$ and time complexity is $O(n^2)$

6406531149157. ✔ Recurrence is $T(n) = T(n-1) + O(n)$ and time complexity is $O(n^2)$

6406531149158. ✖ Recurrence is $T(n) = T(n-1) + O(1)$ and time complexity is $O(n)$

6406531149159. ✖ Recurrence is $T(n) = 2T(n/2) + O(n)$ and time complexity is $O(n\ log\ n)$

Question Number : 92 Question Id : 640653345531 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 functions:

$f1 = n\sqrt{n}$
$f2 = \log^2 n$
$f3 = n \log n$
$f4 = \log \log n$

Which of the following is correct order of increasing growth rate?

Options :

6406531149164. ✖ $f2 < f4 < f1 < f3$

6406531149165. ✖ $f2 < f4 < f3 < f1$

6406531149166. ✔ $f4 < f2 < f3 < f1$

6406531149167. ✖ $f1 < f3 < f2 < f4$

Question Number : 93 Question Id : 640653345535 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 statements:

1. A single stack can be used to check whether a word is palindrome or not
2. A stack can be used to evaluate expressions.
3. The last element to be inserted into a stack will always be the last element to be taken out of the stack.

Choose the correct option regarding the given statements.

Note: *A palindrome is a word that spells the same from both sides. Eg: radar*

Options :

6406531149180. ✖ Statement 1 and Statement 3 are false

6406531149181. ✖ Statement 2 and Statement 3 are false

6406531149182. ✖ Only statement 1 is false

6406531149183. ✔ Only statement 3 is false

Question Number : 94 Question Id : 640653345536 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

According to the conventional definition, an array is a fixed size data structure whose values are contiguously located in memory, whereas a linked list is a dynamic collection (size can change) of values that are not contiguously located in memory.

Considering the above definitions, if we use a Binary search algorithm to find a value from a linked list, then what would be the worst-case time complexity of Binary search?

Options :

6406531149184. ✖ $O(n \log n)$

6406531149185. ✖ $O(n^2)$

6406531149186. ✔ $O(n)$

6406531149187. ✖ $O(\log n)$

Question Number : 95 Question Id : 640653345537 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 statements about **Depth First Search (DFS)** on an undirected graph?:

(1) DFS systematically computes reachability in graphs.

(2) Complexity of DFS is $O(n^2)$ using adjacency matrix and $O(m+n)$ using adjacency list.

(3) DFS can be used to identify connected components in an undirected graph.

Choose the correct option regarding the given statements.

Options :

6406531149188. ✖ Only Statement 1 and Statement 3 are true

6406531149189. ✖ Only Statement 2 and Statement 3 are true

6406531149190. ✖ Only Statement 1 and Statement 2 are true

6406531149191. ✔ All statements are true

Question Number : 96 Question Id : 640653345541 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 connected, directed graph on which DFS is executed. Which of the following options are true regarding pre and post numbering used in the DFS algorithm on the graph?

Options :

6406531149203. ✖ If (u, v) is an edge of the graph such that $[pre(u), post(u)]$ contains $[pre(v), post(v)]$ then the graph is necessarily cyclic

6406531149204. ✔ If (u, v) is an edge of the graph such that $[pre(v), post(v)]$ contains $[pre(u), post(u)]$ then the graph is necessarily cyclic

6406531149205. ✖ If (u, v) is an edge of the graph such that $[pre(u), post(u)]$ and $[pre(v), post(v)]$ are disjoint intervals then the graph is necessarily cyclic

6406531149206. ✖ None of these

Question Number : 97 Question Id : 640653345542 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Correct option changed.
Option 1 is correct.
Option 3 is incorrect.

Question Label : Multiple Choice Question

Consider the following statements:

1. Finding the longest path in DAG takes `O(m + n)` time, where `n` is the number of vertices and `m` is the number of edges.
2. A DAG will always have more than one topological ordering.
3. DFS always produces the same number of tree edges, irrespective of the node from which the search started

Choose the correct option.

Options :

6406531149207. ✖ Only statement 1 is true

6406531149208. ✖ Statement 1 and Statement 2 are true

6406531149209. ✔ Statement 1 and Statement 3 are true

6406531149210. ✖ Only statement 3 is true

Sub-Section Number : 4

Sub-Section Id : 64065348866

Question Shuffling Allowed : Yes

Question Number : 98 Question Id : 640653345530 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the following `partition` function, which uses the last element of the list as the pivot.

```
def partition(L, low, high):
    i = low - 1
    pivot = L[high]
    for j in range(low, high):
        if L[j] <= pivot:
            i = i + 1
            L[i], L[j] = L[j], L[i]
    #putting the pivot element in its appropriate position
    L[i+1], L[high] = L[high], L[i+1]

L = [1, 4, 8, 2, 9, 3, 6]
partition(L, 0, len(L)-1)
```

What will be the state of the list `L` after the `partition` function terminates?

Options :

6406531149160. ✖ `[1, 4, 2, 3, 6, 9, 8]`

6406531149161. ✖ `[1, 4, 2, 8, 9, 3, 6]`

6406531149162. ✔ `[1, 4, 2, 3, 6, 8, 9]`

6406531149163. ✖ `[1, 2, 3, 4, 6, 8, 9]`

Question Number : 99 Question Id : 640653345532 Question Type : MCQ Is Question

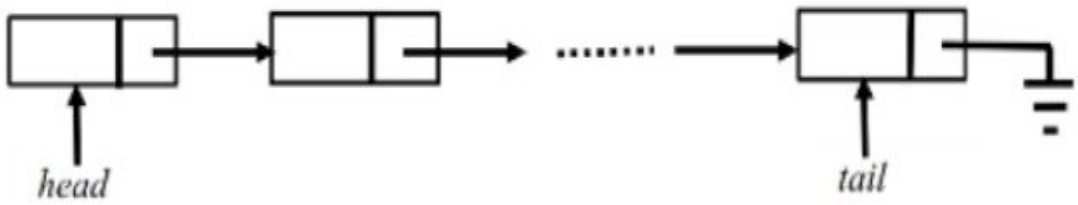
Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

```
class Node:
    def __init__(self,data):
        self.data = data
        self.next = None
```

Consider an implementation of a singly linked list, where each node is created using the given class `Node`. Suppose it has a `head` pointer that points to the first node of the linked list and a `tail` pointer that points to the last element of the linked list.



Suppose we want to perform the following operations on the given linked list:-

1. Insertion of the new node at the front of the linked list.
2. Insertion of the new node at the end of the linked list.
3. Deletion of the first node of the linked list.
4. Deletion of the last node of the linked list.

Which of the following option represents the correct complexity for each operation?

Options :

6406531149168. ✖ $1-O(1), 2-O(n), 3-O(1), 4-O(1)$

6406531149169. ✖ $1-O(1), 2-O(1), 3-O(1), 4-O(1)$

6406531149170. ✖ $1-O(1), 2-O(n), 3-O(1), 4-O(n)$

6406531149171. ✔ $1-O(1), 2-O(1), 3-O(1), 4-O(n)$

Question Number : 100 Question Id : 640653345533 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 a linked list made up of nodes whose structure is defined by the following class

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

Assume we have a class `LinkedList` in which `head` refers to the first node of the linked list. A method `fun(self, curr_node, prev_node)` is defined in the `LinkedList` class, as given below:

```
def fun(self, curr_node, prev_node):
    if curr_node.next is None:
        self.head = curr_node
        curr_node.next = prev_node
        return

    temp = curr_node.next
    curr_node.next = prev_node

    self.fun(temp, curr_node)
```

The initial state of the linked list before calling `fun` was: 34, 12, 67, 9, 12, 4
What would be the state of the linked list after calling `fun(l.head, None)`, where `l` is the `LinkedList` object?

Options :

6406531149172. ✖ 12, 34, 9, 67, 4, 12

6406531149173. ✔ 4, 12, 9, 67, 12, 34

6406531149174. ✖ 4, 12, 67, 9, 12, 34

6406531149175. ✖ None of these

Sub-Section Number : 5

Sub-Section Id : 64065348867

Question Shuffling Allowed : Yes

Question Number : 101 Question Id : 640653345534 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

Linear probing is an open addressing scheme in computer programming for resolving hash collisions in hash tables. Linear probing takes the original hash index and increments the value by 1 until a free slot is found.

Consider the given hash table with hash function `h(key) = key mod 5` which uses linear probing for solving collisions.

Index	Key
0	45
1	51
2	60
3	18
4	34

Which among the following options correspond to possible orders of insertion of values in the hash table?

Options :

6406531149176. ✔ 51, 18, 45, 60, 34

6406531149177. ✖ 18, 60, 45, 51, 34

6406531149178. ✖ 18, 45, 34, 60, 51

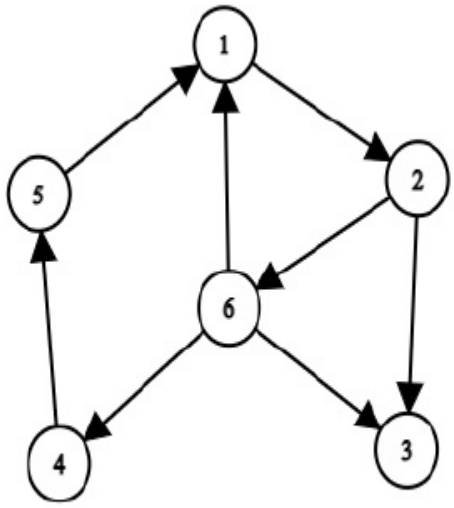
6406531149179. ✔ 34, 45, 18, 51, 60

Question Number : 102 Question Id : 640653345538 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 following graph



A **Breadth First Search (BFS)** is started at node `2`. The nodes are listed in the order they are first visited. Which of the following is (are) possible output(s)?

Options :

6406531149192. ✔ `2 6 3 4 1 5`

6406531149193. ✔ `2 3 6 1 4 5`

6406531149194. ✖ `2 6 4 5 1 3`

6406531149195. ✔ `2 3 6 4 1 5`

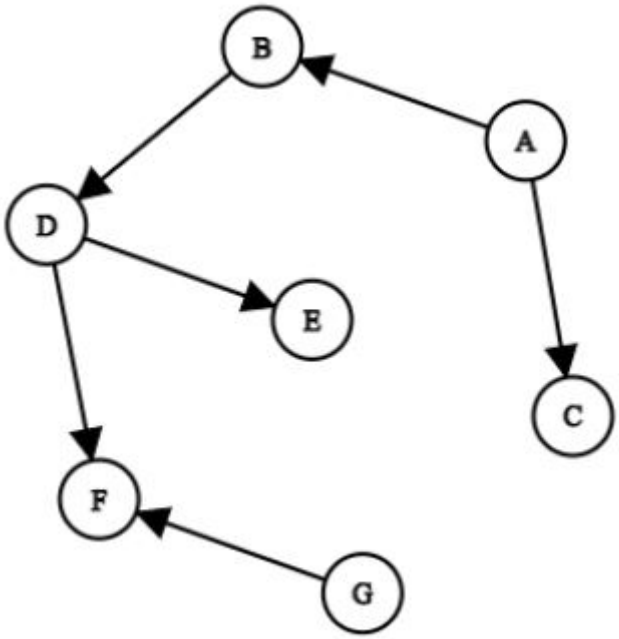
6406531149196. ✖ `2 6 1 3 4 5`

Question Number : 103 Question Id : 640653345539 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 DAG with V = {A, B, C, D, E, F, G}, shown below. Which of the following is/are **valid** topological orderings of the DAG?



Options :

6406531149197. ✖ A B C D E F G

6406531149198. ✔ A B G C D E F

6406531149199. ✖ G A C F B D E

6406531149200. ✔ A G C B D F E

6406531149201. ✔ G A B D F C E

Sub-Section Number : 6

Sub-Section Id : 64065348868

Question Shuffling Allowed : Yes

Question Number : 104 Question Id : 640653345540 Question Type : SA Calculator : None

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

Correct Marks : 4

Question Label : Short Answer Question

Consider an undirected graph with 5 vertices {A, B, C, D, E}. DFS is executed on this graph with the start vertex as `A`. Let $push\_time(v)$ represent the sequence number when the vertex 'v' is first visited (i.e. pushed onto the stack) and let $pop\_time(v)$ represent the sequence number when vertex 'v' is last visited (i.e. popped out of stack).
For the given values of pop_time and $push\_time$ of all the vertices, find the number of components in the graph

$$push\_time(A) = 1, pop\_time(A) = 6$$
$$push\_time(B) = 2, pop\_time(B) = 5$$
$$push\_time(C) = 3, pop\_time(C) = 4$$
$$push\_time(D) = 7, pop\_time(D) = 10$$
$$push\_time(E) = 8, pop\_time(E) = 9$$

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

AppDev-1

Section Id :	64065321873
Section Number :	7
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	17
Number of Questions to be attempted :	17
Section Marks :	50
Display Number Panel :	Yes
Group All Questions :	No
Enable Mark as Answered Mark for Review and	Yes

Clear Response :

Maximum Instruction Time : 0

Sub-Section Number : 1

Sub-Section Id : 64065348869

Question Shuffling Allowed : No

Question Number : 105 Question Id : 640653345543 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 :

6406531149211. ✔ YES

6406531149212. ✖ NO

Sub-Section Number : 2

Sub-Section Id : 64065348870

Question Shuffling Allowed : Yes

Question Number : 106 Question Id : 640653345544 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 statement is true about MVC architecture?

Options :

6406531149213. ✖ The view redirects the incoming request to model.

6406531149214. ✖ In MVC architecture, the model defines the business-logic layer.

6406531149215. ✔ The controller passes data model information to view.

6406531149216. ✖ It is not possible to share a view across multiple controllers.

Question Number : 107 Question Id : 640653345549 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 hexadecimal representation of the number 5457_8 is _____ .

Options :

6406531149233. ✖ A2F

6406531149234. ✖ B1F

6406531149235. ✔ B2F

6406531149236. ✖ C1E

Question Number : 108 Question Id : 640653345553 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 file consisting of 2000 alphanumeric characters including spaces. How much would be the total occupied space in bits, assuming UCS-4 is used?

Options :

6406531149249. ✔ 64000 bits

6406531149250. ✖ 32000 bits

6406531149251. ✖ 24000 bits

6406531149252. ✖ 12000 bits

Question Number : 109 Question Id : 640653345554 Question Type : MCQ Is Question

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

Correct Marks : 2

Question Label : Multiple Choice Question

Choose the correct internal CSS that sets the body background color to green and the heading color of the text to red.

Options :

6406531149253. ✖

```
<style>
  body {
    background-color:"green";
  }
  h1 {
    color:"blue";
  }
</style>
```

6406531149254. ✔

```
<style>
  body {
    background-color:"green";
  }
  h1 {
    color:"red";
  }
</style>
```

6406531149255. ✖

```
<style>
  body {
    background-color:"blue";
  }
  h1 {
    color:"red";
  }
</style>
```

6406531149256. ✖ None of these

Sub-Section Number : 3

Sub-Section Id : 64065348871

Question Shuffling Allowed : Yes

Question Number : 110 Question Id : 640653345545 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 code below.

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8"/>
    <style>
      body{text-align: center}
      p{font-size: 30px;font-style: italic;color: black;}
      .blue{color: green;}
      .red{color: blue;}
      .green{color: red;}
      #myId{color: grey;}
    </style>
  </head>
  <body>
    <div>
      <h2>Welcome to IIT</h2>
      <p class="blue red green">Paragraph 1</p>
      <p class="red blue green" id="myId">Paragraph 2</p>
      <p class="green red blue">Paragraph 3 </p>
    </div>
  </body>
</html>
```

How will the browser render the above given HTML file?

Options :

6406531149217. ✔

Welcome to IIT

Paragraph 1

Paragraph 2

Paragraph 3

Welcome to IIT

Paragraph 1

Paragraph 2

6406531149218. ✖ *Paragraph 3*

Welcome to IIT

Paragraph 1

Paragraph 2

6406531149219. ✖ *Paragraph 3*

Welcome to IIT

Paragraph 1

Paragraph 2

6406531149220. ✖ *Paragraph 3*

Question Number : 111 Question Id : 640653345547 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 Python code snippet.

filename: code.py

```
import sys
my_args = sys.argv

print("The python file name is:", my_args[1])
print(f"My username is: {my_args[3]}{my_args[4]}")
```

What will be the output on console if the command given is:

```
python code.py output.py Appdev Michael 2003 1003
```

Options :

6406531149225. ✖
```
The python file name is: code.py
My username is: Michael1003
```

6406531149226. ✖
```
The python file name is: code.py
My username is: Michael2003
```

6406531149227. ✖
```
The python file name is: output.py
My username is: Michael1003
```

6406531149228. ✔
```
The python file name is: output.py
My username is: Michael2003
```

Question Number : 112 Question Id : 640653345548 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 PyHTML program.

```
from pyhtml import *
def items(ctx):
  for title, page in [("coffee", "/drink.html"),
  ("kitkat", "/chocolate.html"),
  ("good day", "/biscuit.html")]:
    yield li(a(href=page)(title))

t = html(head(title("Grocery")), body(ol(items)))
print(t.render())
```

What will be the output of the above program?

Options :

6406531149229. ✖

```
<!DOCTYPE html>
<html>
  <head>
    <title>
      Grocery
    </title>
  </head>
  <body>
    <ul>
      <li>
        <a href="/biscuit.html">
          good day
        </a>
      </li>
      <li>
        <a href="/chocolate.html">
          kitkat
        </a>
      </li>
      <li>
        <a href="/drink.html">
          coffee
        </a>
      </li>
    </ul>
  </body>
 </html>
```

6406531149230.

```
<!DOCTYPE html>
<html>
  <head>
    <title>
      Grocery
    </title>
  </head>
  <body>
    <ul>
      <li>
        <a href="/drink.html">
          coffee
        </a>
      </li>
      <li>
        <a href="/chocolate.html">
          kitkat
        </a>
      </li>
      <li>
        <a href="/biscuit.html">
          good day
        </a>
      </li>
    </ul>
  </body>
</html>
```

6406531149231. ✔

```
<!DOCTYPE html>
<html>
  <head>
    <title>
      Grocery
    </title>
  </head>
  <body>
    <ol>
      <li>
        <a href="/drink.html">
          coffee
        </a>
      </li>
      <li>
        <a href="/chocolate.html">
          kitkat
        </a>
      </li>
      <li>
        <a href="/biscuit.html">
          good day
        </a>
      </li>
    </ol>
  </body>
</html>
```

6406531149232. ✖ None of these

Question Number : 113 Question Id : 640653345550 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

Annie and Curly took Database and Networks courses. Bella took Compiler and Python courses and Deva took Compiler and Database courses. Which of the following list of tuples correctly represents the relationship between names and courses.
names = {0: 'Annie', 1: 'Bella', 2: 'Curly', 3: 'Deva'}
courses = {0: 'Database', 1: 'Compiler', 2: 'Networks', 3: 'Python'}

Options :

6406531149237. ✔ rels = [(names[0], courses[0]), (names[2], courses[0]), (names[0], courses[2]), (names[2], courses[2]), (names[3], courses[0]), (names[3], courses[1]), (names[1], courses[1]), (names[1], courses[3])]

6406531149238. ✖ rels = [(names[2], courses[0]), (names[3], courses[0]), (names[2], courses[2]), (names[3], courses[2]), (names[0], courses[0]), (names[0], courses[1]), (names[2], courses[1]), (names[2], courses[3])]

6406531149239. ✖ rels = [(0, 1), (2,0), (0,2), (2,2), (3,0), (2,1), (1,1), (1,3)]

6406531149240. ✖ rels = [(1, 1), (2,2), (0,0), (2,3), (3,1), (2,4), (4,4), (1,4)]

Question Number : 114 Question Id : 640653345551 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 tables 'users' and 'book' stored in SQLite database.

```
Table: users
Id    Name    Age
1      Vinu    25
2      Manu    30
3      Somu    15
4      Ram     20

Table: book
Id    Bookname    Username
1      C++          Somu
2      Database     Vinu
3      C            Manu
4      sqlite       Ram
```

What will be the output of the following SQL query?

```
SELECT b.Bookname, u.Age FROM user as u, Book as b
WHERE b.Username = u.Name
```

Options :

6406531149241. ✖

Bookname	Username
C++	Somu
Database	Vinu
C	Manu
sqlite	Ram

6406531149242. ✖

Bookname	Age
sqlite	25
C	30
Database	15
C++	20

6406531149243. ✖

Bookname	Age
Database	20
C	15
C++	30
sqlite	25

6406531149244. ✔

Bookname	Age
Database	25
C	30
C++	15
sqlite	20

Question Number : 115 Question Id : 640653345552 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.

```
from jinja2 import Template
template = """
           {% for i in range(2) %}
           {{user[i]}}'s marks are
           {{mark[i]}}
           {% endfor %}
           """
user = { 0: "Balu", 1: "Kala"}
mark = [[30,40,56,78],[25,67,80,90]]
x = Template(template)
print(x.render(user = user, mark = mark))
```

What will be the output of above program?

Options :

6406531149245. ✖
```
0's marks are
[30, 40, 56, 78]

1's marks are
[25, 67, 80, 90]
```

6406531149246. ✖
```
Balu's marks are
[30, 40, 56, 78]

Kala's marks are
[30, 40, 56, 78]
```

6406531149247. ✔
```
Balu's marks are
[30, 40, 56, 78]

Kala's marks are
[25, 67, 80, 90]
```

6406531149248. ✖
```
Balu's marks are
[25, 67, 80, 90]

Kala's marks are
[30, 40, 56, 78]
```

Question Number : 116 Question Id : 640653345558 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 network bandwidth of 8 Gbps, what should be the size of each request if 5000 such requests are to be sent over the network per second? [**Use these relations:** 1 Byte = 8 bits, 1 KB = 1000 Bytes, 1 MB = 1000 KBs and so on.]

Options :

6406531149269. ✖ 1.6 KB

6406531149270. ✔ 200 KB

6406531149271. ✖ 1.6 MB

6406531149272. ✖ 200 MB

Sub-Section Number :	4
Sub-Section Id :	64065348872
Question Shuffling Allowed :	Yes

Question Number : 117 Question Id : 640653345546 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 statements is/are true about an HTML 5 document?

Options :

6406531149221. ✔ <!DOCTYPE> declaration represents that a given HTML file is HTML5 compliant.

6406531149222. ✖ We cannot create HTML pages without <head> and <body> tags.

6406531149223. ✔ It is possible to render HTML files without .html extension.

6406531149224. ✖ An HTML file will not be rendered if any of its non-self-closing tag is left open.

Sub-Section Number : 5

Sub-Section Id : 64065348873

Question Shuffling Allowed : Yes

Question Number : 118 Question Id : 640653345555 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

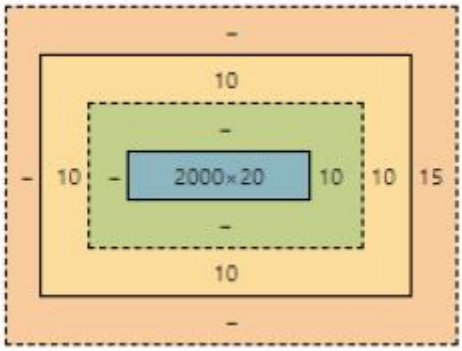
Consider the following HTML document with an embedded style sheet.

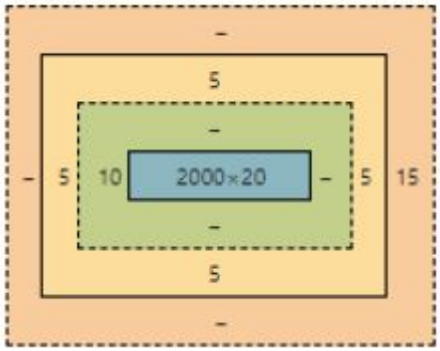
```
<!DOCTYPE html>
<html>
    <head>
        <title>Quiz 1</title>
        <style type="text/css">
            div{
                padding-left: 10px;
                margin-right: 15px;
                border-style: solid;
                border-width: 5px;
                width: 2000px;
                height: 20px;
                }
        </style>
    </head>
    <body>
        <div>My first Div element</div>
    </body>
</html>
```

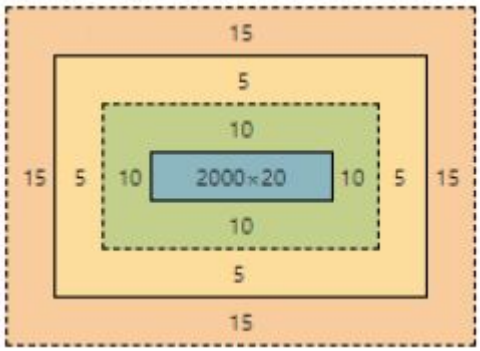
Which of the following figures correctly represents the box model of the above HTML document?

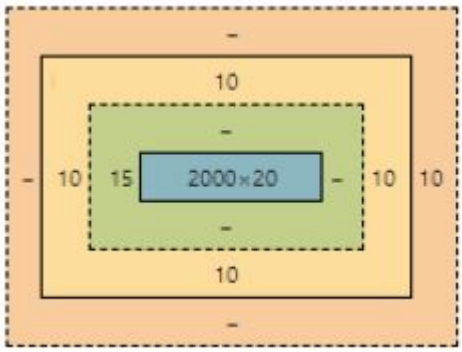
Options :

6406531149257. ✖



6406531149258. 

6406531149259. 

6406531149260. 

Question Number : 119 Question Id : 640653345556 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 jinja2 import Template

Config_1 = {1:"red",2:"blue",3:"green",4:"yellow"}

Config_2 = {1:"pink",2:"orange",3:"brown",4:"darkblue"}

test_temp = """
                <!DOCTYPE html>
                <html>
                    <head>
                        <style type="text/css">
                            *{
                                margin: 0px;
                                width: 253px;
                                }
                            div{
                                margin: 10px;
                                padding: 20px;
                                border-style: solid;
                                border-width: 10px;
                                font-size: 30px;
                                color: {{Config_1[1]}};
                                background-color: {{Config_2[1]}};
                                border-color: {{Config_2[4]}};
                                }
                        </style>
                        <title>Quiz 1</title>
                    </head>
                    <body>
                        <div>
                            My first Div element
                        </div>
                    </body>
                    </html>
            """

output = Template(test_temp)
print(output.render(Config_1 = Config_1, Config_2 = Config_2))
```

How will the browser render the HTML file generated by the above Python code?

Options :

6406531149261. ✖

6406531149262. ✖

6406531149263. ✔

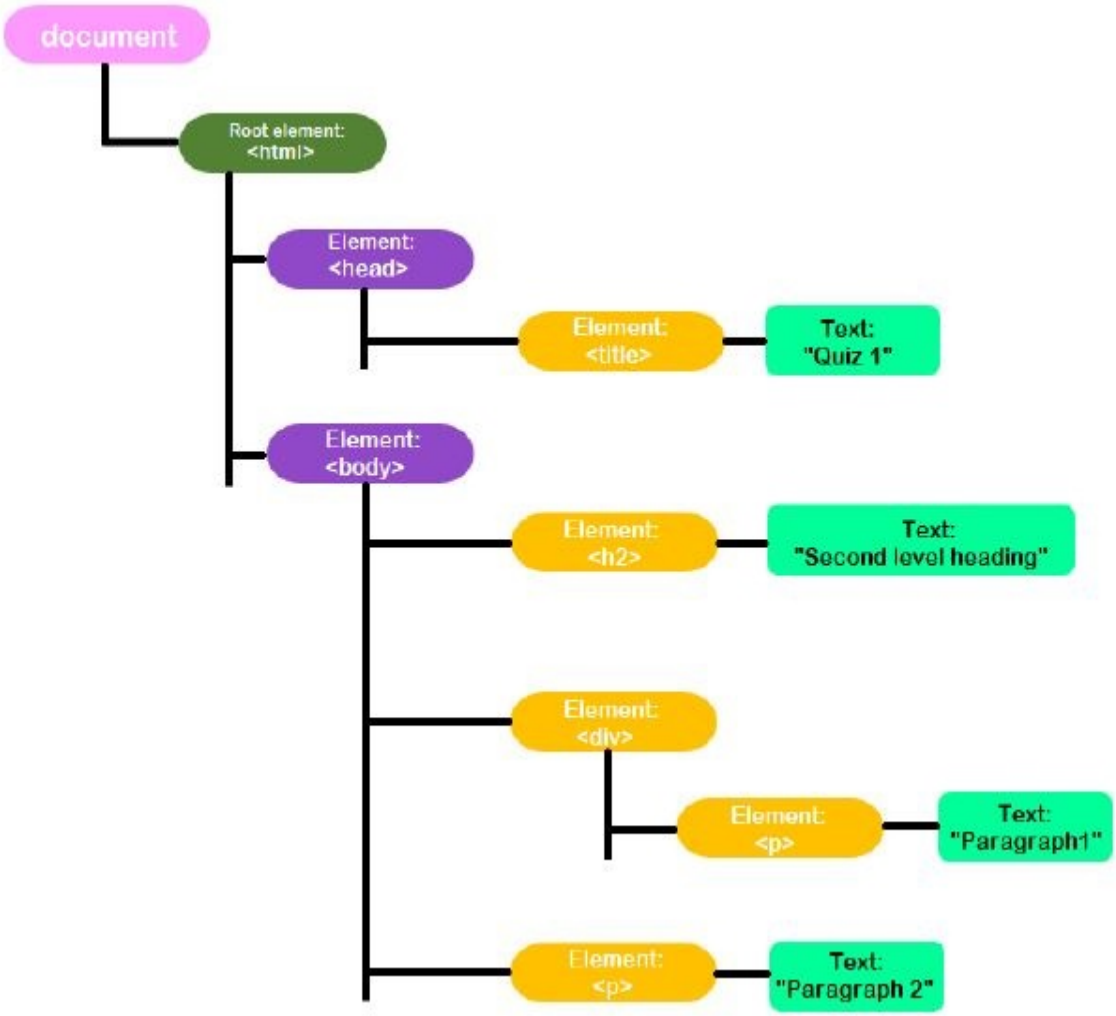
6406531149264. ✖

Question Number : 120 Question Id : 640653345557 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 DOM structure given below.



If an HTML document is to be programmatically created using Pyhtml whose DOM structure is exactly the same as the one given above, which of the following Pyhtml code will correctly create the document?

Options :

6406531149265. ✖

```
from pyhtml import *
my_html = html(head(title("Quiz 1"),
                    body(h2("Second level heading"),
                         div(p("Paragraph1")),
                         p("Paragraph2")
                         )
                        )
                   )
output = my_html.render()
print(output)
```

6406531149266. ✖

```
from pyhtml import *
my_html = html(head(title("Quiz 1")),
               body(h2("Second level heading"),
               div(p("Paragraph1"),
                   p("Paragraph2")
                  ))
              )
output = my_html.render()
print(output)
```

6406531149267. ✖

```
from pyhtml import *
my_html = html(head(title("Quiz 1")),
               body(h2("Second level heading"),
               div("This is my first div"),
               p("Paragraph1"),
               p("Paragraph2")
                   )
              )
output = my_html.render()
print(output)
```

6406531149268. ✔

```
from pyhtml import *
my_html = html(head(title("Quiz 1")),
               body(h2("Second level heading"),
                    div(p("Paragraph1")),
                    p("Paragraph2")
                    )
              )
output = my_html.render()
print(output)
```

Question Number : 121 Question Id : 640653345559 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 a client which is located 6000 kilometers from the server makes a request through the cable. Suddenly after the request reaches the server, the cable breaks and the response is now to be sent to the client via air with the help of repeaters which added a delay of 75 milliseconds. How

long will the client have to wait before receiving the response? [**Note:** the speed of light on cable is 2×10^8 m/sec and that in air is 3×10^8 m/sec.]

Options :

6406531149273. ✖ 50 milliseconds

6406531149274. ✖ 135 milliseconds

6406531149275. ✔ 125 milliseconds

6406531149276. ✖ 115 milliseconds

MLF

Section Id :	64065321874
Section Number :	8
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 :	64065348874
Question Shuffling Allowed :	No

Question Number : 122 Question Id : 640653345560 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 :

6406531149277. ✔ YES

6406531149278. ✖ NO

Sub-Section Number : 2

Sub-Section Id : 64065348875

Question Shuffling Allowed : Yes

Question Number : 123 Question Id : 640653345561 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

For the data sets $(x^i, y^i) = [(1,1),(2,3),(3,4),(4,4),(5,7)], i = 1$ to 5, Consider the regression model $f(x) = x + 2$. What is the mean squared loss of $f(x)$

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 : 124 Question Id : 640653345562 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

$f(x_1, x_2, x_3) = \frac{x_1+x_2+x_3}{3}$ is used as encoder function and $g(u) = [u, 2u, 3u]$ is used as decoder function for dimensionality reduction of following data set.

X
[1,2,3]
[2,3,4]

Give the reconstruction error for this encoder decoder pair. The reconstruction error is the mean of the squared distance between the reconstructed input and input.

NOTE: Enter your answer to the nearest integer.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

24 to 25

Question Number : 125 Question Id : 640653345565 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Short Answer Question

What will be the directional derivative of $f(x, y, z) = x^2y^3 - 4xz$ at point $(1, 1, 1)$ in the direction of [-1, 2, 0]?

NOTE: Enter your answer in one decimal place.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

3.3 to 3.7

Question Number : 126 Question Id : 640653345566 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

For what value of k, will the following function be continuous?

$$f(x) = \begin{cases} 3x^2 - kx + 5, & \text{if } 0 \leq x < 2 \\ 1 - 3x, & \text{if } 2 \leq x \leq 3 \end{cases}$$

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 :

11

Question Number : 127 Question Id : 640653345567 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

Find the linear approximation (L) of $f(x_1, x_2) = 2x_1^2 + 4x_2^4$ around (1, 1), and

use it to compute L(1.1, 1.1). What will be the value of $f(1.1, 1.1) - L(1.1, 1.1)$?

NOTE: Enter your answer in two decimal places.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.20 to 0.35

Question Number : 128 Question Id : 640653345572 Question Type : SA Calculator : None

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

Correct Marks : 4

Question Label : Short Answer Question

The eigenvalues of the matrix $\begin{bmatrix} 1 & 0 & -1 \\ 1 & 0 & 0 \\ -2 & 2 & 1 \end{bmatrix}$ are a, b, c in increasing order, then the value of $a + b$ is

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 :

0

Question Number : 129 Question Id : 640653345573 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

If $A = PDP^{-1}$ where $P = \begin{bmatrix} 1 & 2 \\ 1 & -5 \end{bmatrix}$ and $D = \begin{bmatrix} -1 & 0 \\ 0 & 6 \end{bmatrix}$. Calculate A^4 and enter the summation of all the elements of A^4

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 :

1297

Question Number : 130 Question Id : 640653345574 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

Find the values of α and β for which the matrix $A = \begin{bmatrix} 2 & \alpha \\ 2 & \beta \end{bmatrix}$ has eigenvalues equal to -1 and -3. Enter your answer as $2 \times \alpha + \beta$

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 :

-21

Sub-Section Number : 3

Sub-Section Id : 64065348876

Question Shuffling Allowed : Yes

Question Number : 131 Question Id : 640653345563 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

Identify which of the following requires use of classification technique.

Options :

6406531149281. ✖ Predicting the amount of rainfall in May 2022 in North India based on precipitation data of the year 2021.

6406531149282. ✖ Predicting the price of a land based on its area and distance from the market.

6406531149283. ✔ Predicting whether an email is spam or not.

6406531149284. ✔ Predicting whether the patient is having cancer or not.

Sub-Section Number : 4

Sub-Section Id : 64065348877

Question Shuffling Allowed : Yes

Question Number : 132 Question Id : 640653345564 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

Consider a function

$$f(x) = \begin{cases} \frac{x-|x|}{x}, & \text{if } x \neq 0 \\ 2, & \text{if } x = 0 \end{cases}$$

Is f continuous?

(Provide 1 as answer for 'Yes' and 0 for 'No'.)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Sub-Section Number : 5

Sub-Section Id : 64065348878

Question Shuffling Allowed : Yes

Question Number : 133 Question Id : 640653345568 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

For the matrix $S = \begin{bmatrix} 2 & -1 & 3 \\ 1 & 0 & 1 \\ 0 & 2 & -1 \\ 1 & 1 & 4 \end{bmatrix}$ what is the dimension of its row space?

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 :

3

Sub-Section Number : 6

Sub-Section Id : 64065348879

Question Shuffling Allowed : Yes

Question Number : 134 Question Id : 640653345569 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 system $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 5 & 7 \\ 2 & 4 & 6 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} b_1 \\ b_2 \\ b_3 \end{bmatrix}$.

Under what condition on b_1, b_2, b_3 is this system solvable?

Options :

6406531149290. ✖ $b_2 = 2b_1$

6406531149291. ✖ $b_2 = 3b_1$

6406531149292. ✔ $b_3 = 2b_1$

6406531149293. ✖ $b_3 = 3b_1$

Sub-Section Number :	7
Sub-Section Id :	64065348880
Question Shuffling Allowed :	Yes

Question Number : 135 Question Id : 640653345570 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

Calculate the projection of vector $(2, -1, 3)^T$ onto another vector $(-1, 3, 1)^T$.

Which of the following is the squared length of the projection vector?

Options :

6406531149294. ✖ 0.8686

6406531149295. ✔ 0.3636

6406531149296. ✖ 1.0363

6406531149297. ✖ 1.3636

Question Number : 136 Question Id : 640653345571 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 data set with input x and output y as follows.

x	y
1	2
2	1
1	3
3	4

For the above given data set Raj wants to compute a least square approximation that best fits the dataset with minimum error. Which of the following is the correct equation for the best fit line computed by Raj?

Options :

6406531149298. ✖ $\hat{y} = 0.412x + 0.215$

6406531149299. ✖ $\hat{y} = 1.335x + 2.245$

6406531149300. ✔ $\hat{y} = 0.545x + 1.545$

6406531149301. ✖ $\hat{y} = 1.713x + 1.175$

6406531149302. ✖ $\hat{y} = 2.225x + 3.665$

Section Id :	64065321875
Section Number :	9
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 :	64065348881
Question Shuffling Allowed :	No

Question Number : 137 Question Id : 640653345575 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 :

6406531149306. ✔ YES

6406531149307. ✖ NO

Sub-Section Number :	2
Sub-Section Id :	64065348882

Question Shuffling Allowed : Yes

Question Number : 138 Question Id : 640653345576 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Match the following:

A. Dynamic Lookup	I. Region of the program where a variable is available for use
B. Activation Record	II. Stores the instance variables
C. Scope	III. Duration/time during which a variable is available in the memory
D. Abstraction	IV. Stores the local variables
	V. Choice of method implementation is determined at run-time
	VI. Hiding the implementation details

Options :

6406531149308. ✔ A-V, B-IV, C-I, D-VI

6406531149309. ✖ A-VI, B-II, C-III, D-V

6406531149310. ✖ A-V, B-II, C-I, D-VI

6406531149311. ✖ A-VI, B-IV, C-III, D-V

Question Number : 139 Question Id : 640653345581 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.

```
1  interface Transferable{
2      public void transfer();
3  }
4  interface Receivable{
5      public void receive();
6      public default void sanityCheck() {
7          System.out.println("Checks receipt details");
8      }
9  }
10 class BankAccount implements Transferable, Receivable{
11     public void transfer() {
12         System.out.println("Transfers money");
13     }
14 }
```

Choose the correct option

Options :

6406531149328. ✖ Compilation error at LINE 6 because the method sanityCheck is not abstract.

6406531149329. ✖ Compilation error at LINE 10 because the class BankAccount cannot implement two interfaces.

6406531149330. ✔ Compilation error at LINE 10 because the class BankAccount is not declared as abstract.

6406531149331. ✖ Compilation error at LINE 2 and LINE 5 because the methods transfer and receive are not abstract.

Question Number : 140 Question Id : 640653345582 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 Tree{
    String name;
    String scientificName;
    int avg_height;
    public Tree(String n, String sn, int h){
        name = n;
        scientificName = sn;
        avg_height = h;
    }
    ***---------------***
    * CODE SEGMENT *
    ***---------------***
}
public class Test{
    public static void main(String[] args){
        Tree t = new Tree("Neem", "Azadirachta indica", 20);
        System.out.println(t);
    }
}
```

Choose the correct option to fill the CODE SEGMENT so that the output is:
Neem:Azadirachta indica:20

Options :

6406531149332. ✖ No additional code is required in place of CODE SEGMENT.

6406531149333. ✖ This output will never be printed because Java does not allow printing of objects using System.out.println.

6406531149334. ✖
```
public String toString(Object ob){
    return ob.name + ":" + ob.scientificName + ":" + ob.avg_height;
}
```

6406531149335. ✔
```
public String toString(){
    return name + ":" + scientificName + ":" + avg_height;
}
```

Question Number : 141 Question Id : 640653345584 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the Java code given below.

```
public class Test {
    public static void show() {
        for(int i=0;i<5;i++) {
            switch(i) {
                case 1:
                    System.out.print(1+" ");
                case 2:
                    System.out.print(2+" ");
                case 3:
                    System.out.print(3+" ");
                default:
                    System.out.print("wrong number");
                break;
            }
            System.out.println();
        }
    }
    public static void main(String[] args) {
        show();
    }
}
```

Choose the correct option.

Options :

6406531149340. ✖

It generates output:

```
wrong number
1
2
3
wrong number
```

6406531149341. ✔

It generates output:

```
wrong number
1 2 3 wrong number
2 3 wrong number
3 wrong number
wrong number
```

It generates output:

```
wrong number
1 2 3
2 3
3
wrong number
```

6406531149342. ✖

It generates output:

```
wrong number
wrong number
```

6406531149343. ✖

Question Number : 142 Question Id : 640653345588 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.

```
interface Operations{
    public void compute(int m);
}
class Arithmetic{
    public Operations computation(String task){
        Operations pr = null;
        if (task == "square")
            pr = new Square();
        return pr;
    }
    private class Square implements Operations{
        public void compute(int n){
            System.out.println(n*n);
        }
    }
    //Inner classes for other operations are added here
}
public class InnerClass {
    public static void main(String[] args) {
        // CODE SEGMENT //
        arithOp.compute(3);
    }
}
```

Choose the correct option to fill in at `CODE SEGMENT` such that the output is 9.

Options :

6406531149356. ✖
```
Square arithOp = new Arithmetic().computation("square");
```

6406531149357. ✔
```
Operations arithOp = new Arithmetic().computation("square");
```

6406531149358. ✖
```
Arithmetic a = new Arithmetic();
Square arithOp = a.computation("square");
```

6406531149359. ✖
No line/s of code at `CODE SEGMENT` can generate the given output because it generates a compilation error due to the inner class being `private`.

Sub-Section Number : 3

Sub-Section Id : 64065348883

Question Shuffling Allowed : Yes

Question Number : 143 Question Id : 640653345577 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 Java code given below.

```
class Person{
  public void showDetails(){
    System.out.println("displays person details");
  }
}
class Employee extends Person{
  public void showDetails(){
    System.out.println("displays employee details");
  }
  public void incrementSalary(){
    System.out.println("displays the incremented salary");
  }
}
public class Test{
  public static void main(String[] args){
    Person p = new Employee();
    p.showDetails();
    p.incrementSalary();
  }
}
```

Choose the correct option.

Options :

6406531149312. ✔ Compilation error

6406531149313. ✖ The program compiles successfully but produces no output.

6406531149314. ✖ It generates output:
displays employee details
displays the incremented salary

6406531149315. ✖ It generates output:
displays person details
displays the incremented salary

Question Number : 144 Question Id : 640653345579 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 Java code given below.

```
class Calculator{
  public void operations(){
    System.out.println("Performs basic operations");
  }
}
class UpdatedCalculator extends Calculator{
  public void operations(){
    System.out.println("Performs updated operations");
  }
}
class SmartCalculator extends UpdatedCalculator{
  public void operations(){
    System.out.println("Performs smart operations");
  }
}
public class Test{
  public static void main(String[] args){
    Calculator c1 = new SmartCalculator();
    c1.operations();
  }
}
```

What will the output be?

Options :

6406531149320. ✖ Compiler error

6406531149321. ✖ It generates output:
Performs updated operations

6406531149322. ✖ It generates output:
Performs basic operations

6406531149323. ✔ It generates output:
Performs smart operations

Question Number : 145 Question Id : 640653345585 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 Java code given below.

```
public class Test{
    int a=1;
    long b=1;
    boolean c=true;
    String str="";
    public void show(){
        str+=a;
        str+=b;
        str+=c;
        System.out.println(str);
    }
    public static void main(String[] args){
        new Test().show();
    }
}
```

Choose the correct option.

Options :

6406531149344. ✖ This program generates the output:

11

6406531149345. ✔ This program generates the output:

11true

6406531149346. ✖ Compilation error

6406531149347. ✖ This program generates the output:

2true

Question Number : 146 Question Id : 640653345589 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 Java code given below.

```
public class Example {
    public static void main(String[] args) {
        String data = "IITM_JAVA_MADRAS";
        char arr[] = new char[16];
        int count = 0;
        for (int i = 0; i < data.length(); i++) {
            if(data.charAt(i)=='_')
                arr[i]=' ';
            else
                arr[i]=data.charAt(i);
        }
        for (int i = 0; i < arr.length; i++) {
            System.out.print(arr[i]);
            count++;
        }
        System.out.println();
        System.out.println("No. of elements is: "+count);
    }
}
```

Choose the correct option.

Options :

6406531149360. ✔ This program generates the output:
IITM JAVA MADRAS
No. of elements is: 16

6406531149361. ✖ Compilation error

6406531149362. ✖ This program generates the output:
IITMJAVAMADRAS
No. of elements is: 14

This program generates the output:
IITM_JAVA_MADRAS
No. of elements is: 14

6406531149363.

Sub-Section Number : 4

Sub-Section Id : 64065348884

Question Shuffling Allowed : Yes

Question Number : 147 Question Id : 640653345578 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 5

Question Label : Multiple Choice Question

Consider the Java code given below.

```
class Operations{
  int l;
  String[] str;
  public Operations(int n, String[] s){
    l = n;
    str = s;
  }
  public Operations(Operations o){
    this.l = o.l;
    this.str = o.str;
  }
}
public class Test{
  public static void main(String[] args){
    String[] s = {"sonu", "ravi","vicky"};
    Operations o1 = new Operations(3, s);
    Operations o2 = new Operations(o1);
    o2.str[0] = "ram";
    o2.l= 2;
    System.out.println(o1.str[0] +","+ o1.l);
    System.out.println(o2.str[0] +","+ o2.l);
  }
}
```

What will the output be?

Options :

6406531149316. ✔

It generates output:
ram,3
ram,2

6406531149317. ✖

It generates output:
sonu,3
ram,2

6406531149318. ✖

It generates output:
sonu,2
ram,2

6406531149319. ✖

It generates output:
ram,2
ram,2

Question Number : 148 Question Id : 640653345580 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

Two employees are said to be the same if their ids are equal. Consider the Java code given below. Choose the correct code block to fill the CODE SEGMENT to override the method boolean equals(Object o) in order to compare two Employee objects.

```
public class Employee{
  String name;
  int id;
  public Employee(String n, int i){
    this.name = n;
    this.id = i;
  }
  ***---------------***
    * CODE SEGMENT *
  ***---------------***
}
```

Options :

6406531149324. ✖

```
public boolean equals(Object ob){
  if(this.id = ob.id){
    return true;
  }
  return false;
}
```

6406531149325. ✖

```
public boolean equals(Object ob){
  if(this.id == ob.id){
    return true;
  }
  return false;
}
```

6406531149326. ✔

```
public boolean equals(Object ob){
  if(!(ob instanceof Employee)){
    return false;
  }
  Employee e = (Employee)ob;
  if(this.id == e.id){
    return true;
  }
  return false;
}
```

6406531149327. ✖

```
public boolean equals(Object ob){
  if(ob instanceof Employee){
      Employee e = (Employee)ob;
      if(this.id == e.id){
          return true;
       }
       return false;
   }
 }
```

Question Number : 149 Question Id : 640653345590 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 5

Question Label : Multiple Choice Question

Consider the Java code segment given below.

```
interface Iterator{
    public boolean has_next();
    public Object get_next();
}
abstract class Printable{
    public abstract void print();
}
class CustomerList{
    private class Customer extends Printable{
        private String name, billno;
        public Customer(String n, String b) {
            //initialize name and billno
        }
        public void print() {
            System.out.println(billno + ", " + name);
        }
    }
    private class CustIter implements Iterator{
        private int indx;
        public CustIter() {
            //constructor
        }
        public boolean has_next() {
            //if next element available in list return true; else false
        }
        public Object get_next() {
            //return next element from list
        }
    }
    public Iterator getIterator() {
        return new CustIter();
    }
    private final int limit = 5;
    private Customer[] list =  {new Customer("Rahul", "Cust1001"),
                                new Customer("Sai", "Cust1002"),
                                new Customer("Neeraj", "Cust1003")};
}
public class IterTest{
    public static void main(String[] args) {
        CustomerList cList = new CustomerList();
        Iterator iter = cList.getIterator();
        while(iter.has_next()) {

            ________________________;    //LINE-1
        }
    }
}
```

Identify the appropriate statement to fill in the blank at LINE-1, such that the output is

```
Cust1001, Rahul
Cust1002, Sai
Cust1003, Neeraj
```

Options :

6406531149364. ✔ `((Printable)iter.get_next()).print()`

6406531149365. ✖ `((Customer)iter.get_next()).print()`

6406531149366. ✖ ((CustomerList)iter.get_next()).print()

6406531149367. ✖ iter.get_next().print();

Sub-Section Number : 5

Sub-Section Id : 64065348885

Question Shuffling Allowed : Yes

Question Number : 150 Question Id : 640653345583 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 5

Question Label : Multiple Select Question

Consider the Java code given below.

```
abstract class Order{
    public abstract void getFood();            //LINE-1
}
class Twiggy extends Order{
    public void getFood() {
        System.out.println("Get Rs.100 off on first order");
    }
}
class Komato extends Order{
    public void getFood() {
        System.out.println("Refer a friend and get Rs.150");
    }
}
public class Test {
    public static void main(String[] args) {
        Order[] ord = new Order[2];
        ord[0] = new Komato();                 //LINE-2
        ord[1] = new Twiggy();                 //LINE-3
        for (int i = 0; i < ord.length; i++)   //LINE-4
            ord[i].getFood();
    }
}
```

Choose the correct option.

Options :

6406531149336. ✖ Compilation error at LINE-1 because an abstract function cannot be declared as public.

6406531149337. ✖ Compilation error at LINE-2 and LINE-3.

6406531149338. ✖ Compilation error at LINE-4.

6406531149339. ✔ This program generates the output:

```
Refer a friend and get Rs.150
Get Rs.100 off on first order
```

Question Number : 151 Question Id : 640653345586 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 5

Question Label : Multiple Select Question

Consider the following code.

```
class Employee{
    public String name;
    private String dept;
    public String getName(){
        return name;
    }
    public void setName(String name){
        this.name = name;
    }
    public String getDept(){
        return dept;
    }
    public void setDept(String dept){
        this.dept = dept;
    }
}
public class EncapTest {
    public static void main(String[] args) {
        Employee obj = new Employee();
        /*************************/
              *CODE SEGMENT*
        /*************************/
    }
}
```

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

```
Harshal
Sales
```

Options :

6406531149348. ✔

```
obj.name="Harshal";
obj.setDept("Sales");
System.out.println(obj.name);
System.out.println(obj.getDept());
```

6406531149349. ✖

```
obj.setName("Harshal");
obj.dept="Sales";
System.out.println(obj.getName());
System.out.println(obj.getDept());
```

6406531149350. ✔

```
obj.setName("Harshal");
obj.setDept("Sales");
System.out.println(obj.name);
System.out.println(obj.getDept());
```

```
obj.name="Harshal";
obj.dept="Sales";
System.out.println(obj.getName());
System.out.println(obj.getDept());
```

6406531149351.

Sub-Section Number : 6

Sub-Section Id : 64065348886

Question Shuffling Allowed : Yes

Question Number : 152 Question Id : 640653345587 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

Consider the Java code given below.

```
class Base {
    public void show() {
        System.out.println("Base class method");
    }
    public void show(int a) {
        System.out.println(a);
    }
}
class Sub extends Base{
    public void show() {
        System.out.println("Sub class method");
    }
    public void show(String str) {
        System.out.println(str);
    }
}
```

Choose the correct option regarding the code given above.

Options :

6406531149352. ✖ Method `public void show(int a)` is an overridden method in class `Base`. Method `public void show(String str)` is an overridden method in class `Sub`.

6406531149353. ✔ Method `public void show(int a)` is an overloaded method in class `Base`. Method `public void show(String str)` is an overloaded method in class `Sub`.

6406531149354. ✖ Method `public void show(int a)` is an overridden method in class `Base`. Method `public void show(String str)` is an overloaded method in class `Sub`.

6406531149355. ✔ Method `public void show(int a)` is an overloaded method in class `Base`. Method `public void show()` is an overriding method in class `Sub`.

AppDev-2

Section Id :	64065321876
Section Number :	10
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 :	64065348887

Question Shuffling Allowed : No

Question Number : 153 Question Id : 640653345591 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 :

6406531149368. ✔ YES

6406531149369. ✖ NO

Sub-Section Number : 2

Sub-Section Id : 64065348888

Question Shuffling Allowed : Yes

Question Number : 154 Question Id : 640653345593 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 correct way to define immediately invoked function expressions in javascript language?

Options :

6406531149374. ✖ (function () { return value; });

6406531149375. ✔ (function () { return value; }) ();

6406531149376. ✖ function () { return value; } ();

6406531149377. ✖ All of these

Question Number : 155 Question Id : 640653345607 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

Say you are trying to make an app where users can play “bullet” chess with each other - the entire game has to be completed within 40 seconds. Which one of the following design considerations is most important here?

Options :

6406531149430. ✖ The size of the images used for the chess board should be kept small.

6406531149431. ✖ The UI should be completely ephemeral and hold all state only locally.

6406531149432. ✔ Every move should be transmitted back to the server with as little latency as possible.

6406531149433. ✖ The app requires a powerful desktop browser with GPU.

Sub-Section Number :	3
Sub-Section Id :	64065348889
Question Shuffling Allowed :	Yes

Question Number : 156 Question Id : 640653345594 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 javascript language?

Options :

6406531149378. ✖ The variables declared using “let” keyword are not hoisted.

6406531149379. ✔ The variables declared using “let” keyword are not accessible until the code execution reaches the declaration / initialization for that particular variable.

6406531149380. ✔ JavaScript is a weakly typed and dynamically typed language.

6406531149381. ✖ All of these

Question Number : 157 Question Id : 640653345595 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 Vue framework?

Options :

6406531149382. ✔ In general, props are used to send data from the parent to the child.

6406531149383. ✖ In general, custom events are used to send data from the parent to the child.

6406531149384. ✔ The lifecycle hooks in Vue framework are invoked implicitly.

6406531149385. ✖ All of these

Sub-Section Number :	4
Sub-Section Id :	64065348890
Question Shuffling Allowed :	Yes

Question Number : 158 Question Id : 640653345596 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">
    Main App Data
    <some>Slot Data</some>
</div>
<script src = "app.js"> </script>
```

app.js:

```
Vue.component('some', {
   template : `<div>
                        <slot></slot>
                        <h1>Component Data</h1>

               </div>
            `
});

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

What will be rendered on the browser screen (ignore the formatting and styling)?

Options :

6406531149386. ✔ Main App Data

Slot Data

Component Data

6406531149387. ✖ A warning will be issue for using an undefined tag

6406531149388. ✖ Main App Data

Component Data

6406531149389. ✖ Main App Data

Component Data

Slot Data

Question Number : 159 Question Id : 640653345597 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

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

```
let x = 5;
let obj = {

   'x' : 10,
   func : (x) => {
       this.x = x;
   }
}
obj.func(20);
console.log(this.x, "and", obj.x);
```

Options :

6406531149390. ✔ 20 and 10

6406531149391. ✖ 5 and 10

6406531149392. ✖ 5 and 20

6406531149393. ✖ Reference Error

Question Number : 160 Question Id : 640653345598 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. What will be logged on the console?

```
function Player(name, run) {
  this.name = name
  this.run = run
}

Player.prototype.changeRun = function (run) {
  this.run = this.run + run
}

player1 = new Player('Rohit', 5000)
player1.changeRun(400)
console.log(player1.run)
```

Options :

6406531149394. ✖ 5000

6406531149395. ✔ 5400

6406531149396. ✖ 400

6406531149397. ✖ None of these

Question Number : 161 Question Id : 640653345599 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.

```
setTimeout(() => console.log(1), 100)
console.log(2);
setTimeout(() => console.log(3), 0)
console.log(4);
setTimeout(() => console.log(5), 100)
```

What will be logged on to the console?

Options :

6406531149398. ✖

1
2
3
4
5

6406531149399. ✖
2
4
3
5
1

6406531149400. ✔
2
4
3
1
5

6406531149401. ✖
3
1
5
2
4

Question Number : 162 Question Id : 640653345600 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.

```
const cars = [
  { name: 'Ford', color: 'green' },
  { name: 'Sedan', color: 'yellow' },
  { name: 'Swift', color: 'green' },
]

const myCars = cars.filter((car) => {
  return car.color != 'green'
})

const myCarsList = []

for (let car of myCars) {
  myCarsList.push(car.name)
}

console.log(myCarsList)
```

What will be logged on to the console?

Options :

6406531149402. ✖ 'Sedan'

6406531149403. ✔ ['Sedan']

6406531149404. ✖ 'Ford'

6406531149405. ✖ 'Swift'

Question Number : 163 Question Id : 640653345601 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:

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8" />
    <script
src="https://cdn.jsdelivr.net/npm/vue@2/dist/vue.js"></script>
    <style>
      .danger {
        color: red;
      }
    </style>
  </head>
  <body>
    <div id="app" :class="{danger:isDanger}">
      Welcome to MAD2 Quiz <br />
      <button @click="changeStyle">Danger</button>
    </div>
  </body>
  <script src="app.js"></script>
</html>
```

app.js:

```
const vm = new Vue({
  el: '#app',
  data: {
    isDanger: false,
  },
  methods: {
    changeStyle() {
      this.isDanger = !this.isDanger
    },
  },
})
```

What will be the color of the text “Welcome to the MAD2 Quiz”, after clicking the button “Danger” 6 times (for a normal browser which shows black colored text on a white background)?

Options :

6406531149406. ✔ Black

6406531149407. ✖ Red

6406531149408. ✖ White

6406531149409. ✖ None of these

Question Number : 164 Question Id : 640653345605 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">
      <run-comp :run="run" v-on:increaserun="run+=5"></run-comp>
    </div>
    <script src="app.js"></script>
  </body>
```

app.js:

```
const runComp = {
  template: `<div id="total-run">{{run}}
    <div>
      <button @click="$emit('increaserun')">click me</button>
    </div>
  </div>`,
  props: {
    run: Number,
  },
}
const vm = new Vue({
  el: '#app',
  data: {
    run: 10,
  },
  components: {
    'run-comp': runComp,
  },
})
```

If the user clicks on the button “click me” 5 times, what will be rendered inside the div with ID “total-run”?

Options :

6406531149422. ✖ 10

6406531149423. ✖ 25

6406531149424. ✔ 35

6406531149425. ✖ None of these

Question Number : 165 Question Id : 640653345606 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 document.

```
<body>
    <div>
      <section id="section-one" style="color: red">
        Hello from section 1
      </section>
    </div>
    <script>
      const sec1 = document.querySelector('#section-one')
      const sec2 = document.createElement('section')
      sec2.innerHTML = 'Hello from section 2'
      sec1.parentNode.appendChild(sec2)
    </script>
  </body>
```

What will be rendered inside the div element along with the color of the text (for a normal browser which shows black colored text on a white background)?

Options :

6406531149426. ✖ Hello from section 1 (color: red)
Hello from section 2 (color: red)

6406531149427. ✔ Hello from section 1 (color: red)
Hello from section 2 (color: black)

6406531149428. ✖ Hello from section 1 (color: black)
Hello from section 2 (color: black)

6406531149429. ✖ Hello from section 1 (color: black)
Hello from section 2 (color: red)

Sub-Section Number : 5

Sub-Section Id : 64065348891

Question Shuffling Allowed : Yes

Question Number : 166 Question Id : 640653345592 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.

```
for (var i = 1; i<=3; i++) {
    setTimeout(() => console.log(i), i*1000)
}
```

What will be the output of the above program after 10 seconds?

Options :

6406531149370. ✖
1
2
3

6406531149371. ✖
3
3
3

6406531149372. ✔
4
4
4

6406531149373. ✖ Error

Question Number : 167 Question Id : 640653345602 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:

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8" />
    <script
src="https://cdn.jsdelivr.net/npm/vue@2/dist/vue.js"></script>
    <style>
      .dark {
        color: white;
        background-color: black;
      }
    </style>
  </head>
  <body>
    <div id="app">
      <form @change="changeRadio">
        <input type="radio" name="theme" id="dark" value="dark" />
        <label for="dark">Dark</label>
        <input type="radio" name="theme" id="light" value="light" />
        <label for="light">Light</label>
      </form>
      <div :class="{dark:isDark}">Welcome to MAD2 Quiz</div>
    </div>
  </body>
  <script src="app.js"></script>
</html>
```

app.js:

```
const vm = new Vue({
  el: '#app',
  data: {
    isDark: true,
  },
  methods: {
    changeRadio(event) {
      if (event.target.value == 'dark') {
        this.isDark = false
      } else {
        this.isDark = true
      }
    },
  },
})
```

What will be the color and background color of the text “Welcome to the MAD2 Quiz” respectively, if the user selects the radio button “Light” (for a normal browser which shows black colored text on a white background)?

Options :

6406531149410. ✔ White, Black

6406531149411. ✖ Black, White

6406531149412. ✖ White, White

6406531149413. ✖ Black, Black

Question Number : 168 Question Id : 640653345603 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:

```
<body>
    <div id="app">
      <div id="current-postion">{{position}}</div>
      <button @click="move">Next Move</button>
    </div>
    <script src="app.js"></script>
  </body>
```

app.js:

```
const vm = new Vue({
  el: '#app',
  data: {
    rollArray: [
      { result: 'snake', init: 0, final: 10 },
      { result: 'ladder', init: 0, final: 10 },
      { result: null, point: 10 },
    ],
    position: 0,
  },
  methods: {
    move() {
      obj = this.rollArray.pop()
      if (obj.result == 'ladder') {
        this.position = obj.final
      }
      if (obj.result == 'snake') {
        this.position = obj.init
      }
    },
  },
})
```

What will be rendered inside the div with ID “current-postion”, if the user clicks on the button “Next Move” thrice?

Options :

6406531149414. ✖ 10

6406531149415. ✖ 30

6406531149416. ✔ 0

6406531149417. ✖ None of these

Question Number : 169 Question Id : 640653345604 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:

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8" />
    <script
src="https://cdn.jsdelivr.net/npm/vue@2/dist/vue.js"></script>
    <style>
      .light {
        height: 50px;
        width: 50px;
        border-radius: 50px;
      }
      .red-light {
        background-color: red;
      }
      .green-light {
        background-color: green;
      }
    </style>
  </head>
  <body>
    <div id="app">
      <div
        class="light"
        :class="{'red-light':isRed, 'green-light':!isRed}"
      ></div>
      <br />
      <button @click="peopleCount++">New Person</button>
    </div>
  </body>
  <script src="app.js"></script>
</html>
```

app.js:

```
const vm = new Vue({
  el: '#app',
  data: {
    isRed: false,
    peopleCount: 0,
  },
  watch: {
    peopleCount(newValue, oldValue) {
      if (newValue > oldValue && newValue > 2) {
        this.isRed = true
      }
    },
  },
})
```

If the user clicks on the button “New Person” 7 times. What will be the background color of div with class “light”?

Options :

6406531149418. ✖ Green

6406531149419. ✔ Red

6406531149420. ✖ Black

6406531149421. ✖ None of these

MLT

Section Id :	64065321877
Section Number :	11
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 :	64065348892
Question Shuffling Allowed :	No

Question Number : 170 Question Id : 640653345608 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 :

6406531149434. ✔ YES

6406531149435. ✖ NO

Question Number : 171 Question Id : 640653345609 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

Note:

Do not write your answer as percentage. Always enter fractions as they are. e.g. if your answer is 0.245, enter the same, do not enter 24.5 %.

Options :

6406531149436. ✔ Useful Data has been mentioned above.

6406531149437. ✖ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number : 2

Sub-Section Id : 64065348893

Question Shuffling Allowed : Yes

Question Number : 172 Question Id : 640653345610 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

For the given data set

x	y
1	3
2	4
3	8
4	11
5	12

What is the mean squared error if the predicted model is given by $\hat{y} = 2x + 1$? Write your answer correct upto 2 decimal places, do not round up or off.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

1.38 to 1.42

Sub-Section Number : 3

Sub-Section Id : 64065348894

Question Shuffling Allowed : No

Question Id : 640653345611 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 : (173 to 176)

Question Label : Comprehension

Consider the following confusion matrix. Positive class is represented by 'True' and negative class is represented by 'False'.

		Predicted	
		False	True
Actual	False	187	133
	True	95	105

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 173 Question Id : 640653345612 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 the accuracy. Write your answer correct upto 2 decimal places, do not round up or off.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.55 to 0.57

Question Number : 174 Question Id : 640653345613 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 the precision. Write your answer correct upto 2 decimal places, do not round up or off.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.43 to 0.45

Question Number : 175 Question Id : 640653345614 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 the recall. Write your answer correct upto 2 decimal places, do not round up or off.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.515 to 0.535

Question Number : 176 Question Id : 640653345615 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 the F-1 score. Write your answer correct upto 2 decimal places, do not round up or off.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.460 to 0.485

Question Id : 640653345626 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 178)

Question Label : Comprehension

Ajay has a dataset that has a non-linear relationship between the features and the label. The dimension of training samples is 4×2 (excluding the additional all-ones feature for the bias term, which you should add), label vector is 4 × 1 and weight vector is 3 × 1.

X	y
[1 , 1]	1
[2 , 2]	1
[3 , 2]	2
[4 , 3]	2

w
0.1
0.2
0.3

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 177 Question Id : 640653345627 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

Suppose Ajay has to compute the ridge loss value for this data with regularization parameter value as 0.2 for performing ridge regression. What will be the value of ridge loss correct up to 2 decimal places?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.35 to 0.37

Question Number : 178 Question Id : 640653345628 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

For the same dataset, suppose Ajay has to compute the lasso loss value with regularization

parameter value as 0.2 for performing lasso regression. What will be the value of lasso loss correct up to 2 decimal places?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.39 to 0.43

Question Id : 640653345634 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 : (179 to 180)

Question Label : Comprehension

A perceptron model is trained on linearly separable binary classification data-set. Consider that the data-set has two features (x_1, x_2) excluding dummy feature. The learnt weight vector is

$$\mathbf{W} = \begin{bmatrix} -1 \\ 0.2 \\ 0.5 \end{bmatrix}$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 179 Question Id : 640653345635 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

What will be the prediction for an example having the features vector as (2, 1)? Assume the classes are 1 and −1.

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 :

-1

Question Number : 180 Question Id : 640653345636 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 accuracy for the given test data-set. Write your answer correct to two decimal places.

x_1	x_2	True label (y)
1	-2	-1
-2	-2	-1
1	2	1
3	2	1

Test data-set

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.73 to 0.77

Sub-Section Number : 4

Sub-Section Id : 64065348895

Question Shuffling Allowed : No

Question Id : 640653345616 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 : (181 to 182)

Question Label : Comprehension

Consider the following code snippet

```
import numpy as np
a=[[1,2,3],[0,2,1],[0,2,1]]
b=[[1,1,0],[1,2,3],[0,1,3]]
A=np.array(a)
B=np.array(b)
C=A@B
D=A*B
```

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 181 Question Id : 640653345617 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

What is the output of following code snippet?

```
print(C[1][0]+D[1][2])
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

5

Question Number : 182 Question Id : 640653345618 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

What is the output of following code snippet?

```
print(C.sum().sum())
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

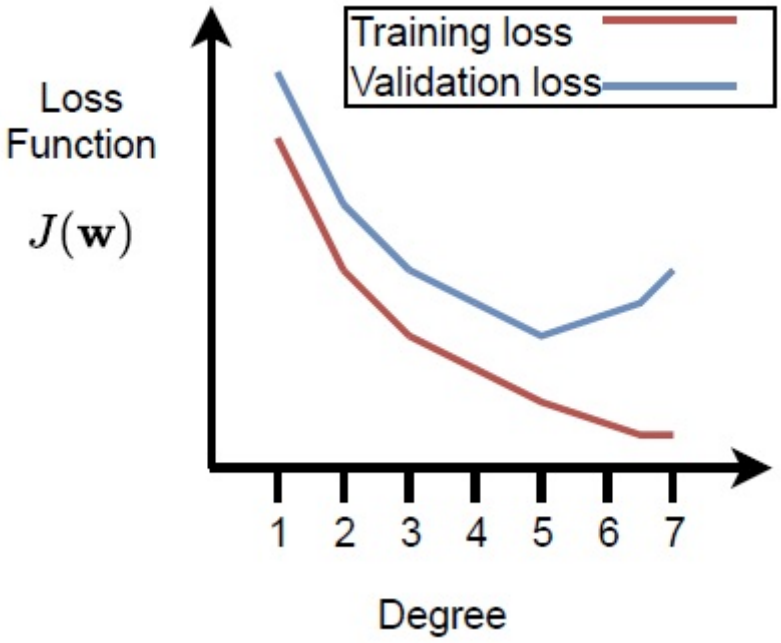
58

Question Id : 640653345629 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 : (183 to 184)

Question Label : Comprehension

Abhishek trains a polynomial regression model on a dataset. He tries with different degree of polynomial transformation and gets following learning curve:



Based on the above data, answer the given subquestions.

Sub questions

Question Number : 183 Question Id : 640653345630 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

What value of degree of polynomial transformation should Abhishek choose for the given dataset?

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 :

5

Question Number : 184 Question Id : 640653345631 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 do you think will happen if Abhishek tries to fit a linear regression model with polynomial transformation of degree 20?

Options :

6406531149472. ✖ High validation loss and high training loss.

6406531149473. ✔ High validation loss and low training loss.

6406531149474. ✖ Low validation loss and high training loss.

6406531149475. ✖ Low validation loss and low training loss.

Sub-Section Number :	5
Sub-Section Id :	64065348896
Question Shuffling Allowed :	Yes

Question Number : 185 Question Id : 640653345619 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Consider following label vector for a movie data $D = (X, y)$

$$X = \begin{bmatrix} 2019 & \text{'Uri: The Surgical Strike'} & 8.3 \\ 2009 & \text{'3 Idiots'} & 8.4 \end{bmatrix}$$

$$y = \begin{bmatrix} \text{'Drama', 'Action', 'War'} \\ \text{'Comedy', 'Drama'} \end{bmatrix}$$

X has year of release, name of the movie and IMDb rating as features. And y has corresponding genres. Predicting genres of a movie is following type of problem:

Options :

6406531149445. ✔ Multi-label, multi-class classification problem

6406531149446. ✖ Single-label, multi-class classification problem

6406531149447. ✖ Single-label, binary class classification problem

6406531149448. ✖ Multi-label, binary class classification problem

Question Number : 186 Question Id : 640653345620 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 gradient of function $f(x_1, x_2) = x_1^2 + x_1x_2 + x_2^2$ at point $(x_1, x_2) = (1, 2)$ is:

Options :

6406531149449. ✔ $[4, 5]^T$

6406531149450. ✖ $[5, 4]^T$

6406531149451. ✖ $[2, 3]^T$

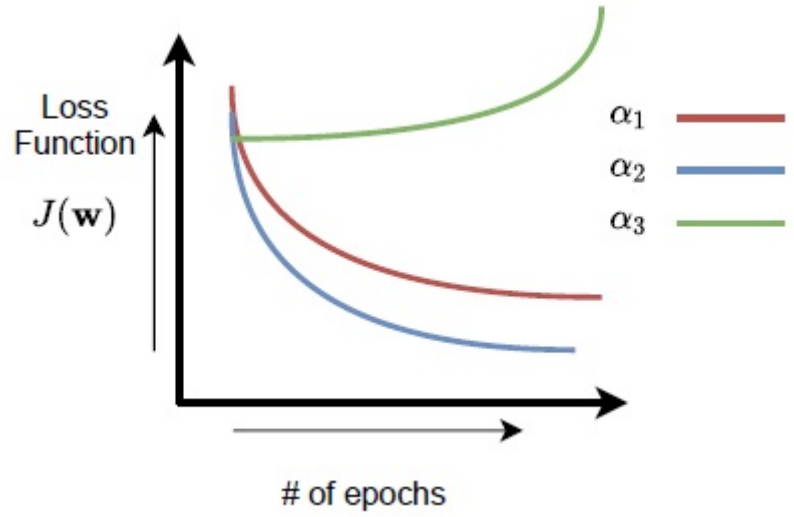
6406531149452. ✖ $[4, 6]^T$

Question Number : 187 Question Id : 640653345624 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

Brijmohan trains his linear regression model with three different values of learning rate, i.e. α_1, α_2 and α_3, for the same training set. He gets learning curves as displayed in the following chart.



Which of the following correctly explains relationship among α_1, α_2 and α_3?

Options :

6406531149463. ✖ $\alpha_1 > \alpha_2 > \alpha_3$

6406531149464. ✔ $\alpha_1 < \alpha_2 < \alpha_3$

6406531149465. ✖ $\alpha_2 > \alpha_1 > \alpha_3$

6406531149466. ✖ $\alpha_3 > \alpha_2 > \alpha_1$

6406531149467. ✖ $\alpha_1 > \alpha_3 > \alpha_2$

Sub-Section Number : 6

Sub-Section Id : 64065348897

Question Shuffling Allowed : Yes

Question Number : 188 Question Id : 640653345621 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 can NOT be a linear regression model?

Options :

6406531149453. ✖ $\mathrm{y} = \sum_{i=0}^{m} w_i x_i$

6406531149454. ✔ $\mathrm{y} = \prod_{i=0}^{m} w_i x_i$

6406531149455. ✔ $\mathrm{y} = \sum_{i=0}^{m} {w_i}^{x_i} x_i$

6406531149456. ✔ $\mathrm{y}^2 = \sum_{i=0}^{m} {w_i}^2 x_i$

Question Number : 189 Question Id : 640653345622 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 correctly computes the solution of linear regression problem via normal equation method? Assume necessary imports.

Options :

6406531149457. ✔
```
w = np.linalg.pinv(X)@y
```

6406531149458. ✖
```
w = X@X.T@y
```

6406531149459. ✖
```
w = X.T@np.linalg.inv(X)@y
```

6406531149460. ✖
```
w = X.T@np.linalg.pinv(X@y)@y
```

6406531149461. ✖
```
w = np.linalg.inv(X.T@X)(X.T@y)
```

Question Number : 190 Question Id : 640653345632 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

In ridge regression, the loss function is computed as $J(\mathbf{w}) = L + \lambda P$ Where P is penalty term for ridge regularization, λ is rate of regularization and L is plain loss function without any regularization. Choose the correct statements from the following:

Options :

6406531149476. ✔ As λ tends to infinite, the solution of ridge regularization tends towards origin.

6406531149477. ✖ As λ tends to zero, the solution of ridge regularization tends towards origin.

6406531149478. ✖ As λ tends to infinite, the solution of ridge regularization tends towards the solution of least squares.

6406531149479. ✔ As λ tends to zero, the solution of ridge regularization tends towards the solution of least squares.

6406531149480. ✔ The penalty term P represents circles if we draw the contour plot of ridge loss function.

6406531149481. ✖ The penalty term *P* represents squares if we draw the contour plot of ridge loss function.

Sub-Section Number : 7

Sub-Section Id : 64065348898

Question Shuffling Allowed : Yes

Question Number : 191 Question Id : 640653345623 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

For the given dataset:

x	y
1	5
2	7
3	6

Assume the initial weight vector is $w = [1, 2]$ and learning rate $\alpha = 0.20$. Compute the weight vector after one iteration, let's call it w_1. Compute prediction for $x = 5$ correct upto two decimal points with new weight vector (i.e. w_1). Do not round up or off.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

15.4 to 15.80

Question Number : 192 Question Id : 640653345625 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

Ankita had a feature vector **x** and she wanted to apply polynomial transformation on **x**. She had written a code snippet as follows:

```
import itertools, functools
import numpy as np
x = np.array([[2, 3]])
degree= 3
x_t = x.transpose()
features = [np.ones(len(x))]
for degree in range(1, degree + 1):
  for items in itertools.combinations_with_replacement(x_t, degree):
    features.append(functools.reduce(lambda x, y: x * y, items))
output = np.sum(np.asarray(features).transpose())
print(int(output))
```

What is the output of the code snippet?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

90

Question Number : 193 Question Id : 640653345638 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Short Answer Question

A classification model was trained on some training examples with two features and three classes (0, 1 and 2) using least square algorithm. The learnt weight matrix is

$$\mathbf{W} = \begin{bmatrix} -1.2 & 0.6 & 0.5 \\ 0.3 & 0.8 & -1.5 \\ 0.4 & 1.3 & 1 \end{bmatrix}$$

(Remember for *k* class classification problem with *m* features, shape of weight matrix is $(m + 1) \times k$)

Which class will the sample (-1, 1) be classified to?

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

Sub-Section Number :	8
Sub-Section Id :	64065348899
Question Shuffling Allowed :	Yes

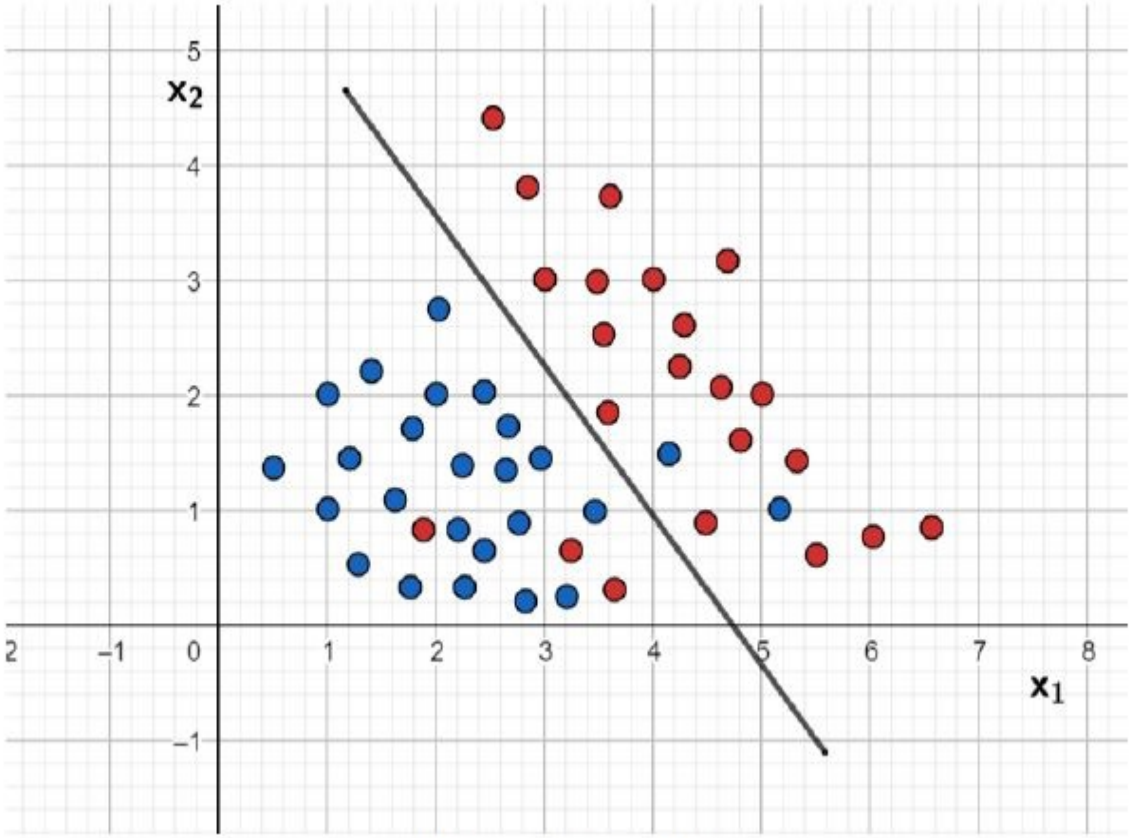
Question Number : 194 Question Id : 640653345633 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

Consider the decision boundary learnt using a perceptron algorithm as shown in the figure. Find the loss associated with this model.

Note: Since, perceptron model doesn't converge for non linearly separable data, we have terminated the learning process after a fixed numbers of iterations.



Perceptron model

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 :

5

Question Number : 195 Question Id : 640653345637 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

Decision boundary for binary classification data-set is given by

$$0.3x_1 + 2.3x_2 + 1.8x_3 + 3 = 0$$

where x_1, x_2 and x_3 are features. What will be the distance of the decision boundary from the origin?

NOTE: Enter your answer in two decimal places.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

1.00 to 1.05

MLP

Section Id :	64065321878
Section Number :	12
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	23
Number of Questions to be attempted :	23
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 :	64065348900

Question Shuffling Allowed : No

Question Number : 196 Question Id : 640653345639 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 PRACTICES"

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 :

6406531149487. ✔ YES

6406531149488. ✖ NO

Sub-Section Number : 2

Sub-Section Id : 64065348901

Question Shuffling Allowed : Yes

Question Number : 197 Question Id : 640653345640 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

Consider the following code snippet:

```
from sklearn.datasets import load_iris
from sklearn.model_selection import train_test_split
X, y = load_iris(return_X_y = True)
```

The size of X and y is (150, 4) and (150,) respectively.

Which of the following option(s) split X and y into training and test data such that test data has 30 samples?

Options :

6406531149489. ✖
```
train_X, test_X, train_y, test_y = train_test_split(X, y,
test_size=20, random_state=42)
```

6406531149490. ✔
```
train_X, test_X, train_y, test_y = train_test_split(X, y,
test_size=30, random_state=42)
```

6406531149491. ✔
```
train_X, test_X, train_y, test_y = train_test_split(X, y,
test_size=0.2, random_state=42)
```

6406531149492. ✖
```
train_X, test_X, train_y, test_y = train_test_split(X, y,
test_size=0.3, random_state=42)
```

Question Number : 198 Question Id : 640653345642 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

We wish to load iris data from sklearn. Which of the following will result in an error?

Options :

6406531149497. ✔
```
from sklearn.datasets import load_iris
data = load_iris(load_X_y = True)
```

6406531149498. ✖
```
from sklearn.datasets import load_iris
data = load_iris(return_X_y = True)
```

6406531149499. ✔
```
from sklearn.datasets import load_iris
X, y = load_iris(load_X_y = True)
```

6406531149500. ✖
```
from sklearn.datasets import load_iris
X, y = load_iris(return_X_y = True)
```

Question Number : 199 Question Id : 640653345648 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 output of the following code block based on the 'Iris' dataset is shown in Figure 1.

```
import seaborn as sns
from matplotlib import pyplot as plt
iris= sns.load_dataset("iris")
sns.set(font_scale=1.5)
plt.figure(figsize=(8,6))
sns.boxplot(data=iris)
sns.swarmplot(data=iris,size=2,color='k')
plt.grid()
plt.title('Box Plot')
plt.ylabel('Range')
plt.show()
```

Based on the Figure 1, mark the correct statements from below options.

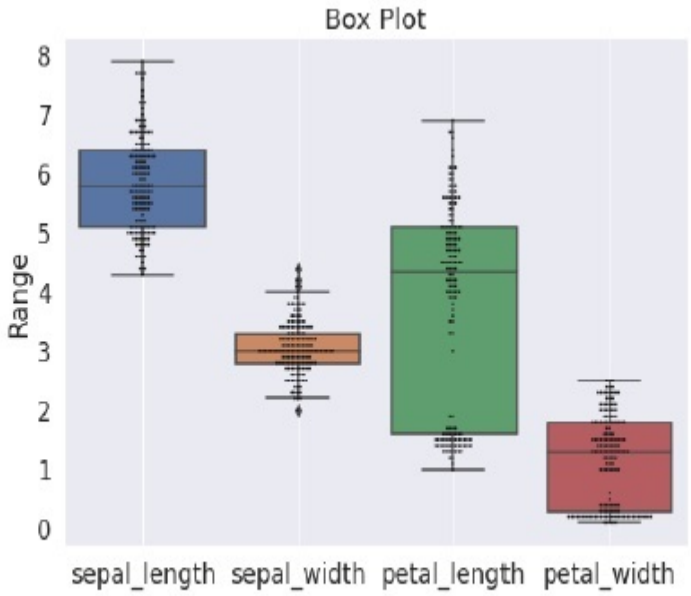


Figure 1

Options :

6406531149523. ✔ Median petal_length value is greater than median petal_width.

6406531149524. ✖ Median sepal_length value is smaller than the value of median petal_width.

6406531149525. ✔ The range of petal_length values is larger than the ranges of all three other

features.

6406531149526. ✖ Only the feature sepal_length has outliers.

Question Number : 200 Question Id : 640653345653 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 correct code block or blocks to set adaptive learning rate while using SGDRegressor will be-

Options :

6406531149540. ✖
```
from sklearn.model_selection import SGDRegressor
linear_regressor = SGDRegressor(learning_rate='log2',eta0=1e-2)
```

6406531149541. ✔
```
from sklearn.linear_model import SGDRegressor
linear_regressor = SGDRegressor(learning_rate='adaptive',eta0=1e-2)
```

6406531149542. ✔
```
from sklearn.linear_model import SGDRegressor
linear_regressor = SGDRegressor(learning_rate='adaptive')
```

6406531149543. ✖
```
from sklearn.model_selection import SGDRegressor
SGD_regressor = LinearRegressor(learning_rate='adaptive',eta0=1e-2)
```

Sub-Section Number : 3

Sub-Section Id : 64065348902

Question Shuffling Allowed : Yes

Question Number : 201 Question Id : 640653345641 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

We wish to download a data set available online. Assume that the url of the csv containing the data is 'url_1'. Which of the following is the correct code to load the data?

Options :

6406531149493. ✖
```
import pandas as pd
data = pd.fetch_csv(url_1)
```

6406531149494. ✖
```
import pandas as pd
data = pd.fetch_data(url_1)
```

6406531149495. ✖
```
import pandas as pd
data = pd.load_data(url_1)
```

6406531149496. ✔
```
import pandas as pd
data = pd.read_csv(url_1)
```

Question Number : 202 Question Id : 640653345644 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 will be the shapes of X and y?

```
from sklearn.datasets import make_classification
X, y = make_classification(n_features=20,
                           n_informative=10,
                           n_redundant = 1,
                           n_classes=2,
                           n_clusters_per_class=1,
                           random_state=20,
                           n_samples=30)
```

Options :

6406531149507. ✖ (30,10) and (30,)

6406531149508. ✔ (30,20) and (30,)

6406531149509. ✖ (20,30) and (20,)

6406531149510. ✖ (20,10) and (20,)

Question Number : 203 Question Id : 640653345645 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 the code?

```
data = [{'plot number': 51, 'Carpet area':251.8},
        {'Plot number': 69, 'Carpet area':611.9}]
from sklearn.feature_extraction import DictVectorizer
dv = DictVectorizer(sparse=False)
data_transformed = dv.fit_transform(data)
data_transformed
```

Options :

6406531149511. ✖ array([[610.9, 0. , 77.], [51. , 251.8, 0.]])

6406531149512. ✖ array([[611.9, 0. , 69.], [251.8, 51. , 0.]])

6406531149513. ✖ array([[251.8, 0. , 69.], [611.9, 51. , 0.]])

6406531149514. ✔ array([[251.8, 0. , 51.], [611.9, 69. , 0.]])

Question Number : 204 Question Id : 640653345647 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 the code?

```
from sklearn.feature_selection import RFE
from sklearn.linear_model import LinearRegression
from sklearn.datasets import fetch_california_housing
from sklearn.model_selection import train_test_split
X_california, y_california = fetch_california_housing(return_X_y=True)
# select a subset of data
X, y = X_california[:2000, :], y_california[:2000]
estimator = LinearRegression()
selector = RFE(estimator, n_features_to_select = 3, step=1)
selector = selector.fit(X, y)
print(selector.support_)
```

Options :

6406531149519. ✖ [True False False True False True True True]

6406531149520. ✔ [True False False False False False True True]

6406531149521. ✖ [True False False False False True True True]

6406531149522. ✖ [True False False False False False True False]

Question Number : 205 Question Id : 640653345649 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

Output of the following code is-

```
movie_genres =[{'action', 'comedy' },
               {'comedy'},
               {'action', 'thriller'},
               {'science-fiction', 'action', 'thriller'}]
from sklearn.preprocessing import MultiLabelBinarizer
mlb = MultiLabelBinarizer()
mlb.fit_transform(movie_genres)
```

Options :

6406531149527. ✔ array([[1, 1, 0, 0], [0, 1, 0, 0], [1, 0, 0, 1], [1, 0, 1, 1]])

6406531149528. ✖ array([[1, 0, 0, 0], [0, 1, 0, 0], [1, 0, 0, 1], [1, 0, 1, 1]])

6406531149529. ✖ array([[1, 0, 0, 0], [0, 1, 0, 0], [1, 0, 0, 0], [1, 0, 1, 1]])

6406531149530. ✖ array([[1, 0, 0], [0, 1, 0], [1, 0, 0], [1, 0, 1]])

Question Number : 206 Question Id : 640653345650 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

Output of the following block of code is -

```
import numpy as np
from sklearn.datasets import fetch_california_housing
from sklearn.model_selection import train_test_split
from sklearn.feature_selection import SelectKBest, mutual_info_regression
# download data
X_california, y_california = fetch_california_housing(return_X_y=True)
# select a subset of data
X, y = X_california[:2000, :], y_california[:2000]
skb = SelectKBest(mutual_info_regression, k = 3)
X_new = skb.fit_transform(X,y)
print(X_new.shape)
```

Options :

6406531149531. ✖ (2000,8)

6406531149532. ✔ (2000,3)

6406531149533. ✖ (3, 2000)

6406531149534. ✖ (2000, 5)

Question Number : 207 Question Id : 640653345651 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 'explained variance score' for the following code?

```
from sklearn.metrics import explained_variance_score
y_true = [1, 2, 3]
y_pred = [2, 5, 8]
explained_variance_score(y_true, y_pred)
```

Options :

6406531149535. ✔ -3

6406531149536. ✖ 3

6406531149537. ✖ -2

6406531149538. ✖ 2

Question Number : 208 Question Id : 640653345654 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

Calculate the coefficient of determination (R^2) from the following block of code?

```
from sklearn.metrics import r2_score
y_true = [3, -0.5, 2, 7]
y_pred = [2.5, 0.0, 2, 8]
print(r2_score(y_true, y_pred))
```

Options :

6406531149544. ✖ 0.789

6406531149545. ✔ 0.948

6406531149546. ✖ 0.922

6406531149547. ✖ 0.824

Question Number : 209 Question Id : 640653345656 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?

```
import numpy as np
from sklearn.model_selection import RepeatedKFold

X = np.array([[1, 2], [3, 4], [1, 2], [3, 4]])
rkf = RepeatedKFold(n_splits=2,
                    n_repeats=2,
                    random_state=1)
for train, test in rkf.split(X):
    print("%s %s" % (train, test))
```

Options :

6406531149552. ✖ [0 1] [2 3] [2 3] [NaN 1] [1 3] [2 2] [0 2] [1 3]

6406531149553. ✖ [0 1] [NaN 3] [2 3] [0 1] [1 3] [0 2] [0 2] [1 3]

6406531149554. ✖ [0 1] [1 3] [2 3] [2 1] [1 3] [3 2] [0 2] [1 3]

6406531149555. ✔ [0 1] [2 3] [2 3] [0 1] [1 3] [0 2] [0 2] [1 3]

Question Number : 210 Question Id : 640653345659 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 likely to be the correct output of the following code snippet?

```
from sklearn import linear_model
clf = linear_model.Lasso(alpha=0.1)
clf.fit([[1,0], [2, 1], [3, 2]], [1, 2, 3])
linear_model.Lasso(alpha=0.1,
                   max_iter=1000,
                   tol=0.0001,
                   warm_start=False,
                  fit_intercept=True)
print(clf.coef_)
```

Options :

6406531149564. ✖ [0.85,0.1,0.05]

6406531149565. ✖ [3,2,1]

6406531149566. ✔ [0.85,0]

6406531149567. ✖ There are some mistakes in the 3rd /4th line of code, hence it will produce an error.

Question Number : 211 Question Id : 640653345663 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Consider the following code snippet:

```
from sklearn import linear_model
clf = linear_model.Ridge(alpha=0.01)
X= [[1,0], [2, 1], [3, 2]]
y= [1, 2, 3]
clf.fit(X, y)
linear_model.Ridge(alpha=0.01, max_iter=1000,
                   tol=0.0001, fit_intercept=True)
clf.score(X,y)
```

Which of the following is likely to be the correct output of the code above?

Options :

6406531149576. ✖ 5

6406531149577. ✖ 99

6406531149578. ✔ 0.999

6406531149579. ✖ No evaluation metrics is mentioned, hence it will produce an error.

Sub-Section Number : 4

Sub-Section Id : 64065348903

Question Shuffling Allowed : Yes

Question Number : 212 Question Id : 640653345643 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the following code snippet.

```
from sklearn.datasets import load_iris
one = load_iris()
two = load_iris(return_X_y = True)
three = load_iris(as_frame = True)
four = load_iris(as_frame = True, return_X_y = True)
```

What will be the data types of one, two, three and four?

Options :

6406531149501. ✖ Bunch, Tuple, DataFrame, DataFrame

6406531149502. ✖ Bunch, Tuple, DataFrame, Tuple

6406531149503. ✖ Bunch, Ndarray, Bunch, Ndarray

6406531149504. ✖ Ndarray, Tuple, Ndarray, Tuple

6406531149505. ✔ Bunch, Tuple, Bunch, Tuple

6406531149506. ✖ It will result in an error.

Sub-Section Number : 5

Sub-Section Id : 64065348904

Question Shuffling Allowed : Yes

Question Number : 213 Question Id : 640653345646 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 output of the following block of the code?

```
from sklearn.pipeline import Pipeline
from sklearn.impute import SimpleImputer
from sklearn.preprocessing import StandardScaler
estimators = [('simpleImputer', SimpleImputer()),
              ('standardScaler', StandardScaler())]
pipe = Pipeline(steps=estimators)
print(len(pipe.steps))
```

Options :

6406531149515. ✔ 2

6406531149516. ✖ 3

6406531149517. ✖ 4

6406531149518. ✖ 1

Sub-Section Number : 6

Sub-Section Id : 64065348905

Question Shuffling Allowed : Yes

Question Number : 214 Question Id : 640653345652 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 will be the output of following block of code?

```
from sklearn.model_selection import ShuffleSplit
rs = ShuffleSplit(n_splits=3, random_state=0)
rs.get_n_splits(X)
```

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 :

3

Sub-Section Number : 7

Sub-Section Id : 64065348906

Question Shuffling Allowed : Yes

Question Number : 215 Question Id : 640653345655 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 code snippets represent correct methods to obtain cross validated performance measure using LeaveOneOut?

Options :

6406531149548. ✔

```
from sklearn.model_selection import cross_val_score
from sklearn.model_selection import LeaveOneOut
from sklearn.linear_model import linear_regression

lin_reg = linear_regression()
loocv = LeaveOneOut()
score = cross_val_score(lin_reg, X, y, cv=loocv)
```

6406531149549. ✖

```
from sklearn.linear_model import SGDRegressor
linear_regressor = SGDRegressor(loss='squared_error',
                                early_stopping=True
                                max_iter=500,
                                tol=1e-3,
                                validation_fraction=0.2,
                                n_iter_no_change=5)
```

6406531149550. ✖

```
from sklearn.linear_model import linear_regression
from sklearn.model_selection import cross_val_score
from sklearn.model_selection import ShuffleSplit
from sklearn.model_selection import LeaveOneOut
lin_reg = linear_regression()
shuffle_split = ShuffleSplit(n_splits=5, test_size=0.2,
                             random_state=42)
score = cross_val_score(lin_reg, X, y, cv=loocv)
```

```
from sklearn.model_selection import cross_validate
from sklearn.model_selection import ShuffleSplit
from sklearn.model_implementation import LeaveOneOut
cv = ShuffleSplit(n_splits=40, test_size=0.3, random_state=0)
cv_results = cross_validate(regressor, data,
                            target, cv=cv,
                            scoring="loocv_neg_mean_absolute_error")
```

6406531149551. ✖

Question Number : 216 Question Id : 640653345657 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 recall value for the class "2" for the following block of code?

```
from sklearn.metrics import confusion_matrix
y_true = [2, 0, 2, 2]
y_pred = [0, 0, 2, 2]
confusion_matrix(y_true, y_pred)
from sklearn.metrics import classification_report
print(classification_report(y_true, y_pred))
```

Options :

6406531149556. ✖ 1.00

6406531149557. ✔ 0.67

6406531149558. ✖ 0.50

6406531149559. ✖ 0.81

Question Number : 217 Question Id : 640653345658 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:

```
data=np.array([ 1, 2, 3, 4])
from sklearn.preprocessing import PolynomialFeatures
poly= PolynomialFeatures(degree=3, interaction_only=True)
data = data.reshape(2,2)
print(poly.fit_transform(data))
```

Which of the following is the correct output?

Options :

6406531149560. ✖ array([[1., 1., 2., 2.], [1., 5., 10., 50.], [1., 3., 4., 12.]])

6406531149561. ✖ array([[1., 1., 2., 3., 2., 3., 6.], [1., 4., 5., 10., 20., 40., 50.]])

6406531149562. ✖ array([[1., 4., 5., 10., 20., 40., 50.], [1., 1., 2., 3., 2., 3., 6.]])

6406531149563. ✔ array([[1., 1., 2., 2.], [1., 3., 4., 12.]])

Sub-Section Number : 8

Sub-Section Id : 64065348907

Question Shuffling Allowed : No

Question Id : 640653345660 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 : (218 to 219)

Question Label : Comprehension

Consider the following code snippet, and answer the given subquestions.

```
from sklearn.preprocessing import PolynomialFeatures
from sklearn.pipeline import Pipeline
from sklearn.preprocessing import StandardScaler
from sklearn.linear_model import RidgeCV
from sklearn.datasets import fetch_california_housing
california_housing = fetch_california_housing(as_frame=True)
com_train_features=california_housing.data
com_train_labels=california_housing.target

lf= np.logspace(-3, 0, num=4)

ridge_reg_pipeline = Pipeline([("poly", PolynomialFeatures(degree=2)),
                               ("feature_scaling", StandardScaler())
                              ])

ridge= RidgeCV(alphas=lf,
               scoring="neg_mean_squared_error",
               fit_intercept = False)
results = ridge.fit(com_train_features, com_train_labels)
```

Sub questions

Question Number : 218 Question Id : 640653345661 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 will be the output of the following code?

```
print(results.intercept_)
```

Options :

6406531149568. ✖ 0.0001

6406531149569. ✖ 0.001

6406531149570. ✖ 0.1

6406531149571. ✔ 0.0

Question Number : 219 Question Id : 640653345662 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

What will be the output of the following code?

```
print(results.best_score_)
```

Options :

6406531149572. ✖ 0.32

6406531149573. ✖ 0.528

6406531149574. ✖ 0.681

6406531149575. ✔ -0.609

BDM

Section Id :	64065321879
Section Number :	13
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	13
Number of Questions to be attempted :	13
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 :	64065348908
Question Shuffling Allowed :	No

Question Number : 220 Question Id : 640653345664 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 :

6406531149580. ✔ YES

6406531149581. ✖ NO

Sub-Section Number : 2

Sub-Section Id : 64065348909

Question Shuffling Allowed : Yes

Question Number : 221 Question Id : 640653345666 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

A product is likely to have a price elasticity of demand that exceeds 1 when.

Options :

6406531149586. ✖ Its price falls

6406531149587. ✖ It is a necessity

6406531149588. ✔ It has close substitutes

6406531149589. ✖ The percentage of income spent on it decreases

Question Number : 222 Question Id : 640653345670 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

Match the “Definition” in Colum-X to its appropriate “Ratio” in Column-Y.

Column-X	Column-Y
1. The ability of the firm to pay its way	A. Profitability Ratio
2. Information to enable decisions to be made on the extent of risk and earning potential of a business investment	B. Gearing Ratio
3. Information on relationship between the exposure of the business to loans as opposed to share capital	C. Investment Ratio
4. How effective the firm is at generating profits given sales	D. Financial Ratio
	E. Liquidity Ratio

Options :

6406531149600. ✔ 1-E, 2-C, 3-B, 4-A

6406531149601. ✖ 1-E, 2-C, 3-B, 4-D

6406531149602. ✖ 1-B, 2-C, 3-E, 4-A

6406531149603. ✖ 1-B, 2-C, 3-E, 4-D

Question Number : 223 Question Id : 640653345672 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Multiple Choice Question

The strength of the five forces in the “Five Forces Model” helps determine _____ within an industry that a competitor can expect.

Options :

6406531149608. ✔ Level of profit

6406531149609. ✖ Level of competitiveness

6406531149610. ✖ Level of mark share

6406531149611. ✖ Level of monopoly

Question Number : 224 Question Id : 640653345684 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 one of the five key indicators in Purchasing Manager's Index (PMI)?.

Options :

6406531149632. ✖ New orders

6406531149633. ✖ Employment environment

6406531149634. ✖ Supplier Deliveries

6406531149635. ✔ Competitor Analysis

Sub-Section Number : 3

Sub-Section Id : 64065348910

Question Shuffling Allowed : Yes

Question Number : 225 Question Id : 640653345665 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

If gross profit = net profit + x, which of the following statements is/ are true? (select all that is applicable).

Options :

6406531149582. ✖ "X" includes variable cost

6406531149583. ✖ "X" includes the cost of goods sold (e.g.: building, equipment, etc.)

6406531149584. ✔ "X" includes the indirect expenses (e.g.: operating, interest, taxes, etc.)

6406531149585. ✖ None of these

Question Number : 226 Question Id : 640653345671 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 is not a source of survey data? (select all that is applicable).

Options :

6406531149604. ✔ Stock market data

6406531149605. ✖ Market research data

6406531149606. ✖ Consumer pyramid data

6406531149607. ✖ None of these

Question Number : 227 Question Id : 640653345673 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

When a company operates in a monopolistic market (assume it is 100% monopolistic), which of the following forces in the “Five Forces Model” becomes unimportant for the company *(choose all that are applicable)*?.

Options :

6406531149612. ✖ Bargaining power of suppliers

6406531149613. ✔ Bargaining power of customers

6406531149614. ✔ Threat of substitutes

6406531149615. ✖ Threat of new entrants

6406531149616. ✖ None of these

Question Number : 228 Question Id : 640653345683 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

The Board of Directors of Company-X have met and a discussion on acquiring another company-Y is underway. A competitor firm wants to stop this merger due to fears that the market will become monopolistic. So, the competitor has approached the justice department. Then which of the

following statements **will assist** the competitor's claim?.

Options :

6406531149628. ✔ As the acquisition will cause the Herfindahl Index of the industry to change from 2000 to 8000 it should not be permitted

6406531149629. ✖ As the acquisition will cause the Herfindahl Index of the industry to change from 8000 to 2000 it should not be permitted

6406531149630. ✔ The 4-firm concentration ratio will change from 52% to 84% and hence must not be permitted

6406531149631. ✖ The 4-firm concentration ratio will change from 84% to 52% and hence must not be permitted

Sub-Section Number : 4

Sub-Section Id : 64065348911

Question Shuffling Allowed : No

Question Id : 640653345667 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 : (229 to 230)

Question Label : Comprehension

The table provides data on rice sold (25Kg Bags) and price (Rs./ 25Kg Bag) at a rice wholesaler for the first 5 months of the year. Then answer the given subquestions.

Month	Price Per 25 Kg Bag of Rice	Number of 25Kg Bags of Rice Sold
1	40	350
2	45	300
3	47	270
4	55	240
5	60	200

Sub questions

Question Number : 229 Question Id : 640653345668 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

Based on price elasticity, which of the following pairs of Months indicate that Rice is an **elastic** item?.

Options :

6406531149590. ✔ Month 1 to Month 2

6406531149591. ✔ Month 2 to Month 3

6406531149592. ✖ Month 3 to Month 4

6406531149593. ✔ Month 4 to Month 5

6406531149594. ✖ None of these

Question Number : 230 Question Id : 640653345669 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

Based on price elasticity, which of the following pairs of Months indicate that Rice is an **inelastic** item?.

Options :

6406531149595. ✖ Month 1 to Month 2

6406531149596. ✖ Month 2 to Month 3

6406531149597. ✔ Month 3 to Month 4

6406531149598. ✖ Month 4 to Month 5

6406531149599. ✖ None of these

Sub-Section Number :	5
Sub-Section Id :	64065348912
Question Shuffling Allowed :	No

Question Id : 640653345674 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 : (231 to 233)

Question Label : Comprehension

The table below provides information on the number of items sold by different firms in a month. With this information, answer the given subquestions.

Firm	Number of units sold
A	1200
B	3000
C	1500
D	1000
E	2600
F	4500
G	1100
H, I, J, K, L, M	5100

Sub questions

Question Number : 231 Question Id : 640653345675 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 5-firm Concentration ratio (round your answer to 2 decimal places)?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

64 to 65

Question Number : 232 Question Id : 640653345676 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 HHI for the industry (round your answer to 2 decimal places)?.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

1047 to 1048

Question Number : 233 Question Id : 640653345677 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

How is the industry based on the HHI?.

Options :

6406531149619. ✖ Monopolistic

6406531149620. ✖ Acute concentration

6406531149621. ✔ Moderately concentration

6406531149622. ✖ Oligopolistic

6406531149623. ✖ Cannot say

Question Id : 640653345685 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 : (234 to 236)

Question Label : Comprehension

The following table gives the sales and purchases of eggs at a Kirana store. With this information, answer the given subquestions assuming a linear relationship between price and quantities.

Price (Rs.)	Quantity purchased	Quantity sold
2	16	11
3	14	14
4	12	17
5	10	20
6	8	23

Sub questions

Question Number : 234 Question Id : 640653345686 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 market-clearing price for eggs?

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 :

3

Question Number : 235 Question Id : 640653345687 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

How many eggs will be purchased at the market-clearing price?

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 :

14

Question Number : 236 Question Id : 640653345688 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

Any price **higher than** the market-clearing price will lead to (choose all that is applicable)?

Options :

6406531149638. ✖ More eggs being purchased

6406531149639. ✔ More eggs being sold

6406531149640. ✔ Less eggs being purchased

6406531149641. ✖ Less eggs being sold

6406531149642. ✖ Will have no impact on the eggs being purchased or sold

Sub-Section Number :	6
Sub-Section Id :	64065348913
Question Shuffling Allowed :	No

Question Id : 640653345678 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 : (237 to 240)

Question Label : Comprehension

A company wants to start manufacturing a product that will be sold in a competitive market at a price of Rs.15 each. Estimates indicate that a fixed cost of Rs. 10 will be incurred every day. The total variable cost (in Rs.) and the corresponding number of units that can be produced in a day (at the specified total variable cost) are provided in the table below. With this information, answer the given subquestions.

Total Variable Cost (Rs.)	Number of Units Produced (units/day)
0	0
8	13
10	15
12	20
15	22
17	25
20	27

Sub questions

Question Number : 237 Question Id : 640653345679 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Short Answer Question

How many items should the company be recommended to produce?.

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 :

13

Question Number : 238 Question Id : 640653345680 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Short Answer Question

What is the total profit that the company makes if the recommended number of products (identified in the previous question) are produced?.

NOTE: Enter your answer to the nearest integer.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

80 to 82

Question Number : 239 Question Id : 640653345681 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 average total cost if the recommended number of products (identified in the previous question) is produced *[Note: Round your answer to two decimal places]*?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

8.7 to 8.8

Question Number : 240 Question Id : 640653345682 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 marginal cost if the recommended number of products (identified in the previous question) is produced *[Note: Round your answer to two decimal places]*?.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

7.8 to 8.1

Business Analytics

Section Id :	64065321880
Section Number :	14
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	11
Number of Questions to be attempted :	11
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 :	64065348914
Question Shuffling Allowed :	No

Question Number : 241 Question Id : 640653345689 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 :

6406531149643. ✔ YES

6406531149644. ✖ NO

Sub-Section Number : 2

Sub-Section Id : 64065348915

Question Shuffling Allowed : No

Question Id : 640653345690 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 : (242 to 243)

Question Label : Comprehension

The linear demand response for a product-A is modelled as a simple linear regression represented as D(P) = 1500 – 20*P, where D(P) is the demand at price-P. Then, answer the given subquestions.

Sub questions

Question Number : 242 Question Id : 640653345691 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Short Answer Question

What is the elasticity of this curve when the price is Rs.50?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 243 Question Id : 640653345692 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Short Answer Question

What is the satiating price for this curve?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

750

Sub-Section Number :	3
Sub-Section Id :	64065348916
Question Shuffling Allowed :	Yes

Question Number : 244 Question Id : 640653345693 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 distributions is/are not symmetric in nature (select all that are applicable)?

Options :

6406531149647. ✖ Standard normal distribution

6406531149648. ✔ Exponential distribution

6406531149649. ✖ Uniform distribution between [-1 to +1]

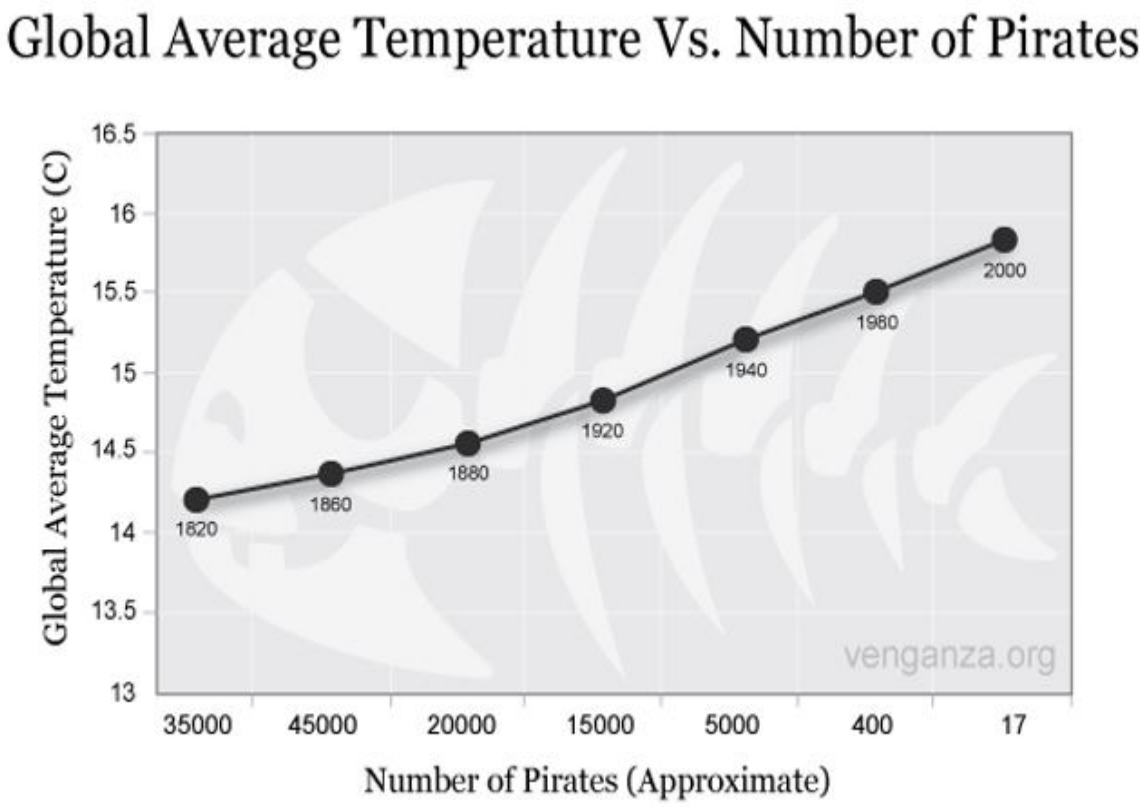
6406531149650. ✔ Poisson distribution

Question Number : 245 Question Id : 640653345694 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

From the given figure, which of the below statements are true?



Options :

6406531149651. ✖ The number of pirates does not increase with the global average temperature increase

6406531149652. ✔ There is a positive correlation between the number of pirates and the global average temperature increase

6406531149653. ✖ There is no correlation between the number of pirates and the global average temperature increase

6406531149654. ✖ More data is required to come to a conclusion

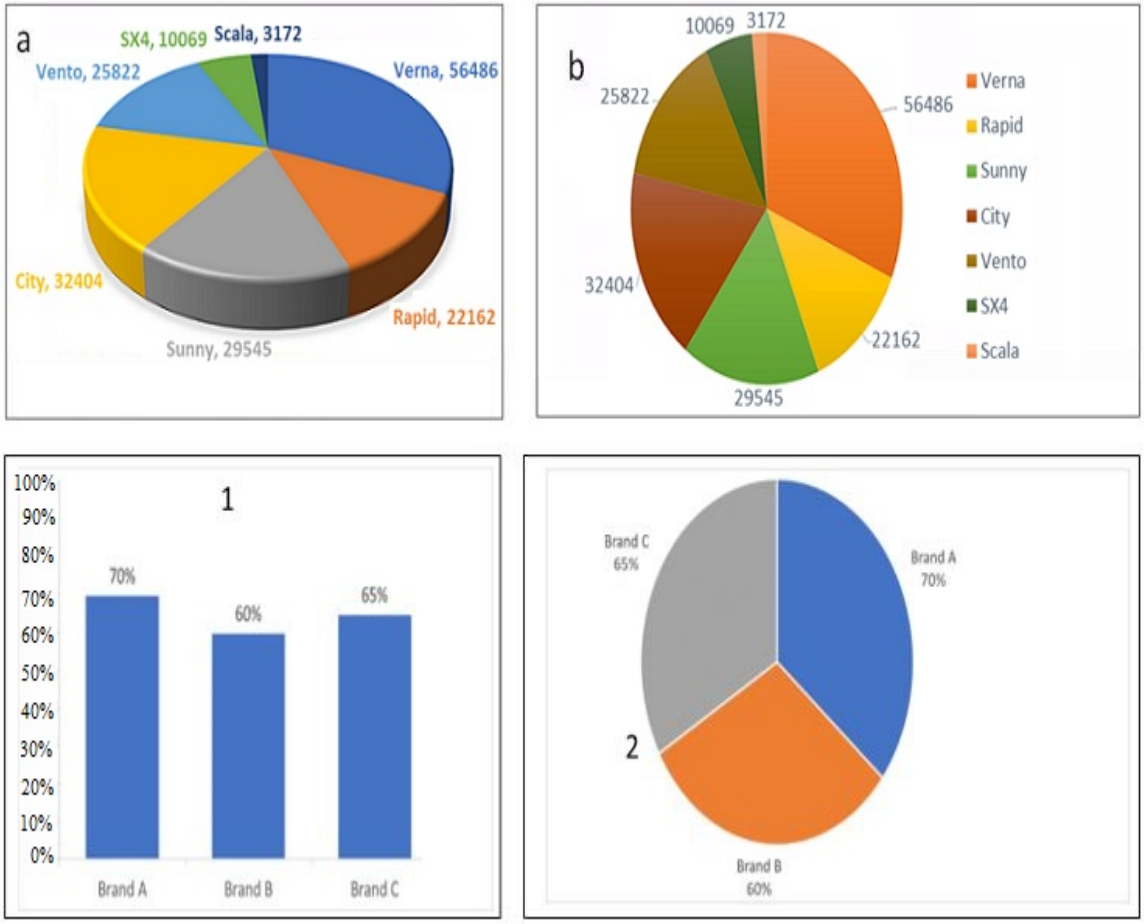
Sub-Section Number :	4
Sub-Section Id :	64065348917
Question Shuffling Allowed :	Yes

Question Number : 246 Question Id : 640653345695 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

Among the following graphs, which are **not recommended/correct** for use?



Options :

6406531149655. ✖ (a) & (1)

6406531149656. ✔ (a) & (2)

6406531149657. ✖ (b) & (2)

6406531149658. ✖ (b) & (1)

Question Number : 247 Question Id : 640653345709 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Multiple Choice Question

The p-value of the chi-square goodness of fit test represents _____

Options :

6406531149681. ✖ The chance of observing the sample when the null hypothesis is false

6406531149682. ✖ The chance of observing the sample when the alternative hypothesis is true

6406531149683. ✖ The chance of observing the sample at the specified level of significance

6406531149684. ✔ None of these

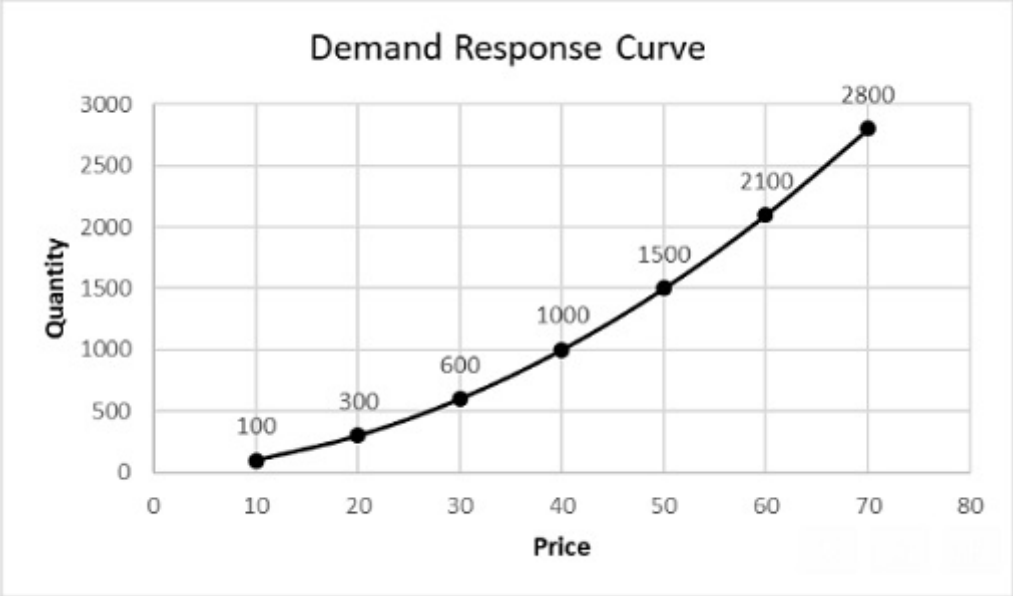
Sub-Section Number :	5
Sub-Section Id :	64065348918
Question Shuffling Allowed :	No

Question Id : 640653345701 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 : (248 to 250)

Question Label : Comprehension

Given the imaginary demand response curve in the below figure, answer the given subquestions.



Sub questions

Question Number : 248 Question Id : 640653345702 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 statements are true? (choose all that is applicable)

Options :

6406531149669. ✔ As price increases, latent demand increases

6406531149670. ✖ As price increases, latent demand decreases

6406531149671. ✖ As it is a linear curve, there is no impact of price on latent demand

6406531149672. ✖ None of these

Question Number : 249 Question Id : 640653345703 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Short Answer Question

What is the elasticity between any two points of the given demand response curve (Note: **Do not assume** that it is linear and **do not assume** that it is a constant elasticity curve)?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 250 Question Id : 640653345704 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

Based on the computed elasticity, what kind of demand is being exhibited by the product?

Options :

6406531149674. ✔ Elastic demand

6406531149675. ✖ Inelastic demand

6406531149676. ✖ Demand for an inferior good

6406531149677. ✖ Demand for a normal good

Question Id : 640653345705 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 : (251 to 252)

Question Label : Comprehension

If the demand response curve for the data given in the following table is modelled by a constant elasticity curve, then answer the given subquestions

Demand (number of units)	Price (Rs.)
1.0	10
0.50	20
0.33	30
0.25	40
0.20	50

Sub questions

Question Number : 251 Question Id : 640653345706 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 demand when the price is Rs.1?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

10

Question Number : 252 Question Id : 640653345707 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

What is the price elasticity for the demand response curve?

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 :	64065348919
Question Shuffling Allowed :	No

Question Id : 640653345696 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 : (253 to 255)

Question Label : Comprehension

You are given the following contingency table based on sample data where different cities and their brand preferences are provided. You perform a chi-squared test of independence to make inferences about the population from this sample.

	Brand A	Brand B	Total
Chennai	288	220	508
Mumbai	353	204	557
Total	641	424	1065

Sub questions

Question Number : 253 Question Id : 640653345697 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

From the given contingency table, find the expected frequency of Chennai people preferring brand B?

Note: Do not round off the values in the intermediate iterations. Round off to two decimal values only at the last step.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

200 to 204

Question Number : 254 Question Id : 640653345698 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 calculated value of chi-squared?

Note: Do not round off the values in the intermediate iterations. Round off to two decimal values

only at the last step.

Options :

6406531149660. ✖ 8.24

6406531149661. ✔ 4.95

6406531149662. ✖ 3.12

6406531149663. ✖ 6.24

Question Number : 255 Question Id : 640653345699 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

At the significance level 0.01, chi-squared tabular value is 6.63. What do you conclude?

Options :

6406531149664. ✖ Reject the null hypothesis and conclude that the categorical variables are not independent

6406531149665. ✖ Fail to reject the null hypothesis and conclude that the categorical variables are not independent

6406531149666. ✔ Fail to reject the null hypothesis and conclude that the categorical variables are independent

6406531149667. ✖ Reject the null hypothesis and conclude that the categorical variables are independent

Sub-Section Number :	7
Sub-Section Id :	64065348920
Question Shuffling Allowed :	Yes

Question Number : 256 Question Id : 640653345700 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

Suppose a factory manufactures products on three machines A, B and C. Suppose 65% of total

output comes from machine A, 30% of total output comes from machine B and 5% of total output comes from machine C. From the past data, it is known that 1% of products by machine A are defectives, 2% of products by machine B are defectives and 10% of products by machine C are defectives. What is the probability that the product has come from machine C given that it is a defective?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.24 to 0.34

Sub-Section Number :	8
Sub-Section Id :	64065348921
Question Shuffling Allowed :	Yes

Question Number : 257 Question Id : 640653345708 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Short Answer Question

A data set with 200 data points on 15 variables is provided. Chi-square goodness of fit test is conducted on a variable in the data-set, to see if it follows an exponential distribution. If the dataset is binned into 10 bins, then how many degrees of freedom does the chi-square statistic have?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

8

System Commands

Section Id :	64065321881
Section Number :	15
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 :	64065348922
Question Shuffling Allowed :	No

Question Number : 258 Question Id : 640653345710 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 :

6406531149685. ✔ YES

6406531149686. ✖ NO

Sub-Section Number : 2

Sub-Section Id : 64065348923

Question Shuffling Allowed : Yes

Question Number : 259 Question Id : 640653345711 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

Initially, four files named `a`, `b`, `c` and `d` are present in the current working directory, every file has some text in it. Select the file(s) whose contents are not modified at the end of executing the below set of commands in the same sequence.

Hint: Description of option with `echo` command.

-n: do not output the trailing newline

```
touch a
echo -n "> b  #There is no space between quotes.
echo -n ">> c  #There is no space between quotes.
cat a > d
```

Options :

6406531149687. ✔ a

6406531149688. ✖ b

6406531149689. ✔ c

6406531149690. ✖ d

Question Number : 260 Question Id : 640653345714 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

```
$ cat file1.txt
1
2
3
4
5
6
7
8
```

Which of the following commands will give the output as.

```
6
7
```

Options :

6406531149696. ✔ `cat file1.txt | head -7 | tail -2`

6406531149697. ✖ `cat file1.txt | head -6 | tail -7`

6406531149698. ✖ `cat file1.txt | tail -6 | head -3`

6406531149699. ✔ `cat file1.txt | tail -3 | head -2`

Question Number : 261 Question Id : 640653345719 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

```
echo 'Hello, World' >out 1>&2
```

Which of the following statement(s) will be true after executing the above command.

Options :

6406531149717. ✖ The file `out` contains the text `Hello, World`.

6406531149718. ✔ The text `Hello, World` will be printed on the terminal.

6406531149719. ✔ The file `out` contains no text (i.e. will be an empty file).

6406531149720. ✖ No text will be printed on the terminal.

Sub-Section Number : 3

Sub-Section Id : 64065348924

Question Shuffling Allowed : Yes

Question Number : 262 Question Id : 640653345713 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

```
! (ls global_config || ls local_config) && touch default_config
```

The file `default_config` does not exist in the current working directory. All the statements below are with respect to the current working directory.

After running the above command the file `default_config` will be created iff,

Note: `&&` and `||` have same precedence.

Options :

6406531149692. ✖ The files `global_config` and `local_config` both exist.

6406531149693. ✖ The file `local_config` exists but `global_config` does not exist.

6406531149694. ✖ The file `global_config` exists but `local_config` does not exist.

6406531149695. ✔ The files `global_config` and `local_config` both do not exist.

Question Number : 263 Question Id : 640653345729 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 output of the command `ls -lR ./ | grep -e "^[d]" | wc -l` represents?

Hint: Command `ls -lR` will recursively list all the files and subdirectories in the long listing format.

Options :

6406531149757. ✖ Number of files in the current directory.

6406531149758. ✖ Number of directories in the current directory.

6406531149759. ✖ Number of directories and all sub-directories in the parent directory.

6406531149760. ✔ Number of directories and all sub-directories in the current directory.

6406531149761. ✖ Number of directories in the parent directory.

Sub-Section Number : 4

Sub-Section Id : 64065348925

Question Shuffling Allowed : Yes

Question Number : 264 Question Id : 640653345717 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

Below are three date-time formats according to ISO 8601 in UTC

```
2022-05-06T13:00:56+00:00
2022-05-06T13:00:56Z
20220506T130056Z
```

Select the extended regular expression that matches only with one of the above date-time formats.

Options :

6406531149709. ✖ `^[0-9]{4}-*[0-9]{2}-*[0-9]{2}T[0-9]{2}:*[0-9]{2}:*[0-9]{2}(Z|\+00:00)$`

6406531149710. ✖ `^[0-9]{4}-+[0-9]{2}-+[0-9]{2}T[0-9]{2}:+[0-9]{2}:+[0-9]{2}(Z|\+00:00)$`

6406531149711. ✔ `^[0-9]{4}-?[0-9]{2}-?[0-9]{2}T[0-9]{2}:?[0-9]{2}:?[0-9]{2}(Z|\+00:00)$`

6406531149712. ✖ `^[0-9]{4}-[0-9]{2}-[0-9]{2}T[0-9]{2}:[0-9]{2}:[0-9]{2}(Z|\+00:00)$`

Sub-Section Number :	5
Sub-Section Id :	64065348926
Question Shuffling Allowed :	Yes

Question Number : 265 Question Id : 640653345716 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 file hierarchy structure given below to answer the question. All the file names have an extension e.g. `.sh`, `.txt` etc, and the rest are directories. The top-most directory is `/home`.

```
/home
├── classA
│   └── attendance
│       ├── feb.csv
│       ├── jan.csv
│       └── mar.csv
├── classB
│   └── attendance
│       ├── feb.csv
│       ├── jan.csv
│       └── mar.csv
├── classC
│   └── attendance
│       ├── feb.csv
│       ├── jan.csv
│       └── mar.csv
├── aprClassB.csv
└── script.sh

6 directories, 10 files
```

Which of the following commands can be used to rename the file `aprClassB.csv` to `apr.csv` and move it to the directory `attendance` in the directory `classB`. Consider that the current working directory is `/home/classB`.

Options :

6406531149704. ✖ `cp aprClassB.csv apr.csv`

6406531149705. ✖ `cp ../aprClassB.csv attendance/apr.csv`

6406531149706. ✔ `mv ../aprClassB.csv attendance/apr.csv`

6406531149707. ✔ `mv /home/aprClassB.csv /home/classB/attendance/apr.csv`

```
cp ../aprClassB.csv attendance/
mv attendance/aprClassB.csv attendance/apr.csv
rm ../aprClassB.csv
```

6406531149708. ✔

Sub-Section Number : 6

Sub-Section Id : 64065348927

Question Shuffling Allowed : Yes

Question Number : 266 Question Id : 640653345715 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

```
ls | grep "^[^a-z]"
```

The above command will print the filenames in the current working directory that,

Options :

6406531149700. ✖ Starts with an uppercase letter.

6406531149701. ✖ Starts with a lowercase letter.

6406531149702. ✖ Does not start with an uppercase letter.

6406531149703. ✔ Does not start with a lowercase letter.

Question Number : 267 Question Id : 640653345718 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

```
$ ps
    PID TTY          TIME CMD
  64754 pts/3    00:00:00 bash
  65657 pts/3    00:00:00 sleep
  65671 pts/3    00:00:00 sleep
  65718 pts/3    00:00:00 python3
  65774 pts/3    00:00:00 ps

$ ps | grep "$$"
```

What will be the output of the last command in the above sequence of commands?

Options :

6406531149713. ✖ `PID TTY TIME CMD`

6406531149714. ✔ `64754 pts/3 00:00:00 bash`

6406531149715. ✖ `65718 pts/3 00:00:00 python3`

6406531149716. ✖ `65774 pts/3 00:00:00 ps`

Question Number : 268 Question Id : 640653345724 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 will the contents of the file `notes.txt` be after executing the below commands?

```
$ echo note > notes.txt
$ echo memo > memos.txt
$ echo list > lists.txt
$ cat lists.txt memos.txt >> notes.txt
```

Options :

6406531149732. ✖

```
note
```

6406531149733. ✖

```
memo
list
note
```

6406531149734. ✖

```
list
memo
note
```

6406531149735. ✔

```
note
list
memo
```

6406531149736. ✖

```
note
memo
list
```

Question Number : 269 Question Id : 640653345725 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

```
$ pwd
/home/runner
$ ls -l
total 8
-rw-r--r-- 1 runner runner 105 May 19 10:52 main.sh
-rw-r--r-- 1 runner runner  62 Nov 11  2021 replit.nix

$ cd /
$ cd home/runner
$ COMMAND1 # Find correct command for this.
$ long_listing
total 8
-rw-r--r-- 1 runner runner 105 May 19 10:52 main.sh
-rw-r--r-- 1 runner runner  62 Nov 11  2021 replit.nix
```

There is a command which is missing in the command sequence above, it is marked as `COMMAND1`. Analyze the outputs of the commands and select the command from the below options that is the correct replacement for `COMMAND1`.

Options :

6406531149737. ✖
```
long_listing="ls -l"
```

6406531149738. ✔
```
alias long_listing="ls -l"
```

6406531149739. ✖
```
alias long_listing "ls -l"
```

6406531149740. ✖
```
apropos long_listing "ls -l"
```

6406531149741. ✖ None of these.

Question Number : 270 Question Id : 640653345726 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

```
#!/usr/bin/bash

sleep 10 &
sleep 10 &
sleep 10 &
echo Good Morning
```

After how many seconds the text `Good Morning` will be displayed?

Options :

6406531149742. ✖ After 10 seconds.

6406531149743. ✖ After 20 seconds.

6406531149744. ✖ After 30 seconds.

6406531149745. ✔ Immediately.

Question Number : 271 Question Id : 640653345731 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

```
$ var="IIT Madras"
```

The above command is executed before running any of the commands below. Match the commands below to their outputs.

Commands	Output
1. echo ${var:-"value"}	a. value
2. echo ${var:+"value"}	b. IIT Madras
3. echo ${var:="value"}	c. T Ma
4. echo ${var:2:4}	d. stem

Options :

6406531149766. ✖ 1—>b; 2—>a; 3—>a; 4—>c;

6406531149767. ✖ 1—>a; 2—>b; 3—>b; 4—>d;

6406531149768. ✖ 1—>a; 2—>b; 3—>b; 4—>c;

6406531149769. ✔ 1—>b; 2—>a; 3—>b; 4—>c;

Sub-Section Number : 7

Sub-Section Id : 64065348928

Question Shuffling Allowed : Yes

Question Number : 272 Question Id : 640653345712 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

Below are the commands executed in the given sequence in an empty directory(containing no files or directories). Enter the number of files that will be created at the end of the execution of the below commands.

```
# Format Strings
# %H     hour (00..23)
# %M     minute (00..59)

fileName=$(date +'%M')
touch $fileName; sleep 3600; touch $fileName; sleep 3600
```

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 :

1

Sub-Section Number : 8

Sub-Section Id : 64065348929

Question Shuffling Allowed : Yes

Question Number : 273 Question Id : 640653345723 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

Select the command(s) that prints the file/directory names, that start with the letter "a" and end with the letter "e" (case-sensitive) present in the current working directory.

Options :

6406531149728. ✔ `ls | grep '^a.*e$'`

6406531149729. ✖ `ls | grep 'a.*e'`

6406531149730. ✔ `echo a*e`

6406531149731. ✖ `echo *a*e*`

Question Number : 274 Question Id : 640653345727 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 long listing output of the present working directory below.

```
$ ls -l
total 5
-rw-r--r-- 1 ram      teacher          315 May 17 17:18 Quiz1.md
-rw-r--r-- 1 megha    studentsDiploma   10 May 17 17:18 assignment1.txt
-rw-r--rw- 1 ravi     teacher           24 May 17 17:07 assignment2.txt
drwxr-xr-x 1 guest    guest              0 Dec 20 09:37 abc.ab
```

Which of the following statement(s) are true?

Options :

6406531149746. ✔ The owner of the file `Quiz1.md` is `ram`.

6406531149747. ✖ The owner of the file `Quiz1.md` is `teacher`.

6406531149748. ✔ `ram` does not have write permissions on the file `assignment1.txt`.

6406531149749. ✖ `ram` does not have read permissions on the file `assignment1.txt`.

6406531149750. ✖ If `ram` is in the group named `teacher`, then he has execute permission on the file `assignment2.txt`.

6406531149751. ✖ If `ram` is in the group named `teacher`, then he has write permission on the file `assignment2.txt`.

Question Number : 275 Question Id : 640653345728 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 contents of the file `employee_details.txt` below. The employees are ordered in the increasing order of their age in the file from top to bottom.

```
$ cat employee_details.txt
A1998001,Ram Kumar,7,Male
B2000002,Sanjay Narayan,10,Male
B2000003,Srishti Rai,12,Female
E1997001,Manoj Pillai,14,Male
G1998001,Preeti Suresh,18,Female
G1999001,Leela L G,21,Female
```

Which of the following command will output the full names of the 3 youngest employees, one name on each line.

Options :

6406531149752. ✔ `cat employee_details.txt | head -3 | cut -d "," -f 2`

6406531149753. ✔ `cat employee_details.txt | cut -d "," -f 2 | head -3`

6406531149754. ✖ `cat employee_details.txt | tail -3 | cut -d "," -f 2`

6406531149755. ✖ `cat employee_details.txt | head -3 | cut -f 3`

6406531149756. ✖ `cat employee_details.txt | cut -d "," -f 3 | tail -3`

Question Number : 276 Question Id : 640653345730 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 statements for hard and soft(symbolic) links are true.

Options :

6406531149762. ✔ Inode of a file and its hard link will be the same.

6406531149763. ✖ Inode of a file and its soft link will be the same.

6406531149764. ✖ Hard links become inaccessible after the file it links to is deleted.

6406531149765. ✔ Soft links become inaccessible after the file it links to is deleted.

Sub-Section Number : 9

Sub-Section Id : 64065348930

Question Shuffling Allowed : No

Question Id : 640653345720 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 : (277 to 278)

Question Label : Comprehension

```
cp a b # Command 1
mv b c # Command 2
mv c d # Command 3
mv a d # Command 4
cp a b # Command 5
mv b d # Command 6
```

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 277 Question Id : 640653345721 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

Initially, file `a` exists in the current working directory. How many files will be present in the current working directory after executing the given commands in the same sequence?

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 :

1

Question Number : 278 Question Id : 640653345722 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

Select the command(s) that will return with an error, given that only file `a` is present initially in the current working directory.

Options :

6406531149722. ✖ `cp a b # Command 1`

6406531149723. ✖ `mv b c # Command 2`

6406531149724. ✖ `mv c d # Command 3`

6406531149725. ✖ `mv a d # Command 4`

6406531149726. ✔ `cp a b # Command 5`

6406531149727. ✔ `mv b d # Command 6`