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 QUIZ 1 FOUNDATION DAD DIPLOMA QPD2 16 Oct 2022
Subject Name :	2022 Oct: IIT M QUIZ 1 FOUNDATION DAD DIPLOMA QPD2
Creation Date :	2022-10-10 18:03:57
Duration :	180
Total Marks :	751
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 :	6406539324
Group Maximum Duration :	0
Group Minimum Duration :	90
Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	751
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

Maths2

Section Id :	64065323897

Section Number :	1
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	8
Number of Questions to be attempted :	8
Section Marks :	25
Display Number Panel :	Yes
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	64065355315
Question Shuffling Allowed :	No

Question Number : 1 Question Id : 640653386644 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 " FOUNDATION LEVEL:SEMESTER 2/DIRECT ENTRY DIPLOMA : 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 :

6406531285880. ✔ YES

6406531285881. ✖ NO

Sub-Section Number :	2
Sub-Section Id :	64065355316
Question Shuffling Allowed :	Yes

Question Number : 2 Question Id : 640653386648 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Select Question

Choose the set of correct options.

Options :

6406531285884. ✖ If there is a square matrix A such that $A^2 + A = 0$, then $det(A)$ must be either 0 or -1.

6406531285885. ✔ If u is a solution of the system of linear equations $Ax = c$ and c is a solution of the system of linear equations $Ax = b$, then u is a solution of the system of linear equations $A^2x = b$.

6406531285886. ✖ If B is a diagonal matrix of order 3, then $AB - BA = 0$ for all square matrices A of order 3.

6406531285887. ✔ If there is an invertible real 3×3 matrix A such that $A\, adj(A) = 3I$, then $det(adj(A))$ must be 9.

Sub-Section Number :	3
Sub-Section Id :	64065355317
Question Shuffling Allowed :	Yes

Question Number : 3 Question Id : 640653386649 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 addition and scalar multiplication on $V = \mathbb{R}^2$ is defined as follows:

$$\textit{Addition: } (x_1, y_1) + (x_2, y_2) = (0, 0);$$
$$(x_1, y_1), (x_2, y_2) \in V$$
$$\textit{Scalar multiplication: } c(x, y) = (0, 0);\ (x, y) \in V,\ c \in \mathbb{R}$$

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. For each vector of $v \in V$ and for each pair $a, b \in \mathbb{R}, (a + b)v = av + bv$.
3. For each vector of $a \in \mathbb{R}$ and for each pair $v_1, v_2 \in V, a(v_1 + v_2) = av_1 + av_2$.
4. 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 :

1

Question Number : 4 Question Id : 640653386659 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 following two statements:

P: $V = \mathbb{R}^2$, with the operations:

Addition:

$$(x_1, y_1) + (x_2, y_2) = (x_1x_2, y_1y_2);\ (x_1, y_1), (x_2, y_2) \in V$$

and

Scalar multiplication:

$$c(x, y) = (cx, cy);\ (x, y) \in V,\ c \in \mathbb{R}$$

is a vector space.

Q: Let V be a vector space. If $u, v, w \in V$ are such that $au + bv + cw = 0$ for some scalars $a, b, c \in \mathbb{R}$ and $ac \neq 0$, then $\text{span}\{u, v\} = \text{span}\{v, w\}$.

Consider the following statements:

- **Statement 1:** P is true, but Q is false.
- **Statement 2:** Q is true, but P is false.
- **Statement 3:** Both P and Q are true.
- **Statement 4:** Both P and Q are false.

Which one of the above statements is correct? (e.g. if Statement 1 is correct, then enter 1 as your answer).

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Sub-Section Number :	4
Sub-Section Id :	64065355318
Question Shuffling Allowed :	No

Question Id : 640653386645 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 : (5 to 6)

Question Label : Comprehension

Consider the matrix $A = \begin{bmatrix} a & a \\ -a & a \end{bmatrix}$, for some real number a.

Answer the given subquestions:

Sub questions

Question Number : 5 Question Id : 640653386646 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 $A^4 = \beta a^4 I$, then what is the value of β?

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

Question Number : 6 Question Id : 640653386647 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 $a + \lambda$ for which $det\,(A - \lambda I) = 0$, where λ is a real number (treat a as a variable).

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 Id : 640653386650 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (7 to 10)

Question Label : Comprehension

Consider the following subsets of $\mathbb{R}^3$.

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

Subset 2) $W = \{(x, y, z) \mid x, y, z \in \mathbb{R}, \text{ and } x = z\}$

Subset 3) $W = \{(x, y, z) \mid x, y, z \in \mathbb{R}, \ x = y + z \text{ and } x + z = y\}$

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

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 7 Question Id : 640653386651 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

Subset 1 is a subspace of dimension _____. (Enter the numerical value only. Suppose the dimension is 3, then enter 3 as your answer.)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 8 Question Id : 640653386652 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

Subset 2 is a subspace of dimension _____. (Enter the numerical value only. Suppose the dimension is 3, then enter 3 as your answer.)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 9 Question Id : 640653386653 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

Subset 3 is a subspace of dimension _____. (Enter the numerical value only. Suppose the dimension is 3, then enter 3 as your answer.)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 10 Question Id : 640653386654 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

Subset 4 is a subspace of dimension _____. (Enter the numerical value only. Suppose the dimension is 3, then enter 3 as your answer.)

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 :	64065355319
Question Shuffling Allowed :	No

Question Id : 640653386655 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 : (11 to 13)

Question Label : Comprehension

Suppose W_1 and W_2 are subspaces of $\mathbb{R}^3$ defined as follows:

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

and

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

with usual addition and scalar multiplication, i.e.,

$$\textit{Addition: } (x_1, y_1, z_1) + (x_2, y_2, z_2) = (x_1 + x_2, y_1 + y_2, z_1 + z_2);$$
$$(x_1, y_1, z_1), (x_2, y_2, z_2) \in V$$
$$\textit{Scalar multiplication: } c(x, y, z) = (cx, cy, cz);\ (x, y, z) \in V,\ c \in \mathbb{R}$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 11 Question Id : 640653386656 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 option(s) represent $W_1 \cap W_2$? (More than one options may be correct)

Options :

6406531285893. ✖ $Span\{(1,1,0),(1,-1,0)\}$

6406531285894. ✔ $Span\{(-1,1,0),(1,-1,0)\}$

6406531285895. ✔ $Span\{(1,-1,0)\}$

6406531285896. ✖ $Span\{(1,1,2),(1,1,0)\}$

Question Number : 12 Question Id : 640653386657 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 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 : 13 Question Id : 640653386658 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Which of the following options is true?

Options :

6406531285898. ✖ $W_1 \cup W_2$ is a vector space of dimension 3 (with usual addition and scalar multiplication).

6406531285899. ✖ $W_1 \cup W_2$ is a vector space of dimension 2 (with usual addition and scalar multiplication).

6406531285900. ✖ $W_1 \cup W_2$ is a vector space of dimension 1 (with usual addition and scalar multiplication).

6406531285901. ✔ $W_1 \cup W_2$ is not a vector space (with usual addition and scalar multiplication).

Sub-Section Number :	6
Sub-Section Id :	64065355320
Question Shuffling Allowed :	No

Question Id : 640653386660 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 : (14 to 16)

Question Label : Comprehension

A system can be in one of 3 possible states at a given time. At the next instant, it changes its state as represented pictorially in the diagram below. The number beside an arrow shows the transition probabilities from the beginning state of the arrow to the ending state of the arrow (e.g. in the diagram M2Q1:1, you can see that there is an arrow starting at state 1 and ending at state 2, with the number $\frac{1}{2}$ beside the arrow. It implies that the probability of transition from state 1 to state 2 is $\frac{1}{2}$). No arrow from state 2 to state 1 indicates that direct transition is not possible (equivalently the transition probability is 0). The probability of transition from a state to itself is 0.

M2Q1:1

The information in the diagram is represented by the matrix

$P = \begin{bmatrix} 0 & \frac{1}{2} & \frac{1}{2} \\ 0 & 0 & 1 \\ \frac{1}{2} & \frac{1}{2} & 0 \end{bmatrix}$, where the ij-th entry of P denotes the probability of transition from state i to state j. Let the probabilities that the system is in State 1, State 2 or State 3 initially (i.e., at $t = 0$) be X_0^1, X_0^2, and X_0^3, respectively. This is represented by the initial distribution vector (3×1 matrix) and is denoted by $X_0 = \begin{bmatrix} X_0^1 \\ X_0^2 \\ X_0^3 \end{bmatrix}$.

For any positive integer n, the distribution vector at $t = n$ is denoted by X_n and is given by the equation $P^T X_{n-1} = X_n$.

Answer the given subquestions from the given information.

Sub questions

Question Number : 14 Question Id : 640653386661 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

Suppose at $t = 2$ the distribution vector X_2 is $\begin{bmatrix} \frac{1}{3} \\ \frac{1}{2} \\ \frac{2}{3} \end{bmatrix}$. Which of the following options are true?

Options :

6406531285903. ✔ $X_0 = X_2$.

6406531285904. ✔ $X_0 = X_1$.

6406531285905. ✖ $X_0 \neq X_n$ for some $n \in \mathbb{N}$.

6406531285906. ✖ There are infinitely many vectors, which are possible candidates for X_0.

6406531285907. ✖ There are infinitely many vectors, which are possible candidates for X_1.

Question Number : 15 Question Id : 640653386662 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Suppose at $t = 1$ the distribution vector

X_1 is $\begin{bmatrix} \frac{1}{2} \\ \frac{1}{2} \\ 0 \end{bmatrix}$. Which of the following options

is true?

Options :

6406531285908. ✖ The system had positive initial probabilities of being in State 1 or State 2.

6406531285909. ✔ The system was initially in State 3.

6406531285910. ✖ The system was initially in State 1.

6406531285911. ✖ The system had positive initial probabilities of being in State 2 and State 3.

Question Number : 16 Question Id : 640653386663 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 set of correct option(s).

Options :

6406531285912. ✔ Both P and P^2 have the same reduced row echelon form.

6406531285913. ✖ P is already in reduced row echelon form.

6406531285914. ✖ $P^2 = \lambda P$ for some real number λ.

6406531285915. ✖ P^2 is already in reduced row echelon form.

Statistics2

Section Id :	64065323898
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 :	64065355321
Question Shuffling Allowed :	No

Question Number : 17 Question Id : 640653386664 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 "FOUNDATION LEVEL:SEMESTER 2/DIRECT ENTRY DIPLOMA : 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 :

6406531285916. ✔ Yes

6406531285917. ✖ No

Question Number : 18 Question Id : 640653386665 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) $A = \{a, a+1, \ldots, b\}$	$\frac{1}{n}$, $x = k$ $n = b - a + 1$ $k = a, a+1, \ldots, b$	$\begin{cases} 0 & x < 0 \\ \frac{k-a+1}{n} & k \le x < k+1 \\ & k = a, a+1, \ldots, b-1, b \\ 1 & x \ge n \end{cases}$	$\frac{a+b}{2}$	$\frac{n^2-1}{12}$
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 :

6406531285918. ✔ Useful Data has been mentioned above.

6406531285919. ✖ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number : 2

Sub-Section Id : 64065355322

Question Shuffling Allowed : Yes

Question Number : 19 Question Id : 640653386669 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 and Y be two independent Bernoulli(1/4) random variables. Define another random variable $Z = |Y - X|$. Find the PMF of Z.

Options :

6406531285926. ✖

z	0	1
$f(z)$	1/2	1/2

6406531285927. ✖

z	0	1
$f(z)$	3/8	5/8

6406531285928. ✔

z	0	1
$f(z)$	5/8	3/8

6406531285929. ✖

z	-1	0	1
$f(z)$	3/8	1/16	9/16

Question Number : 20 Question Id : 640653386671 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 Poisson random variable with mean equal to 10. Which of the following bounds can be obtained using Markov's inequality?

Options :

6406531285931. ✖ $P(X > 20) \geq \frac{1}{2}$

6406531285932. ✖ $P(X < 20) \leq \frac{1}{2}$

6406531285933. ✖ $P(X > 25) \geq \frac{10}{25}$

6406531285934. ✔ $P(X > 25) \leq \frac{10}{26}$

Question Number : 21 Question Id : 640653386672 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Which of the following statements are correct?

Options :

6406531285935. ✖ The probability density function (PDF) of a continuous random variable X must be continuous.

6406531285936. ✔ The cumulative distribution function (CDF) of a continuous random variable X must be continuous.

6406531285937. ✖ The sum of two independent binomial random variables must be a binomial random variable.

6406531285938. ✖ For a random variable X, mean and variance cannot be equal.

Sub-Section Number :	3
Sub-Section Id :	64065355323

Question Shuffling Allowed : Yes

Question Number : 22 Question Id : 640653386670 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Short Answer Question

The joint PMF of two discrete random variables X and Y is given in the following table:

$Y \backslash X$	0	1
0	$\frac{1}{12}$	$\frac{1}{3}$
1	$\frac{1}{4}$	0
2	$\frac{1}{6}$	$\frac{1}{6}$

Joint PMF of X and Y

Calculate Cov(X, Y). Enter the answer correct to three decimal places.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

-0.125

Sub-Section Number : 4

Sub-Section Id : 64065355324

Question Shuffling Allowed : No

Question Id : 640653386666 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 : (23 to 24)

Question Label : Comprehension

The joint PMF of two discrete random variables *X* and *Y* is given in the following table:

$Y \backslash X$	0	1	2	$f_Y(y)$
0	a	$\frac{1}{8}$	c	$\frac{1}{4}$
1	$\frac{1}{4}$	b	d	$\frac{3}{4}$
$f_X(x)$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{6}$	1

Joint PMF of X and Y

Based on the above data, answer the given subquestions

Sub questions

Question Number : 23 Question Id : 640653386667 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 values of *c* and *d*.

Options :

6406531285920. ✖ *c* = 1/8, *d* = 1/24.

6406531285921. ✔ *c* = 1/24, *d* = 1/8.

6406531285922. ✖ *c* = 1/24, *d* = 1/6.

6406531285923. ✖ *c* = 1/4, *d* = 1/8.

Question Number : 24 Question Id : 640653386668 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

Are X and Y independent?

Options :

6406531285924. ✔ Yes

6406531285925. ✖ No

Sub-Section Number :	5
Sub-Section Id :	64065355325
Question Shuffling Allowed :	No

Question Id : 640653386673 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 : (25 to 26)

Question Label : Comprehension

A fair coin is tossed twice. Let X denote the number of heads obtained. Let Y be defined as

$$Y = \begin{cases} 0, & \text{if no heads are obtained} \\ 1, & \text{if the first head appears on the first toss} \\ 2, & \text{if the first head appears on the second toss} \end{cases}$$

Based on the above data, answer the given subquestions

Sub questions

Question Number : 25 Question Id : 640653386674 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 among the following can be the joint PMF of X and Y ?

Options :

6406531285939. ✖

Y \ X	0	1	2
0	0	0	0
1	0	1/4	1/4
2	0	1/4	1/4

6406531285940. ✖

Y \ X	0	1	2
0	1/4	0	0
1	0	1/2	1/4
2	0	0	0

6406531285941. ✔

Y \ X	0	1	2
0	1/4	0	0
1	0	1/4	1/4
2	0	1/4	0

6406531285942. ✖

Y \ X	0	1	2
0	1/4	0	0
1	0	1/4	0
2	0	1/4	1/4

Question Number : 26 Question Id : 640653386675 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

Find $P(X \geq 1 \mid Y = 2)$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Id : 640653386676 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 : (27 to 28)

Question Label : Comprehension

A fair die is thrown three times. Let

X_1 represent the number obtained in the 1st throw,

X_2 represent the number obtained in the 2nd throw,

X_3 represent the number obtained in the 3rd throw.

Suppose all the throws are independent. Let

$$X = \max(X_1, X_2, X_3)$$

Based on the above data, answer the given subquestions

Sub questions

Question Number : 27 Question Id : 640653386677 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Compute the CDF of X, $F_X(k)$,
where $k \in \{1, 2, \ldots, 6\}$.

Options :

6406531285944. ✖ $F_X(k) = \left(\frac{k}{6}\right)$

6406531285945. ✖ $F_X(k) = \left(\frac{1}{6}\right)^3$

6406531285946. ✖ $F_X(k) = \left(\frac{k+1}{6}\right)^3$

6406531285947. ✔ $F_X(k) = \left(\frac{k}{6}\right)^3$

Question Number : 28 Question Id : 640653386678 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 *P(X* = 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 :

0.26 to 0.30

Question Id : 640653386679 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 : (29 to 30)

Question Label : Comprehension

Aman answers a question correctly with a probability of 1/3 independent of other questions. Suppose he is called for an interview where he can be asked either 1 or 2, or 3 questions with probability 1/3 each. Let X denote the number of questions he is asked during the interview. Let Y denote the number of questions he answers correctly during the interview.

Based on the above data, answer the given subquestions

Sub questions

Question Number : 29 Question Id : 640653386680 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 Aman is asked two questions during the interview, what is the probability that he will answer both of them correctly? 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 :

0.10 to 0.12

Question Number : 30 Question Id : 640653386681 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 $P(X = Y)$. 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 :

0.14 to 0.18

Question Id : 640653386682 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (31 to 32)

Question Label : Comprehension

Consider a function $f : \mathbb{R} \longrightarrow \mathbb{R}$ such that

$$f(x) = \begin{cases} \frac{1}{b} & -1 \le x < 0 \\ ax(x+1)(x-1) & 0 \le x \le 1 \\ 0 & \text{Otherwise} \end{cases}$$

where a, b are any real constants.

Based on the above data, answer the given subquestions

Sub questions

Question Number : 31 Question Id : 640653386683 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

Among the options below, for what values of a and b, is the function f a valid density function?

Options :

6406531285951. ✖ $a = 3, b = 4$

6406531285952. ✔ $a = -3, b = 4$

6406531285953. ✖ $a = -3, b = 3$

6406531285954. ✖ $a = 4, b = 3$

Question Number : 32 Question Id : 640653386684 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

With the choice of a, b, find

$$P\left(X > -\frac{1}{2} \mid X < 1\right).$$

Enter the answer correct to three decimal places.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0.875

Question Id : 640653386685 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (33 to 34)

Question Label : Comprehension

Suppose a fair die is rolled. Let X and Y be defined as

$$X = \begin{cases} 1, & \text{if the number is odd} \\ 0, & \text{otherwise} \end{cases}$$

$$Y = \begin{cases} 1, & \text{if the number is prime} \\ 0, & \text{otherwise} \end{cases}$$

Based on the above data, answer the given subquestions

Sub questions

Question Number : 33 Question Id : 640653386686 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 $E[XY]$. 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 :

0.32 to 0.34

Question Number : 34 Question Id : 640653386687 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 Var(XY). 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 :

0.21 to 0.23

CT

Section Id : 64065323899

Section Number :	3
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 :	64065355326
Question Shuffling Allowed :	No

Question Number : 35 Question Id : 640653386688 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 " FOUNDATION LEVEL:SEMESTER 1/DIRECT ENTRY DIPLOMA : 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 :

6406531285958. ✔ Yes

6406531285959. ✖ No

Question Number : 36 Question Id : 640653386689 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0

Question Label : Multiple Choice Question

Scores

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

Words

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

Library

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

Olympics

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

Three sample cards out of 30 for Shopping Bills dataset

Item List

SV Stores — Srivatsan (1)

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

Sun General — Vignesh (14)

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

Big Bazaar — Sudeep (2)

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

Options :

6406531285960. ✔ Useful Data has been mentioned above.

6406531285961. ✖ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number : 2

Sub-Section Id : 64065355327

Question Shuffling Allowed : Yes

Question Number : 37 Question Id : 640653386690 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

Select the most appropriate datatype specific to "Scores" dataset for the left column.

Field	Data Type
a. Is Bhuvanesh's total marks > 200 ?	1. String
b. Gender	2. Character
c. TownCity	3. Boolean
d. Sequence number	4. Integer

Options :

6406531285962. ✔ a - (3), b - (2), c- (1), d - (4)

6406531285963. ✖ a - (1), b - (2), c- (4), d - (3)

6406531285964. ✖ a - (2), b - (3), c- (1), d - (4)

6406531285965. ✖ a - (2), b - (1), c- (3), d - (4)

Sub-Section Number : 3

Sub-Section Id : 64065355328

Question Shuffling Allowed : Yes

Question Number : 38 Question Id : 640653386691 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

The following pseudocode is executed using the "Words" dataset. What will **count** represent at the end of the execution?

```
count = 0, Flag = False
while(Table 1 has more rows){
    Read the first row X in Table 1
    if(X.PartOfSpeech == "Noun"){
        Flag = True
    }
    else{
        if(Flag){
            count = count + 1
        }
    }
    Move X to Table 2
}
```

Options :

6406531285966. ✖ Number of nouns in the dataset

6406531285967. ✖ Number of words before the first noun in the dataset

6406531285968. ✖ Number of words after the first noun in the dataset

6406531285969. ✔ Number of words except nouns after the first noun in the dataset

Question Number : 39 Question Id : 640653386692 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 **count** represent at the end of the execution?

```
count = 0, A = 0
while(Table 1 has more rows){
    Read the first row X in Table 1
    if(X.Gender == 'F' or X.Mathematics > X.Physics){
        A = 1
    }
    else{
        count = count + 1
    }
    Move X to Table 2
}
```

Options :

6406531285970. ✖ Number of male students whose Physics marks are greater than Mathematics marks

6406531285971. ✔ Number of male students whose Physics marks are greater than or equal to Mathematics marks

6406531285972. ✖ Number of female students whose Physics marks are greater than or equal to Mathematics marks

6406531285973. ✖ Number of female students whose Physics marks are less than or equal to Mathematics marks

Question Number : 40 Question Id : 640653386694 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 "Shopping Bills" dataset. Procedure **findCommon** takes pair of cards **X** and **Y** as input and returns True if the two cards share at least one common item otherwise returns False. What will **count** represent at the end of the execution?

```
count = 0
while(Pile 1 has more cards){
    Read the top card X from Pile 1
    Move the card X to Pile 2
    while(Pile 1 has more Cards){
        Read the top card Y from Pile 1
        if(X.ShopName == Y.ShopName and findCommon(X, Y)){
            count = count + 1
        }
        Move the card Y to Pile 3
    }
    Move all the cards from Pile 3 to Pile 1
}
```

Options :

6406531285978. ✖ Number of pair of bills with at least one common items

6406531285979. ✔ Number of pair of bills from the same shop with at least one common items

6406531285980. ✖ Number of pair of bills with at least two common items

6406531285981. ✖ Number of pair of bills from the same shop with no common items

Sub-Section Number :	4
Sub-Section Id :	64065355329
Question Shuffling Allowed :	Yes

Question Number : 41 Question Id : 640653386693 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. What will **count** represent at the end of the execution?

```
count = 0
while(Table 1 has more rows){
    Read the first row X in Table 1
    Move X to Table 2
    Flag = True
    while(Table 1 has more rows){
        Read the first row Y in Table 1
        if(X.Word == Y.Word){
            Flag = False
            Move Y to Table 2
        }
        else{
            Move Y to Table 3
        }
    }
    if(Flag){
        count = count + 1
    }
    Move all rows from Table 3 to Table 1
}
```

Options :

6406531285974. ✖ Number of words

6406531285975. ✖ Number of duplicate words

6406531285976. ✖ Number of pair of unique words

6406531285977. ✔ Number of words which occurs only once

Question Number : 42 Question Id : 640653386695 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" table. At the end of the execution, **count** stores the number of pair of nouns such that both nouns have either same letter count or both end with a full stop. Choose the correct code fragment to complete the pseudocode.

```
count = 0
while(Table 1 has more rows){
    Read the first row X in Table 1
    Move X to Table 2
    if(X.PartOfSpeech == "Noun"){
        while(Table 1 has more rows){
            Read the first row Y in Table 1
            Move Y to Table 3
            if(***Statement 1***){
                if(***Statement 2***){
                    count = count + 1
                }
                else{
                    if(***Statement 3***){
                        count = count + 1
                    }
                }
            }
        }
        Move all rows from Table 3 to Table 1
    }
}
```

Options :

6406531285982. ✔ Statement 1: **X**.PartOfSpeech == **Y**.PartOfSpeech

Statement 2: **X**.LetterCount == **Y**.LetterCount

Statement 3: **X**.Word and **Y**.Word end with a full stop

6406531285983. ✖ Statement 1: **X**.Word and **Y**.Word end with a full stop

Statement 2: **X**.PartOfSpeech == **Y**.PartOfSpeech

Statement 3: **X**.LetterCount == **Y**.LetterCount

6406531285984. ✖ Statement 1: **X**.LetterCount == **Y**.LetterCount

Statement 2: **X**.Word and **Y**.Word end with a full stop

Statement 3: **X**.PartOfSpeech == **Y**.PartOfSpeech

6406531285985. ✖ Statement 1: **X**.LetterCount == **Y**.LetterCount

Statement 2: **X**.PartOfSpeech == **Y**.PartOfSpeech

Statement 3: **X**.Word and **Y**.Word end with a full stop

Sub-Section Number :	5
Sub-Section Id :	64065355330
Question Shuffling Allowed :	Yes

Question Number : 43 Question Id : 640653386696 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

Sripriya has used a variable **max** to keep track of the maximum total score to find the maximum total score using "Scores" dataset. There are many ways of initializing **max**. Choose the correct option(s) regarding the initialization of **max**.

It is a Multiple Select Question (MSQ)

Options :

6406531285986. ✔ Pick any random card **X** from the dataset and **max** = **X**.Total

6406531285987. ✔ Pick the top card **X** from the dataset and **max** = **X**.Total

6406531285988. ✖ Initialize **max** with any value greater than the possible maximum total score

6406531285989. ✔ Initialize **max** with any value less than the possible minimum total score

Sub-Section Number :	6
Sub-Section Id :	64065355331
Question Shuffling Allowed :	Yes

Question Number : 44 Question Id : 640653386697 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 "Scores" dataset. At the end of the execution, **count** captures the number of girls who scored at least 75 marks in Physics. Choose the correct code fragment(s) to complete the pseudocode.

It is a Multiple Select Question (MSQ).

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

Options :

```
if(X.Gender == 'F' or X.Physics >= 75){
    count = count + 1
}
```

6406531285990. ✖

```
if(X.Gender == 'F'){
    A = 1
}
if(X.Physics >= 75){
    B = 1
}
if((A + B) > 1){
    count = count + 1
}
```

6406531285991. ✖

```
A = 0, B = 0
if(X.Gender == 'F'){
    A = 1
}
if(X.Physics >= 75){
    B = 1
}
if((A + B) > 1){
    count = count + 1
}
```

6406531285992. ✔

6406531285993. ✔

```
A = 0, B = 1
if(X.Gender == 'F'){
    A = 1
}
if(X.Physics < 75){
    B = 0
}
if((A + B) > 1){
    count = count + 1
}
```

Question Number : 45 Question Id : 640653386698 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 “Scores” dataset. At the end of the execution, **A** captures the number of students who are male from Bengaluru or have scored less marks in Physics than the average Physics marks. Assume that the variable **Avg** holds the value of the average Physics marks. But the pseudocode may have mistakes. Identify all such mistakes (if any). Assume that all statements not listed in the options below are free of errors.

It is a Multiple Select Question (MSQ).

```
1  A = 0
2  while(Table 1 has more rows){
3      Read the first row X in Table 1
4      C = False, D = False
5      if(X.Gender == 'M' or X.CityTown == "Bengaluru"){
6          C = True
7      }
8      if(X.Physics > Avg){
9          D = True
10     }
11     if(C or D){
12         A = A + 1
13     }
14     Move X to Table 2
15 }
```

Options :

6406531285994. ✔ Line 5

6406531285995. ✔ Line 8

6406531285996. ✖ Line 11

6406531285997. ✖ Line 12

6406531285998. ✖ No error in the code

Question Number : 46 Question Id : 640653386699 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 “Scores” dataset. At the end of the execution, **count** captures the number of pairs of students having either same gender or from the same city but not both. Choose the correct code fragment to complete the pseudocode.

It is a Multiple Select Question (MSQ).

```
count = 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
        count = count + findPair(X, Y)
    }
    Move all rows from Table 3 to Table 1
}
Procedure findPair(X, Y)
    **************************
    ***** Fill the code ******
    **************************
End findPair
```

Options :

```
A = 0, B = 0
if(X.Gender == Y.Gender or X.CityTown == Y.CityTown){
    A = A + 1
}
if(X.Gender == Y.Gender and X.CityTown == Y.CityTown){
    B = B + 1
}
return(A-B)
```

6406531285999. ✔

```
A = 0, B = 0
if(X.Gender == Y.Gender and X.CityTown == Y.CityTown){
    A = A + 1
}
if(X.Gender == Y.Gender or X.CityTown == Y.CityTown){
    B = B + 1
}
return(A-B)
```

6406531286000. ✖

6406531286001. ✔

```
A = False, B = False
if(X.Gender == Y.Gender){
    A = True
}
if(X.CityTown == Y.CityTown){
    B = True
}
if((A and not B) or (not A and B)){
    return(1)
}
return(0)
```

```
A = False, B = False
if(X.Gender == Y.Gender){
    A = True
}
if(X.CityTown == Y.CityTown){
    B = True
}
if((A or not B) and (not A or B)){
    return(1)
}
return(0)
```

6406531286002. ✖

Question Number : 47 Question Id : 640653386700 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. Assume that Table 1 contains all the books authored by "Narayan" only. Also assume that the "Year" field of each book item is distinct in the Table.

```
Procedure groupBooks(Table 1)
    A = 0, B = 0
    while(Table 1 has more rows){
        Read the first row Z from Table 1
        if(Z.Year > A){
            A = Z.Year
            B = Z.SeqNo
        }
        Move Z to Table 2
    }
    while(Table 2 has more rows){
        Read the first row K from Table 2
        if(K.SeqNo == B){
            Move K to Table 3
        }
        else{
            Move K to Table 4
        }
    }
End groupBooks
```

Which of the following statement(s) are correct at the end of execution of this pseudocode?

It is a Multiple Select Question (MSQ).

Options :

6406531286003. ✔ Table 2 will be empty

6406531286004. ✔ Table 3 will have one record corresponding to the most recently published book of "Narayan".

6406531286005. ✖ Table 3 will have one record corresponding to the earliest published book of "Narayan".

6406531286006. ✖ Table 4 will have one record corresponding to the earliest published book of "Narayan".

6406531286007. ✖ Table 4 will have one record corresponding to the most recently published book of "Narayan".

Question Number : 48 Question Id : 640653386701 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 procedure **countGirls** is executed using the "Scores" dataset which counts the number of girls who have got less than the subject-wise average marks in at least one of the three subjects. Assume that the subject-wise average marks for Physics, Chemistry and Mathematics are stored in variables **P**,**C** and **M** respectively. Choose the correct code fragment(s) to complete the procedure.

It is a Multiple Select Question (MSQ).

```
Procedure countGirls(P,C,M)
    count = 0
    while(Table 1 has more rows){
        Read the first row X from Table 1
        ************************
        ****Fill in the code****
        ************************
        Move X to Table 2
    }
    return(count)
End countGirls
```

Options :

```
if(X.Gender == 'F'){
    if(X.Mathematics < M or X.Physics < P or X.Chemistry < C){
        count = count + 1
    }
}
```

6406531286008. ✔

```
if(X.Gender == 'F'){
    if(not(X.Mathematics >= M and X.Physics >= P and X.Chemistry >= C)){
        count = count + 1
    }
}
```

6406531286009. ✔

```
if(X.Gender == 'F' and (X.Mathematics < M or X.Physics < P or X.Chemistry <
C)){
    count = count + 1
}
```

6406531286010. ✔

```
if(X.Gender == 'F' and (X.Mathematics < M and X.Physics < P and X.Chemistry < C)){
    count = count + 1
}
```

6406531286011.

Sub-Section Number :	7
Sub-Section Id :	64065355332
Question Shuffling Allowed :	No

Question Id : 640653386702 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 : (49 to 50)

Question Label : Comprehension

Answer the given subquestions.

Sub questions

Question Number : 49 Question Id : 640653386703 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 “Olympics” dataset. Procedure **doSomething** accepts a Table of rows which contains rows of same player. Assume that every player has won at least two medals and only one medal in any year. What will **(B-A)** represent at the end of the execution?

```
Procedure doSomething(Table T1)
    A = 2030, B = 2030
    while(Table T1 has more rows){
        Read the first row Z from Table T1
        if(Z.Year < A){
            B = A
            A = Z.Year
        }
        if(Z.Year > A and Z.Year < B){
            B = Z.Year
        }
        Move the row Z to Table T2
    }
    return((B - A))
End doSomething
```

Options :

6406531286012. ✔ Year gap between first and second medal won by a player

6406531286013. ✖ Year gap between first and latest medal won by a player

6406531286014. ✖ Year gap between latest and second latest medal won by a player

6406531286015. ✖ Year gap between first and second latest medal won by a player

Question Number : 50 Question Id : 640653386704 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 on the "Olympics" dataset. Use the procedure **doSomething** in the previous question. What will **count** represent at the end of the execution? Assume that every player has won at least two medals and only one medal in a year.

```
count = 0, max = 0
while(Table 1 has more rows){
    Read the first row X from Table 1
    Move the row X to Table 2
    while(Table 1 has more rows){
        Read the first row Y from Table 1
        if(X.Name == Y.Name){
            Move the row Y to Table 2
        }
        else{
            Move the row Y to Table 3
        }
    }
    diff = doSomething(Table 2)
    if(diff == max){
        count = count + 1
    }
    if(diff > max){
        max = diff
        count = 1
    }
    Delete all the rows from Table 2
    Move all the rows from Table 3 to Table 1
}
```

Options :

6406531286016. ✔ Number of players with maximum year gap between first and second medal

6406531286017. ✖ Number of players with minimum year gap between first and second medal

6406531286018. ✖ Number of players with maximum year gap between latest and second latest medal

6406531286019. ✖ Number of players with minimum year gap between latest and second latest medal

Intro to Python

Section Id :	64065323900
Section Number :	4
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	14

Number of Questions to be attempted :	14
Section Marks :	50
Display Number Panel :	Yes
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	64065355333
Question Shuffling Allowed :	No

Question Number : 51 Question Id : 640653386705 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 "FOUNDATION LEVEL:SEMESTER 2/DIRECT ENTRY DIPLOMA : 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 :

6406531286020. ✔ YES

6406531286021. ✖ NO

Sub-Section Number :	2
Sub-Section Id :	64065355334
Question Shuffling Allowed :	Yes

Question Number : 52 Question Id : 640653386706 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

E1 and **E2** are Boolean expressions. Consider the following expression:

```
not(E1 and E2) != (not E1 or not E2)
```

What can you say about the value of the expression given above?

Options :

6406531286022. ✖ It is **True** if and only if **E1** and **E2** have different values

6406531286023. ✖ It is **False** if and only if **E1** and **E2** have the same value

6406531286024. ✖ It is always **True**

6406531286025. ✔ It is always **False**

Question Number : 53 Question Id : 640653386707 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:

```
a, b, c, d = input()
d = 3
print((a + b + c) * d)
```

What will be the output of the code given above for the following input ?

Input

```
1234
```

Options :

6406531286026. ✔

```
123123123
```

6406531286027. ✖

```
18
```

6406531286028. ✖

```
24
```

6406531286029. ✖

```
492
```

6406531286030. ✖

```
123412341234
```

Question Number : 54 Question Id : 640653386709 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 will be 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 :

6406531286035. ✖ n^2

6406531286036. ✖ $n(n+1)$

6406531286037. ✖ $n(n+1)/2$

6406531286038. ✔ $n(n-1)/2$

Sub-Section Number : 3

Sub-Section Id : 64065355335

Question Shuffling Allowed : Yes

Question Number : 55 Question Id : 640653386710 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

What will be the output of the code snippet given below?

```
L = [-1, 1]
for i in range(8):
    size = len(L)
    value = L[size - 2] + L[size - 1]
    L.append(value)
print(L)
```

Options :

6406531286039. ✔

```
[-1, 1, 0, 1, 1, 2, 3, 5, 8, 13]
```

6406531286040. ✖

```
[0, 1, 1, 2, 3, 5, 8, 13, 21, 34]
```

6406531286041. ✖

```
[1, 1, 2, 3, 5, 8, 13, 21, 34, 55]
```

6406531286042. ✖

```
[-1, -1, -2, -3, -5, -8, -13, -21, -34, -55]
```

Question Number : 56 Question Id : 640653386712 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 **n** is a positive integer, what is the output of the following code? Assume that natural numbers start from 1, that is, 0 is not a natural number.

```
a = 0
for i in range(1, n + 1):
    b = 1
    for j in range(1, i + 1):
        b = b * j
    a = a + b
print(a)
```

Options :

6406531286047. ✖ Sum of the first **n** natural numbers

6406531286048. ✖ Product of the first **n** natural numbers

6406531286049. ✔ Sum of the factorial of the first **n** natural numbers

6406531286050. ✖ Factorial of the sum of the first **n** natural numbers

Question Number : 57 Question Id : 640653386713 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

L is a non-empty list of positive integers that is already defined. Consider the following snippet of code:

```
flag1, flag2 = True, True
for i in range(1, len(L)):
    if L[i] > L[i - 1]:
        flag2 = False
    elif L[i] < L[i - 1]:
        flag1 = False
if flag1:
    print('one')
elif flag2:
    print('two')
else:
    print('three')
```

What is the output of the code if L = [394, 289, 120, 79, 50, 27, 15] ?

Options :

6406531286051. ✖
```
one
```

6406531286052. ✔
```
two
```

6406531286053. ✖
```
three
```

6406531286054. ✖
```
four
```

Sub-Section Number :	4
Sub-Section Id :	64065355336
Question Shuffling Allowed :	Yes

Question Number : 58 Question Id : 640653386708 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

T is a positive integer that represents the temperature in degree Celsius. Consider the following snippet of code:

```
if 0 < T <= 15:
    print('freezing')
elif 15 < T <= 25:
    print('cold')
elif 25 < T <= 30:
    print('warm')
else:
    print('hot')
```

Two snippets of code are equivalent if they produce the same output for any given input. Select all snippets of code that are equivalent to the code given above.

Options :

```
if 0 < T <= 15:
    print('freezing')
if 15 < T <= 25:
    print('cold')
if 25 < T <= 30:
    print('warm')
if T > 30:
    print('hot')
```

6406531286031. ✔

```
if 0 < T <= 15:
    print('freezing')
if 15 < T <= 25:
    print('cold')
if 25 < T <= 30:
    print('warm')
else:
    print('hot')
```

6406531286032. ✖

6406531286033. ✔

```python
if 0 < T <= 15:
    print('freezing')
elif 15 < T <= 25:
    print('cold')
elif 25 < T <= 30:
    print('warm')
elif T > 30:
    print('hot')
```

```python
if 0 < T <= 15:
    print('freezing')
if 15 < T <= 25:
    print('cold')
if 25 < T <= 30:
    print('warm')
else T > 30:
    print('hot')
```

6406531286034. ✖

Sub-Section Number : 5

Sub-Section Id : 64065355337

Question Shuffling Allowed : Yes

Question Number : 59 Question Id : 640653386711 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Select Question

Which of the following options print "Welcome to Python Quiz!" on **n** separate lines? Here, **n** is a positive integer that has already been defined. Your answer should be applicable for any positive integer.

Sample output for n = 5

```
Welcome to Python Quiz!
Welcome to Python Quiz!
Welcome to Python Quiz!
Welcome to Python Quiz!
Welcome to Python Quiz!
```

Options :

6406531286043. ✖

```
print('Welcome to Python Quiz!')
print('Welcome to Python Quiz!')
print('Welcome to Python Quiz!')
print('Welcome to Python Quiz!')
print('Welcome to Python Quiz!')
```

6406531286044. ✔

```
for i in range(n, 2 * n):
    print('Welcome to Python Quiz!')
```

6406531286045. ✖

```
for i in range(1, n):
    print('Welcome to Python Quiz!')
```

6406531286046. ✔

```
for i in range(n):
    print('Welcome to Python Quiz!')
```

Question Number : 60 Question Id : 640653386715 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

Reverse a sentence based on words. The ith word from the left in the input sentence is the ith word from the end in the output sentence.

Consider following example:

```
sentence = "i know how to code in python"
modified_sentence = "python in code to how know i"
```

Choose all the options that accepts a sentence as input and prints the modified sentence.

Options :

6406531286056. ✔

```python
sentence = input()
words = sentence.split(' ')
n = len(words)
for i in range(n - 1, 0, -1):
    print(words[i] + ' ', end = '')
print(words[0])
```

6406531286057. ✖

```python
sentence = input()
words = sentence.split(' ')
n = len(words)
for i in range(n - 1, -2, -1):
    print(words[i] + ' ', end = '')
```

6406531286058. ✖

```python
sentence = input()
words = sentence.split(' ')
n = len(words)
for i in range(n - 1, -1, -1):
    print(words[i] + ' ', end = '')
print(words[0])
```

6406531286059. ✔

```python
words = sentence.split(' ')
n = len(words)
for i in range(n - 1):
    print(words[n - i - 1], end = ' ')
print(words[0])
```

Question Number : 61 Question Id : 640653386716 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.

```
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 :

6406531286060. ✔

```
[[1, 2, 3], [2, 5, 4], [3, 4, 6]]
```

6406531286061. ✔

```
[[1, 5, 3, 4], [5, 1, 4, 6], [3, 4, 2, 8], [4, 6, 8, 3]]
```

6406531286062. ✖

```
[[1, 2, 3], [0, 5, 4], [3, 4, 6]]
```

6406531286063. ✖

```
[[1, 5, 3, 6], [5, 1, 4, 6], [3, 4, 2, 8], [4, 6, 8, 3]]
```

Sub-Section Number :	6
Sub-Section Id :	64065355338
Question Shuffling Allowed :	Yes

Question Number : 62 Question Id : 640653386717 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

For what values of **a**, **b** and **c** does the code given below print a sequence which has **0** as one of the elements?

```
for i in range(a, b, c):
    print(i)
```

Options :

6406531286064. ✔

```
a = 10, b = -1, c = -1
```

6406531286065. ✔

```
a = -10, b = 1, c = 1
```

6406531286066. ✖

```
a = 10, b = -2, c = 0
```

6406531286067. ✖

```
a = 10, b = -2, c = 1
```

Question Number : 63 Question Id : 640653386718 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

Select all snippets of code that print the following sequence of **n** lines, where **n** is a positive integer that is already defined. The **i**th line in the output corresponds to the first **i** Fibonacci numbers, for $1 \leq i \leq n$. Assume that 0 and 1 are the first two Fibonacci numbers. There should be a single space after every number. Specifically, there should be a single space after the last number in any given line.

Sample output for n = 7

```
0
0 1
0 1 1
0 1 1 2
0 1 1 2 3
0 1 1 2 3 5
0 1 1 2 3 5 8
```

Options :

```
L = [0, 1]
for i in range(n - 2):
    L.append(L[-1] + L[-2])
for i in range(1, n + 1):
    for j in range(i):
        print(L[j], end = ' ')
    print()
```

6406531286068. ✔

```
i = 0
L = []
while i < n:
    if i == 0:
        L.append(0)
    elif i == 1:
        L.append(1)
    else:
        L.append(L[-1] + L[-2])
    i += 1
    for j in range(i):
        print(L[j], end = ' ')
    print()
```

6406531286069. ✔

6406531286070. ✖

```python
i = 0
L = []
while i <= n:
    if i == 0:
        L.append(0)
    elif i == 1:
        L.append(1)
    else:
        L.append(L[-1] + L[-2])
    i += 1
    for j in range(i):
        print(L[j], end = ' ')
    print()
```

6406531286071. ✔

```python
L = [0, 1]
for i in range(n):
    L.append(L[-1] + L[-2])
for i in range(1, n + 1):
    for j in range(i):
        print(L[j], end = ' ')
    print()
```

Sub-Section Number :	7
Sub-Section Id :	64065355339
Question Shuffling Allowed :	Yes

Question Number : 64 Question Id : 640653386714 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

R is a zero-matrix (all entries are zeros) of size 3 x 3 and

$$P = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}, Q = \begin{bmatrix} 1 & -1 & 1 \\ 1 & -1 & 1 \\ 1 & -1 & 1 \end{bmatrix}$$

What is the output of the following snippet of code?

```
val = 0
for i in range(3):
    for j in range(3):
        R[i][j] = P[i][j] * Q[i][j]
        val = val + R[i][j]
print(val)
```

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 :

15

DBMS

Section Id :	64065323901
Section Number :	5
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	16
Number of Questions to be attempted :	16
Section Marks :	50
Display Number Panel :	Yes
Group All Questions :	No

Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	64065355340
Question Shuffling Allowed :	No

Question Number : 65 Question Id : 640653386719 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL: DATABASE MANAGEMENT SYSTEMS"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?
CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

(IF IT IS NOT THE CORRECT SUBJECT, PLS CHECK THE SECTION AT THE TOP FOR THE SUBJECTS REGISTERED BY YOU)

Options :

6406531286072. ✔ YES

6406531286073. ✖ NO

Sub-Section Number :	2
Sub-Section Id :	64065355341
Question Shuffling Allowed :	Yes

Question Number : 66 Question Id : 640653386729 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 SQL query.

```
SELECT emp_name FROM employees WHERE salary > 20000
```

Which among the following steps of query processing will convert the above query to the given relational algebra expression?

$$\Pi_{emp_name}(\sigma_{salary>20000}(employees))$$

Options :

6406531286105. ✖ Evaluation Engine

6406531286106. ✔ Parser and Translator

6406531286107. ✖ Optimizer

6406531286108. ✖ Execution Plan

Question Number : 67 Question Id : 640653386733 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

An organization called **Super Kids** offers educational and recreational opportunities for disabled children. The details of all the students have been added to Table **Students**. In the case that a student leaves the school, their names and details are removed from the table. Which among the following categories of SQL commands is used for removing the records from the table?

Options :

6406531286121. ✖ DDL

6406531286122. ✔ DML

6406531286123. ✖ DCL

6406531286124. ✖ TCL

Sub-Section Number : 3

Sub-Section Id : 64065355342

Question Shuffling Allowed : Yes

Question Number : 68 Question Id : 640653386728 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 E-R diagram as shown in figure 1:

Figure 1: ER-Diagram

Which among the following is the correct relational schema for the given ER Diagram?

Options :

6406531286101. ✔ Student(*student_num*, *student_name*, *course_num*)
Course(*course_num*,*course_name*)

6406531286102. ✖ Student(*student_num*, *student_name*)
Course(*course_num*, *course_name*)

6406531286103. ✖ Student(*student_num*, *student_name*)
Course(*course_num*, *course_name*, *student_name*)

6406531286104. ✖ Student(*student_num*, *student_name*, *course_num*)
Course(*course_num*, *course_name*, *student_num*)

Question Number : 69 Question Id : 640653386731 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 insurance(*ins_id, company_name, ins_type, ratings*) shown in Figure 3.

ins_id	company_name	ins_type	ratings
I0001	Naturol	Health	5
I0002	Prismz	Health	4
I0003	Mind Free	Education	2
I0004	Capevirgo	Life-Term	3

Figure 3: insurance

Which among the following options will be the correct output for the given query?

```
SELECT 'Good' AS no_of_goodcompanies
FROM insurance
WHERE ratings >= 3
```

Options :

Output:

no_of_goodcompanies
Naturol
Prismz
Capevirgo

6406531286113. ✖

Output:

no_of_goodcompanies
Good
Good
Good

6406531286114. ✔

6406531286115. ✖

Output:

no_of_goodcompanies
Naturol
Prismz
Mind Free
Capevirgo

Output:

no_of_goodcompanies

6406531286116. ✖

Question Number : 70 Question Id : 640653386732 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 relational schemas.

employee(*emp_id, emp_name, dob, dept_id, desg_id*)
department(*dept_id, dept_name*)
designation(*desg_id, desg_name, salary*)

Choose the correct options to fill in the blanks of the given query so that it returns the highest salary in 'Computer Science' department.

```
SELECT ___A___(de.salary)
FROM employee AS e
INNER JOIN department AS d ON e.dept_id = d.dept_id
INNER JOIN designation AS de ON e.desg_id = de.desg_id
___B___ BY d.dept_name
___C___ d.dept_name = 'Computer Science'
```

Options :

6406531286117. ✖ A:MAX, B:GROUP, C:WHERE

6406531286118. ✔ A:MAX, B:GROUP, C:HAVING

6406531286119. ✖ A:MAX, B:ORDER, C:WHERE

6406531286120. ✖ A:MAX, B:ORDER, C:HAVING

Sub-Section Number : 4

Sub-Section Id : 64065355343

Question Shuffling Allowed : Yes

Question Number : 71 Question Id : 640653386727 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 Table 4 and Table 5.

a	b	c
a1	b1	c1
a2	b2	c2
a3	b3	c3
a4	b4	c4

Table 4: Alpha

c	d	e
c1	d1	e1
c2	d2	e2
c1	d1	e3
c2	d4	e4

Table 5: Beta

Find out the number of tuples returned by the following relational algebra expression.
$(\text{Alpha} \bowtie \text{Beta}) \div \Pi_{c,d}(\text{Beta})$

Choose the correct option.

Options :

6406531286097. ✔ 0

6406531286098. ✖ 1

6406531286099. ✖ 2

6406531286100. ✖ 3

Question Number : 72 Question Id : 640653386730 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 relation **customers**(*cus_id*, *cus_name*, *credit_score*) shown in Figure 2.

cus_id	cus_name	credit_score
C001	Suresh	200
C002	Naksh	180
C003	Ramesh	270
C004	Ram	300
C005	Pratik	400
C006	Lokesh	350

Figure 2: **customers**

Which among the following queries will return the output given below?

cus_id	creditscore
C001	100
C006	175
C003	135

Options :

```
SELECT cus_id, credit_score/2 AS creditscore
FROM customers
WHERE cus_name LIKE '%e%'
ORDER by cus_name desc
```

6406531286109. ✖

6406531286110. ✖

```
SELECT cus_id, credit_score/2 AS creditscore
FROM customers
WHERE cus_name NOT LIKE '%esh'
AND cus_name LIKE '%a%'
```

6406531286111. ✔

```
SELECT cus_id, credit_score/2 AS creditscore
FROM customers
WHERE cus_name NOT LIKE '_r%'
AND cus_name LIKE '%es%'
```

6406531286112. ✖

```
SELECT cus_id, credit_score/2 AS creditscore
FROM customers
WHERE cus_name NOT LIKE '%e_'
ORDER by cus_name asc
```

Question Number : 73 Question Id : 640653386734 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 two relational schemas **Faculty**(*f_id, name, dept_name*) and **Student** (*s_id, name, dept_name*) as shown in the Figure 4.

f_id	name	dept_name
F001	Marry	Biology
F003	Abhi	Zoology
F007	Harry	Physics
F002	Sunil	Biology
F009	Rose	Zoology

s_id	name	dept_name
S001	Shima	Physics
S002	Rose	Zoology
S003	Henry	Zoology
S004	Abhi	Biology
S005	Abhi	Physics

Figure 4: **Faculty and Student**

What will be the total numbers of tuples resulting from the following relational algebra expression?

$$\Pi_{name,dept_name}(Faculty \bowtie Student)$$

Options :

6406531286125. ✖ 3

6406531286126. ✖ 2

6406531286127. ✔ 1

6406531286128. ✖ 4

Sub-Section Number : 5

Sub-Section Id : 64065355344

Question Shuffling Allowed : Yes

Question Number : 74 Question Id : 640653386723 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 SQL statement:

```
CREATE TABLE Student(
        Roll_no varchar(8) primary key,
        Name varchar(10),
        Dept_name varchar(10),
        Semester varchar(10),
        check (Semester in ('Fall', 'Winter', 'Summer')));
```

Identify the correct INSERT statement for table **Student**.

Options :

6406531286083. ✔ `INSERT INTO Student values('CS101','Rakesh','CS','Winter')`

6406531286084. ✔ `INSERT INTO Student(Roll_no,Name,Dept_name,Semester) values('CS102','Ram','CS','Summer')`

6406531286085. ✖ `INSERT INTO Student(Roll_no,Name,Dept_name,Semester) values('CS104','Shyam','CS','Spring')`

6406531286086. ✖ `INSERT INTO Student ('CS106','Mohan','CS','Winter')`

Sub-Section Number : 6

Sub-Section Id : 64065355345

Question Shuffling Allowed : Yes

Question Number : 75 Question Id : 640653386720 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 relational schema given below.
student(*roll_no*, *name*, *house_name*)

Which of the following queries will return the student's name and number of students in their respective houses?

Options :

6406531286074. ✖

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

6406531286075. ✔

```
SELECT e.name AS student_name, dc.house_count AS  count
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;
```

6406531286076. ✖

```
WITH house_count AS (select
house_name, COUNT(*) AS house_count FROM student
GROUP BY house_name)

SELECT e.name AS student_name , dc.house_count AS count
FROM student e, house_count dc
WHERE e.name = dc.name;
```

6406531286077. ✔

```
WITH house_count AS (select
house_name, COUNT(*) AS house_count FROM student
GROUP BY house_name)

SELECT e.name AS student_name , dc.house_count AS count
FROM student e, house_count dc
WHERE e.house_name = dc.house_name;
```

Question Number : 76 Question Id : 640653386721 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Select Question

Consider the relation bike(*name*, *model*, *price*).
Assume that no two bikes have the same price.
Choose the appropriate query/queries to find the names of four most expensive bikes.

Options :

6406531286078. ✖

```
SELECT name  FROM bike
ORDER BY price
FETCH FIRST 4 ROWS ONLY
```

6406531286079. ✔

```
SELECT name  FROM bike
ORDER BY price DESC
FETCH FIRST 4 ROWS ONLY
```

6406531286080. ✔

```
SELECT name FROM bike a
WHERE
(SELECT COUNT(price)
FROM bike b
WHERE b.price>a.price)<4
```

6406531286081. ✖

```
SELECT name FROM bike a
WHERE
(SELECT COUNT(price)
FROM bike b
WHERE b.price>a.price)>4
```

Question Number : 77 Question Id : 640653386725 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Select Question

Consider the following relations:

auto_part($\underline{pid}$, $pname$, $color$)
auto_suppliers($\underline{sid}$, $sname$, $location$)
catalog($\underline{pid, sid}$, $price$)

Choose the correct relational algebra expressions to find the suppliers ID (sid) who supply auto parts of both the 'Red' and 'Black' colors.

Options :

6406531286088. ✖ $\Pi_{sid}(\sigma_{color='Red'}(auto_part \bowtie catalog)) \wedge \Pi_{sid}(\sigma_{color='Black'}(auto_part \bowtie catalog))$

6406531286089. ✖ $\Pi_{sid}(\sigma_{color='Red' \wedge color='Black'}(auto_part \bowtie catalog))$

6406531286090. ✔ $\Pi_{sid}(\sigma_{color='Red'}(auto_part \bowtie catalog)) \cap \Pi_{sid}(\sigma_{color='Black'}(auto_part \bowtie catalog))$

6406531286091. ✖ $\Pi_{sid}(\sigma_{color='Red'}(auto_part \bowtie auto_suppliers)) \cup \Pi_{sid}(\sigma_{color='Black'}(auto_part \bowtie auto_suppliers))$

6406531286092. ✖ $\Pi_{sid}(\sigma_{color='Red'}(auto_part \bowtie auto_suppliers)) \cap \Pi_{sid}(\sigma_{color='Black'}(auto_part \bowtie catalog))$

Question Number : 78 Question Id : 640653386726 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Select Question

Consider the following relations:
auto_part($\underline{pid}, pname, color$)
auto_suppliers($\underline{sid}, sname, location$)
catalog($\underline{pid, sid}, price$)

TRC

1. $\{x \mid \exists s \in auto_suppliers\ \exists c \in catalog\ \exists p \in auto_part(s.location = \text{'}Mumbai\text{'} \wedge c.price = 5000 \wedge x.sid = c.sid \wedge x.pname = p.pname \wedge s.sid = c.sid \wedge p.pid = c.pid)\}$
2. $\{x \mid \exists p \in auto_parts\ \exists c \in catalog(p.pname = \text{'}Suspension\text{'} \wedge c.price = 5000 \wedge x.pid = p.pid \wedge p.pid = c.pid)\}$
3. $\{x \mid \exists p \in auto_parts\ \exists c \in catalog\ \exists s \in auto_suppliers(p.pname = \text{'}Suspension\text{'} \wedge c.price = 5000 \wedge x.pid = p.pid \wedge x.sname = s.sname \wedge p.pid = c.pid \wedge s.sid = c.sid)\}$
4. $\{x \mid \exists s \in auto_suppliers\ \exists c \in catalog(s.location = \text{'}Mumbai\text{'} \wedge c.price = 5000 \wedge x.sid = c.sid \wedge s.sid = c.sid)\}$

DRC

a. $\{< m > \mid \exists m, n, o(< m, n, o > \in auto_parts \wedge n = \text{'}Suspension') \wedge \exists a, b, c(< a, b, c > \in catalog \wedge c = 5000 \wedge m = a)\}$
b. $\{< p > \mid \exists p, q, r(< p, q, r > \in auto_suppliers \wedge r = \text{'}Mumbai') \wedge \exists a, b, c(< a, b, c > \in catalog \wedge c = 5000 \wedge p = b)\}$
c. $\{< p > \mid \exists p, q, r(< p, q, r > \in auto_suppliers \wedge r = \text{'}Mumbai') \wedge \exists a, b, c(< a, b, c > \in catalog \wedge c = 5000)\}$
d. $\{< m > \mid (< m, n, o > \in auto_parts \wedge n = \text{'}Suspension') \wedge (< a, b, c > \in catalog \wedge c = 5000 \wedge m = a)\}$
e. $\{< p, n > \mid \exists m, n, o(< m, n, o > \in auto_parts) \wedge \exists p, q, r(< p, q, r > \in auto_suppliers \wedge r = \text{'}Mumbai') \wedge \exists a, b, c(< a, b, c > \in catalog \wedge c = 5000 \wedge m = a \wedge p = b)\}$
f. $\{< m, q > \mid \exists m, n, o(< m, n, o > \in auto_parts \wedge n = \text{'}Suspension') \wedge \exists p, q, r(< p, q, r > \in auto_suppliers) \wedge \exists a, b, c(< a, b, c > \in catalog \wedge c = 5000 \wedge m = a \wedge p = b)\}$
g. $\{< p, n > \mid \exists m, n, o(< m, n, o > \in auto_parts) \wedge \exists p, q, r(< p, q, r > \in auto_suppliers \wedge r = \text{'}Mumbai') \wedge \exists a, b, c(< a, b, c > \in catalog \wedge c = 5000)\}$
h. $\{< m, q > \mid \exists m, n, o(< m, n, o > \in auto_parts \wedge n = \text{'}Suspension') \wedge \exists p, q, r(< p, q, r > \in auto_suppliers) \wedge \exists a, b, c(< a, b, c > \in catalog \wedge c = 5000)\}$

Match the TRC expression to its correct equivalent DRC expression.

Options :

6406531286093. ✖ 1-e, 2-d, 3-f, 4-c

6406531286094. ✔ 1-e, 2-a, 3-f, 4-b

6406531286095. ✖ 1-g, 2-a, 3-h, 4-b

6406531286096. ✖ 1-g, 2-d, 3-h, 4-c

Sub-Section Number : 7

Sub-Section Id : 64065355346

Question Shuffling Allowed : Yes

Question Number : 79 Question Id : 640653386722 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 Table 1 and predict the output of the query that follows.

id	name	dept_name	salary
10101	Srinivasan	Comp. Sci.	65000.00
12121	Wu	Finance	90000.00
15151	Mozart	Music	40000.00
22222	Einstein	Physics	95000.00
32343	El Said	History	60000.00
33456	Gold	Physics	87000.00
45565	Katz	Comp. Sci.	75000.00
58583	Califieri	History	62000.00
76543	Singh	Finance	80000.00
76766	Crick	Biology	72000.00
83821	Brandt	Comp. Sci.	92000.00
98345	Kim	Elec. Eng.	80000.00

Table 1: **instructor**

```
SELECT COUNT(*) FROM instructor AS a
WHERE a.salary > SOME(SELECT b.salary
                 FROM instructor AS b
                 where b.dept_name='Biology')
AND a.salary  >  ALL(SELECT c.salary
                 FROM instructor AS c
                 WHERE c.dept_name='Accountancy');
```

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 :

7

Sub-Section Number :	8
Sub-Section Id :	64065355347
Question Shuffling Allowed :	Yes

Question Number : 80 Question Id : 640653386724 Question Type : SA Calculator : None

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

Correct Marks : 4

Question Label : Short Answer Question

Consider the following relations as shown in Table 2 and Table 3

shop_no	name
SH01	Tea stall
SH02	Modern Store
SH03	Balaji Store
SH04	Modern Store

Table 2: **Shop**

shop_no	item_name	price
SH01	Sugar	200
SH01	Tea leaf	500
SH02	Cookies	800
SH02	Namkeen	400
SH03	Mustard oil	700
SH04	Cookies	500

Table 3: **Shop_order**

```
SELECT name,AVG(price)
FROM Shop
NATURAL JOIN
Shop_order
GROUP BY name
HAVING AVG(price)>400
```

The number of tuples returned by the above SQL query.

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

PDSA

Section Id :	64065323902
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 :	64065355348
Question Shuffling Allowed :	No

Question Number : 81 Question Id : 640653386735 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL: PROGRAMMING, DATA STRUCTURES AND ALGORITHMS USING PYTHON"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?
CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

(IF IT IS NOT THE CORRECT SUBJECT, PLS CHECK THE SECTION AT THE TOP FOR THE SUBJECTS REGISTERED BY YOU)

Options :

6406531286129. ✔ YES

6406531286130. ✖ NO

Sub-Section Number :	2

Sub-Section Id : 64065355349

Question Shuffling Allowed : Yes

Question Number : 82 Question Id : 640653386736 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

```
def fun(m,n):
    if m == n:
        return n
    else:
        if m > n:
            return fun(m-n, n)
        else:
            return fun(m, n-m)
```

What does the function `fun` compute?

Options :

6406531286131. ✖ `m + n` using repeated subtraction

6406531286132. ✖ `m mod n` using repeated subtraction

6406531286133. ✔ The greatest common divisor of `m` and `n`

6406531286134. ✖ The least common multiple of `m` and `n`

Question Number : 83 Question Id : 640653386737 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

```python
def prime_bad(n):
  if n < 2:
    return False
  for i in range(2, int(n**0.5)):
    if n % i == 0:
      return False
  return True
```

Here is a function `prime_bad` that takes a positive integer `n` as input and returns `True` if the number is prime and `False` otherwise. There is an error in this function. For which of the following input values of `n`, does function `prime_bad` return an **incorrect** output?

Options :

6406531286135. ✖ 36

6406531286136. ✖ 29

6406531286137. ✔ 49

6406531286138. ✖ 37

Question Number : 84 Question Id : 640653386738 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

$$f1(n) = 30n^2 + 6n$$

$$f2(n) = 5n + (\log n)^2$$

$$f3(n) = 2\log(\log n)$$

$$f4(n) = 10\log n$$

$$f5(n) = 7n\log n + 20$$

Arrange the above functions in increasing order of asymptotic complexity.

Options :

6406531286139. ✖ $f3(n), f4(n), f2(n), f1(n), f5(n)$

6406531286140. ✖ $f3(n), f2(n), f1(n), f5(n), f4(n)$

6406531286141. ✔ $f3(n), f4(n), f2(n), f5(n), f1(n)$

6406531286142. ✖ $f4(n), f3(n), f2(n), f1(n), f5(n)$

Question Number : 85 Question Id : 640653386739 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 list `L` of tuples `[(7, 8, 1), (3, 7, 5), (7, 9, 5), (6, 9, 5), (7, 6, 1), (9, 9, 0)]`. The following `sort` function is executed on the list `L`.

```
def sort(L):
    n = len(L)
    if n < 1:
        return(L)
    for i in range(n):
        j = i
        while(j > 0 and L[j][2] < L[j-1][2]):
            (L[j],L[j-1]) = (L[j-1],L[j])
            j = j - 1
    return(L)
```

Which of the following list is returned by the function `sort(L)`?

Options :

6406531286143. ✖ `[(9, 9, 0), (7, 8, 1), (7, 6, 1), (6, 9, 5), (3, 7, 5), (7, 9, 5)]`

6406531286144. ✖ `[(9, 9, 0), (7, 6, 1), (7, 8, 1), (6, 9, 5), (3, 7, 5), (7, 9, 5)]`

6406531286145. ✖ `[(9, 9, 0), (7, 6, 1), (7, 8, 1), (3, 7, 5), (6, 9, 5), (7, 9, 5)]`

6406531286146. ✔ `[(9, 9, 0), (7, 8, 1), (7, 6, 1), (3, 7, 5), (7, 9, 5), (6, 9, 5)]`

Question Number : 86 Question Id : 640653386740 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 an input list `L` of `n` distinct elements, and the aim is to sort it in increasing order. Which of the following statement(s) is/are **true**?

1. Input in increasing order is the worst case for Insertion sort, but not for Quick sort.
2. Input in increasing order is the worst case for Quick sort, but not for Insertion sort.
3. Input in decreasing order is the worst case for both Quick sort and Insertion sort.

Options :

6406531286147. ✖ 1 and 2

6406531286148. ✖ 1 and 3

6406531286149. ✔ 2 and 3

6406531286150. ✖ 1, 2 and 3

Question Number : 87 Question Id : 640653386741 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 list `L` of `n` sorted numbers that are circularly shifted `k` positions to the right.

For example, `[-1,0,3,4,9,12]` is a sorted list.

`[9,12,-1,0,3,4]` : circularly shifted `2` positions to the right.

`[3,4,9,12,-1,0]` : circularly shifted `4` positions to the right.

What will be the complexity of the **most efficient algorithm** to search for the smallest element in `L` for the two cases listed below?

I. Value of `k` is not known.

II. Value of `k` is known.

Options :

6406531286151. ✖ I. $O(n)$, II. $O(1)$

6406531286152. ✖ I. $O(\log n)$, II. $O(\log n)$

6406531286153. ✖ I. $O(n)$, II. $O(\log n)$

6406531286154. ✔ I. $O(\log n)$, II. $O(1)$

Question Number : 88 Question Id : 640653386742 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

```
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` variable that points to the first node of the linked list and a `tail` variable 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 first position of the linked list.
2. Insertion of the new node at the last position 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 above operation can be performed in **constant time** $O(1)$?

Options :

6406531286155. ✖ 1, 2 and 4

6406531286156. ✔ 1, 2 and 3

6406531286157. ✖ 2, 3 and 4

6406531286158. ✖ 1, 2, 3 and 4

Question Number : 89 Question Id : 640653386743 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 hash table of size 10 uses open addressing with hash function `h(k) = k mod 10`, and linear probing. After inserting 6 keys into an empty hash table, the table is as shown below.

Index	Key(k)
0	
1	
2	72
3	23
4	12
5	54
6	36
7	83
8	
9	

Which of the following option **cannot** be a possible order in which the key could have been inserted in the hash table?

Options :

6406531286159. ✖ 23, 36, 72, 12, 54, 83

6406531286160. ✖ 36, 72, 23, 12, 54, 83

6406531286161. ✔ 36, 23, 72, 12, 83, 54

6406531286162. ✖ 36, 23, 72, 12, 54, 83

Question Number : 90 Question Id : 640653386744 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

Select the most appropriate data structure for the following applications.

Application	Data Structure
1. To implement ticket reservation waiting list	a. Array
2. Matrix operations	b. Graph
3. Undo/Redo operation for editor	c. Stack
4. Friend suggestion algorithm for social networking site	d. Queue

Options :

6406531286163. ✔ 1-d, 2-a, 3-c, 4-b

6406531286164. ✖ 1-d, 2-b, 3-c, 4-a

6406531286165. ✖ 1-d, 2-a, 3-b, 4-c

6406531286166. ✖ 1-c, 2-a, 3-d, 4-b

Question Number : 91 Question Id : 640653386745 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 implementation for queue.

```
class Queue:
    def __init__(self):
        self.L = []
    def enqueue(self,v):
        self.L.append(v)
    def isempty(self):
        return(self.L == [])
    def dequeue(self):
        v = None
        if not self.isempty():
            v = self.L.pop(0)
        return(v)
```

```
def fun(Q):
    if (not Q.isempty()):
        i = Q.dequeue()
        fun(Q)
        Q.enqueue(i)
```

Let Q be a queue `[5, 3, 7, 2, 8, 1, 4]` created using the given class `Queue`. What will be the state of the queue after the execution of `fun(Q)`?

Options :

6406531286167. ✖ `[5, 3, 7, 2, 8, 1, 4]`

6406531286168. ✖ `[4, 3, 7, 2, 8, 1, 5]`

6406531286169. ✔ `[4, 1, 8, 2, 7, 3, 5]`

6406531286170. ✖ `[3, 4, 2, 7, 1, 8, 5]`

Question Number : 92 Question Id : 640653386746 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 an undirected connected graph `G` with `7` vertices. Which of the following is a possible listing of the degrees of vertices in graph `G`?

Options :

6406531286171. ✖ 6, 6, 6, 6, 6, 6, 1

6406531286172. ✖ 4, 4, 4, 3, 3, 3, 2

6406531286173. ✔ 5, 4, 3, 3, 2, 2, 1

6406531286174. ✖ 7, 7, 6, 2, 1, 1, 2

Question Number : 93 Question Id : 640653386747 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 *G* be an undirected connected graph and *T* be a breadth-first search tree for G, let *x* and *y* be nodes in *T* belonging to the levels *i* and *j* respectively, and let (*x*,*y*) be an edge of *G*. Then *i* and *j* differ by at most___.

Options :

6406531286175. ✖ 0

6406531286176. ✔ 1

6406531286177. ✖ 2

6406531286178. ✖ 3

Question Number : 94 Question Id : 640653386748 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 G on which **DFS** is executed. `pre` and `post` numbering is used in the DFS algorithm on the graph. In which of the following situations can we conclude that edge `(u,v)` is a **Back edge**?

Options :

6406531286179. ✔ `pre[u] = 3, post[u] = 6, pre[v] = 1, post[v] = 10`

6406531286180. ✖ `pre[u] = 7, post[u] = 8, pre[v] = 4, post[v] = 5`

6406531286181. ✖ `pre[u] = 2, post[u] = 9, pre[v] = 7, post[v] = 8`

6406531286182. ✖ `pre[u] = 2, post[u] = 9, pre[v] = 4, post[v] = 5`

Sub-Section Number : 3

Sub-Section Id : 64065355350

Question Shuffling Allowed : Yes

Question Number : 95 Question Id : 640653386751 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Select Question

Which of the following statement(s) is/are **true** about Breadth First Search (BFS) on an undirected graph?

Options :

6406531286185. ✔ BFS systematically computes reachability in graphs.

6406531286186. ✖ The Time complexity of BFS is $O(mn)$ when Adjacency List is used and $O(m^2)$ when Adjacency Matrix is used, where m represents the number of vertices and n represents the number of edges.

6406531286187. ✖ BFS cannot be used to check for cycles in the graph.

6406531286188. ✔ Paths discovered by BFS are the shortest paths in terms of the number of edges from source to destination.

Sub-Section Number : 4

Sub-Section Id : 64065355351

Question Shuffling Allowed : Yes

Question Number : 96 Question Id : 640653386749 Question Type : SA Calculator : None

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

Correct Marks : 4

Question Label : Short Answer Question

Consider the following DAG

The number of different topological orderings of the vertices of the graph 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 :

8

Question Number : 97 Question Id : 640653386750 Question Type : SA Calculator : None

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

Correct Marks : 4

Question Label : Short Answer Question

A university offers an online learning program in which there are 12 courses in total. The program is divided into **semesters** of 6 months. Students can take any number of courses in one semester, but they can take a course only if they have finished taking its prerequisites.

Course	Prerequisite
Course 1	None
Course 2	None
Course 3	Course 1
Course 4	Course 2
Course 5	None
Course 6	Course 1, Course 3
Course 7	Course 2, Course 4
Course 8	Course 3
Course 9	Course 5, Course 7
Course 10	Course 6, Course 8
Course 11	Course 7
Course 12	Course 4, Course 8

There is no constraint on how many courses a student can take in a semester. The minimum number of **semesters** required to complete all 12 courses 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 :

4

Section Id :	64065323903
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 Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	64065355352
Question Shuffling Allowed :	No

Question Number : 98 Question Id : 640653386752 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL: MODERN APPLICATION DEVELOPMENT 1"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?
CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

(IF IT IS NOT THE CORRECT SUBJECT, PLS CHECK THE SECTION AT THE TOP FOR THE SUBJECTS REGISTERED BY YOU)

Options :

6406531286189. ✔ YES

6406531286190. ✖ NO

Sub-Section Number :	2
Sub-Section Id :	64065355353

Question Shuffling Allowed : Yes

Question Number : 99 Question Id : 640653386754 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

A certain text document consisting of only alphanumeric characters (including spaces) takes 1,36,000 bits, when encoded with UCS-4 (32 bit) encoding. How many bits will the same document take if encoded with ASCII 7 bit encoding?
(Concept: Encoding efficiency)

Options :

6406531286195. ✖ 34000 bits

6406531286196. ✖ 68000 bits

6406531286197. ✔ 29750 bits

6406531286198. ✖ 136000 bits

Question Number : 100 Question Id : 640653386755 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

For a certain table "worker" in SQLite database having one of its fields as "First_name", the correct SQL query to fetch all "First_name" values from "worker" table using the alias name as "Worker_name" is:
(Concept: basic SQL queries)

Options :

6406531286199. ✖ `Select First_name ALIAS Worker_name from worker;`

6406531286200. ✔ `Select First_name AS Worker_name from worker;`

6406531286201. ✖ `Select Worker_name from worker;`

6406531286202. ✖ `Select First_name from worker;`

Question Number : 101 Question Id : 640653386759 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 Python code snippet.

```
from jinja2 import Template
temp = """{% for num in seq|reject("even") %}
{{ num+2 }}
{% endfor %}
"""
seq = [6,5,71,13,30,22]
output = Template(temp)
print(output.render(seq = seq))
```

What will be the output if the given code is executed?

Options :

6406531286215. ✖ 8
7

6406531286216. ✖ 73
15
32
24

5

71

13

7

73

6406531286217. ✔ 15

6

5

71

13

30

6406531286218. ✖ 22

Sub-Section Number :	3
Sub-Section Id :	64065355354
Question Shuffling Allowed :	Yes

Question Number : 102 Question Id : 640653386753 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.

(Concept: Python string and Jinja2 templates)

```
from string import Template as T1
from jinja2 import Template as T2

info = {'girl1': 'Mary', 'girl2': 'Samantha',
        'girl3': 'girl2', 'girl4': 'girl1',
        'city1':'Moscow', 'city2':'city1'}

t1 = T1("{{$girl3}} and {{$girl4}} arrived at the {{$city2}} station early
and waited for the bus.")

out1 = t1.substitute(info)

out2 = T2(out1)

print(out2.render(info))
```

What will be the output on the terminal?

Options :

6406531286191. ✖ `girl2 and girl1 arrived at the city1 station early and waited for the bus.`

6406531286192. ✔ `Samantha and Mary arrived at the Moscow station early and waited for the bus.`

6406531286193. ✖ `Mary and Samantha arrived at the Moscow station early and waited for the bus.`

6406531286194. ✖ Error

Question Number : 103 Question Id : 640653386756 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the code snippets given below.
(Concept: HTML and CSS)

File 1: index.html:

```
<head>
    <link rel="stylesheet" href="style.css">
</head>
<body>
    <h3>The CSS Box Model</h3>
    <div class="my_border box">
        <h3 class="title">Border</h3>
        <div class="my_padding box">
            <h3 class="title">Padding</h3>
            <div class="my_content box">
                <h3 class="title">Content</h3>
            <div>
        <div>
    <div>
</body>
```

File 2: style.css:

```
div.my_border
 {background-color: purple;
  border: 2px dotted grey;
  height: 130px;
  width: 130px;}

div.my_padding
 {background-color: lightblue;
 height: 80px;
 width: 80px;}

div.my_content
 {background-color: yellow;
   height: 40px;
   width: 45px; }

.title
 {text-align: left;
  font-size: 10px;
  font-style: italic;}

.box
{margin: 10px 20px;
    padding: 0px;}
```

What will be rendered by the browser, when the above HTML file is loaded?

Options :

6406531286203. ✔

The CSS Box Model

The CSS Box Model

6406531286204. ✖

The CSS Box Model

6406531286205. ✖

The CSS Box Model

6406531286206. ✖

Question Number : 104 Question Id : 640653386757 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 given below.

(Concept: Flask and concepts of HTTP methods)

```
from flask import Flask, request, url_for

app = Flask(__name__)

@app.route('/dashboard')
def dashboard():
    return 'This is the dashboard'

@app.route('/user/<username>')
def user(username):
    return f'This is {username} profile'

@app.route('/login', methods=['GET', 'POST'])
def login():
    if request.method == 'POST':
        return(url_for('user', username='your_name'))
    else:
        return (url_for('dashboard'))

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

If the above flask application is running on URL "http://127.0.0.1:5000", which of the following is the correct output if a user visits the URL "http://127.0.0.1:5000/login", using a browser?

Options :

6406531286207. ✖ This is the dashboard.

6406531286208. ✔ /dashboard

6406531286209. ✖ "404 NOT FOUND" error

6406531286210. ✖ /user/your_name

Question Number : 105 Question Id : 640653386758 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 class="red">Happy Coding</h2>
<p class="blue">1st class</p>
<p class="red" id="myId">2nd class</p>
<p class="green">3rd class </p>
</div>
</body>
```

How will the browser render the above HTML file?
Match the rendered colour for the text.

1. Happy Coding	a. green
2. 1st Class	b. blue
3. 2nd Class	c. red
4. 3rd Class	d. grey

Options :

6406531286211. ✔ 1- b, 2 - a, 3- d, 4 - c

6406531286212. ✖ 1- a, 2 - c, 3- d, 4 - b

6406531286213. ✖ 1- b, 2 - a, 3- c, 4 - d

6406531286214. ✖ 1- a, 2 - c, 3- b, 4 - d

Question Number : 106 Question Id : 640653386760 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.

User Table:

Id	Name	Age
1	Mala	50
2	Kala	30
3	Saamy	25
4	Ramya	30

Book Table:

Id	Bookname	Username
1	Python	Saamy
2	Java	Kala
3	C	Mala
4	Modern App	Ramya

If the above tables are given as inputs, what will be the output of the following query?

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

Options :

6406531286219. ✖

	Name	Bookname
1	Mala	Python
2	Kala	Java
3	Saamy	C
4	Ramya	Modern App

6406531286220. ✖

	Name	Age
1	Mala	50
2	Kala	30
3	Saamy	25
4	Ramya	30

6406531286221. ✖

	Bookname	Name
1	Python	Kala
2	Java	Saamy
3	C	Mala
4	Modern App	Ramya

6406531286222. ✔

	Bookname	Name
1	C	Mala
2	Java	Kala
3	Python	Saamy
4	Modern App	Ramya

Question Number : 107 Question Id : 640653386764 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Find the correct match with respect to **MVC** Software design pattern.

	Action		Component
1	Defining business logic	A	Model
2	Display the data to user	B	View
3	Databases, indexing for easy searching	C	Controller
4	User interfaces for finding information		
5	Stores core data for the application		

Options :

6406531286232. ✖ 1-A, 2-C, 3-A, 4-B, 5-B

6406531286233. ✔ 1-C, 2-B, 3-A, 4-B, 5-A

6406531286234. ✖ 1-C, 2-B, 3-A, 4-A, 5-B

6406531286235. ✖ 1-A, 2-B, 3-C, 4-B, 5-A

Question Number : 108 Question Id : 640653386770 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the below HTML and CSS styling.

```
<html>
    <head>
        <style>
            h3 {
                color: green;
            }
            .content {
                color: red;
            }
        </style>
    </head>
    <body>
        <h3 class = "content">This is the main Content</h3>
        <button onclick = "remove_class"> Click Me </button>
    </body>
</html>
```

Assuming clicking the button with the text "Click Me" removes the class "content" from the "h3" element, what will be the text colour of the text placed inside the "h3" element, before and after clicking the button with the text "Click Me" (Assume a normal browser is used which shows black text on white background)?

Options :

6406531286253. ✖ Before: Red
After: Green

6406531286254. ✔ Before: Red
After: Black

6406531286255. ✖ Before: Green
After: Black

6406531286256. ✖ Before: Green
After: Red

Sub-Section Number :	4
Sub-Section Id :	64065355355
Question Shuffling Allowed :	Yes

Question Number : 109 Question Id : 640653386762 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

A Server S needs to retrieve data from two datacenters D1 and D2 located at 2500 kilometres and 4500 kilometres respectively. Server S and D1 are connected via medium M1 through which information can be transferred with the speed of 1.5×10^8 m/sec, and server S and D2 are connected via medium M2. If the server received data from both the data centres at the same time, what must be the speed of information transfer in medium M2?
(Concept: Performance parameters of a network)

Options :

6406531286224. ✖ 1.5×10^8 m/sec

6406531286225. ✖ 2×10^8 m/sec

6406531286226. ✔ 2.7×10^8 m/sec

6406531286227. ✖ 3×10^8 m/sec

Question Number : 110 Question Id : 640653386765 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 code for flask application.

main.py:

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

@app.route('/viewdata/')
def student_list():
    student_data={
        'rollno': [1001,1002,1003,1004,1005],
        'name': ['Amit','Ravi','Karthik','Ankur','Ishan'],
        'course':['Python','MAD1','MAD2','DBMS','MAD2']
    }
    return render_template("viewlist.html",st = student_data)
if __name__ == '__main__':
   app.run()
```

viewlist.html:

```
<!DOCTYPE html>
<html lang="en">

<head>
    <title>Document</title>
    <style>
        table, th, td {
            border: 1px solid black;
        }
    </style>
</head>

<body>
    <table>
        <tr>
            <th>Sno</th>
            <th>Roll No</th>
            <th>Name</th>
            <th>Course</th>
        </tr>


<!-- missing code block -->
    HTML code block
<!-- missing code block -->



    </table>
</body>

</html>
```

Suppose we want to display the `student_data` in the following table format for route "`http://127.0.0.1:5000/viewdata/`":

Sno	Roll No	Name	Course
1	1001	Amit	Python
2	1002	Ravi	MAD1
3	1003	Karthik	MAD2
4	1004	Ankur	DBMS
5	1005	Ishan	MAD2

Select the correct option to fill at the place of **HTML code block** in `viewlist.html` file to display the data in the above given table format without any error?

Options :

6406531286236. ✖

```
{for i in range(st['rollno']|length)}
<tr>
    <td>{{i+1}}</td>
    <td>{{st['rollno'][i]}}</td>
    <td>{{st['name'][i]}}</td>
    <td>{{st['course'][i]}}</td>
</tr>
{endfor}
```

6406531286237. ✖

```
{%for i in range(st['rollno']|length)%}
<tr>
    <td>{i+1}</td>
    <td>{st[i]['rollno']}</td>
    <td>{st[i]['name']}</td>
    <td>{st[i]['course']}</td>
</tr>
{%endfor%}
```

6406531286238. ✔

```
{%for i in range(st['rollno']|length)%}
<tr>
    <td>{{i+1}}</td>
    <td>{{st['rollno'][i]}}</td>
    <td>{{st['name'][i]}}</td>
    <td>{{st['course'][i]}}</td>
</tr>
{%endfor%}
```

6406531286239. ✖

```
{{for i in range(st['rollno']|length)}}
<tr>
    <td>{% i+1 %}</td>
    <td>{% st['rollno'][i] %}</td>
    <td>{% st['name'][i] %}</td>
    <td>{% st['course'][i] %}</td>
</tr>
{{endfor}}
```

Sub-Section Number : 5

Sub-Section Id : 64065355356

Question Shuffling Allowed : Yes

Question Number : 111 Question Id : 640653386769 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 HTML and encodings?

Concepts Covered: Encoding Standards, HTML & CSS

Options :

6406531286249. ✖ Both UTF-8 and UTF-32 are variable length encodings.

6406531286250. ✖ The UTF-8 can only be used for encoding (2^{16} + 1) characters.

6406531286251. ✔ The HTML tags are case-insensitive.

6406531286252. ✔ The External CSS is preferred over internal and inline CSS for developing large websites.

Sub-Section Number : 6

Sub-Section Id : 64065355357

Question Shuffling Allowed : Yes

Question Number : 112 Question Id : 640653386763 Question Type : MSQ 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 Select Question

Which of the following option(s) will generate the HTML code equivalent to the below HTML code?

[Concepts covered: Programmatic HTML generation]

```html
<!DOCTYPE html>
<html>
  <head>
    <title>My title</title>
  </head>
  <body>
    <div>
      <div>
        <h2>inside title</h2>
      </div>
      <p>some text in a paragraph</p>
    </div>
  </body>
</html>
```

Options :

6406531286228. ✔

```python
import pyhtml as h
t = h.html(
    h.head(h.title('My title')),
    h.body(
        h.div(h.div(h.h2('inside title')),
        h.p('some text in a paragraph'))
    ))
print(t.render())
```

6406531286229. ✔

```python
from jinja2 import Template
temp_val = { 0: "<div><h2>inside title</h2></div>",
        1: "<title>My title</title>",
        2: "<p>some text in a paragraph</p>"  }

template = """<!DOCTYPE html>
<html>
  <head>
    {{val[1]}}
  </head>
  <body>
    <div>
      {{val[0]}}
      {{val[2]}}
    </div>
  </body>
</html>"""
t = Template(template)
print(t.render( val = temp_val))
```

```python
import pyhtml as h
t = h.html(
    h.head(h.title('My title')),
    h.body(
        h.div(h.div(h.p(h.h2('inside title'),
        ('some text in a paragraph'))))
    ))
print(t.render())
```

6406531286230.

6406531286231.

```
from jinja2 import Template
template = """<!DOCTYPE html>
<html>
  <head>
    <title>{{ title}}</title>
  </head>
  <body>
    <div>
      <div>
        <h2>{{header}}</h2>
      </div>
      <p>{{content}}</p>
    </div>
  </body>
</html>"""
t = Template(template)
print(t.render( header = 'My Title', title = 'Paragraph', content = 'This is
the content'))
```

Sub-Section Number :	7
Sub-Section Id :	64065355358
Question Shuffling Allowed :	Yes

Question Number : 113 Question Id : 640653386761 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 below table student:

(Concept: SQL INNER JOIN)

student

Rollno	Name	Grade
CE01	Anil	A
CE02	Sunil	B
EE01	Kapil	B
EE02	Anil	C

How many tuples are retrieved by the below SQL query?

Note: The answer must be an integer.

```
SELECT *
FROM (SELECT Rollno, Name FROM student) AS A INNER JOIN
(SELECT Name, Grade FROM student) AS B on A.Name = B.Name;
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

6

Sub-Section Number : 8

Sub-Section Id : 64065355359

Question Shuffling Allowed : No

Question Id : 640653386766 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 : (114 to 115)

Question Label : Comprehension

Consider the following instance of relational tables:-

Student

S_Id	Student_Name	City
1001	Sunil	Delhi
1002	Madhur	Chennai
1003	Nihal Surya	Mumbai
1004	Rama Yamuna	Delhi
1005	Sunil	Chennai
1006	Madhur	Chennai

Course

C_Id	Course_Name
CS2001	DBMS
CS2002	PDSA
CS2003	MAD1

Result

S_Id	C_Id	Marks
1001	CS2002	70
1002	CS2003	68
1003	CS2003	76
1004	CS2003	86
1005	CS2001	49
1006	CS2003	73

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 114 Question Id : 640653386767 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2.5

Question Label : Multiple Select Question

Which of the following statement is/are always true for the given instance of the relational tables?

Options :

6406531286240. ✗ The Marks of students in each course can be uniquely identified if the value of the column "Student_Name" is known.

6406531286241. ✓ The average of Marks for any particular course can be retrieved if the value of the column "Course_Name" is known.

6406531286242. ✓ All Course_Name in which at least one student is enrolled can be identified if all the values of column "S_Id" are known.

6406531286243. ✗ The City of the student can be uniquely identified if the value of the column "Student_Name" is known.

6406531286244. ✓ The number of enrolled students in any particular course can be retrieved if the value of the column "Course_Name" is known.

Question Number : 115 Question Id : 640653386768 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 **S_Id(s)** is/are returned by the following SQL query for the given instance of the relational tables?

```
select R.S_Id from Student S join Result R on S.S_Id=R.S_id join
Course C on R.C_Id=C.C_Id where R.Marks>70 and S.City='Chennai' and
C.Course_name='MAD1'
```

Options :

6406531286245. ✗ 1006, 1002

6406531286246. ✖ 1005

6406531286247. ✔ 1006

6406531286248. ✖ 1002, 1005

MLF

Section Id :	64065323904
Section Number :	8
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	16
Number of Questions to be attempted :	16
Section Marks :	50
Display Number Panel :	Yes
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	64065355360
Question Shuffling Allowed :	No

Question Number : 116 Question Id : 640653386771 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL: MACHINE LEARNING FOUNDATIONS"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?
CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

(IF IT IS NOT THE CORRECT SUBJECT, PLS CHECK THE SECTION AT THE TOP FOR THE SUBJECTS REGISTERED BY YOU)

Options :

6406531286257. ✔ Yes

6406531286258. ✖ No

Sub-Section Number : 2

Sub-Section Id : 64065355361

Question Shuffling Allowed : Yes

Question Number : 117 Question Id : 640653386772 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 ML team in a movie production company wanted to predict whether a movie will earn 100 cr or not by using some classification models. Therefore, the team collected presence/absence of various factors $\mathbf{x} = [x_1, x_2, x_3]$ from the movies in the past. The data and the corresponding labels are shown in the Table below.

$\mathbf{x}$	y
[0,1,1]	0
[1,0,1]	1
[1,0,0]	1
[1,1,1]	1
[1,1,0]	1

Compute the loss of the model if they use

$$u(z) = \begin{cases} 1, & \text{if } z \geq 0 \\ 0, & \text{otherwise} \end{cases}$$

and $z = 0.5x_1 - 0.8x_2 + 0.4x_3$

Note: 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 :

0.18 to 0.24

Question Number : 118 Question Id : 640653386778 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 $f(x, y) = 3x^3 + 4y^2 + 10$ around (1, 1) and use it to compute L(1.1, 0.9). What will be the value of $f(1.1, 0.9) - L(1.1, 0.9)$?

Note: 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 :

0.10 to 0.16

Question Number : 119 Question Id : 640653386785 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 the second degree polynomial that fits the below is $ax^2 + bx + c$, then what is the value of $a + b + c$?

x	y
1	2
2	3
3	7

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Sub-Section Number : 3

Sub-Section Id : 64065355362

Question Shuffling Allowed : Yes

Question Number : 120 Question Id : 640653386773 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

Identify which of the following requires use of classification technique.

Options :

6406531286260. ✔ Credit card fraud detection.

6406531286261. ✔ Sentiment analysis.

6406531286262. ✔ Predicting whether an email is spam or not.

6406531286263. ✔ Predicting whether the patient is having cancer or not.

Question Number : 121 Question Id : 640653386780 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

Two vectors v_1 and v_2 are such that $v_1 = 2v_2$. If $v_1 = (1, 2, 3)^T$, and we have another vector $v_3 = (1, -5, 3)^T$, then which of the following statements is/are true?

Options :

6406531286270. ✔ Vectors v_1 and v_2 are parallel to each other.

6406531286271. ✖ Vectors v_1 and v_2 are perpendicular to each other.

6406531286272. ✖ Vectors v_2 and v_3 are not perpendicular to each other.

6406531286273. ✔ Vectors v_2 and v_3 are perpendicular to each other.

Question Number : 122 Question Id : 640653386783 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Select Question

Which of the following is/are eigen vectors of the matrix $\begin{bmatrix} 5 & 2 \\ 3 & 6 \end{bmatrix}$?

Options :

6406531286279. ✔ $(1, -1)^T$

6406531286280. ✖ $(1, 1)^T$

6406531286281. ✔ $(1, 1.5)^T$

6406531286282. ✔ $(2, 3)^T$

Sub-Section Number : 4

Sub-Section Id : 64065355363

Question Shuffling Allowed : Yes

Question Number : 123 Question Id : 640653386774 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 data sets $(x^i, y^i) = [(1,1),(2,2),(3,4),(4,5),(5,5)], i = 1$ to 5, Consider the regression model $f(x) = x + 2$. What is the mean squared loss of $f(x)$. (Enter answer correct to one decimal place)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2.8

Question Number : 124 Question Id : 640653386776 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

What will be the directional derivative of $f(x, y, z) = xyz$ at point (-1, 1, 3) along the direction given by the unit vector $(\frac{1}{3}, \frac{-2}{3}, \frac{2}{3})$

Note: 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 :

2.10 to 2.40

Question Number : 125 Question Id : 640653386777 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 what value of k, will the following function be continuous?

$$f(x) = \begin{cases} \frac{tan3x}{sin2x}, & \text{if } x \neq 0 \\ 2k & \text{if } x = 0 \end{cases}$$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0.75

Question Number : 126 Question Id : 640653386779 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 column space?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Question Number : 127 Question Id : 640653386782 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 length of orthogonal projection vector of $(2,2,3)^T$ on to a line through $(2,3,6)^T$? Round the answer to nearest integer.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

4

Question Number : 128 Question Id : 640653386784 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

If $A = PDP^{-1}$ where $P = \begin{bmatrix} 1 & 2 \\ 1 & -5 \end{bmatrix}$ and $D = \begin{bmatrix} -1 & 0 \\ 0 & 6 \end{bmatrix}$, then what is the summation of all the diagonal elements of A^4?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1297

Question Number : 129 Question Id : 640653386786 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 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 $2 \times \alpha + \beta \times 2$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

-21

Sub-Section Number :	5
Sub-Section Id :	64065355364
Question Shuffling Allowed :	Yes

Question Number : 130 Question Id : 640653386775 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

Is the following function continuous?

$f(x) = |x|$ at $x = 0$

(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 :

1

Sub-Section Number :	6
Sub-Section Id :	64065355365
Question Shuffling Allowed :	Yes

Question Number : 131 Question Id : 640653386781 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

In a linear regression problem $X\theta = y$, with features $X = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 1 & 2 \\ 3 & 1 & 5 \end{bmatrix}$ $y = (16, 9, 18)^T$, what is the weight vector θ?

Options :

6406531286274. ✔ $(-3, 2, 5)^T$

6406531286275. ✖ $(3, 2, 5)^T$

6406531286276. ✖ $(-1, 1, 6)^T$

6406531286277. ✖ $(-3, 5, 2)^T$

Java

Section Id :	64065323905
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 :	64065355366
Question Shuffling Allowed :	No

Question Number : 132 Question Id : 640653386787 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL : PROGRAMMING CONCEPTS USING JAVA"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?
CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

(IF IT IS NOT THE CORRECT SUBJECT, PLS CHECK THE SECTION AT THE TOP FOR THE SUBJECTS REGISTERED BY YOU)

Options :

6406531286286. ✔ YES

6406531286287. ✖ NO

Sub-Section Number :	2
Sub-Section Id :	64065355367

Question Shuffling Allowed : Yes

Question Number : 133 Question Id : 640653386788 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 Readable{
  public default void read(){
    System.out.println("Reads");
  }
}
interface Writable{
  public default void write(){
    System.out.println("Writes");
  }
}
class Document implements Readable, Writable{
  public void read(){
    System.out.println("Reads the lines in doc");
  }
}
public class Test {
  public static void main(String[] args) {
    Readable r1 = new Document();
    r1.read();
    r1.write();
  }

}
```

Choose the correct option

Options :

6406531286288. This program generates the output:
Reads the lines in doc
Writes

6406531286289.

This program generates the output:

```
Reads
Writes
```

6406531286290. ✖ This program generates compiler error because neither is class `Document` declared as abstract nor does it override method `write( )`.

6406531286291. ✔ This program generates compiler error because `r1` of type `Readable` cannot invoke method `write( )`.

Question Number : 134 Question Id : 640653386791 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 Iterator{
  public boolean has_next();
  public Object get_next();
}
class Faculty{
  // ...
  private class FacIter implements Iterator{
    // ....
    public boolean has_next() {
      // ...
      return false;
    }
    public Object get_next() {
      // ...
    }
  }
  public Iterator getIterator() {
      return new FacIter();
  }
}
public class Test{
    public static void main(String[] args) {
        Faculty fList = new Faculty();
        //CODE BLOCK                          // LINE-1
        boolean hasNext = iter.has_next();    // LINE-2
    }
}
```

Identify the appropriate statements to fill in place of LINE-1 in order to correctly invoke method has_next() as given in LINE-2.

Options :

6406531286300. ✖ `Iterator iter = new FacIter();`

6406531286301. ✔ `Iterator iter = fList.getIterator();`

6406531286302. ✖ `FacIter iter = fList.getIterator();`

6406531286303. ✖ Method has_next() cannot be invoked from an outside class.

Question Number : 135 Question Id : 640653386792 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 Experiment{
  public void begin(){
    Simulation s = new Simulation(this); // LINE 1
    s.simulate();
    System.out.println("Experiment finished");
  }
  public void alarm(){
    System.out.println("Collected results");
  }
}
class Simulation{
  Experiment exp;
  public Simulation(Experiment e){
    exp = e;
  }
  public void simulate(){
    System.out.println("Simulated Successfully");
    exp.alarm(); // LINE 2
  }
}
public class Test {
  public static void main(String[] args) {
    Experiment e1 = new Experiment();
    e1.begin();
  }
}
```

Choose the correct option.

Options :

6406531286304. ✖ This program generates compiler error at LINE 1
Reason: An object of Simulation cannot be created inside method begin because it uses an object of Experiment in its constructor.

6406531286305. ✔

This program generates the output:

```
Simulated Successfully
Collected results
Experiment finished
```

6406531286306. ✖

This program generates the output:

`Simulated Successfully`

followed by runtime error

Reason: A method inside class `Experiment` is invoking method `simulate` inside class `Simulation`, whereas `simulate` is invoking another method in class `Experiment`.

6406531286307. ✖

This program generates compiler error at `LINE 2`

Reason: A method inside class `Experiment` is invoking method `simulate` inside class `Simulation`, whereas `simulate` is invoking another method in class `Experiment`.

Question Number : 136 Question Id : 640653386794 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 Taxable{
    public default void tax(){
        System.out.println("no tax");
    }
}
class LowerScalePay implements Taxable{          //LINE 1
    // No tax
}
class HigherScalePay implements Taxable{
    public void tax() {
        System.out.println("tax: 10000");
    }
}
public class Test{
    public static void main(String[] args) {
        Taxable t1 = new LowerScalePay();
        t1.tax();                                // LINE 2
        Taxable t2 = new HigherScalePay();
        t2.tax();
    }
}
```

Choose the correct option.

Options :

6406531286312. ✖ Compiler error at `LINE 1` because class `LowerScalePay` is not abstract

6406531286313. ✖ This program generates output:
`no tax`
`no tax`

6406531286314. ✖ Runtime error because method `tax()` is not defined for class `LowerScalePay` (see `LINE 2`)

6406531286315. ✔ This program generates output:
`no tax`
`tax: 10000`

Question Number : 137 Question Id : 640653386796 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 Faculty{
    private String name;
    private double salary;
    public Faculty(String n, double s) {
        name = n;
        salary = s;
    }
    public String toString() {
        return "name = " + name + ", salary = " + salary;
    }
}
class HOD extends Faculty{
    String classTeacher;
    public HOD(String ct) {
        //LINE-1
    }
    public HOD(String n, double s, String ct) {
        //LINE-2
        classTeacher = ct;
    }
    public String toString() {
        return super.toString()+", classTeacher = "+classTeacher;
    }
}
public class ConTest {
    public static void main(String[] args) {
        Faculty obj = new HOD("XYZ");
        System.out.println(obj);
    }
}
```

Choose the correct option to fill in place of LINE-1 and LINE-2 so that the output is:

```
name = ABC, salary = 5000.0, classTeacher = XYZ
```

Options :

6406531286320. ✖

```
LINE-1 :  super("ABC", 5000.00, ct);
LINE-2 :  this(n, s);
```

6406531286321. ✔
```
LINE-1 :  this("ABC", 5000.00, ct);
LINE-2 :  super(n, s);
```

6406531286322. ✖
```
LINE-1 :  super(n, s);
LINE-2 :  this("ABC", 5000.00, ct);
```

6406531286323. ✖
```
LINE-1 :  this(n, s);
LINE-2 :  super("ABC", 5000.00, ct);
```

Question Number : 138 Question Id : 640653386797 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 Teacher{
    public void teach() {
        System.out.println("Teacher teaching");
    }
    public void markAttendance() {
        System.out.println("Teacher marking attendance");
    }
    public void evaluate() {
        System.out.println("Teacher evaluate students");
    }
}
class ClassTeacher extends Teacher{
    public void teach() {
        System.out.println("ClassTeacher teaching");
    }
    public void markAttendance() {
        System.out.println("ClassTeacher marking attendance");
    }
    public void evaluate() {
        System.out.println("ClassTeacher evaluate students");
    }
}
class HeadMaster extends ClassTeacher{
    public void teach() {
        System.out.println("HeadMaster teaching");
    }
    public void markAttendance() {
        System.out.println("HeadMaster marking attendance");
    }
    public void evaluate() {
        System.out.println("HeadMaster evaluate students");
    }
}
public class ModTest {
    public static void main(String[] args) {
        Teacher obj1 = new HeadMaster();
        ClassTeacher obj2 = new HeadMaster();
        HeadMaster obj3 = new HeadMaster();
        obj1.teach();
        obj2.markAttendance();
        obj3.evaluate();
    }
}
```

What will the output be?

Options :

```
Teacher teaching
Teacher marking attendance
ClassTeacher marking attendance
Teacher evaluate students
ClassTeacher evaluate students
HeadMaster evaluate students
```

6406531286324. ✖

6406531286325. ✔
```
HeadMaster teaching
HeadMaster marking attendance
HeadMaster evaluate students
```

6406531286326. ✖
```
Teacher teaching
Teacher marking attendance
Teacher evaluate students
```

6406531286327. ✖
```
Teacher teaching
ClassTeacher marking attendance
HeadMaster evaluate students
```

Question Number : 139 Question Id : 640653386799 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 SwitchTest{
    public static void main(String args[]){
        for(int i = 1; i <= 2; i++) {
            switch(i){
                case 1:
                    System.out.println("IITM");
                case 2:
                    switch(i){
                        case 1:
                            System.out.println("Java");
                            break;
                        case 2:
                            System.out.println("Programming");
                    }
            }
        }
    }
}
```

What will the output be?

Options :

6406531286332. ✖ IITM
Programming

6406531286333. ✔ IITM
Java
Programming

6406531286334. ✖ IITM
Java

6406531286335. ✖ Java
Programming

Question Number : 140 Question Id : 640653386800 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 Labour{
    String name;
    double wage;
    public Labour(String name, double wage) {
        this.name = name;
        this.wage = wage;
    }
    public String toString() {
        return "name = "+  name +" wage = " + wage + " ";
    }
}
class Contractor extends Labour{
    int labourCount;
    public Contractor(String n, Labour l, int lc) {
        super(n, l.wage+1000);
        this.labourCount = lc;
    }
    public Contractor(Contractor c) {
        super(c.name, c.wage);
        this.labourCount = c.labourCount;
      }
      public String toString() {
          return super.toString() + "labourCount = " + labourCount;
      }
  }
  public class ConTest{
      public static void main(String args[]){
          Labour obj1 = new Labour("ABC", 500.00);
          Labour obj2 = new Contractor("XYZ", obj1, 20);
          Labour obj3 = new Contractor((Contractor)obj2);
          System.out.println(obj1);
          System.out.println(obj2);
          System.out.println(obj3);
      }
  }
```

What will the output be?

Options :

6406531286336. ✖
```
name = ABC wage = 500.0
name = XYZ wage = 500.0 labourCount = 20
name = XYZ wage = 500.0 labourCount = 20
```

6406531286337. ✖
```
name = ABC wage = 500.0
name = ABC wage = 500.0 labourCount = 20
name = XYZ wage = 1500.0 labourCount = 20
```

```
name = ABC wage = 500.0
name = XYZ wage = 1500.0 labourCount = 20
```

6406531286338. ✔ `name = XYZ wage = 1500.0 labourCount = 20`

```
name = ABC wage = 500.0
name = XYZ wage = 1500.0 labourCount = 20
```

6406531286339. ✖ `name = ABC wage = 500.0 labourCount = 20`

Question Number : 141 Question Id : 640653386801 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 VarTest {
    private static int a;
    private final int b;
    private int c;
    public VarTest(){
        a = 30;
        b = 10;
        c = 50;
    }
    public String toString() {
        return "a = " + a + ", b = " + b + ", c = " + c ;
    }
    public static void main(String[] args) {
        VarTest obj1 = new VarTest();
        VarTest obj2 = new VarTest();
        obj2.c = 40;                          //LINE-1
        VarTest.a = 100;
        System.out.println(obj1);
        System.out.println(obj2);
    }
}
```

What will the output be?

Options :

6406531286340. ✖ Compilation error at LINE-1 because private variable c cannot be accessed without using an accessor method.

6406531286341. ✖ The program generates the output:
a = 30, b = 20, c = 50
a = 100, b = 20, c = 40

6406531286342. ✖ The program generates the output:
a = 0, b = 20, c = 50
a = 0, b = 20, c = 40

6406531286343. ✔ The program generates the output:
a = 100, b = 10, c = 50
a = 100, b = 10, c = 40

Question Number : 142 Question Id : 640653386802 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 Student{
  String name;
  int[] marks;

  public Student(String n, int[] m){
    name = n;
    marks = m;
  }
  public Student(Student s){
    this.name = s.name;
    this.marks = s.marks;
  }
}
public class Test{
  public static void main(String[] args){
    int[] m  = {90, 70, 60};
    Student s1 = new Student("reena", m);
    Student s2 = new Student(s1);
    s2.name= "madhu";
    s2.marks[0] = 79;
    System.out.println(s1.name + "," +s1.marks[0]);
    System.out.println(s2.name + "," +s2.marks[0]);
  }
}
```

What will the output be?

Options :

6406531286344. ✖ It generates output:
madhu,79
madhu,79

6406531286345. ✔ It generates output:
reena,79
madhu,79

6406531286346. ✖ It generates output:
reena,90
madhu,79

6406531286347. ✖ It generates output:
madhu,90
madhu,79

Sub-Section Number :	3
Sub-Section Id :	64065355368
Question Shuffling Allowed :	Yes

Question Number : 143 Question Id : 640653386789 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the Java code given below.

```
interface Summable{
  public Object twoSum(Object o1);
}
abstract class Printable implements Summable{
  public abstract void print();
}
class Point extends Printable{
  double x, y;
  public Point(){
  }
  public Point(double n1, double n2){
    x = n1;
    y = n2;
  }
  // ------- CODE BLOCK -------
  public void print(){
    System.out.println(x+","+ y);
  }
}
public class Test{
  public static void main(String[] args){
    Point p = new Point();
    Point p1 = new Point(2, 3);
    Point p2 = new Point(2, 3);
    p = p1.twoSum(p2);
    p.print();
  }
}
```

Identify the correct option to be filled in place of CODE BLOCK to generate the output 4.0,6.0

Options :

```
public Object twoSum(Point p1){
    Point p = new Point(this.x, this.y);
    p.x = p.x + p1.x;
    p.y = p.y + p1.y;
    return p;
}
```

6406531286292. ✖

6406531286293. ✖

```
public Point twoSum(Point p1){
    Point p = new Point(this.x, this.y);
    p.x = p.x + p1.x;
    p.y = p.y + p1.y;
    return p;
}
```

6406531286294.

```
public Point twoSum(Object obj){
    Point p = new Point(this.x, this.y);
    p.x = p.x + obj.x;
    p.y = p.y + obj.y;
    return p;
}
```

6406531286295.

```
public Point twoSum(Object obj){
    Point p = new Point(this.x, this.y);
    if(obj instanceof Point){
        Point p1 = (Point)obj;
        p.x = p.x + p1.x;
        p.y = p.y + p1.y;
    }
    return p;
}
```

Question Number : 144 Question Id : 640653386790 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

Match the following:

A. Inheritance	I. Region of the program where a variable is available for use
B. Control Link	II. Enables catching of bug in source code early on
C. Lifetime	III. Duration/time during which a variable is available in the memory
D. Static Typing	IV. Points to the location to store the result
	V. Relationship of interfaces
	VI. Relationship of implementations
	VII. Points to the start of previous activation record

Options :

6406531286296. ✖ A-VI, B-IV, C-I, D-II

6406531286297. ✖ A-V, B-VII, C-I, D-IV

6406531286298. ✖ A-V, B-IV, C-I, D-II

6406531286299. ✔ A-VI, B-VII, C-III, D-II

Question Number : 145 Question Id : 640653386793 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 the rank of an applicant is < 10000, the following Java program should print Seat allotted. Otherwise, it should print Seat cannot be allotted.

```
interface Enquiry{
  public void printAvailability();
}
class Admission{
  // ...
  public Enquiry checkDetails(){
    // ...
    if(rank < 10000)
      return new PassedEnquiry();
    return new FailedEnquiry();
  }
  private class PassedEnquiry implements Enquiry{
    public void printAvailability(){
        System.out.println("Seat allotted");
    }
  }
  private class FailedEnquiry implements Enquiry{
    public void printAvailability(){
        System.out.println("Seat cannot be allotted");
    }
  }
}
public class Test {
  public static void main(String[] args) {
    Admission a1 = new Admission(100);         //rank of a1 is 100
    Admission a2 = new Admission(12000);       //rank of a2 is 12000
    // LINE 1
  }
}
```

Identify the correct statement to fill in the blank at LINE-1, such that the output is: Seat cannot be allotted

Options :

6406531286308. ✔ `a2.checkDetails().printAvailability();`

6406531286309. ✖ `a2.printAvailability();`

6406531286310. ✖ `a1.printAvailability();`

6406531286311. ✖ `a1.checkDetails().printAvailability();`

Sub-Section Number :	4
Sub-Section Id :	64065355369
Question Shuffling Allowed :	Yes

Question Number : 146 Question Id : 640653386795 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 Java code given below.

```
class Principal{
    private String name;
    private int age;
    public Principal(String n, int a) {
        name = n;
        age = a;
    }
    public String toString() {
        return "name = " + name + ", age = " + age;
    }
}
class Director extends Principal{
    private String rules;
    public void setRules(String r) {
        rules = r;
    }
    public Director(String n, int a) {
        super(n, a);
    }
    public String toString() {
        return super.toString()+", rules = " + rules;
    }
}
class Founder extends Director{
    private String resources;
    public void setResources(String r) {
        resources = r;
    }
    public Founder(String n, int a) {
        super(n, a);
    }
    public String toString() {
        return super.toString()+", resources = " + resources ;
    }
}
public class DynamicTest {
    public static void main(String[] args) {
        //CODE BLOCK
        ((Director)obj1).setRules("Rule 1");
        ((Founder)obj2).setRules("Rule 2");
        ((Founder)obj2).setResources("Resource 1");

          System.out.println(obj1);
          System.out.println(obj2);
      }
  }
```

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

```
name = Shahin, age = 43, rules = Rule 1
name = Harideep, age = 47, rules = Rule 2, resources = Resource 1
```

Options :

6406531286316. ✔ `Principal obj1 = new Director("Shahin", 43);`
`Principal obj2 = new Founder("Harideep", 47);`

6406531286317. ✖ `Director obj1 = new Principal("Shahin", 43);`
`Founder obj2 = new Director("Harideep", 47);`

6406531286318. ✔
```
Principal obj1 = new Director("Shahin", 43);
Director obj2 = new Founder("Harideep", 47);
```

6406531286319. ✖
```
Director obj1 = new Principal("Shahin", 43);
Founder obj2 = new Principal("Harideep", 47);
```

Question Number : 147 Question Id : 640653386798 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 Java code given below.

```
class Developer{
    public void doPrograms() {
        System.out.println("Doing programs");
    }
}
class TeamLead extends Developer{
    public void doPrograms() {
        System.out.println("Assigning tasks");
    }
}
class Manager extends TeamLead{
    public void setTeams() {
        System.out.println("Setting teams");
    }
}
```

Choose the correct option(s).

Options :

6406531286328. ✖ Both Developer and TeamLead are subtypes of Manager.

6406531286329. ✖ Developer is a subtype of TeamLead as well as Manager.

6406531286330. ✔ TeamLead and Manager are subtypes of Developer.

6406531286331. ✔ Manager is a subtype of Developer as well as TeamLead.

AppDev2

Section Id :	64065323906
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 :	64065355370
Question Shuffling Allowed :	No

Question Number : 148 Question Id : 640653386803 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL: MODERN APPLICATION DEVELOPMENT 2 "

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?
CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

(IF IT IS NOT THE CORRECT SUBJECT, PLS CHECK THE SECTION AT THE TOP FOR THE SUBJECTS REGISTERED BY YOU)

Options :

6406531286348. ✔ YES

6406531286349. ✖ NO

Sub-Section Number : 2

Sub-Section Id : 64065355371

Question Shuffling Allowed : Yes

Question Number : 149 Question Id : 640653386804 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Which of the following statements is correct regarding javascript language?

Options :

6406531286350. ✖ The equality operator “==” is used to avoid coercion in the language.

6406531286351. ✖ A variable declared using the keyword “var” can be used anywhere in the program.

6406531286352. ✖ The keyword “break” is used to terminate the execution of the program in the language.

6406531286353. ✔ None of these

Question Number : 150 Question Id : 640653386809 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 Vue application with markup “index.html” and javascript file “app.js”.

index.html:

```
<div id = "app">
      <h3> Header Content </h3>
      <main></main>
      <h3> Footer Content </h3>
</div>
<script src="app.js"></script>
```

app.js:

```
const main = {
    template : `
                <div>
                    <h3> Main Content </h3>
                </div>
               `

}

const comp = {
    'main' : main
}

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

If the file “index.html” is opened with the help of a browser. What will be rendered on the browser?

Options :

6406531286370. ✖ Header Content

Main Content

Footer Content

6406531286371. ✖ The app will show a warning, and nothing will be shown on the browser.

6406531286372. ✔ Header Content

Footer Content

6406531286373. ✖ The app will not show any warning, but nothing will be shown on the browser.

Sub-Section Number :	3
Sub-Section Id :	64065355372
Question Shuffling Allowed :	Yes

Question Number : 151 Question Id : 640653386806 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

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

```
var num = 20;

function demo () {
    num = 50;

    function num () {
        console.log("Number is:", num)
    }
}
demo()
console.log("Number is:", num)
```

Options :

6406531286358. ✔ Number is: 20

6406531286359. ✖ Number is: 50

6406531286360. ✖ Number is: undefined

6406531286361. ✖ Number is:

Question Number : 152 Question Id : 640653386810 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">
        <h3>Number : {{total_num}}</h3>
        <button @click = "update_num"> Click Me </button>
</div>
<script src="app.js"></script>
```

app.js:

```
new Vue({
    el : "#app",
    data : {
        num : 10
    },
    computed : {
        total_num : function () {
            return this.num % 3 == 0 ? this.num * 3 + 5 : this.num / 4 + 6;
        }
    },
    methods : {
        update_num : function () {
            this.num = this.num < 10 ? this.num * 4 + 1 : this.num * 3 - 5;
        }
    }
})
```

If the file “index.html” is opened with the help of a browser. What will be rendered on the browser (excluding the button) for the first time and after clicking the button with the text “Click Me” twice?

Options :

6406531286374. ✔ Before Click: Number : 8.5

After Click: Number : 23.5

6406531286375. ✖ Before Click: Number : 8.5

After Click: Number : 70

6406531286376. ✖ Before Click: Number : 35

After Click: Number : 23.5

6406531286377. ✖ Before Click: Number : 35

After Click: Number : 70

Question Number : 153 Question Id : 640653386811 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 logged on to the console, if the program written below is executed?

```
{
  let x = 10
  {
    let getNum = () => {
      return x + 10
    }
  }
  console.log(getNum())
}
```

Options :

6406531286378. ✖ 10

6406531286379. ✖ NaN

6406531286380. ✖ Undefined

6406531286381. ✔ ReferenceError

Question Number : 154 Question Id : 640653386812 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 logged on to the console, if the program written below is executed?

```
function outer(x) {
  let a = 2
  function inner(y) {
    function innerMost(z) {
      return x + y + z + a
    }
    return innerMost
  }
  return inner
}
console.log(outer(19)(20)(30))
```

Options :

6406531286382. ✖ Undefined

6406531286383. ✖ NaN

6406531286384. ✖ Will return a function reference

6406531286385. ✔ 71

Question Number : 155 Question Id : 640653386813 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 logged on to the console, if the program written below is executed?

```
let x = 10
var y = 10,
  z = 10
{
  let x = 20
  var y = 20
  function test() {
    var z = 20
  }
}
console.log(x, y, z)
```

Options :

6406531286386. ✔ 10 20 10

6406531286387. ✖ 20 20 20

6406531286388. ✖ 10 20 20

6406531286389. ✖ 10 10 10

Question Number : 156 Question Id : 640653386815 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 logged on to the console, if the program written below is executed?

```
const obj1 = { x: 10, y: 20 },
  obj2 = { x: 30, y: 40 }

function area() {
  return this.x * this.y
}

function test() {
  return area.call(obj2)
}

console.log(test.call(obj1), test.call(obj2))
```

Options :

6406531286394. ✖ 200, 1200

6406531286395. ✖ 1200, 200

6406531286396. ✔ 1200, 1200

6406531286397. ✖ 200, 200

Question Number : 157 Question Id : 640653386816 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 logged on to the console, if the program written below is executed?

```
class Circle {
  constructor(r) {
    this.r = r
  }
}

Circle.prototype.area = function () {
  return 3.14 * this.r
}

const obj1 = new Circle(2)
console.log(
  Circle.prototype === obj1.__proto__.__proto__,
  Circle.prototype === obj1.__proto__
)
```

Options :

6406531286398. ✖ false false

6406531286399. ✔ false true

6406531286400. ✖ true true

6406531286401. ✖ true false

Question Number : 158 Question Id : 640653386817 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

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

index.html:

```html
<html lang="en">
  <head>
    <style>
      .dark-mode {
        color: white;
        background-color: black;
      }
    </style>
  </head>
  <body>
    <div id="app">
      <h1 :class="{'dark-mode': darkMode}">IITM online degree</h1>
    </div>
    <script
src="https://cdn.jsdelivr.net/npm/vue@2.7.8/dist/vue.js"></script>
    <script src="app.js"></script>
  </body>
</html>
```

app.js:

```js
new Vue({
  el: '#app',
  name: 'app',
  data: {
    darkMode: false,
  },
  beforeCreate() {
    this.darkMode = true
  },
})
```

What will be the text colour and background colour of text “IITM Online degree”, assuming a normal browser is used, which shows black coloured text on a white background?

Options :

6406531286402. ✔ Black, White

6406531286403. ✖ White, Black

6406531286404. ✖ Black, Black

6406531286405. ✖ White, White

Sub-Section Number : 4

Sub-Section Id : 64065355373

Question Shuffling Allowed : Yes

Question Number : 159 Question Id : 640653386807 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 below javascript program, and predict the output, if executed.

```
var num = 10

const obj1 = {
    num : 20,
    func : function (key) {
        let temp = () => {
            console.log("Number 1:", num, "Number 2:", this.num, "Sum:",
this.num + num + key)
        }
        temp()
    }
}

const obj2 = {
    num : 30,
    func : function (key) {
        console.log("Function Called !!", key)
    }
}

new_func = obj1.func.bind(obj2, 40)
new_func()
```

Options :

6406531286362. ✖ Number 1: 10 Number 2: 20 Sum: 70

6406531286363. ✔ Number 1: 10 Number 2: 30 Sum: 80

6406531286364. ✖ Number 1: 20 Number 2: 20 Sum: 80

6406531286365. ✖ Number 1: 20 Number 2: 30 Sum: 90

Question Number : 160 Question Id : 640653386814 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

What will be logged on to the console, if the program written below is executed.

```
function getY() {
  return () => this.y
}

const Obj1 = {
  y: 15,
  getY: getY,
  obj3: {
    y: 45,
    getY: getY,
  },
}

console.log(Obj1.obj3.getY()(), Obj1.getY()())
```

Options :

6406531286390. ✖ Undefined, Undefined

6406531286391. ✖ Undefined, 15

6406531286392. ✔ 45, 15

6406531286393. ✖ 45, Undefined

Question Number : 161 Question Id : 640653386818 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">
      <h3 id="total">Total: {{total}}</h3>
      <h4 id="strike">{{batsmans.strike.name}}: {{batsmans.strike.run}}</h4>
      <h4 id="non-strike">{{batsmans.nonStrike.name}}:
{{batsmans.nonStrike.run}}</h4>
      <div>
        <button @click="total+=1">1</button>
        <button @click="total+=2">2</button>
      </div>
    </div>
    <script
src="https://cdn.jsdelivr.net/npm/vue@2.7.8/dist/vue.js"></script>
    <script src="app.js"></script>
  </body>
```

app.js:

```
class Player {
  constructor(name) {
    this.name = name
    this.run = 0
  }
}

new Vue({
  el: '#app',
  data: {
    batsmans: {
      strike: new Player('Rohit Sharma'),
      nonStrike: new Player('Virat Kohli'),
    },
    total: 30,
  },
  watch: {
    total(newRun, oldRun) {
      change = newRun - oldRun
      this.batsmans.strike.run += change
      if (change % 2 == 0) {
        this.changeStrike()
      }
    },
  },
  methods: {
    changeStrike() {
      temp = this.batsmans.strike
      this.batsmans.strike = this.batsmans.nonStrike
      this.batsmans.nonStrike = temp
    },
  },
})
```

If the user clicks on the button with the text “2” twice and “1” once. What will be rendered inside the element with ID “total”, “strike”, and “non-strike”?

Options :

6406531286406. ✖ Total: 5, Virat Kohli: 0, Rohit Sharma: 5

6406531286407. ✖ Total: 5, Rohit Sharma: 5, Virat Kohli: 0

6406531286408. ✖ Total: 35, Virat Kohli:3, Rohit Sharma: 2

6406531286409. ✔ Total: 35, Rohit Sharma: 3, Virat Kohli: 2

Question Number : 162 Question Id : 640653386819 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:

```html
<html lang="en">
  <head>
    <style>
      .sold {
        color: red;
      }
    </style>
  </head>
  <body>
     <div id="app">
      <Product
        v-for="(product, index) in products"
        :product="product"
        @buy="buy"
        :key="index"
      />
    </div>
    <script
src="https://cdn.jsdelivr.net/npm/vue@2.7.8/dist/vue.js"></script>
    <script src="app.js"></script>
  </body>
</html>
```

app.js:

```js
const Product = {
  template: `<div :class="{sold:product.sold}">
    <h4>{{product.name}}</h4>
    <h3>Price:{{product.price}}</h3>
    <div><button @click="$emit('buy', product.id)"> Buy </button></div>
    </div>`,
  props: ['product'],
}

new Vue({
  el: '#app',
  components: { Product },
  data() {
    return {
      products: [
        { id: 1, name: 'Watch', price: '200', sold: true },
        { id: 2, name: 'Mobile', price: '4000', sold: true },
      ],
    }
  },
  methods: {
    buy(id) {
      prod = this.products.find((prod) => {
        return prod.id == id
      })
      prod.sold = false
    },
  },
})
```

If the user clicks on the button with the text “Buy” corresponding to the product having ID “1”. What will be the text colour of the rendered “Product” component, corresponding to the product having ID “1” and “2”, respectively?

Options :

6406531286410. ✖ Black, Black

6406531286411. ✔ Black, Red

6406531286412. ✖ Red, Black

6406531286413. ✖ Red, Red

Sub-Section Number : 5

Sub-Section Id : 64065355374

Question Shuffling Allowed : Yes

Question Number : 163 Question Id : 640653386805 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 false regarding javascript language?

Options :

6406531286354. ✖ The variables declared outside all functions using “var” keyword are initialized with the value “undefined”, until the code execution reaches the initialization statement for that particular variable.

6406531286355. ✔ The variables declared outside all functions using “const” keyword are initialized with the value “null”, until the code execution reaches the initialization statement for that particular variable.

6406531286356. ✖ The function expressions in the language are not hoisted.

6406531286357. ✔ A javascript object can not have its own functions or methods.

Question Number : 164 Question Id : 640653386808 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 the state of a web application?

Options :

6406531286366. ✔ The system state is usually a huge collection of information.

6406531286367. ✖ The system state is dependent on the user interface.

6406531286368. ✔ Your Amazon wish list is an example of application state.

6406531286369. ✖ All of these

MLT

Section Id :	64065323907
Section Number :	11
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	16
Number of Questions to be attempted :	16
Section Marks :	100
Display Number Panel :	Yes
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 :	64065355375
Question Shuffling Allowed :	No

Question Number : 165 Question Id : 640653386820 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL: MACHINE LEARNING TECHNIQUES"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?
CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

(IF IT IS NOT THE CORRECT SUBJECT, PLS CHECK THE SECTION AT THE TOP FOR THE SUBJECTS REGISTERED BY YOU)

Options :

6406531286414. ✔ Yes

6406531286415. ✖ No

Sub-Section Number : 2

Sub-Section Id : 64065355376

Question Shuffling Allowed : Yes

Question Number : 166 Question Id : 640653386821 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 6

Question Label : Multiple Choice Question

Consider the following kernel:

$$k : R^2 \times R^2 \rightarrow R$$
$$k(x, y) = (x^T y)^2$$

Which of the following transformation mapping ϕ may correspond to the kernel k?

Options :

6406531286416. ✖ $\phi([x_1, x_2]^T) = [x_1, x_1x_2, x_2]^T$

6406531286417. ✖ $\phi([x_1, x_2]^T) = [x_1^2, x_1 + x_2, x_2^2]^T$

6406531286418. ✖ $\phi([x_1, x_2]^T) = [x_1, \sqrt{2}x_1^2x_2^2, x_2]^T$

6406531286419. ✔ $\phi([x_1, x_2]^T) = [x_1^2, \sqrt{2}x_1x_2, x_2^2]^T$

Question Number : 167 Question Id : 640653386822 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 6

Question Label : Multiple Choice Question

A function k is defined as

$$k : \mathbb{R} \times \mathbb{R} \to \mathbb{R}$$
$$k(x_1, x_2) = x_1 x_2 + x_1^2 x_2^2 + x_1^3 x_2 + 1$$

Is k a valid kernel?

Options :

6406531286420. ✖ Yes

6406531286421. ✔ No

Question Number : 168 Question Id : 640653386823 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 6

Question Label : Multiple Choice Question

Let X be a data matrix of shape (d, n) for a centered dataset. The first principal component of the dataset is $\left[\frac{1}{2}, \frac{\sqrt{3}}{2}\right]^T$. What will the scalar proxy of the point $[1, 2]^T$ be on the first principal component?

Options :

6406531286422. ✖ $1 + 2\sqrt{3}$

6406531286423. ✔ $\frac{1 + 2\sqrt{3}}{2}$

6406531286424. ✖ $\frac{1 + 2\sqrt{3}}{4}$

6406531286425. ✖ $\frac{1+2\sqrt{3}}{\sqrt{5}}$

Question Number : 169 Question Id : 640653386825 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 6

Question Label : Multiple Choice Question

Consider the scenario where you observe that 8 of your friends $\{f_1, \ldots, f_8\}$ have scored the following marks in a quiz: {6, 3, −5, −4, 2, −3, 5, −2} respectively.

Which of the cluster initializations given below will result in clusters where your friends with positive marks are in one cluster and the rest are in another after executing one step of the Lloyd's algorithm?

$I_1 : z_1 = z_2 = z_3 = z_4 = z_5 = z_6 = z_7 = 2$ and $z_8 = 1$
$I_2 : z_1 = 1, z_2 = z_3 = z_4 = z_5 = z_6 = z_7 = z_8 = 2$

Options :

6406531286429. ✖ I_1: No, I_2: No

6406531286430. ✖ I_1: Yes, I_2: Yes

6406531286431. ✔ I_1: Yes, I_2: No

6406531286432. ✖ I_1: No, I_2: Yes

6406531286433. ✖ Insufficient Information

Sub-Section Number : 3

Sub-Section Id : 64065355377

Question Shuffling Allowed : Yes

Question Number : 170 Question Id : 640653386824 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 following data set:

$$\left\{x_1 = \begin{bmatrix}0\\2\end{bmatrix}, x_2 = \begin{bmatrix}2\\0\end{bmatrix}, x_3 = \begin{bmatrix}0\\0\end{bmatrix}, x_4 = \begin{bmatrix}0\\-2\end{bmatrix}, x_5 = \begin{bmatrix}-2\\0\end{bmatrix}, x_6 = \begin{bmatrix}0\\1\end{bmatrix}, x_7 = \begin{bmatrix}0\\-1\end{bmatrix}\right\}$$

For $k = 3$, assume that the following cluster assignment is given to us which shows the clusters assigned to all data points but x_3 :

$$z = \{1, 2, ?, 3, 2, 1, 3\}$$

What should be the cluster assigned to the data point x_3?

Options :

6406531286426. ✖ 1

6406531286427. ✔ 2

6406531286428. ✖ 3

Question Number : 171 Question Id : 640653386826 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 data points shown in the following image:

Consider that in the initialization step of K-means with $k = 2$, the data points x_1 and x_6 got selected as initial cluster centers. That is, $\mu_1^0 = (0, 0)$ and $\mu_2^0 = (3, 0)$. As per these cluster centers, the data points were then assigned to either cluster 1 or cluster 2. After this assignment, what will be the value of the objective function (Obj)? Further, as per the assignment of data points, the cluster centers will be re-computed for the next iteration. What will be the value of μ_1^1 and μ_2^1?

Options :

6406531286434. ✖ $Obj = 17, \mu_1^1 = (1, 0), \mu_2^1 = (3.33, 0)$

6406531286435. ✖ $Obj = 17, \mu_1^1 = (1, 0), \mu_2^1 = (3, 0)$

6406531286436. ✖ $Obj = 7, \mu_1^1 = (0, 0), \mu_2^1 = (3.33, 0)$

6406531286437. ✔ $Obj = 7, \mu_1^1 = (0, 0), \mu_2^1 = (3.25, 0)$

Sub-Section Number :	4
Sub-Section Id :	64065355378
Question Shuffling Allowed :	Yes

Question Number : 172 Question Id : 640653386827 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

In the context of EM algorithm, select all true statements from the options given below. There are n data-points and K mixtures. The index i corresponds to the ith data-point, the index k corresponds to the kth mixture. f is the density of a Gaussian. All other symbols have their usual meaning.

Options :

6406531286438. ✔ $\pi_k = P(z_i = k)$

6406531286439. ✖ $\sum_{i=1}^{n} \lambda_k^i = 1$

6406531286440. ✔ $\lambda_k^i = P(z_i = k \mid x_i)$

6406531286441. ✖ $\lambda_k^i = f(x_i \mid z_i = k)$

Sub-Section Number :	5
Sub-Section Id :	64065355379
Question Shuffling Allowed :	Yes

Question Number : 173 Question Id : 640653386828 Question Type : SA Calculator : None

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

Correct Marks : 5

Question Label : Short Answer Question

Consider a centered dataset of 100 points in $\mathbb{R}^5$. Standard PCA is performed on this dataset. Consider the following ratio:

$$\theta = \frac{\text{variance along the first principal component}}{\text{sum of variances along all five principal components}}$$

What is the minimum value of θ?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.19 to 0.21

Question Number : 174 Question Id : 640653386829 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 5

Question Label : Short Answer Question

Consider a centered dataset of 1000 points in $\mathbb{R}^{10}$. Standard PCA is performed on this dataset. What is the maximum number of principal components that can be retained so that the compression ratio does not fall below 1.4 ? The compression ratio is defined as:

$$\frac{\text{size of original dataset}}{\text{size of reconstructed dataset}}$$

Assume that each real number occupies one unit of storage space. Note that we are interested in the reconstructions and not just in the scalar projections. So, the reconstructed dataset will also be in $\mathbb{R}^{10}$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

7

Question Number : 175 Question Id : 640653386835 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 5

Question Label : Short Answer Question

Consider a dataset with 60 points in which all points are either 0 or 1. We use a Bernoulli distribution with parameter p to model this problem. The prior and posterior distributions for the parameter p are $\text{Beta}(10, 5)$ and $\text{Beta}(30, 45)$ respectively. How many data-points have the value 0 in this dataset? Note that $p = P(x = 1)$ as usual.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

40

Question Number : 176 Question Id : 640653386836 Question Type : SA Calculator : None

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

Correct Marks : 5

Question Label : Short Answer Question

A GMM is fit for a dataset with 5 points. At some time-step in the EM algorithm, the following are the values of λ_k^i for all points in the dataset for the kth mixture after the E-step:

$$\lambda_k^1 = 0.9$$
$$\lambda_k^2 = 0.8$$
$$\lambda_k^3 = 0.7$$
$$\lambda_k^4 = 0.6$$
$$\lambda_k^5 = 0.5$$

What is the estimate of π_k after the M-step?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.69 to 0.71

Sub-Section Number : 6

Sub-Section Id : 64065355380

Question Shuffling Allowed : Yes

Question Number : 177 Question Id : 640653386830 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 7

Question Label : Short Answer Question

Consider the dataset as shown in the figure. We want to project the dataset into another feature space so that it lives in a linear subspace of a higher-dimension space. We apply the kernel PCA with a polynomial kernel of the appropriate degree to achieve the same. What will be the dimension of transformed feature space?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

6

Sub-Section Number : 7

Sub-Section Id : 64065355381

Question Shuffling Allowed : No

Question Id : 640653386831 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 : (178 to 180)

Question Label : Comprehension

Consider the following data set:

$$\left\{x_1 = \begin{bmatrix}0\\2\end{bmatrix}, x_2 = \begin{bmatrix}2\\0\end{bmatrix}, x_3 = \begin{bmatrix}0\\0\end{bmatrix}, x_4 = \begin{bmatrix}0\\-2\end{bmatrix}, x_5 = \begin{bmatrix}-2\\0\end{bmatrix}\right\}$$

With $k = 2$, as per k-means++,

(Enter your answers correct up to three decimal places)

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 178 Question Id : 640653386832 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 of the following points x_2, x_1 (in that order) being chosen as initial cluster centers?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.03 to 0.05

Question Number : 179 Question Id : 640653386833 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 of the following points x_2, x_3 (in that order) being chosen as initial cluster centers?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.01 to 0.03

Question Number : 180 Question Id : 640653386834 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 of the following points x_2, x_5 (in that order) being chosen as initial cluster centers?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.08 to 0.095

Sub-Section Number :	8
Sub-Section Id :	64065355382
Question Shuffling Allowed :	No

Question Id : 640653386837 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 184)

Question Label : Comprehension

Consider a dataset that has 4 points in $\mathbb{R}^2$ that lie on a line passing through the origin:

$$D = \left\{ \begin{bmatrix} -2 \\ -6 \end{bmatrix}, \begin{bmatrix} -1 \\ -3 \end{bmatrix}, \begin{bmatrix} 1 \\ 3 \end{bmatrix}, \begin{bmatrix} 2 \\ 6 \end{bmatrix} \right\}$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 181 Question Id : 640653386838 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

Is this dataset centered?

Options :

6406531286450. ✔ Yes

6406531286451. ✖ No

Question Number : 182 Question Id : 640653386839 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 all representatives $\mathbf{w}$ for this dataset such that $||\mathbf{w}|| = 1$.

Options :

6406531286452. ✔ $\frac{1}{\sqrt{10}} \cdot \begin{bmatrix} 1 \\ 3 \end{bmatrix}$

6406531286453. ✔

$$\frac{1}{\sqrt{10}} \cdot \begin{bmatrix} -1 \\ -3 \end{bmatrix}$$

6406531286454. ✖ $\begin{bmatrix} -1 \\ -3 \end{bmatrix}$

6406531286455. ✖ $\begin{bmatrix} 2 \\ 6 \end{bmatrix}$

Question Number : 183 Question Id : 640653386840 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 5

Question Label : Short Answer Question

If standard PCA is performed on this dataset, what is the variance along the first principal component?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

25

Question Number : 184 Question Id : 640653386841 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 standard PCA is performed on this dataset, what is the variance along the second principal component?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Sub-Section Number :	9
Sub-Section Id :	64065355383
Question Shuffling Allowed :	No

Question Id : 640653386842 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 : (185 to 186)

Question Label : Comprehension

Assume that you have a dataset of four points $\{x_1, x_2, x_3, x_4\}$, all of which lie in $[0, 1]$. You hypothesise that the data points are iid random variables with the following density:

$$f(x;\theta) = \begin{cases} \theta x^{\theta-1}, & 0 \le x \le 1 \\ 0, & \text{otherwise} \end{cases}$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 185 Question Id : 640653386843 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 5

Question Label : Multiple Choice Question

What is the log-likelihood of this dataset under this distribution?

Options :

6406531286458. ✖ $\prod_{i=1}^{4} \theta x_i^{\theta-1}$

6406531286459. ✖ $\sum_{i=1}^{4} \theta x_i^{\theta-1}$

6406531286460. ✔ $\sum_{i=1}^{4} [\log \theta + (\theta - 1) \log x_i]$

6406531286461. ✖ $\prod_{i=1}^{4} [\log \theta + (\theta - 1) \log x_i]$

Question Number : 186 Question Id : 640653386844 Question Type : SA Calculator : None

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

Correct Marks : 5

Question Label : Short Answer Question

You are given the actual values of these observations:

$$x_1 = \frac{1}{e}, \quad x_2 = \frac{1}{e^2}, \quad x_3 = \frac{1}{e^3}, \quad x_4 = \frac{1}{e^4}$$

What is the maximum likelihood estimate for θ? Use $\log_e$ wherever appropriate.

Hint: Differentiate the log-likelihood with respect to θ and set it to zero.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.39 to 0.41

MLP

Section Id :	64065323908
Section Number :	12
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 :	64065355384
Question Shuffling Allowed :	No

Question Number : 187 Question Id : 640653386845 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL: MACHINE LEARNING PRACTICE"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?
CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

(IF IT IS NOT THE CORRECT SUBJECT, PLS CHECK THE SECTION AT THE TOP FOR THE SUBJECTS REGISTERED BY YOU)

Options :

6406531286463. ✔ YES

6406531286464. ✖ NO

Sub-Section Number :	2
Sub-Section Id :	64065355385
Question Shuffling Allowed :	Yes

Question Number : 188 Question Id : 640653386858 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 violin plot shown in Figure 2 demonstrates the age of passengers on the Titanic ship. Mark the approximate age range of most of the passengers.

Figure 2: Violin plot for Titanic data-set

Options :

6406531286517. ✔ 20 - 40

6406531286518. ✖ 80 above

6406531286519. ✖ Less than 20

6406531286520. ✖ 40-60

Sub-Section Number : 3

Sub-Section Id : 64065355386

Question Shuffling Allowed : Yes

Question Number : 189 Question Id : 640653386847 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 Sklearn objects can help you to reduce, expand or generate feature representations?

Options :

6406531286469. ✖ Estimator

6406531286470. ✖ Predictor

6406531286471. ✔ Transformer

6406531286472. ✖ None of these

Question Number : 190 Question Id : 640653386850 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?

```
from sklearn.datasets import load_wine
data= load_wine(return_X_y = False)
print(type(data))
```

Options :

6406531286481. ✔ `<class 'sklearn.utils.Bunch'>`

6406531286482. ✖ `<class 'sklearn.utils.Tuple'>`

6406531286483. ✖ <class 'sklearn.utils.Ndarray'>

6406531286484. ✖ It will result in an error

Question Number : 191 Question Id : 640653386851 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

Go through the code snippet given below:

```
import numpy as np
j = 1000
i=6
X = 2 * np.random.randn(j, i)
y =  6+ 3* np.random.randn(j)
```

What will be the shape of the feature matrix (X.shape) and the label vector (y.shape)?

Options :

6406531286485. ✖ (2000, 12) and (1000, 6)

6406531286486. ✖ (1, 1000) and (1,1000)

6406531286487. ✖ (599, 1) and (699, 1)

6406531286488. ✔ (1000, 6) and (1000,)

Question Number : 192 Question Id : 640653386853 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Which of the following options is likely to be the correct output of the code snippet given below?

```
import numpy as np
from sklearn.preprocessing import MaxAbsScaler
x= np.array([3, 2, 5, -4, -21]).reshape(-1,1)
mas = MaxAbsScaler()
x_new = mas.fit_transform(x)
print(x_new)
```

Options :

6406531286493. ✔ [[0.14285714] [0.0952381] [0.23809524] [-0.19047619] [-1.]]

6406531286494. ✖ [[0.14285714] [0.0952381] [-0.23809524] [-1.19047619] [-0.]]

6406531286495. ✖ [[0.14285714] [0.0952381] [0.23809524] [-0.19047619] [1.2134245]]

6406531286496. ✖ [[1] [0.0952381] [0.23809524] [-0.19047619] [-1.]]

Question Number : 193 Question Id : 640653386854 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

In the figure 1, what are the names of classes arranged in the increasing order of the median values?

Figure 1: Box plot

Options :

6406531286497. ✖ First < Second < Third

6406531286498. ✔ Third < Second < First

6406531286499. ✖ Second < Third < First

6406531286500. ✖ Third < First < Second

Question Number : 194 Question Id : 640653386856 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

Go through the code snippet given below and mark the correct output.

```
from sklearn.metrics import max_error
y_true = [2, 2, 2, 1]
y_pred = [3, 5, 7, 5]
max_error(y_true, y_pred)
```

Options :

6406531286505. ✖ 1

6406531286506. ✖ 3

6406531286507. ✖ 9

6406531286508. ✖ 25

6406531286509. ✖ 4

6406531286510. ✔ 5

Question Number : 195 Question Id : 640653386860 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 code given below?

```
from sklearn import linear_model
clf = linear_model.Ridge(alpha=1)
X= [[1,0], [2, 1], [3, 2]]
y= [10, 20, 30]
clf.fit(X, y)
linear_model.Ridge(alpha=1,max_iter=1000, tol=0.0001,fit_intercept=True)
clf.score(X,y)
```

Options :

6406531286525. ✖ 12

6406531286526. ✖ 29

6406531286527. ✖ No evaluation metrics are mentioned, hence it will produce an error

6406531286528. ✔ 0.96

Sub-Section Number :	4
Sub-Section Id :	64065355387
Question Shuffling Allowed :	Yes

Question Number : 196 Question Id : 640653386849 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Which of the following is likely to be the correct output of the code given below?

```
from math import nan
import numpy as np
from sklearn.impute import SimpleImputer
data=[(2,3),(4,5),(3,1),(1,2),(5, nan)]
imputer = SimpleImputer(missing_values = np.nan, strategy ='mean',
                        add_indicator=True)
imputer = imputer.fit(data)
data_imputed_with_indicator = imputer.transform(data)
print (data_imputed_with_indicator)
```

Options :

6406531286477. ✖ [[2. 3. 0.] [4. 5. 0.] [3. 1. 0.] [1. 2. 0.] [5. 2.2 1.]]

6406531286478. ✔ [[2. 3. 0.] [4. 5. 0.] [3. 1. 0.] [1. 2. 0.] [5. 2.75 1.]]

6406531286479. ✖ [[2. 3.] [4. 5.] [3. 1.] [1. 2.] [5. 2.2]]

6406531286480. ✖ There are some mistakes in the code, hence it will produce errors.

Question Number : 197 Question Id : 640653386852 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([ 5,7,2,1])
from sklearn.preprocessing import PolynomialFeatures
poly= PolynomialFeatures(degree=2, interaction_only=True)
data = data.reshape(2,2)
poly.fit_transform(data)
```

Which of the following could be the correct output?

Options :

6406531286489. ✔ array([[1., 5., 7., 35.], [1., 2., 1., 2.]])

6406531286490. ✖ array([[1., 5., 7.], [1., 2., 1.]])

6406531286491. ✖ array([[1., 5., 7., 25., 35., 49., 125., 175., 245., 343.], [1., 2., 1., 4., 2., 1., 8., 4., 2., 1.]])

6406531286492. ✖ array([[1., 5., 7., 25., 35., 49.], [1., 2., 1., 4., 2., 1.]])

Question Number : 198 Question Id : 640653386855 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Which of the following options will be the correct output of print(clf.coef_)?

```
from sklearn import linear_model
clf = linear_model.Lasso(alpha=0.1)
clf.fit([[3,1,0], [2, 2, 1], [1,3, 2]], [2,5,1])
linear_model.Lasso(alpha=0.1,max_iter=1000, tol=0.0001,
warm_start=False,fit_intercept=True)
```

Options :

6406531286501. ✔ [0.35 -0. -0.]

6406531286502. ✖ [-0.85,0]

6406531286503. ✖ [3,2,1,2]

6406531286504. ✖ Given code block will return an error.

Question Number : 199 Question Id : 640653386857 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

Go through the code snippet given below and mark the correct output.

```
from sklearn.metrics import r2_score
y_true = [3, -1, 2, 8]
y_pred = [2, 0.0, 2, 8]
r2_score(y_true, y_pred)
```

Options :

6406531286511. ✖ 0.61

6406531286512. ✖ 0.83

6406531286513. ✔ 0.95

6406531286514. ✖ 1

6406531286515. ✖ -0.6

6406531286516. ✖ 5

Question Number : 200 Question Id : 640653386859 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Which of the following is likely to be the correct output of the code given below?

```
from sklearn.preprocessing import OneHotEncoder
enc = OneHotEncoder(handle_unknown='ignore')
X = [['Red', 1], ['White', 2], ['orange', 2]]
b=enc.fit_transform(X).toarray()
print(b)
```

Options :

6406531286521. ✖ [[0. 0. 0. 1. 0.] [0. 1. 0. 0. 1.] [0. 0. 1. 0. 1.]]

6406531286522. ✖ [[1. 0. 0. 0. 0.] [0. 1. 0. 0. 0.] [0. 0. 1. 0. 0.]]

6406531286523. ✖ [[1. 0. 0. 1. 0.] [0. 1. 0. 0. 2.] [0. 0. 1. 0. 2.]]

6406531286524. ✔ [[1. 0. 0. 1. 0.] [0. 1. 0. 0. 1.] [0. 0. 1. 0. 1.]]

Question Number : 201 Question Id : 640653386862 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 blocks will correctly take the learning rate as'optimal' ?

Options :

6406531286530. ✔
```
from sklearn.linear_model import SGDRegressor
linear_regressor = SGDRegressor(learning_rate='optimal', eta0=1e-3)
```

6406531286531. ✖
```
from sklearn.linear_model import SGDRegressor
linear_regressor = (SGDRegressor_learning_rate='adaptive',eta0=1e-2)
```

6406531286532. ✖
```
from sklearn.model_selection import SGDRegressor
SGD_regressor = LinearRegressor(learning_rate='optimal',eta0=1e-2)
```

6406531286533. ✖ None of these

Sub-Section Number :	5
Sub-Section Id :	64065355388
Question Shuffling Allowed :	Yes

Question Number : 202 Question Id : 640653386848 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 code blocks will correctly return an array of feature variables?

Options :

6406531286473. ✖
```
from sklearn.datasets import load_iris
X,y = load_iris()
print(X)
```

6406531286474. ✔
```
from sklearn.datasets import load_iris
data = load_iris()
print(data.data)
```

6406531286475. ✖
```
from sklearn.datasets import load_iris
(X, y) = load_iris()
print(X)
```

6406531286476. ✔
```
from sklearn.datasets import load_iris
X,y = load_iris(return_X_y = True)
print(X)
```

Sub-Section Number :	6
Sub-Section Id :	64065355389
Question Shuffling Allowed :	Yes

Question Number : 203 Question Id : 640653386846 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

Scikit-Learn's API is remarkably well designed. The main design principles are:-

Options :

6406531286465. ✔ Nonproliferation of classes

6406531286466. ✔ Sensible defaults

6406531286467. ✔ Consistency

6406531286468. ✖ Proportion

Question Number : 204 Question Id : 640653386863 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

Go through the code block given below:

```
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 load_diabetes
diabetes = load_diabetes(as_frame=True)
train_X= diabetes.data
train_y= diabetes.target

lf= np.logspace(-5, 0, num=6)

reg= Pipeline([("poly", PolynomialFeatures(degree=2)),
                              ("feature_scaling", StandardScaler())
                              ])

ridge= RidgeCV(alphas=lf,scoring= None,fit_intercept = False)
results = ridge.fit(train_X, train_y)
print(results.intercept_)
```

Which of the following can't be the correct output of the given code block?

Options :

6406531286534. ✖ 0.0

6406531286535. ✔ 0.01

6406531286536. ✔ 0.1

6406531286537. ✔ 1

Sub-Section Number :	7
Sub-Section Id :	64065355390
Question Shuffling Allowed :	Yes

Question Number : 205 Question Id : 640653386861 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Short Answer Question

Enter the correct output of the following code block.

```
import numpy as np
from sklearn.model_selection import ShuffleSplit
X = np.array([[2, 2], [5, 4], [1, 6], [2, 8], [3, 4], [2, 6]])
y = np.array([3, 2, 1, 2, 3, 2])
rs = ShuffleSplit(n_splits=5, test_size=.25, random_state=0)
k=1
for i,j in rs.split(X):
  k+=1
print(k)
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

6

Sub-Section Number :	8
Sub-Section Id :	64065355391
Question Shuffling Allowed :	No

Question Id : 640653386864 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (206 to 207)

Question Label : Comprehension

Go through the code snippet given below and answer the given subquestions.

```
import numpy as np
from sklearn.linear_model import SGDRegressor
from sklearn.pipeline import make_pipeline
n_samples, n_features = 18, 4
rng = np.random.RandomState(0)
y = rng.randn(n_samples)
X = rng.randn(n_samples, n_features)
reg = SGDRegressor(max_iter=1000,tol=1e-3,eta0= 0.04, power_t=5,
                   n_iter_no_change=3, validation_fraction=0.3 ,random_state=42)
reg.fit(X, y)
print(reg.coef_)
```

Sub questions

Question Number : 206 Question Id : 640653386865 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Which of the following options will be the output of the given code?

Options :

6406531286538. ✔ [-0.02634908 0.01189399 0.0917284 0.08966849]

6406531286539. ✖ array([-0.22622766, -0.00582008, -0.1820344 , 0.03518086, -0.14490955])

6406531286540. ✖ array([-0.22622766, -0.00582008, -0.1820344])

6406531286541. ✖ Given code will return an error because the data set is not given

Question Number : 207 Question Id : 640653386866 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 could be the possible output of print(reg.score())?

Options :

6406531286542. ✖ -0.528

6406531286543. ✖ 1

6406531286544. ✖ 0.528

6406531286545. ✔ Given code will return an error

BDM

Section Id :	64065323909
Section Number :	13
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	13
Number of Questions to be attempted :	13
Section Marks :	16
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 :	64065355392
Question Shuffling Allowed :	No

Question Number : 208 Question Id : 640653386867 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL: BUSINESS DATA MANAGEMENT"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?
CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

(IF IT IS NOT THE CORRECT SUBJECT, PLS CHECK THE SECTION AT THE TOP FOR THE SUBJECTS REGISTERED BY YOU)

Options :

6406531286546. ✔ YES

6406531286547. ✖ NO

Sub-Section Number : 2

Sub-Section Id : 64065355393

Question Shuffling Allowed : Yes

Question Number : 209 Question Id : 640653386868 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

Total utility _____ at (a / an) _____ rate when marginal utility is decreasing but positive.

Options :

6406531286548. ✖ decreases, increasing

6406531286549. ✔ increases, decreasing

6406531286550. ✖ decreases, decreasing

6406531286551. ✖ increases, increasing

Question Number : 210 Question Id : 640653386869 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

Statement 1: She prefers bread over ice cream, and sandwiches over bread.

Statement 2: She derives 100 utility points from eating a slice of bread.

Which of the two utility theories, viz., the Cardinal Utility Theory (CUT) and the Ordinal Utility Theory (OUT), does each of these statements belong?

Options :

6406531286552. ✖ Statement 1: CUT; Statement 2: OUT

6406531286553. ✔ Statement 1: OUT; Statement 2: CUT

6406531286554. ✖ Statement 1: CUT; Statement 2: CUT

6406531286555. ✖ Statement 1: OUT; Statement 2: OUT

Question Number : 211 Question Id : 640653386870 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 axes (x and y) of the indifference curve represent:

Options :

6406531286556. ✖ X: Price; Y: Price

6406531286557. ✖ X: Supply; Y: Demand

6406531286558. ✖ X: Quantity; Y: Price

6406531286559. ✔ X: Quantity; Y: Quantity

Question Number : 212 Question Id : 640653386872 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

"She was hungry and wanted a Dosa. The app on her phone gave her a better price for a plate of Idlis; so she chose Idli over Dosa. She also wanted to buy a printer. However, the cartridge was very expensive, and thus she had to drop the idea of getting a printer."

The first purchase decision (Dosa/Idli) is a classic example of _____ goods and the second

(printer/cartridge) is an example of _____ goods.

Options :

6406531286566. ✖ complementary; complementary

6406531286567. ✖ substitutable; substitutable

6406531286568. ✖ complementary; substitutable

6406531286569. ✔ substitutable; complementary

Question Number : 213 Question Id : 640653386874 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

Assume person **X** consumes only 2 goods **food** and **books** in a month. Also assume that both **food** and **books** are normal goods for **X**. A decrease in the price of **food** will lead to **X**'s consumption of **books** to:

Options :

6406531286571. ✖ increase owing to substitution effect.

6406531286572. ✖ increase owing to negative income elasticity.

6406531286573. ✔ increase owing to income effect.

6406531286574. ✖ remain unchanged

Question Number : 214 Question Id : 640653386875 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 amount of at least one of the inputs used remain constant" is an assumption of

Options :

6406531286575. ✖ Long run production function

6406531286576. ✔ Short run production function

Question Number : 215 Question Id : 640653386881 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

Ram's toy shop on an e-commerce website was having a dry spell despite him running a price promotion. To boost the sales, he set out a banner on the landing page of the shop that read "Only few hours left for the sale to end!" while he would actually reset the banner every couple of hours. What pricing strategy is Ram is using?

Options :

6406531286584. ✖ Customer value pricing

6406531286585. ✔ Psychological pricing

6406531286586. ✖ Contribution pricing

6406531286587. ✖ Going rate pricing

Sub-Section Number :	3
Sub-Section Id :	64065355394
Question Shuffling Allowed :	Yes

Question Number : 216 Question Id : 640653386871 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

See the Demand curves (D_1 and D_2) in the figure below. Choose all the correct statements pertaining to these curves.

Options :

6406531286560. ✔ An increase in Demand will shift the curve D_1 towards D_2

6406531286561. ✖ A Decrease in Demand will shift the curve D_1 towards D_2

6406531286562. ✔ A Decrease in Demand will shift the curve D_2 towards D_1

6406531286563. ✖ An increase in Demand will not shift the curve D_1 towards D_2

6406531286564. ✔ A Decrease in Demand will not shift the curve D_1 towards D_2

6406531286565. ✖ A Decrease in Demand will not shift the curve D_2 towards D_1

Sub-Section Number :	4
Sub-Section Id :	64065355395
Question Shuffling Allowed :	Yes

Question Number : 217 Question Id : 640653386873 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 this hypothetical example: *Coca-Cola decreased the price of 300 ml Diet Coke can from INR 40 per can to INR 38. This resulted in consumers buying 7000 cans a week. Before the price drop, consumers bought only 5000 cans a week. In the same week, Pepsi reduced the price of its Black cans by INR 2, which increased the sales of Pepsi Black by a whopping 25%! To add to all the complexity, in the same week, the price of petrol increased by 3%, and that of diesel by 2.5%, resulting in a net decrease in fuel usage by 0.02%*. Given all this data, calculate the price elasticity of demand of Diet Coke (round the answer to 2 decimal places).

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

8.00

Sub-Section Number : 5

Sub-Section Id : 64065355396

Question Shuffling Allowed : Yes

Question Number : 218 Question Id : 640653386876 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Match the following:

i) Marginal Cost > Average Variable Cost	1) Average Variable Cost is minimized
ii) Marginal Cost < Average Variable Cost	2) Average Variable Cost is increasing
iii) Marginal Cost = Average Variable Cost	3) Total Cost is decreasing
iv) Marginal Cost < 0	4) Average Variable Cost is decreasing

Options :

6406531286577. ✔ i - 2; ii - 4; iii - 1; iv – 3

6406531286578. ✖ i - 4; ii - 2; iii - 1; iv – 3

6406531286579. ✖ i - 1; ii - 4; iii - 2; iv – 3

6406531286580. ✖ i - 1; ii - 3; iii - 4; iv – 2

Sub-Section Number : 6

Sub-Section Id : 64065355397

Question Shuffling Allowed : No

Question Id : 640653386877 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 : (219 to 220)

Question Label : Comprehension

A firm has total assets worth INR 45000000/- of which 10000000/- is illiquid. Its total current liabilities sum up to INR 60000000/-.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 219 Question Id : 640653386878 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Short Answer Question

What is the value of quick ratio (acid-test) (round the answer to 2 decimal places)?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.54 to 0.59

Question Number : 220 Question Id : 640653386879 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

Current ratio for this firm (round the answer to 2 decimal places)?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.725 to 0.775

Sub-Section Number :	7
Sub-Section Id :	64065355398
Question Shuffling Allowed :	Yes

Question Number : 221 Question Id : 640653386880 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Short Answer Question

A firm has INR 500000/- as accounts receivable (debtors), while its annual sales turnover is INR 6500000/-. Calculate the firm's debtor days (round the answer to 2 decimal places).

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

28.00 to 28.10

Business Analytics

Section Id :	64065323910
Section Number :	14
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 :	64065355399
Question Shuffling Allowed :	No

Question Number : 222 Question Id : 640653386882 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

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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 :

6406531286588. ✔ Yes

6406531286589. ✖ No

Sub-Section Number :	2
Sub-Section Id :	64065355400
Question Shuffling Allowed :	Yes

Question Number : 223 Question Id : 640653386883 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

Select which of the following are discrete data?

Options :

6406531286590. ✔ How many siblings do you have

6406531286591. ✖ Weight

6406531286592. ✔ Number of houses in your locality

6406531286593. ✔ Defects per hour

6406531286594. ✖ Pressure

Question Number : 224 Question Id : 640653386884 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

Select which of the following are continuous data?

Options :

6406531286595. ✔ Time between two successive failures of an equipment

6406531286596. ✔ Volume

6406531286597. ✖ Gender

6406531286598. ✖ Your favourite cuisines

6406531286599. ✔ Density

Sub-Section Number :	3
Sub-Section Id :	64065355401
Question Shuffling Allowed :	Yes

Question Number : 225 Question Id : 640653386885 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

Select the scenario where a histogram will be an appropriate representation?

Options :

6406531286600. ✖ One item proportional to totals

6406531286601. ✔ Frequency of items

6406531286602. ✖ Correlation representation

6406531286603. ✖ Outlier identification

Question Number : 226 Question Id : 640653386887 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Multiple Choice Question

For a set of observations, the skewness = - 4. What does this indicate?

Options :

6406531286608. ✖ Right tail is bigger than the left tail in the density plot

6406531286609. ✔ Left tail is bigger than the right tail in the density plot

6406531286610. ✖ Both the tails are bigger than normal

6406531286611. ✖ Both the tails are smaller than normal

Question Number : 227 Question Id : 640653386888 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Multiple Choice Question

If the mean, mode, and median of a data set are not equal, what does that indicate?

Options :

6406531286612. ✖ Distribution is symmetric

6406531286613. ✖ Distribution is partially symmetric

6406531286614. ✔ Distribution is non-symmetric

6406531286615. ✖ Can’t say about symmetry with the information provided

Question Number : 228 Question Id : 640653386892 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

We have a dataset with a minimum value of 0.05 and a maximum value of 0.8. We are building an empirical distribution using the dataset. What is the probability (P) of finding the value 0.04 in the dataset?

Options :

6406531286622. ✖ P = 0.1

6406531286623. ✖ P=0.001

6406531286624. ✔ P=0

6406531286625. ✖ P>0.05

Sub-Section Number :	4
Sub-Section Id :	64065355402
Question Shuffling Allowed :	Yes

Question Number : 229 Question Id : 640653386886 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1.5

Question Label : Multiple Select Question

Identify the misleading visual(s).

Options :

6406531286604. ✖

6406531286605. ✖

6406531286606. ✖

6406531286607. ✔ All of these

Sub-Section Number :	5
Sub-Section Id :	64065355403
Question Shuffling Allowed :	Yes

Question Number : 230 Question Id : 640653386889 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Correct Marks : 0.5

Question Label : Multiple Choice Question

For a normal distribution, the Coefficient of variation (CV) is greater than one. Is the statement True or False?

Options :

6406531286616. ✖ TRUE

6406531286617. ✔ FALSE

Question Number : 231 Question Id : 640653386890 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0.5

Question Label : Multiple Choice Question

P-P plot is only applicable for continuous distributions only and not for discrete distributions. Is the statement True or False?

Options :

6406531286618. ✖ TRUE

6406531286619. ✔ FALSE

Question Number : 232 Question Id : 640653386891 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0.5

Question Label : Multiple Choice Question

In trace-driven simulation, there will not be sufficient data to run all possible simulations. Is the statement True or False?

Options :

6406531286620. ✔ TRUE

6406531286621. ✖ FALSE

Sub-Section Number : 6

Sub-Section Id : 64065355404

Question Shuffling Allowed : No

Question Id : 640653386893 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 : (233 to 236)

Question Label : Comprehension

You are given the following contingency table based on a sample data with two age groups and their brand preferences. You perform a chi-squared test of independence to make inferences about the population from this sample.

	Brand A	Brand B	Brand C	Brand D
40 - 50	122	111	208	86
20 - 30	65	86	83	71

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 233 Question Id : 640653386894 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1.5

Question Label : Short Answer Question

From the given contingency table, find the expected frequency of people belonging to the (20 – 30) age group preferring brand B?

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 :

70 to 74

Question Number : 234 Question Id : 640653386895 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1.5

Question Label : Short Answer Question

What is the calculated value of chi-squared?

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 :

15 to 19

Question Number : 235 Question Id : 640653386896 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 p-value?

Options :

6406531286628. ✖ 0.4

6406531286629. ✖ 0.25

6406531286630. ✖ 0.01

6406531286631. ✔ None of these

Question Number : 236 Question Id : 640653386897 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

At the significance level 0.05, chi-squared tabular value is 7.82. What do you conclude?

Options :

6406531286632. ✔ Reject the null hypothesis and conclude that the categorical variables are not independent

6406531286633. ✖ Fail to reject the null hypothesis and conclude that the categorical variables are not independent

6406531286634. ✖ Fail to reject the null hypothesis and conclude that the categorical variables are independent

6406531286635. ✖ Reject the null hypothesis and conclude that the categorical variables are independent

Sub-Section Number :	7
Sub-Section Id :	64065355405
Question Shuffling Allowed :	Yes

Question Number : 237 Question Id : 640653386898 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 a factory manufactures products on three machines A, B and C. Suppose 45% of total output comes from machine A, 25% of total output comes from machine B and 9% of total output comes from machine C. From the past data, it is known that 10% of products by machine A are defectives, 5% of products by machine B are defectives and 15% 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?

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 :

0.05 to 0.09

System Commands

Section Id :	64065323911
Section Number :	15
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	15
Number of Questions to be attempted :	15
Section Marks :	100
Display Number Panel :	Yes
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	64065355406
Question Shuffling Allowed :	No

Question Number : 238 Question Id : 640653386899 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL: SYSTEM COMMANDS"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?
CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

(IF IT IS NOT THE CORRECT SUBJECT, PLS CHECK THE SECTION AT THE TOP FOR THE SUBJECTS REGISTERED BY YOU)

Options :

6406531286637. ✔ Yes

6406531286638. ✖ No

Sub-Section Number :	2
Sub-Section Id :	64065355407
Question Shuffling Allowed :	Yes

Question Number : 239 Question Id : 640653386908 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

Which of the following command will run the script `/home/reena/scripts/monday-greetings.sh` on every Monday at 10:00 AM in the month of October.

Hint: Below is the description of the sequence in the cron job command. It tells at what date/time periodically the job needs to be executed.

```
*   *   *   *   *   <Command(s) with argument>
|   |   |   |   |              |
|   |   |   |   |      Command or Script to Execute
|   |   |   |   |
|   |   |   |   |
|   |   |   |   |

|   |   |   | Day of the Week(0-6)
|   |   |   |
|   |   | Month of the Year(1-12)
|   |   |
|   | Day of the Month(1-31)
|   |
| Hour(0-23)
|
Min(0-59)
```

Options :

6406531286670. ✖ `0 0 10 10 * /home/reena/scripts/monday-greetings.sh`

6406531286671. ✖ `10 0 0 10 1 /home/reena/scripts/monday-greetings.sh`

6406531286672. ✖ `* 0 10 * 0 /home/reena/scripts/monday-greetings.sh`

6406531286673. ✔ `0 10 * 10 1 /home/reena/scripts/monday-greetings.sh`

Question Number : 240 Question Id : 640653386916 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 5

Question Label : Multiple Choice Question

What will be the output from the script when the value of variable `status` is 200?

```
if [[ $status -eq 200 ]]; then
        print "Success"
else
        print "Something went wrong"
fi
```

Options :

6406531286698. ✔ `Success`

6406531286699. ✖ `Something went wrong`

6406531286700. ✖ Nothing will be printed

6406531286701. ✖ Throws an error and nothing will be printed

Sub-Section Number :	3
Sub-Section Id :	64065355408
Question Shuffling Allowed :	Yes

Question Number : 241 Question Id : 640653386901 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 6

Question Label : Multiple Choice Question

Select the output from the below script

Note: `rev` command will reverse

```
A="HA"
echo "${A}NN$(echo $A | rev)"
```

Options :

6406531286643. ✖ HANNA

6406531286644. ✖ HANNHA

6406531286645. ✖ HAHA

6406531286646. ✖ HANN

6406531286647. ✖ NN

6406531286648. ✔ HANNAH

6406531286649. ✖ ${A}NN$(echo $A | rev)

Question Number : 242 Question Id : 640653386909 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 6

Question Label : Multiple Choice Question

Below is the output of `ls -li` command. Select the number of hardlinks and softlinks `todo.md` is having respectively.

```
$ pwd
/home/ram/tmp/6177

$ ls -li
total 0
28320712 -rw-rw-r-- 1 ram ram 0 Sep 20 13:24 notes.md
28320714 -rw-rw-r-- 1 ram ram 0 Sep 20 13:24 quicklinks.md
28320713 -rw-rw-r-- 4 ram ram 0 Sep 20 13:24 todo.md
```

Options :

6406531286674. ✖ 1, 4

6406531286675. ✖ 4,1

6406531286676. ✖ 1,0

6406531286677. ✔ 4,cannot be determined with above data

6406531286678. ✖ cannot be determined with above data, cannot be determined with above data

Question Number : 243 Question Id : 640653386913 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Correct Marks : 6

Question Label : Multiple Choice Question

What will be the result of the keystrokes `$jddk0dw` on vi editor or `<C-e><C-k><C-k><C-a><M-d><C-d>` on emacs editor from first line first character on the text given below. `<C-x>` and `<M-x>` refers to Control + x and Meta/Alt + x respectively.

```
abcd efgh ijkl
mnop qrst uvw
xyz
```

Hint:
Emacs:
- `<C-k>` delete the entire line (from the cursor to the end)
- `<M-d>` delete word
- `<C-d>` delete character

Vi:
- `dd` delete the entire line
- `dw` delete word

Options :

6406531286686. ✖

```
abcd efgh
xyz
```

6406531286687. ✖

```
mnop qrst uvw
xyz
```

6406531286688. ✔

```
efgh ijkl
xyz
```

6406531286689. ✖

```
efgh ijkl
mnop
xyz
```

Question Number : 244 Question Id : 640653386914 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 6

Question Label : Multiple Choice Question

Choose the command that matches a sequence of one or more digits at the end of the lines in the file `data.txt`.

Options :

6406531286690. ✗ `grep '^[0-9]*' data.txt`

6406531286691. ✗ `grep '[0-9][0-9]*' data.txt`

6406531286692. ✓ `grep '[0-9]*[0-9]$' data.txt`

6406531286693. ✗ `grep '^[0-9]*[0-9]$' data.txt`

Sub-Section Number :	4
Sub-Section Id :	64065355409
Question Shuffling Allowed :	Yes

Question Number : 245 Question Id : 640653386906 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 7

Question Label : Multiple Choice Question

Select the output from the below script.

```
var="Water"
echo "-var-"
echo "-${var2:=Air}-"
echo "-${var2:-Fire}-"
echo "-${var2:+Earth}-"
```

Options :

6406531286662. ✖

```
-Water-
-Air-
-Fire-
-Earth-
```

6406531286663. ✖

```
-var-
-Air-
-Fire-
-Earth-
```

6406531286664. ✔

```
-var-
-Air-
-Air-
-Earth-
```

6406531286665. ✖

```
--
-Air-
-Air-
-Air-
```

Question Number : 246 Question Id : 640653386907 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 7

Question Label : Multiple Choice Question

In an organization a particular software requires a key file. The key file will change at 6 am and 6 pm. The command `generate-key` will generate the key file with either of the option `--day` or `--night` with respect to the time at which the command is executed. Choose the command that does the above job.

Hint:
The output of date command with and without the option are shown below.

```
$ date +%H:%M
15:06

$ date
Monday 19 September 2022 03:06:44 PM IST
```

Options :

6406531286666. ✔

```
[[ $(date +%H:%M) > 06:00 && $(date +%H:%M) < 18:00 ]] &&
        generate-key --day ||
        generate-key --night
```

6406531286667. ✖

```
[[ $(date) > 06:00 || $(date) < 18:00 ]] &&
        generate-key --day ||
        generate-key --night
```

6406531286668. ✖

```
[[ $(date +%H:%M) > 06:00 && $(date +%H:%M) < 18:00 ]] &&
        generate-key --night ||
        generate-key --day
```

6406531286669. ✖

```
[[ $(date +%H:%M) -gt 06:00 && $(date +%H:%M) -lt 18:00 ]] &&
        generate-key --day ||
        generate-key --night
```

Sub-Section Number : 5

Sub-Section Id : 64065355410

Question Shuffling Allowed : Yes

Question Number : 247 Question Id : 640653386900 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 6

Question Label : Multiple Select Question

Choose the command to print the below text in the terminal.

```
Welcome to the Summer Camp
Pichavaram
```

Options :

6406531286639. ✔

```
echo 'Welcome to the Summer Camp
Pichavaram'
```

6406531286640. ✖

```
echo 'Welcome to the Summer Camp\nPichavaram'
```

6406531286641. ✔

```
echo 'Welcome to the Summer Camp'
echo 'Pichavaram'
```

6406531286642. ✖

```
echo 'Welcome to the Summer Camp' echo 'Pichavaram'
```

Question Number : 248 Question Id : 640653386915 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 6

Question Label : Multiple Select Question

The contents of file.txt is given below

```
You've gotta dance like there's nobody watching,
Love like you'll never be hurt,
Sing like there's nobody listening,
And live like it's heaven on earth.
- William W. Purkey
```

Select the command that prints the output same as the contents of file.txt

Options :

6406531286694. ✔ `grep . file.txt`

6406531286695. ✔ `grep .* file.txt`

6406531286696. ✖ `grep [0-9] file.txt`

6406531286697. ✖ `grep [.] file.txt`

Question Number : 249 Question Id : 640653386918 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 6

Question Label : Multiple Select Question

Select all the files that will be copied (not moved) to `~/anotherdir` after running the below script.
Note that `stat` command is used to get the file status and with option `-c %s` is to get the total size in bytes.

```
for i in *; do
        if ! [[ $(stat -c %s "$i") -eq 0 ]]; then
                cp $i ~/anotherdir/$i
        else
                mv $i ~/anotherdir/$i
        fi
done
```

```
$ ls -l
-rw-rw-r--   1 ahmed ahmed   61432 Jul 20 18:40  temp.awk
-rw-rw-r--   1 ahmed ahmed       0 Aug  7 13:55  temp.hi
-rw-rw-r--   1 ahmed ahmed   12233 Aug 20 15:24  temp.hs
-rw-rw-r--   1 ahmed ahmed   59433 Aug  7 13:55  temp.o
-rwxrw-r--   1 ahmed ahmed       0 Aug 21 01:49  temp.py
-rwxr-xr-x   1 ahmed ahmed       0 Aug  6 17:39  temp.sh

$ stat -c %s temp.hs #
12233
```

Options :

6406531286708. ✔ temp.awk

6406531286709. ✖ temp.hi

6406531286710. ✔ temp.hs

6406531286711. ✔ temp.o

6406531286712. ✖ temp.py

6406531286713. ✖ temp.sh

Sub-Section Number :	6
Sub-Section Id :	64065355411
Question Shuffling Allowed :	Yes

Question Number : 250 Question Id : 640653386917 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Correct Marks : 8

Question Label : Multiple Select Question

```
while read line; do
        $pat = '[0-3][a-g][123][xyz]'
        [[ $line =~ $pat ]] && break
done
```

Select the standard input(s) that break the loop.

Options :

6406531286702. ✖ 8iadaz

6406531286703. ✔ 3g2z

6406531286704. ✔ jkjkjkjk2j2yjkjk

6406531286705. ✖ .a.a.a.2.2.1.

6406531286706. ✔ 00210132a1z01231

6406531286707. ✖ 1a2w01231

Sub-Section Number :	7
Sub-Section Id :	64065355412
Question Shuffling Allowed :	No

Question Id : 640653386910 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

Consider the below command outputs for the given subquestions.

Note that in the output of the command `ls -li` the first field is the inode number. Also that /home/ram is the home directory of the user.

```
$ pwd
/home/ram/tmp/6177

$ ls -li
total 0
28320712 -rw-rw-r-- 1 ram ram 0 Sep 20 13:24 notes.md
28320714 -rw-rw-r-- 1 ram ram 0 Sep 20 13:24 quicklinks.md
28320713 -rw-rw-r-- 4 ram ram 0 Sep 20 13:24 todo.md
```

```
$ cd /home/ram/tmp/28041

$ pwd
/home/ram/tmp/28041

$ ls -li
total 0
28320713 -rw-rw-r-- 4 ram ram  0 Sep 20 13:24 todo2.md
28320713 -rw-rw-r-- 4 ram ram  0 Sep 20 13:24 todo3.md
28320716 -rw-rw-r-- 1 ram ram  0 Sep 20 13:26 todo4.md
28320717 lrwxrwxrwx 1 ram ram 15 Sep 20 13:26 todo5.md →
../6177/todo.md
28320718 lrwxrwxrwx 1 ram ram 16 Sep 20 13:26 todo6.md →
../6177/notes.md
28320713 -rw-rw-r-- 4 ram ram  0 Sep 20 13:24 todo.md
```

Sub questions

Question Number : 251 Question Id : 640653386911 Question Type : SA Calculator : None

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

Correct Marks : 5

Question Label : Short Answer Question

With respect to the given data, how many files in `~/tmp/28041` is referring (hardlink + softlink) to the file `~/tmp/6177/todo.md` ?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

4

Question Number : 252 Question Id : 640653386912 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 6

Question Label : Multiple Select Question

With respect to the given data, if the directory name `~/tmp/6177` is changed to `~/tmp/6178`, then which of the files in `~/tmp/28041` will be broken?

Options :

6406531286680. ✖ todo.md

6406531286681. ✖ todo2.md

6406531286682. ✖ todo3.md

6406531286683. ✖ todo4.md

6406531286684. ✔ todo5.md

6406531286685. ✔ todo6.md

Sub-Section Number :	8
Sub-Section Id :	64065355413
Question Shuffling Allowed :	No

Question Id : 640653386902 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

Case 1

```
echo Hello
read line
echo World
```

Case 2

```
echo Hello
read line &
echo World
```

Based on the above data, answer the given subquestions

Sub questions

Question Number : 253 Question Id : 640653386903 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 5

Question Label : Multiple Choice Question

When will the text `World` be printed if no input is given to stdin in case 1?

Options :

6406531286650. ✖ Immediately

6406531286651. ✖ After a minute

6406531286652. ✔ The text `World` will not be printed

6406531286653. ✖ Not enough information

Question Number : 254 Question Id : 640653386904 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 5

Question Label : Multiple Choice Question

When will the text `World` be printed
if no input is given to stdin in case 2?

Options :

6406531286654. ✔ Immidiately

6406531286655. ✖ After a minute

6406531286656. ✖ The text `World` will not be printed

6406531286657. ✖ Not enough information

Question Number : 255 Question Id : 640653386905 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

Select the correct statement with
respect to the given script?

Options :

6406531286658. ✔ The command `read line` will run in background

6406531286659. ✖ The commands `read line` and `echo World` both will run in background

6406531286660. ✖ The processes sent to background will be killed

6406531286661. ✔ The `fg` command will move back the execution of `read line` to foreground