

Notations :

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

Question Paper Name :

IIT M DIPLOMA ET1 EXAM QPD2 S1 30 Apr
2023

Subject Name :

2023 Apr30: IIT M DIPLOMA ET1 EXAM
QPD2

Creation Date :

2023-04-21 16:50:49

Duration :

180

Total Marks :

1145

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 :	64065313514
Group Maximum Duration :	0
Group Minimum Duration :	90
Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	1145
Is this Group for Examiner? :	No
Examiner permission :	Cant View
Show Progress Bar? :	No
Revisit allowed for group Instructions? :	Yes
Maximum Instruction Time :	0
Minimum Instruction Time :	0
Group Time In :	Minutes
Navigate To Group Summary From Last Question? :	No
Disable Submit Button During Assessment? :	No
Section Selection Time? :	0
No of Optional sections to be attempted :	0

Section Id :	64065338333
Section Number :	1
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 :	64065380456
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 1 Question Id : 640653564154 Question Type : MCQ Is Question

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

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "MATHEMATICS FOR DATA SCIENCE 2 (COMPUTER BASED EXAM)"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?

CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

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

Options :

6406531885857. ✓ YES

6406531885858. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 64065380457

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 2 Question Id : 640653564173 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 function $f(x, y) = x^3 + y^3$. Which of the following affine subspaces represents the tangent line at the point $(1, 1)$ in the direction of the vector $(1, 1)$?

Options :

$$\{(x, y, z) \in \mathbb{R}^3 \mid \frac{x-1}{\frac{1}{\sqrt{2}}} = \frac{y-1}{\frac{1}{\sqrt{2}}} = \frac{z-1}{\frac{1}{\sqrt{2}}}\}$$

6406531885886. ✗

$$\{(x, y, z) \in \mathbb{R}^3 \mid \frac{x-1}{\frac{1}{\sqrt{2}}} = \frac{y-1}{\frac{1}{\sqrt{2}}} = \frac{z-2}{\frac{1}{\sqrt{2}}}\}$$

6406531885887. ✗

$$\{(x, y, z) \in \mathbb{R}^3 \mid \frac{x-1}{\frac{1}{\sqrt{2}}} = \frac{y-1}{\frac{1}{\sqrt{2}}} = \frac{z-2}{\frac{6}{\sqrt{2}}}\}$$

6406531885888. ✓

$$\{(x, y, z) \in \mathbb{R}^3 \mid \frac{x}{\frac{1}{\sqrt{2}}} = \frac{y}{\frac{1}{\sqrt{2}}} = \frac{z}{\frac{6}{\sqrt{2}}}\}$$

6406531885889. ✗

Sub-Section Number : 3

Sub-Section Id : 64065380458

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 3 Question Id : 640653564179 Question Type : MSQ Is Question

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

Correct Marks : 3 Selectable Option : 0

Question Label : Multiple Select Question

Choose the correct statements for the function

$$f(x, y) = \begin{cases} \frac{x^4 y^2}{x^4 + y^4} & (x, y) \neq (0, 0) \\ 0 & (x, y) = (0, 0) \end{cases}$$

Options :

6406531885894. ❌ $\lim_{(x,y) \rightarrow (0,0)} f(x, y) = 1$

6406531885895. ✓ $f_x(0, 0) = 0$

6406531885896. ✓ The directional derivative of f at $(0, 0)$ in the direction of $(-1, 1)$ exists.

6406531885897. ❌ f is not continuous at $(0, 0)$.

Sub-Section Number :

4

Sub-Section Id :

64065380459

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 4 Question Id : 640653564164 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

For what values of a , does the system of linear equations $x + y - z = 0$, $2x + 3y + z = 0$, $ax + y + z = 0$ have infinitely many solutions?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0.5

Question Number : 5 Question Id : 640653564165 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

If A is a 3×3 orthogonal matrix with positive determinant, what is the determinant of $3A$?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

27

Sub-Section Number : 5

Sub-Section Id : 64065380460

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 6 Question Id : 640653564155 Question Type : SA Calculator : None

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

Correct Marks : 2

Question Label : Short Answer Question

If $\begin{pmatrix} a+2 & b+c-1 \\ b-c+1 & d \end{pmatrix} = 3I$, where I denotes the 2×2 identity matrix, then what is the determinant of $\begin{pmatrix} a & b \\ c & d \end{pmatrix}$?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Question Number : 7 Question Id : 640653564163 Question Type : SA Calculator : None

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

Correct Marks : 2

Question Label : Short Answer Question

What is the maximum product of three non-negative numbers whose sum is 6?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

8

Question Number : 8 Question Id : 640653564166 Question Type : SA Calculator : None

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

Correct Marks : 2

Question Label : Short Answer Question

Let V_1, V_2 and V_3 represent the subspaces $\{(x, y, z) : 2x+y+z=0\}$, $\{(x, y, z) : x+2y+z=0\}$ and $\{(x, y, z) : x+y+2z=0\}$, respectively of \mathbb{R}^3 . Let $A_i, i = 1, 2, 3$ be the affine spaces corresponding to $V_i, i = 1, 2, 3$. Suppose A_1 contains $(1, 1, -2)$, A_2 contains $(-2, 1, 1)$ and A_3 contains $(1, -2, 1)$. If (x_1, x_2, x_3) is the point of intersection of A_1, A_2 and A_3 , find $4x_1 + 8x_2 + 12x_3$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

6

Sub-Section Number : 6

Sub-Section Id : 64065380461

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653564156 **Question Type :** COMPREHENSION **Sub Question Shuffling Allowed :** No **Group Comprehension Questions :** No **Question Pattern Type :** NonMatrix **Calculator :** None **Response Time :** N.A **Think Time :** N.A **Minimum Instruction Time :** 0

Question Numbers : (9 to 11)

Question Label : Comprehension

Let U denote the set of all 2×2 upper triangular matrices. Consider an

ordered basis $\beta = \left\{ \begin{pmatrix} 1 & 0 \\ 0 & 0 \end{pmatrix}, \begin{pmatrix} 0 & 1 \\ 0 & 0 \end{pmatrix}, \begin{pmatrix} 0 & 0 \\ 0 & 1 \end{pmatrix} \right\}$. Let $T : U \rightarrow \mathbb{R}^2$ be a

linear transformation defined as $T \begin{pmatrix} a & b \\ 0 & c \end{pmatrix} = (a+b, c)$. Let matrix A be the

matrix representation of T with respect to the ordered basis β for U and the standard ordered basis for the co-domain \mathbb{R}^2 . Answer the given subquestions.

Sub questions

Question Number : 9 **Question Id :** 640653564157 **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 matrix is A ?

Options :

6406531885860. ✓ $A = \begin{pmatrix} 1 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

6406531885861. ✗ $A = \begin{pmatrix} 1 & 0 & 0 \\ 1 & 1 & 1 \end{pmatrix}$

6406531885862. ✗ $A = \begin{pmatrix} 1 & 0 \\ 1 & 0 \\ 0 & 1 \end{pmatrix}$

6406531885863. ✗ $A = \begin{pmatrix} 1 & 1 \\ 0 & 1 \\ 0 & 1 \end{pmatrix}$

Question Number : 10 Question Id : 640653564158 Question Type : MSQ Is Question

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

Correct Marks : 3 Selectable Option : 0

Question Label : Multiple Select Question

Which of the following is/are true about T ?

Options :

6406531885864. ✗ Rank of T is 3.

6406531885865. ✓ T is onto.

6406531885866. ✓ Nullity of T is 1.

6406531885867. ✘ T is one-one.

Question Number : 11 Question Id : 640653564159 Question Type : MSQ Is Question

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

Correct Marks : 1 Selectable Option : 0

Question Label : Multiple Select Question

Let B be the matrix representation of T with respect to the ordered basis β for the domain and an ordered basis $\{(1, 0), (1, 1)\}$ for the co-domain \mathbb{R}^2 .

Which of the following is/are true?

Options :

6406531885868. ✓ A is equivalent to B .

6406531885869. ✘ Rank of B is 3.

6406531885870. ✓ Nullity of B is 1.

6406531885871. ✘ A is not equivalent to B .

Question Id : 640653564160 Question Type : COMPREHENSION Sub Question Shuffling

Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (12 to 13)

Question Label : Comprehension

Consider the subspace $W = \{(x, y, z, w) : x + y = z, z + w = x - y\}$ of \mathbb{R}^4 .

Answer the subquestions based on the given information.

Sub questions

Question Number : 12 Question Id : 640653564161 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 a basis β for W ?

Options :

6406531885872. ✘ $\beta = \{(1, 1, 1, -2)\}$

6406531885873. ✓ $\beta = \{(1, 0, 1, 0), (0, 1, 1, -2)\}$

6406531885874. ✘ $\beta = \{(1, 0, 1, 0), (0, 1, 1, -2), (1, 1, 1, -2)\}$

6406531885875. ✘ $\beta = \{(1, 0, 1, 0), (0, 1, 0, 1), (1, 1, 1, -2)\}$

Question Number : 13 Question Id : 640653564162 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 γ is the orthonormal basis of W obtained from β (from the previous question) by using the Gram Schmidt process with respect to the usual inner product, and (a, b, c, d) is the projection of $(0, \sqrt{\frac{11}{2}}, 0, \sqrt{\frac{11}{2}})$ onto W , then what is $\sqrt{22}(a + b + c + d)$?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

Question Id : 640653564167 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (14 to 18)

Question Label : Comprehension

Let $f(x, y) = x^3 + y^3 + 3x^2 - 3y^2 - 8$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 14 Question Id : 640653564168 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

The number of critical points of $f(x, y)$ is

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

4

Question Number : 15 Question Id : 640653564169 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Short Answer Question

The number of saddle points of $f(x, y)$ is

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 16 Question Id : 640653564170 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

The number of local maxima of $f(x, y)$ is

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 17 Question Id : 640653564171 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

The number of local minima of $f(x, y)$ is

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 18 **Question Id :** 640653564172 **Question Type :** SA **Calculator :** None

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

Correct Marks : 1

Question Label : Short Answer Question

If $H(x, y)$ denotes the Hessian matrix
of $f(x, y)$, find the determinant of $H(1, 0)$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

-72

Question Id : 640653564174 **Question Type :** COMPREHENSION **Sub Question Shuffling Allowed :** No **Group Comprehension Questions :** No **Question Pattern Type :** NonMatrix

Calculator : None **Response Time :** N.A **Think Time :** N.A **Minimum Instruction Time :** 0

Question Numbers : (19 to 22)

Question Label : Comprehension

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

- 1) Rank 2
- 2) Non-zero nullity
- 3) Non-zero determinant
- 4) Closure with respect to addition and scalar multiplication
- 5) Existence of zero element
- 6) Existence of additive inverse
- 7) Commutativity of addition
- 8) Associativity of addition
- 9) Elements
- 10) Global maxima
- 11) Global minima
- 12) A critical point
- 13) Gradient exists
- 14) Directional derivative exists in any direction
- 15) Partial derivatives exist
- 16) Orthonormal columns
- 17) Standard ordered basis
- 18) Affine subspace.
- 19) Limit exists

Sub questions

Question Number : 19 Question Id : 640653564175 Question Type : SA Calculator : None

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

Correct Marks : 2

Question Label : Short Answer Question

A local maxima is/can be _____ . (Enter 2 best possible options. Enter only the serial numbers of those options in increasing order without adding any comma or space in between them.) [Suppose your answer is 7 and 17, then you should enter 717]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1012

Question Number : 20 Question Id : 640653564176 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

Orthogonal matrix of order 3 has _____. (Enter 2 best possible options. Enter only the serial numbers of those options in increasing order without adding any comma or space in between them.) [Suppose your answer is 7 and 17, then you should enter 717]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

316

Question Number : 21 Question Id : 640653564177 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

If the tangent plane exists for a function at a point then at that point _____. (Enter 4 best possible options. Enter only the serial numbers of those options in increasing order without adding any comma or space in between them.) [Suppose your answer is 7, 14, 15 and 17, then you should enter 7141517]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

13141519

Question Number : 22 Question Id : 640653564178 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

Some of the conditions that need to be checked to identify a vector space V are _____ .
(Enter 5 best possible options. Enter only the serial numbers of those options in increasing order without adding any comma or space in between them.) [Suppose your answer is 7, 14, 11, 15 and 17, then you should enter 714111517]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

45678

Sub-Section Number : 7

Sub-Section Id : 64065380462

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 23 Question Id : 640653564180 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 equation of the surface in Column A with the tangent plane at the point $(1, 1, 2)$ in column B and the vector subspace corresponding to the affine subspace (of \mathbb{R}^3) formed by the tangent plane, in Column C.

	Equation of the surface (Column A)		Equation of the tangent plane at $(1, 1, 2)$ (Column B)		Vector subspace corresponding to the affine subspace formed by tangent plane (Column C)
i)	$z = x^2 + y^2$	a)	$3x + 3y + 2z = 10$	1)	$\{(x, y, z) \mid x + y = \frac{z}{2}, x, y, z \in \mathbb{R}\}$
ii)	$x^2 + y^2 + z^2 = 6$	b)	$z = 2x + 2y - 2$	2)	$\{(x, y, z) \mid x + y = -\frac{2}{3}z, x, y, z \in \mathbb{R}\}$
iii)	$xy + yz + zx = 5$	c)	$x + y + 2z = 6$	3)	$\{(x, y, z) \mid 2z = -x - y, x, y, z \in \mathbb{R}\}$

Table: M2ES1

Choose the correct option from the following:

Options :

6406531885898. ✖ i) \rightarrow b \rightarrow 1, ii) \rightarrow a \rightarrow 2, iii) \rightarrow c \rightarrow 3

6406531885899. ✖ i) \rightarrow a \rightarrow 2, ii) \rightarrow c \rightarrow 1, iii) \rightarrow b \rightarrow 3

6406531885900. ✓ i) \rightarrow b \rightarrow 1, ii) \rightarrow c \rightarrow 3, iii) \rightarrow a \rightarrow 2

6406531885901. ✖ i) \rightarrow b \rightarrow 1, ii) \rightarrow c \rightarrow 2, iii) \rightarrow a \rightarrow 3

Sub-Section Number : 8

Sub-Section Id : 64065380463

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653564181 Question Type : COMPREHENSION Sub Question Shuffling

Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (24 to 25)

Question Label : Comprehension

Consider the system of linear equations formed by the equations in column B of Table M2ES2 and let A be its coefficient matrix. Answer the related subquestions.

	Equation of the surface (Column A)		Equation of the tangent plane at (1, 1, 2) (Column B)		Vector subspace corresponding to the affine subspace formed by tangent plane (Column C)
i)	$z = x^2 + y^2$	a)	$3x + 3y + 2z = 10$	1)	$\{(x, y, z) \mid x + y = \frac{z}{2}, x, y, z \in \mathbb{R}\}$
ii)	$x^2 + y^2 + z^2 = 6$	b)	$z = 2x + 2y - 2$	2)	$\{(x, y, z) \mid x + y = -\frac{2}{3}z, x, y, z \in \mathbb{R}\}$
iii)	$xy + yz + zx = 5$	c)	$x + y + 2z = 6$	3)	$\{(x, y, z) \mid 2z = -x - y, x, y, z \in \mathbb{R}\}$

Table: M2ES2

Sub questions

Question Number : 24 Question Id : 640653564182 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 denotes the solution space of this system of linear equations?

Options :

6406531885902. ✶ $\{(x, y, 2) \mid x + y = 0, x, y \in \mathbb{R}\}$

6406531885903. ✓ $\{(x, 2 - x, 2) \mid x \in \mathbb{R}\}$

6406531885904. ✗ $\{(x, 2, 2) \mid x \in \mathbb{R}\}$

6406531885905. ✗ $\{(2, 0, 2)\}$

Question Number : 25 Question Id : 640653564183 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 sets denotes
 $nullspace(A)$?

Options :

6406531885906. ✗ $\{(x, y, 0) \mid x - y = 0, x, y \in \mathbb{R}\}$

6406531885907. ✓ $\{(x, -x, 0) \mid x \in \mathbb{R}\}$

6406531885908. ✗ $\{(x, 0, 0) \mid x \in \mathbb{R}\}$

6406531885909. ✗ $\{(0, 0, 0)\}$

Sub-Section Number : 9

Sub-Section Id : 64065380464

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653564184 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Question Numbers : (26 to 27)

Question Label : Comprehension

Consider the system of linear equations formed by the equations in column B of Table M2ES3 and let A be its coefficient matrix. Answer the related subquestions.

	Equation of the surface (Column A)		Equation of the tangent plane at (1, 1, 2) (Column B)		Vector subspace corresponding to the affine subspace formed by tangent plane (Column C)
i)	$z = x^2 + y^2$	a)	$3x + 3y + 2z = 10$	1)	$\{(x, y, z) \mid x + y = \frac{z}{2}, x, y, z \in \mathbb{R}\}$
ii)	$x^2 + y^2 + z^2 = 6$	b)	$z = 2x + 2y - 2$	2)	$\{(x, y, z) \mid x + y = -\frac{2}{3}z, x, y, z \in \mathbb{R}\}$
iii)	$xy + yz + zx = 5$	c)	$x + y + 2z = 6$	3)	$\{(x, y, z) \mid 2z = -x - y, x, y, z \in \mathbb{R}\}$

Table: M2ES3

Sub questions

Question Number : 26 Question Id : 640653564185 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 $\text{Rank}(A)$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 27 Question Id : 640653564186 Question Type : MSQ Is Question**Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0****Correct Marks : 2 Selectable Option : 0**

Question Label : Multiple Select Question

Which of the following denotes the column space of A ? (More than one option may be correct)**Options :**6406531885911. ❌ $\text{Span}\{(3, 2, 1)\}$ 6406531885912. ❌ $\text{Span}\{(2, -1, 2)\}$ 6406531885913. ✓ $\text{Span}\{(3, 2, 1), (2, -1, 2)\}$ 6406531885914. ✓ $\text{Span}\{(3, 2, 1), (2, -1, 2), (1, 3, -1)\}$

Statistics2

Section Id : 64065338334**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 :	64065380465
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 28 Question Id : 640653564187 Question Type : MCQ Is Question

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

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "STATISTICS FOR DATA SCIENCE 2 (COMPUTER BASED EXAM)"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?

CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

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

Options :

6406531885915. ✓ YES

6406531885916. ✘ NO

Question Number : 29 Question Id : 640653564188 Question Type : MCQ Is Question

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

Correct Marks : 0

Question Label : Multiple Choice Question

Discrete random variables:

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

Continuous random variables:

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

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

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

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

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

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

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

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

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

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

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

5. **Bias of an estimator:** $\text{Bias}(\hat{\theta}, \theta) = E[\hat{\theta}] - \theta$.

6. **Method of moments:** Sample moments, $M_k(X_1, X_2, \dots, X_n) = \frac{1}{n} \sum_{i=1}^n X_i^k$

Procedure: For one parameter θ

- Sample moment: m_1
- Distribution moment: $E(X) = f(\theta)$
- Solve for θ from $f(\theta) = m_1$ in terms of m_1 .
- $\hat{\theta}$: replace m_1 by M_1 in the above solution.

7. **Likelihood of i.i.d. samples:** Likelihood of a sampling x_1, x_2, \dots, x_n , denoted

$$L(x_1, \dots, x_n) = \prod_{i=1}^n f_X(x_i; \theta_1, \theta_2, \dots)$$

8. **Maximum likelihood (ML) estimation:**

$$\theta_1^*, \theta_2^*, \dots = \arg \max_{\theta_1^*, \theta_2^*, \dots} \prod_{i=1}^n f_X(x_i; \theta_1, \theta_2, \dots)$$

9. Bayesian estimation: Let $X_1, \dots, X_n \sim$ i.i.d. X , parameter Θ .

Prior distribution of Θ : $\Theta \sim f_\Theta(\theta)$.

Samples, $S : (X_1 = x_1, \dots, X_n = x_n)$

Posterior: $\Theta | (X_1 = x_1, \dots, X_n = x_n)$

Bayes' rule: Posterior \propto Prior \times Likelihood

Posterior density $\propto f_\Theta(\theta) \times P(X_1 = x_1, \dots, X_n = x_n | \Theta = \theta)$

10. Normal samples with unknown mean and known variance:

$X_1, \dots, X_n \sim$ i.i.d. Normal(M, σ^2).

Prior $M \sim$ Normal(μ_0, σ_0^2).

$$\text{Posterior mean: } \hat{\mu} = \bar{X} \left(\frac{n\sigma_0^2}{n\sigma_0^2 + \sigma^2} \right) + \mu_0 \left(\frac{\sigma^2}{n\sigma_0^2 + \sigma^2} \right)$$

11. Hypothesis Testing

- Test for mean

Case (1): When population variance σ^2 is known (z -test)

Test	H_0	H_A	Test statistic	Rejection region
right-tailed	$\mu = \mu_0$	$\mu > \mu_0$	$T = \bar{X}$ $Z = \frac{\bar{X} - \mu_0}{\sigma/\sqrt{n}}$	$\bar{X} > c$
left-tailed	$\mu = \mu_0$	$\mu < \mu_0$	$T = \bar{X}$ $Z = \frac{\bar{X} - \mu_0}{\sigma/\sqrt{n}}$	$\bar{X} < c$
two-tailed	$\mu = \mu_0$	$\mu \neq \mu_0$	$T = \bar{X}$ $Z = \frac{\bar{X} - \mu_0}{\sigma/\sqrt{n}}$	$ \bar{X} - \mu_0 > c$

Case (2): When population variance σ^2 is unknown (t -test)

Test	H_0	H_A	Test statistic	Rejection region
right-tailed	$\mu = \mu_0$	$\mu > \mu_0$	$T = \bar{X}$ $t_{n-1} = \frac{\bar{X} - \mu_0}{S/\sqrt{n}}$	$\bar{X} > c$
left-tailed	$\mu = \mu_0$	$\mu < \mu_0$	$T = \bar{X}$ $t_{n-1} = \frac{\bar{X} - \mu_0}{S/\sqrt{n}}$	$\bar{X} < c$
two-tailed	$\mu = \mu_0$	$\mu \neq \mu_0$	$T = \bar{X}$ $t_{n-1} = \frac{\bar{X} - \mu_0}{S/\sqrt{n}}$	$ \bar{X} - \mu_0 > c$

- χ^2 -test for variance:

Test	H_0	H_A	Test statistic	Rejection region
right-tailed	$\sigma = \sigma_0$	$\sigma > \sigma_0$	$T = \frac{(n-1)S^2}{\sigma_0^2} \sim \chi_{n-1}^2$	$S^2 > c^2$
left-tailed	$\sigma = \sigma_0$	$\sigma < \sigma_0$	$T = \frac{(n-1)S^2}{\sigma_0^2} \sim \chi_{n-1}^2$	$S^2 < c^2$
two-tailed	$\sigma = \sigma_0$	$\sigma \neq \sigma_0$	$T = \frac{(n-1)S^2}{\sigma_0^2} \sim \chi_{n-1}^2$	$S^2 > c^2$ where $\frac{\alpha}{2} = P(S^2 > c^2)$ or $S^2 < c^2$ where $\frac{\alpha}{2} = P(S^2 < c^2)$

- Two samples z -test for means:

Test	H_0	H_A	Test statistic	Rejection region
right-tailed	$\mu_1 = \mu_2$	$\mu_1 > \mu_2$	$T = \bar{X} - \bar{Y}$ $\bar{X} - \bar{Y} \sim \text{Normal}\left(0, \frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}\right)$ if H_0 is true	$\bar{X} - \bar{Y} > c$
left-tailed	$\mu_1 = \mu_2$	$\mu_1 < \mu_2$	$T = \bar{Y} - \bar{X}$ $\bar{Y} - \bar{X} \sim \text{Normal}\left(0, \frac{\sigma_2^2}{n_2} + \frac{\sigma_1^2}{n_1}\right)$ if H_0 is true	$\bar{Y} - \bar{X} > c$
two-tailed	$\mu_1 = \mu_2$	$\mu_1 \neq \mu_2$	$T = \bar{X} - \bar{Y}$ $\bar{X} - \bar{Y} \sim \text{Normal}\left(0, \frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}\right)$ if H_0 is true	$ \bar{X} - \bar{Y} > c$

- Two samples F -test for variances

Test	H_0	H_A	Test statistic	Rejection region
one-tailed	$\sigma_1 = \sigma_2$	$\sigma_1 > \sigma_2$	$T = \frac{S_1^2}{S_2^2} \sim F_{(n_1-1, n_2-1)}$	$\frac{S_1^2}{S_2^2} > 1 + c$
one-tailed	$\sigma_1 = \sigma_2$	$\sigma_1 < \sigma_2$	$T = \frac{S_1^2}{S_2^2} \sim F_{(n_1-1, n_2-1)}$	$\frac{S_1^2}{S_2^2} < 1 - c$
two-tailed	$\sigma_1 = \sigma_2$	$\sigma_1 \neq \sigma_2$	$T = \frac{S_1^2}{S_2^2} \sim F_{(n_1-1, n_2-1)}$	$\frac{S_1^2}{S_2^2} > 1 + c_R$ where $\frac{\alpha}{2} = P(T > 1 + c_R)$ or $\frac{S_1^2}{S_2^2} < 1 - c_L$ where $\frac{\alpha}{2} = P(T < 1 - c_L)$

Use the following values if required:

$$(0.7)^6 = 0.117649, (0.7)^7 = 0.0823543, (0.7)^8 = 0.05764801$$

Options :

6406531885917. ✓ Useful Data has been mentioned above

6406531885918. ❀ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number : 2

Sub-Section Id : 64065380466

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 30 Question Id : 640653564189 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

Two 4-sided fair dice are rolled. If the sum of the numbers on the two dice is less than or equal to 7, then find the conditional probability that the number on the first die is 4.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.17 to 0.23

Question Number : 31 Question Id : 640653564190 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

Suppose X_1, X_2, \dots, X_5 are i.i.d. samples from a distribution X with an unknown mean μ and variance σ^2 . Let $\hat{\mu} = \frac{2X_1 + X_3 + kX_5}{10}$ be an estimator of μ . Find the value of k such that $\text{Bias}(\hat{\mu}, \mu) = 0$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

7

Sub-Section Number : 3

Sub-Section Id : 64065380467

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 32 Question Id : 640653564191 Question Type : MSQ Is Question

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

Correct Marks : 3 Selectable Option : 0

Question Label : Multiple Select Question

Suppose X is a random variable whose distribution has an unknown parameter θ and Y is a zero mean random variable. Which of the following must be true?

Options :

If $\hat{\theta}_1$ is an unbiased estimator of θ , then $\hat{\theta}_2 = \hat{\theta}_1 + Y$ is an unbiased estimator
6406531885921. ✓ of θ .

If $\hat{\theta}_1$ is an estimator of θ such that $E[\hat{\theta}_1] = 0$, then $\hat{\theta}_2 = \hat{\theta}_1 + Y$ is an unbiased
6406531885922. ✗ estimator of θ .

6406531885923. ✗ If $\hat{\theta}_1$ is an unbiased estimator of θ , then $E[X - \hat{\theta}_1] = 0$.

If $\hat{\theta}_1$ is an estimator of θ such that $E[\hat{\theta}_1] = 2\theta$, then $\hat{\theta}_2 = \frac{\hat{\theta}_1}{2}$ is an unbiased
6406531885924. ✓ estimator of θ .

Sub-Section Number :

4

Sub-Section Id :

64065380468

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 33 Question Id : 640653564192 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 100 samples $X_1, X_2, \dots, X_{100} \sim \text{iid Normal}(\mu, 16)$. Let the null and alternative hypothesis be $H_0 : \mu = 1$ and $H_A : \mu = -1$. Suppose $T = \frac{X_1 + X_2 + \dots + X_{100}}{100}$. Consider a test that rejects H_0 if $T < c$ for some constant c . What is the power of the test in terms of ' c '?

Options :

6406531885925. ✗ $1 - F_Z \left(\frac{5c + 5}{2} \right)$

6406531885926. ✓ $F_Z \left(\frac{5c + 5}{2} \right)$

6406531885927. ✘ $1 - F_Z \left(\frac{5c - 5}{2} \right)$

6406531885928. ✘ $F_Z \left(\frac{5c - 5}{2} \right)$

Question Number : 34 Question Id : 640653564193 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 16 samples $X_1, X_2, \dots, X_{16} \sim \text{iid Normal}(\mu, \sigma^2)$. Suppose the mean and the standard deviation of the given samples are 36.9 and 3.8 respectively. Let the null and alternative hypothesis be $H_0 : \mu = 35$ and $H_A : \mu > 35$. Find the P-value.

Options :

6406531885929. ✘ $F_{t_{15}}(2)$

6406531885930. ✓ $1 - F_{t_{15}}(2)$

6406531885931. ✘ $F_Z(2)$

6406531885932. ✘ $1 - F_Z(2)$

Sub-Section Id : 64065380469

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653564194 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (35 to 36)

Question Label : Comprehension

Let X be a random variable with PMF as follows:

x	-1	0	1
$f(x)$	1/8	3/4	1/8

Define another random variable $Y = 2X + 3$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 35 Question Id : 640653564195 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 standard deviation of Y ?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

Question Number : 36 Question Id : 640653564196 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 $Cov(X, Y)$.

Options :

6406531885934. ✘ $\frac{1}{4}$

6406531885935. ✘ 0

6406531885936. ✓ $\frac{1}{2}$

6406531885937. ✘ $\frac{1}{3}$

Question Id : 640653564197 Question Type : COMPREHENSION Sub Question Shuffling

Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (37 to 38)

Question Label : Comprehension

Let X and Y be two random variables having joint density function:

$$f_{XY}(x, y) = \begin{cases} c(6 - x - y), & \text{if } 0 < x < 2, 2 < y < 4, \\ 0, & \text{otherwise.} \end{cases}$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 37 Question Id : 640653564198 Question Type : MCQ Is Question

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

Correct Marks : 2

Question Label : Multiple Choice Question

Find the value of c .

Options :

6406531885938. ✘ $\frac{1}{4}$

6406531885939. ✓ $\frac{1}{8}$

6406531885940. ✘ $\frac{1}{40}$

6406531885941. ✘ $\frac{1}{10}$

Question Number : 38 Question Id : 640653564199 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

Find the value of $P(X < 1, Y < 3)$. Enter the answer correct to three decimal places.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.372 to 0.378

Question Id : 640653564200 Question Type : COMPREHENSION Sub Question Shuffling

Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (39 to 40)

Question Label : Comprehension

Let X be a discrete random variable such that $X \in \{0, 1\}$ and

$$P(X = 0) = \frac{3(1 - \theta)}{4 - \theta},$$

where θ is an unknown constant. Consider a random sample $(1, 0, 0, 1, 0)$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 39 Question Id : 640653564201 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 method of moments estimate of θ for the given sample. Enter the answer correct to two decimal places.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.23 to 0.27

Question Number : 40 Question Id : 640653564202 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

Find the maximum likelihood estimate of θ for the given sample. Enter the answer correct to two decimal places.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.23 to 0.27

Question Id : 640653564203 Question Type : COMPREHENSION Sub Question Shuffling

Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (41 to 42)

Question Label : Comprehension

The number of claims received by an insurance company during a week follows a Poisson(λ) distribution. The weekly number of claims observed over a ten-week period are 2, 5, 4, 6, 1, 3, 3, 5, 2, 4. Assume the prior distribution of λ to be Gamma(5, 1).

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 41 Question Id : 640653564204 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 posterior distribution of p .

Options :

6406531885945. ✘ Gamma(39,11)

6406531885946. ✘ Beta(40, 16)

6406531885947. ✘ Gamma(40,16)

6406531885948. ✓ Gamma(40,11)

Question Number : 42 Question Id : 640653564205 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 posterior mean. 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 :

3.60 to 3.68

Question Id : 640653564206 Question Type : COMPREHENSION Sub Question Shuffling

Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (43 to 44)

Question Label : Comprehension

A manufacturer produces cotter pins and claims that the probability of a randomly selected cotter pin being defective is 0.3. However, an analyst suspects that the claimed probability value is too

high and decides to verify it by conducting a test. The analyst randomly selects 8 cotter pins from the manufacturer's production line and inspects them for defects. If less than 2 cotter pins are defective (out of those 8 cotter pins), then the analyst rejects the claim, or else he accepts it.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 43 Question Id : 640653564207 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

Define null hypothesis and alternative hypothesis.

Options :

6406531885950. ✘ $H_0 : p = 0.3, H_A : p \neq 0.3$

6406531885951. ✘ $H_0 : p = 0.3, H_A : p > 0.3$

6406531885952. ✓ $H_0 : p = 0.3, H_A : p < 0.3$

6406531885953. ✘ $H_0 : p \neq 0.3, H_A : p = 0.3$

Question Number : 44 Question Id : 640653564208 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 significance level of the test. Enter the answer correct to two decimal places.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.23 to 0.29

Intro to Python

Section Id :	64065338335
Section Number :	3
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	26
Number of Questions to be attempted :	26
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 :	64065380470
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 45 Question Id : 640653564209 Question Type : MCQ Is Question

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

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "INTRODUCTION TO PYTHON (COMPUTER BASED EXAM)"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?

CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

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

Options :

6406531885955. ✓ YES

6406531885956. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 64065380471

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 46 Question Id : 640653564210 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 prints the product of the digits for the given number?

Options :

```
1 n = int(input())
2 total = 1
3 while(n > 0):
4     total = total * (n % 10)
5     n = n // 10
6 print(total)
```

6406531885957. ✓

6406531885958. ✗

```
1 n = int(input())
2 total = 1
3 while(n > 0):
4     total = total + (n % 10)
5     n = n // 10
6 print(total)
```

```
1 n = int(input())
2 total = 1
3 while(n > 0):
4     total = total * (n // 10)
5     n = n % 10
6 print(total)
```

6406531885959. *

```
1 n = int(input())
2 total = 1
3 while(n > 0):
4     total = total + (n // 10)
5     n = n % 10
6 print(total)
```

6406531885960. *

Question Number : 47 Question Id : 640653564211 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

What will be the output of the following Python code?

```
1 string1 = 'welcome'
2 string2 = 'hi hello'
3 L = []
4 for i in range(0, len(string1)):
5     for j in range(0, len(string2)):
6         if (string1[i] == string2[j]):
7             L.append(string1[i])
8             break
9         else:
10             continue
11 print(L)
```

Options :

6406531885961. ✘ 1 | ['e', 'e', 'l', 'l', 'o']

6406531885962. ✘ 1 | ['e', 'l', 'l', 'o', 'e']

6406531885963. ✓ 1 | ['e', 'l', 'o', 'e']

6406531885964. ✘ None of these

Question Number : 48 Question Id : 640653564212 Question Type : MCQ Is Question**Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0****Correct Marks : 3**

Question Label : Multiple Choice Question

What will be the output of the following Python code?

```
1 A = [[2, 2, 3], [3, 4, 5], [1, 0, 7]]
2 B = [[1, 1, 4], [4, 5, 2], [1, 4, 1]]
3 n = len(A)
4 C = [[0, 0, 0], [0, 0, 0], [0, 0, 0]]
5 for i in range(n):
6     for j in range(n):
7         C[i][j] = A[i][j] - B[i][j]
8         if j != n - 1:
9             print(C[i][j], end = ',')
10        else:
11            print(C[i][j])
```

Options :1 | 3,3,-7
2 | -7,-9,7
3 | 2,-4,8

6406531885965. ✘ 3 | 2,-4,8

6406531885966. ✘

1	3,3,7
2	7,9,7
3	2,4,8

1	1,1,1
2	1,1,3
3	0,4,6

6406531885967. *

6406531885968. ✓

1	1,1,-1
2	-1,-1,3
3	0,-4,6

Question Number : 49 Question Id : 640653564216 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 snippet of code.

```
1 def func(L):
2     if L == []:
3         return 0
4     if L[0] % 2 == 0:
5         return 1 + func(L[1: ])
6     else:
7         return func(L[1:])
```

If `L` is a non-empty list of positive integers, which of the following statements is correct about the recursive function `func(L)` ?

Options :

6406531885981. * It returns total number of odd elements in the list `L`

6406531885982. ✓ It returns total number of even elements in the list `L`

6406531885983. ✖ It returns sum of the even elements in the list `L`

6406531885984. ✖ It returns sum of the odd elements in the list `L`

Question Number : 50 Question Id : 640653564218 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

```
1 | L = [('Arjun', 75), ('Anita', 85), ('Atul', 80), ('Anwer', 75), ('Andrew', 80)]
```

Each entry in `L` corresponds to a student and the marks he or she has scored in a Python exam.

Write these details to a CSV file named `scores.csv`. The header should be `Name,Python`. The entries should be written to the file in the order in which they appear in the list `L`. Select the correct implementation of a function named `write_to_file` that accepts `L` as argument and writes to the file `scores.csv`.

Options :

```
1 | def write_to_file(L):
2 |     f = open('scores.csv', 'w')
3 |     for i in range(len(L)):
4 |         name, marks = L[i]
5 |         line = f'{name},{marks}'
6 |         if i != len(L) - 1:
7 |             line = line + '\n'
8 |         f.write(line)
9 |     f.close()
```

6406531885990. ✖

6406531885991. ✖

```
1 def write_to_file(L):
2     f = open('scores.csv', 'w')
3     f.write('Name,Python')
4     for i in range(len(L)):
5         name, marks = L[i]
6         line = f'{name},{marks}'
7         if i != len(L) - 1:
8             line = line + '\n'
9         f.write(line)
10    f.close()
```

```
1 def write_to_file(L):
2     f = open('scores.csv', 'r')
3     f.write('Name,Python\n')
4     for i in range(len(L)):
5         name, marks = L[i]
6         line = f'{name},{marks}'
7         if i != len(L) - 1:
8             line = line + '\n'
9         f.write(line)
10    f.close()
```

6406531885992. ✘

```
1 def write_to_file(L):
2     f = open('scores.csv', 'w')
3     f.write('Name,Python\n')
4     for i in range(len(L)):
5         name, marks = L[i]
6         line = f'{name},{marks}'
7         if i != len(L) - 1:
8             line = line + '\n'
9         f.write(line)
10    f.close()
```

6406531885993. ✓

Sub-Section Number : 3

Sub-Section Id : 64065380472

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 51 Question Id : 640653564213 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 following Python code?

```
1 | def new_fun(a):
2 |     s_L = []
3 |     while a != []:
4 |         x = a[0]
5 |         for i in a:
6 |             if i < x:
7 |                 x = i
8 |         a.remove(x)
9 |         s_L.append(x)
10 |    return s_L
11 |
12 L = [4, 7, 1, 3]
13 print(new_fun(L))
```

Options :

6406531885969. ✓ 1 | [1, 3, 4, 7]

6406531885970. ✗ 1 | [7, 4, 3, 1]

6406531885971. ✗ 1 | [1, 3, 7, 4]

6406531885972. ✗ 1 | [7, 4, 1, 3]

Question Number : 52 Question Id : 640653564214 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 snippet of code. `x` is a real number. When `minmax(x, x)` is called, which return statement in the function is executed?

```
1 def minmax(a, b):
2     if a <= b:
3         return a, b
4     return b, a
```

Options :

6406531885973. ✓ The return statement in line 3 which is inside the if-block

6406531885974. ✗ The return statement in line 4 which is outside the if-block

6406531885975. ✗ Both the return statements are executed

6406531885976. ✗ Neither return statement is executed

Question Number : 53 Question Id : 640653564215 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

We wish to populate a list `nums` of 10000 integers, where each integer is drawn at random from the range 1 to 10, both endpoints included. Which of the following code snippets can be used to achieve this?

Options :

```
1 import random
2
3 nums = []
4 for i in range(10000):
5     nums.append(random.randint(1, 10))
```

6406531885977. ✓

```
1 import random
2
3 nums = []
4 for i in range(10):
5     nums.append(random.randint(1, 10000))
```

6406531885978. ✗

```
1 import random  
2  
3 nums = []  
4 for i in range(10000):  
5     nums.append(random.randint(0, 11))
```

6406531885979. ✘

```
1 import random  
2  
3 nums = []  
4 for i in range(10000):  
5     nums.append(random.randint(1, 11))
```

6406531885980. ✘

Question Number : 54 Question Id : 640653564217 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 functions:

```
1 def f(n):  
2     if n < 10:  
3         return 1  
4     return 1 + f(n // 10)  
5  
6 def g(n):  
7     if n < 10:  
8         return n  
9     return n % 10 + g(n // 10)  
10  
11 def h(n):  
12     if n <= 1:  
13         return n  
14     return n * h(n - 1)
```

Which of the following function calls returns the sum of the digits in $100!$, where, $n!$ is the product of the first n positive integers?

Options :

6406531885985. ✘ `f(g(100))`

6406531885986. ✘ f(h(100))

6406531885987. ✓ g(h(100))

6406531885988. ✘ h(g(100))

6406531885989. ✘ h(f(100))

Question Number : 55 Question Id : 640653564219 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

What is the output of the following snippet of code?

```
1 def quotient(a, b):
2     try:
3         q = a // b
4         return q
5     except TypeError:
6         print('Cannot divide strings')
7     except ZeroDivisionError:
8         print('Division by 0 is not allowed')
9     finally:
10        print('I will always be executed')
11
12 x = quotient('10', '5')
13 x = quotient(10, 0)
14 x = quotient(10, 5)
15 print(x)
```

Options :

- | | |
|---|------------------------------|
| 1 | Cannot divide strings |
| 2 | Division by 0 is not allowed |
| 3 | 2 |

6406531885994. ✘

1 | Division by 0 is not allowed
2 | 2

6406531885995. ✘

1 | I will always be executed
2 | I will always be executed
3 | I will always be executed
4 | 2

6406531885996. ✘

1 | Cannot divide strings
2 | I will always be executed
3 | Division by 0 is not allowed
4 | I will always be executed
5 | I will always be executed
6 | 2

6406531885997. ✓

1 | Cannot divide strings
2 | I will always be executed
3 | Division by 0 is not allowed
4 | I will always be executed
5 | I will always be executed

6406531885998. ✘

Question Number : 56 Question Id : 640653564221 Question Type : MCQ Is Question

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

Correct Marks : 4

Question Label : Multiple Choice Question

What is the output of the following snippet of code?

```
1 | L = ['one', 'two', 'one', 'three', 'one']
2 | freq = {word: L.count(word) for word in L}
3 | print(freq)
```

Options :

6406531886004. ✘

1 | {{'one': 3}, {'two': 1}, {'three': 1}}

6406531886005. ✓

```
1 | {'one': 3, 'two': 1, 'three': 1}
```

6406531886006. ✗

```
1 | {[['one', 3], ['two', 1], ['three', 1]]}
```

6406531886007. ✗

```
1 | [{['one': 3}, {'two': 1}, {'three': 1}]]
```

Question Number : 57 Question Id : 640653564222 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

Given a string `s`, find the first occurrence of the substring `not` and `bad`. If `not` is followed by `bad` then replace the whole `not ... bad` substring with `good` and return the updated string.

For example, If the string is `This dinner is not that bad!` then function should return the string `This dinner is good!`.

Which of the following option is the correct implementation for the given problem statement?

find() method

- It returns the first occurrence of the specified value from left.
- It returns -1 if the value is not found.

Options :

```
1 | def not_bad(s):
2 |     n = s.find('not')
3 |     b = s.find('bad')
4 |     if n != -1 and b != -1 and b < n:
5 |         s = s[:n] + 'good' + s[b + 3:]
6 |     return s
```

6406531886008. ✗

6406531886009. ✓

```
1 def not_bad(s):
2     n = s.find('not')
3     b = s.find('bad')
4     if n != -1 and b != -1 and b > n:
5         s = s[:n] + 'good' + s[b + 3:]
6     return s
```

```
1 def not_bad(s):
2     n = s.find('not')
3     b = s.find('bad')
4     if n != -1 and b != -1 and b > n:
5         s = s[:n] + 'good' + s[b:]
6     return s
```

6406531886010. ✘

```
1 def not_bad(s):
2     n = s.find('not')
3     b = s.find('bad')
4     if n != -1 and b != -1 and b > n:
5         s = s[:n + 3] + 'good' + s[b + 3:]
6     return s
```

6406531886011. ✘

Sub-Section Number :

4

Sub-Section Id :

64065380473

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 58 Question Id : 640653564220 Question Type : MCQ Is Question

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

Correct Marks : 5

Question Label : Multiple Choice Question

What is the output of the following code snippet?

```
1 D = {'Anita': 23, 'Ashwin': 43, 'Ahana': '24', 'Adarsh': 30, 'Archana': 15}
2 try:
3     for key in D:
4         value = D[key]
5         if type(value) == str:
6             raise 'Error'
7         print(f'{key}:{value}')
8 except:
9     print("values cannot be strings")
```

Options :

```
1 Anita:23
2 Ashwin:43
3 Ahana:24
4 Adarsh:30
5 Archana:15
```

6406531885999. ❌

```
1 Anita:23
2 Ashwin:43
```

6406531886000. ❌

6406531886001. ❌ 1 | values cannot be strings

```
1 Anita:23
2 Ashwin:43
3 values cannot be strings
```

6406531886002. ✓

```
1 Anita:23
2 Ashwin:43
3 Values cannot be strings
4 Adarsh:30
5 Archana:15
```

6406531886003. ❌

Sub-Section Number :

5

Sub-Section Id :

64065380474

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 59 Question Id : 640653564224 Question Type : MSQ Is Question

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

Correct Marks : 3 Selectable Option : 0

Question Label : Multiple Select Question

Select the correct code block(s) that perform the following task:

1. Accept two strings as input
2. Print `Ascending` if the first string comes before the second in alphabetical order
3. `Descending` otherwise

For example, if the input is as follows:

```
1 | java  
2 | python
```

then the expected output is `Ascending` because `python` comes after `java`. Assume that all the strings consist of only one word and will be entered in lowercase during the time of input.

Options :

```
1 | str1 = input()  
2 | str2 = input()  
3 | if(str1 < str2):  
4 |     print("Ascending")  
5 | else:  
6 |     print("Descending")
```

6406531886016. ✓

```
1 | str1 = input()  
2 | str2 = input()  
3 | if(str1 > str2):  
4 |     print("Ascending")  
5 | else:  
6 |     print("Descending")
```

6406531886017. ✘

```
1 | if(input() < input()):  
2 |     print("Ascending")  
3 | else:  
4 |     print("Descending")
```

6406531886018. ✓

```
1 if(input() > input()):
2     print("Ascending")
3 else:
4     print("Descending")
```

6406531886019. ✘

```
1 str1 = input()
2 str2 = input()
3 result = str1 < str2
4 if(result == True):
5     print("Ascending")
6 else:
7     print("Descending")
```

6406531886020. ✓

```
1 str1 = input()
2 str2 = input()
3 result = str1 > str2
4 if(result == True):
5     print("Ascending")
6 else:
7     print("Descending")
```

6406531886021. ✘

Question Number : 60 Question Id : 640653564226 Question Type : MSQ Is Question

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

Time : 0

Correct Marks : 3 Selectable Option : 0

Question Label : Multiple Select Question

Select all code snippets that run without any error.

Options :

```
1 a, b = (1, 2)
2 print(a)
3 print(b)
```

6406531886026. ✓

```
1 a, b, c = (1, 2, 3)
2 print(a)
3 print(b)
4 print(c)
```

6406531886027. ✓

```
1 a, b = (1, 2, 3)
2 print(a)
3 print(b)
4 print(c)
```

6406531886028. ✘

```
1 a, b, c, d = (1, 2, 3)
2 print(a)
3 print(b)
4 print(c)
5 print(d)
```

6406531886029. ✘

Sub-Section Number : 6

Sub-Section Id : 64065380475

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 61 Question Id : 640653564223 Question Type : MSQ Is Question

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

Correct Marks : 4 Selectable Option : 0

Question Label : Multiple Select Question

Select the correct code snippet(s) which can be used to reverse the given integer `num`. For example, if the input is 3456 then the output should be 6543.

Options :

```
1 reversed_num = 0
2 while num != 0:
3     digit = num % 10
4     reversed_num = reversed_num * 10 + digit
5     num //= 10
6 print(reversed_num)
```

6406531886012. ✓

```
1 | print(str(num)[::-1])
```

6406531886013. ✓

```
1 | reversed_num = 0
2 | while num != 0:
3 |     digit = num % 10
4 |     num /= 10
5 |     reversed_num = reversed_num * 10 + digit
6 | print(reversed_num)
```

6406531886014. ✘

```
1 | print(str(num)[-1::-1])
```

6406531886015. ✘

Question Number : 62 Question Id : 640653564225 Question Type : MSQ Is Question

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

Correct Marks : 4 Selectable Option : 0

Question Label : Multiple Select Question

Select all correct implementations of a function named `concatenate` that accepts two lists `P` and `Q` as arguments and returns the concatenated list `P + Q`.

Options :

```
1 | def concatenate(P, Q):
2 |     R = []
3 |     for x in P:
4 |         R.append(x)
5 |     for x in Q:
6 |         R.append(x)
7 |     return R
```

6406531886022. ✓

```
1 | def concatenate(P, Q):
2 |     R = []
3 |     for x in Q:
4 |         R.append(x)
5 |     for x in P:
6 |         R.append(x)
7 |     return R
```

6406531886023. ✘

6406531886024. ✘

```

1 def copy(P):
2     L = []
3     for x in P:
4         L.append(x)
5     return L
6
7 def concatenate(P, Q):
8     R = copy(Q)
9     for x in P:
10        R.append(x)
11    return R

```

```

1 def copy(P):
2     L = []
3     for x in P:
4         L.append(x)
5     return L
6
7 def concatenate(P, Q):
8     R = copy(P)
9     for x in Q:
10        R.append(x)
11    return R

```

6406531886025. ✓

Sub-Section Number : 7

Sub-Section Id : 64065380476

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 63 Question Id : 640653564227 Question Type : MSQ Is Question

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

Correct Marks : 5 Selectable Option : 0

Question Label : Multiple Select Question

If M is an $n \times n$ matrix, create the transpose of the matrix M and store the result in the matrix M_t . Select all correct implementations of this program.

Options :

6406531886030. ✓ 1 | M_t = [[M[j][i] for j in range(len(M))] for i in range(len(M))]

6406531886031. ✘ 1 | M_t = [[M[i][j] for j in range(len(M))] for i in range(len(M))]

```
1 | M_t = []
2 | n = len(M)
3 | for i in range(n):
4 |     M_t.append([])
5 |     for j in range(n):
6 |         M_t[-1].append(M[j][i])
```

6406531886032. ✓

```
1 | M_t = []
2 | n = len(M)
3 | for j in range(n):
4 |     M_t.append([])
5 |     for i in range(n):
6 |         M_t[-1].append(M[j][i])
```

6406531886033. ✘

6406531886034. ✘ 1 | M_t = [[M[j][i] for i in range(len(M))] for j in range(len(M))]

6406531886035. ✓ 1 | M_t = [[M[i][j] for i in range(len(M))] for j in range(len(M))]

Question Number : 64 Question Id : 640653564228 Question Type : MSQ Is Question

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

Correct Marks : 5 Selectable Option : 0

Question Label : Multiple Select Question

Let `L` be a $m \times m$ matrix of numbers that has already been defined and populated. We wish to find the sum of the elements in each column and store all such column-sums in a list called `colsum`. Columns are indexed from 0 to $m - 1$. For the j^{th} column, `colsum[j]` should be the sum of all elements in that column. Select all correct code snippets that achieve this.

Options :

```
1 colsum = []
2 m = len(L)
3 row, col = 0, 0
4 while col < m:
5     colsum.append(0)
6     while row < m:
7         colsum[col] += L[row][col]
8         row += 1
```

6406531886036. ✘

```
1 colsum = []
2 m = len(L)
3 row, col = 0, 0
4 while col < m:
5     colsum.append(0)
6     while row < m:
7         colsum[col] += L[row][col]
8         row += 1
9     col += 1
```

6406531886037. ✘

```
1 colsum = []
2 m = len(L)
3 row, col = 0, 0
4 while col < m:
5     row = 0
6     colsum.append(0)
7     while row < m:
8         colsum[col] += L[row][col]
9         row += 1
10    col += 1
```

6406531886038. ✓

```
1 colsum = []
2 m = len(L)
3 for j in range(m):
4     val = 0
5     for i in range(m):
6         val = val + L[j][i]
7     colsum.append(val)
```

6406531886039. ✘

6406531886040. ✓

```
1 colsum = []
2 m = len(L)
3 for j in range(m):
4     val = 0
5     for i in range(m):
6         val = val + L[i][j]
7     colsum.append(val)
```

Question Number : 65 Question Id : 640653564229 Question Type : MSQ Is Question

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

Correct Marks : 5 Selectable Option : 0

Question Label : Multiple Select Question

Consider the following snippet of code:

```
1 def f(word, n):
2     P = dict()
3     for c in word:
4         if c not in P:
5             P[c] = 0
6             P[c] += 1
7     for c in P:
8         if P[c] == n:
9             return True
10    return False
11
12 if some_word.isalpha():
13     print(True)
14 print(f(some_word, 5))
```

`some_word` is a string variable that has already been defined. The above code runs without any errors.

The output when the code given above is executed is as follows:

```
1 True
2 True
```

Which of the following statements are True? Note that your answer should hold for any value of the string `some_word` that results in the above output.

Options :

6406531886041. ✓ `some_word` is only made up of alphabets

6406531886042. ✗ `some_word` could also contain numbers

6406531886043. ✓ `len(some_word)` is at least 5

6406531886044. ✓ At least one letter in the English alphabet occurs exactly five times in `some_word`

6406531886045. ✗ Exactly one letter in the English alphabet occurs at least five times in `some_word`

Sub-Section Number : 8

Sub-Section Id : 64065380477

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 66 Question Id : 640653564230 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

`scores.csv` is a CSV file that has the following contents:

```
1 SeqNo,Name,Gender,CT,Python,PDSA
2 0,Ram,M,80,90,100
3 1,Sahana,F,90,80,70
4 2,Ritvik,M,80,100,80
5 3,Suchitra,F,100,100,100
6 4,Praful,M,60,70,85
7 5,Aisha,F,85,95,90
8 6,Andrew,M,100,65,75
9 7,Soundarya,F,85,75,65
10 8,Krishnan,M,95,85,90
11 9,Brinda,F,65,95,85
```

What is the output of the following snippet of code?

```
1 def do_something(filename, sub):
2     f = open(filename, 'r')
3     f.readline()
4     val, count = 0, 0
5
6     for line in f:
7         sno, name, gender, ct, python, pdsa = line.strip().split(',')
8         sno, ct, python, pdsa = int(sno), int(ct), int(python), int(pdsa)
9         if sub == 'CT':
10             val = val + ct
11         elif sub == 'Python':
12             val = val + python
13         elif sub == 'PDSA':
14             val = val + pdsa
15         count = count + 1
16     f.close()
17     return val / count
18
19 print(int(do_something('scores.csv', 'Python')))
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

85

Sub-Section Number :

9

Sub-Section Id : 64065380478

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 67 Question Id : 640653564231 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 following snippet of code:

```
1 | L = [1, 2, 3, 4, 5]
2 | S = []
3 | T = 0
4 | i = 0
5 | while i < len(L):
6 |     S += L[:i] + L[i:]
7 |     for j in S:
8 |         T += j
9 |     i += 1
```

What will be the value of `len(S)` at the end of execution of the above code?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

25

Question Number : 68 Question Id : 640653564232 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 output of the following snippet of code?

```
1 def log(x, y):
2     if x < y:
3         return 0
4     return 1 + log(x // y, y)
5
6 log1 = log(256, 16)
7 log2 = log(16, 2)
8 log3 = log(27, 3)
9
10 print(log1 + log2 + log3)
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

9

Sub-Section Number : 10

Sub-Section Id : 64065380479

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653564233 **Question Type :** COMPREHENSION **Sub Question Shuffling Allowed :** No **Group Comprehension Questions :** No **Question Pattern Type :** NonMatrix

Calculator : None **Response Time :** N.A **Think Time :** N.A **Minimum Instruction Time :** 0

Question Numbers : (69 to 72)

Question Label : Comprehension

Assume the values of Boolean variables `A` and `B` are `True` and `False` respectively.

What will be output of the given code snippets?

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 69 Question Id : 640653564234 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

```
1 | print(not (A and B), not(A) and B)
```

Options :

6406531886049. ✘ 1 | False False

6406531886050. ✓ 1 | True False

6406531886051. ✘ 1 | False True

6406531886052. ✘ 1 | True True

Question Number : 70 Question Id : 640653564235 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

```
1 | print(A or B and A or not(B))
```

Options :

6406531886053. ✘ 1 | False

6406531886054. ✘ 1 | True False

6406531886055. ✘ 1 | False True

6406531886056. ✓ 1 | True

Question Number : 71 Question Id : 640653564236 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

1 | print(not(A or B), not(A) or B)

Options :

6406531886057. ✓ 1 | False False

6406531886058. ✗ 1 | True False

6406531886059. ✗ 1 | False True

6406531886060. ✗ 1 | True True

Question Number : 72 Question Id : 640653564237 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

1 | print(not A and B or A and B)

Options :

6406531886061. ✓ 1 | False

6406531886062. ✘

1 | True False

6406531886063. ✘

1 | False True

6406531886064. ✘

1 | True

Sub-Section Number :	11
Sub-Section Id :	64065380480
Question Shuffling Allowed :	No
Is Section Default? :	null
Question Id : 640653564238 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Question Numbers : (73 to 74)	
Question Label : Comprehension	

Consider the class `Product`:

```
1 class Product:
2     def __init__(self, title, price):
3         self.title = title
4         self.price = price
5
6     def change_price(self, price):
7         self.price = price
8
9     def print_info(self):
10        print(f'Product title: {self.title}')
11        print(f'Product price: {self.price}')
```

`Book` is a sub-class of `Product`:

```
1 class Book(Product):
2     count = 0
3     def __init__(self, title, price, author, genre):
4         super().__init__(title, price)
5         self.author = author
6         self.genre = genre
7         Book.count += 1
8
9     def is_fiction(self):
10        return self.genre == 'Fiction'
11
12    def print_info(self):
13        super().print_info()
14        print('Product is a book')
15        print(f'Author: {self.author}')
16        print(f'Genre: {self.genre}')
```

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 73 Question Id : 640653564239 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 5

Question Label : Multiple Choice Question

What is the output of the following snippet of code?

```
1 book = Book('Wings of Fire', 250, 'Dr. Kalam', 'Non Fiction')
2 book.change_price(300)
3 book.print_info()
```

Options :

6406531886065. ✘

1	Product title: wings of Fire
2	Product price: 300

6406531886066. ✘

1	Product title: wings of Fire
2	Product price: 250

6406531886067. ✘

1	Product is a book
2	Author: Dr. Kalam
3	Genre: Non Fiction

6406531886068. ✘

1	Product title: wings of Fire
2	Product price: 250
3	Product is a book
4	Author: Dr. Kalam
5	Genre: Non Fiction

6406531886069. ✓

1	Product title: wings of Fire
2	Product price: 300
3	Product is a book
4	Author: Dr. Kalam
5	Genre: Non Fiction

Question Number : 74 Question Id : 640653564240 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

Assume that `library` represents a list of objects of type `Book`. What does the variable `count` represent at the end of execution of this code?

```
1 # assume that library has n elements, only three of which are shown below
2 Book.count = 0
3 library = [Book('A Brief History of Time', 250, 'Hawking', 'Non Fiction'),
4             Book('Alice in Wonderland', 300, 'Carroll', 'Fiction'),
5             Book('Feynman Lectures in Physics', 400, 'Feynman', 'Non Fiction')]
6
7 count = 0
8 for book in library:
9     if book.is_fiction():
10         count = count + 1
```

Options :

6406531886070. ✓ Number of fiction books in the library

6406531886071. ✗ Number of non-fiction books in the library

6406531886072. ✗ Number of books in the library

6406531886073. ✗ None of these

Java

Section Id :	64065338336
Section Number :	4
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	24
Number of Questions to be attempted :	24
Section Marks :	100
Display Number Panel :	Yes
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 :	64065380481
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 75 Question Id : 640653564241 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 (COMPUTER BASED EXAM)"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?

CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

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

Options :

6406531886074. ✓ YES

6406531886075. ✗ NO

Sub-Section Number :	2
Sub-Section Id :	64065380482
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 76 Question Id : 640653564242 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.

```
1 class ClassOne{
2     public void methodOne(){
3         // ...
4     }
5     public void methodTwo(){
6         // ...
7         methodOne();
8         // ...
9     }
10 }
11 class ClassTwo{
12     public static void methodThree(){
13         // ...
14         ClassOne c = new ClassOne();
15         c.methodTwo();
16         // ...
17     }
18     public static void main(String[] args) {
19         // ...
20         methodThree();
21     }
22 }
```

During execution of Line 8 in the above code, the activation record of which method is at the top of the stack of activation records?

Options :

6406531886076. ✘ main

6406531886077. ✘ methodOne

6406531886078. ✓ methodTwo

6406531886079. ✘ methodThree

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

Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the following code.

```
class Equipment implements Cloneable{
    String type;
    // Constructor
    // Accessor method getType()
    // Mutator method setType()
    public Equipment clone() throws CloneNotSupportedException{
        return (Equipment)super.clone();
    }
}
class Lab implements Cloneable{
    Equipment eqp;
    String name;
    // Constructor
    // Mutator method setName()
    public Lab clone() throws CloneNotSupportedException{
        Lab lb = (Lab)super.clone();
        lb.eqp = lb.eqp.clone();
        return lb;
    }
    public String toString(){
        return eqp.getType() + ":" + name;
    }
}
public class Test {
    public static void main(String[] args) {
        Lab lb1 = new Lab(new Equipment("Computer"), "Computer");
        try{
            Lab lb2 = lb1.clone();
            lb2.eqp.setType("Milling Machine");
            lb2.setName("Mechanical");
            System.out.println(lb1);
            System.out.println(lb2);
        }
        catch(Exception e){
            System.out.println(e);
        }
    }
}
```

What will the output be?

Options :

6406531886080. * Milling Machine:Computer
Milling Machine:Mechanical

6406531886081. * Milling Machine:Mechanical
Milling Machine:Mechanical

6406531886082. ✓ Computer:Computer
Milling Machine:Mechanical

6406531886083. * Computer:Mechanical
Milling Machine:Mechanical

Question Number : 78 Question Id : 640653564245 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 code given below

```

class Animal{
    public void legs(){
        System.out.println("Number of legs are not known");
    }
    public void wings(){
        System.out.println("Wings may exist");
    }
}
class Dog extends Animal{
    public void legs(){
        System.out.println("Four legs");
    }
}
class Ostrich extends Animal{
    public void legs(){
        System.out.println("Two legs");
    }
    public void wings(){
        System.out.println("Two wings");
    }
}
public class Test{
    static void show(Animal[] a){
        for(int i = 0; i < a.length; i++){
            a[i].legs();
            a[i].wings();
        }
    }
    public static void main(String[] args){
        Animal[] a = {new Dog(), new Ostrich()}; // LINE 1
        show(a);
    }
}

```

Choose the correct option.

Options :

This code generates the output:

Two legs
 Two wings
 Two legs
 Two wings

6406531886088. *

6406531886089. ✓

This code generates the output:

Four legs
Wings may exist
Two legs
Two wings

This code generates the output:

Number of legs are not known
Wings may exist
Number of legs are not known
Wings may exist

6406531886090. ✘

Compilation error at LINE 1 because a reference variable of type Animal cannot refer to an object of class Ostrich

6406531886091. ✘

Question Number : 79 Question Id : 640653564246 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 code given below that checks whether two rectangles are the same. Method `equals` is overridden to compare two `Rectangle` objects as follows: If two rectangles have the same area, then they are the same. Based on the given information, answer the question that follows.

```
class Rectangle{  
    private int length;  
    private int breadth;  
  
    //Constructor to initialize instance variables  
  
    public double area() {  
        return (length * breadth);  
    }  
    public boolean equals(Object obj) {  
        // CODE BLOCK  
    }  
}  
public class Test {  
    public static void main(String[] args) {  
        Rectangle r1 = new Rectangle(3,5);  
        Rectangle r2 = new Rectangle(5,3);  
        if(r1.equals(r2))  
            System.out.println("r1 and r2 are the same");  
        else  
            System.out.println("r1 and r2 are not same");  
    }  
}
```

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

r1 and r2 are the same

Options :

```
if(obj instanceof Rectangle) {  
    Rectangle r = (Rectangle) obj;  
    if(this.area() == r.area())  
        return false;  
}  
6406531886092. ✘ return true;
```

6406531886093. ✘

```
if(obj instanceof Rectangle) {  
    Rectangle r = obj;  
    if(this.area() == r.area)  
        return true;  
}  
return false;
```

```
if(obj instanceof Rectangle) {  
    Rectangle r = obj;  
    if(this.area() == r.area())  
        return false;  
}
```

6406531886094. ✘ return true;

```
if(obj instanceof Rectangle) {  
    Rectangle r = (Rectangle) obj;  
    if(this.area() == r.area())  
        return true;  
}  
return false;
```

6406531886095. ✓

Question Number : 80 Question Id : 640653564250 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, and answer the question that follows:

```

abstract class Op implements Runnable{
    static int sum = 0;
}
class Op1 extends Op{
    public void run() {
        if (sum != 4) {
            sum = sum + 5;
        }
    }
}
class Op2 extends Op{
    public void run() {
        if (sum != 5) {
            sum = sum + 4;
        }
    }
}
public class RaceCondition {
    public static void main(String[] args) {
        Op o1 = new Op1();
        Op o2 = new Op2();

        Thread t1 = new Thread(o1);
        Thread t2 = new Thread(o2);

        t1.start();
        t2.start();

        System.out.println(Op.sum);
    }
}

```

Choose the correct option.

Options :

6406531886108. ❌ The program will never generate the output: 0

6406531886109. ❌ The program will never generate the output: 4

6406531886110. ❌ The program will never generate the output: 5

6406531886111. ❌ The program will never generate the output: 9

6406531886112. ✓ The output can be 0 or 4 or 5 or 9.

Question Number : 81 Question Id : 640653564252 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 code given below.

```
class Circle{  
    static final double PI = 3.14;  
    double radius;  
    public Circle(double r){  
        radius = r;  
    }  
    public Circle(Circle c){  
        radius = c.radius;  
    }  
    public double perimeter(){  
        return 2 * PI * radius;  
    }  
}  
public class ConTest {  
    public static void main(String[] args) {  
        Circle c1 = new Circle(6.0);  
        Circle c2 = new Circle(c1);  
        Circle c3 = new Circle(c2);  
        c1.radius = 4.0;  
        System.out.println(c1.perimeter());  
        System.out.println(c2.perimeter());  
        System.out.println(c3.perimeter());  
    }  
}
```

What will the output be?

Options :

25.12

25.12

6406531886117. ✘ 25.12

37.68

37.68

6406531886118. ✘ 37.68

25.12
37.68
6406531886119. ✓ 37.68

37.68
25.12
6406531886120. ✗ 25.12

Question Number : 82 Question Id : 640653564256 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 code given below.

```
import java.util.*;
public class MapTest {
    public static void main(String[] args) {
        var batsmen= new LinkedHashMap<String, Integer>();
        batsmen.put("Sachin", 100);
        batsmen.put("Sachin", 55 + batsmen.getOrDefault("Sachin", 0));
        batsmen.put("Sehwag", 100);
        batsmen.put("Sehwag", 55);
        for(Map.Entry<String, Integer> obj1:batsmen.entrySet())
            System.out.println(obj1.getKey()+"："+obj1.getValue());
    }
}
```

Choose the correct option.

Options :

This program generates the output:

Sachin:55

Sehwag:55

6406531886133. ✗

This program generates the output:

Sachin:155

Sehwag:155

6406531886134. ✘

This program generates the output:

Sachin:100

Sehwag:100

6406531886135. ✘

This program generates the output:

Sachin:155

Sehwag:55

6406531886136. ✓

Question Number : 83 Question Id : 640653564257 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the Java code given below.

```

class RightAngledException extends Exception{
    public RightAngledException(String str) {
        super(str);
    }
}

class Triangle{
    double hypotenuse, base, altitude;
    //Constructor to initialize instance variables
    public boolean isRightAngled() throws RightAngledException{
        double hyp = hypotenuse * hypotenuse;
        double b = base * base;
        double a = altitude * altitude;
        if(hyp != (b+a))
            throw new RightAngledException("Not a Right Angled Triangle");
        else
            return true;
    }
}

public class ExceptionTest {
    public static void main(String[] args) {
        var obj1 = new Triangle(13, 12, 5);
        var obj2 = new Triangle(5, 4, 3);
        try {
            System.out.println(obj1.isRightAngled());
            System.out.println(obj2.isRightAngled());
        } catch (RightAngledException e) {
            System.out.println(e.getMessage());
        }
    }
}

```

What will the output be?

Options :

- Not a Right Angled Triangle
- 6406531886137. ✘ Not a Right Angled Triangle**

- 6406531886138. ✓ Not a Right Angled Triangle**

- Not a Right Angled Triangle
- 6406531886139. ✘ true**

true
6406531886140. ✘ true

Question Number : 84 Question Id : 640653564258 Question Type : MCQ Is Question

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

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the Java code given below.

```
import java.io.*;
class CreditCard implements Serializable{
    private String cardNo = "*****";
    private transient int pin = 1000;
    private String exp = "00/00";
    public CreditCard(String cno, int p, String e) {
        cardNo = cno;
        pin = p;
        exp = e;
    }
    public String toString() {
        return cardNo + ", " + pin + ", " + exp;
    }
}
public class SerialTest{
    public static void main(String[] args) throws Exception{
        var fos = new FileOutputStream("credit.txt");
        var os = new ObjectOutputStream(fos);
        os.writeObject(new CreditCard("4688171329130605", 9999, "03/23"));

        var fis = new FileInputStream("credit.txt");
        var ois = new ObjectInputStream(fis);
        CreditCard card = (CreditCard)ois.readObject();
        System.out.println(card);
    }
}
```

What will the output be?

Options :

6406531886141. ✘ null, 0, null

6406531886142. ✘ 4688171329130605, 1000, 03/23

6406531886143. ✘ 4688171329130605, 9999, 03/23

6406531886144. ✓ 4688171329130605, 0, 03/23

6406531886145. ✘ *****, 1000, 00/00

Question Number : 85 Question Id : 640653564259 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 code given below.

```

import java.util.*;
class Team{
    HashMap<String, String> f = new HashMap<String, String>();
    public Team() {
        f.put("CSK", "Radhakrishnan");
        f.put("MI", "Ambani");
    }
    public String getOwner(String t){
        return f.get(t);
    }
}
public class OptionalTest {
    public static void main(String[] args){
        Optional<String> op1 = Optional.ofNullable(new Team().getOwner("CSK"));
        Optional<String> op2 = Optional.ofNullable(new Team().getOwner("RCB"));
        op1.ifPresent(n->System.out.println(n.toUpperCase()));
        op2.ifPresent(n->System.out.println(n.toUpperCase()));
    }
}

```

Choose the correct option.

Options :

This program generates the output:

6406531886146. ✓

RADHAKRISHNAN

This program terminates due to `NullPointerException` after printing the message:

RADHAKRISHNAN

6406531886147. ✗

This program generates the output:

RADHAKRISHNAN

null

6406531886148. ✗

This program generates no output.

6406531886149. ✗

Question Number : 86 Question Id : 640653564260 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 code given below.

```
import java.util.*;
import java.util.stream.*;
class Faculty{
    String name;
    double salary;
    //Constructor to initialize instance variables
    //Method toString() to return name of the faculty
}
public class CollectingTest {
    public static void main(String[] args){
        var fArr = new ArrayList<Faculty>();
        fArr.add(new Faculty("Sravya",30000.00));
        fArr.add(new Faculty("Thanvi",50000.00));
        fArr.add(new Faculty("Sharadha",100000.00));
        fArr.add(new Faculty("Pooja",29000.00));
        Map<Boolean, List<Faculty>> facMap;
        facMap = fArr.stream()
            .collect(Collectors.partitioningBy(f->f.salary >= 50000.00));
        System.out.println(facMap.get(false));
    }
}
```

Choose the correct option.

Options :

This program generates the output:
6406531886150. ❌ [Thanvi, Sharadha]

This program generates the output:
6406531886151. ❌ [Sharadha]

This program generates the output:
6406531886152. ✓ [Sravya, Pooja]

6406531886153. ❌

This program generates the output:
[Sravya, Thanvi, Pooja]

Question Number : 87 Question Id : 640653564261 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 code given below.

Assume that file "abc.txt" exists and contains the following text.

Hello IITM students

Assume that there is no file named "xyz.txt".

```
import java.io.*;
import java.util.Scanner;
public class FileTest {
    public static void main(String[] args) throws Exception{
        try {
            FileInputStream in = new FileInputStream("abc.txt");
            Scanner sc = new Scanner(in);
            String data = "";
            if(sc.hasNext())
                data = sc.nextLine();

            var out = new FileOutputStream("xyz.txt");
            var dout = new DataOutputStream(out);
            dout.writeBytes(data);
            System.out.println("Data written to file successfully");
            out.close();
            dout.close();
            sc.close();
        }
        catch (FileNotFoundException e) {
            System.out.println("File does not exist");
        }
        catch (IOException e) {
            System.out.println("Error in writing to a file");
        }
    }
}
```

Choose the correct option regarding the code.

Options :

6406531886154. ✓ This program prints the message:
Data written to file successfully

6406531886155. ✗ This program prints the message:
Files does not exist

6406531886156. ✗

This program prints the message:

Error in writing to a file

6406531886157. ❗ This program terminates abnormally due to unhandled exceptions.

Question Number : 88 Question Id : 640653564262 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.

You may make use of the description given below.

The logarithm of a number n to the base x is the number of times x has to be multiplied with itself so get n, and is denoted by $\log_x(n)$.

For example, $\log_2(4) = 2$, $\log_{10}(100) = 2$. Note that $\log_x(1) = 1$.

```
class Logarithm{  
    private int base;  
    // Constructor to initialize the instance variable base  
    public int log(int num) {  
        assert num > 0; //LINE 1  
        if (num == 1)  
            return 0;  
        assert base > 0; //LINE 2  
        return 1 + log(num/base);  
    }  
}  
public class AssertionTest {  
    public static void main(String[] args) {  
        Logarithm obj1 = new Logarithm(10);  
        Logarithm obj2 = new Logarithm(-2);  
  
        System.out.println(obj1.log(1000));  
        System.out.println(obj2.log(-2));  
    }  
}
```

Choose the correct option when the program is executed as:

java -ea AssertionTest

Options :

This program generates the output:

3

1

6406531886158. ✘

This program throws `AssertionError` at LINE 1 after printing the value:

6406531886159. ✓ 3

This program throws `AssertionError` at LINE 2 after printing the value:

6406531886160. ✘ 3

This program terminates abnormally after printing the value:

3

6406531886161. ✘

Question Number : 89 Question Id : 640653564263 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 program given below.

```

import javax.swing.*;
public class GUITest extends JFrame{
    JPanel inputPanel,outputPanel,opPanel;
    JLabel label1,label2;
    JRadioButton sq,cube;
    JTextField input;
    JButton button;
    public GUITest() {
        label1 = new JLabel("Enter Number");
        input = new JTextField(10);
        button = new JButton("Submit");
        inputPanel = new JPanel();
        // label1, input and button are added to inputPanel

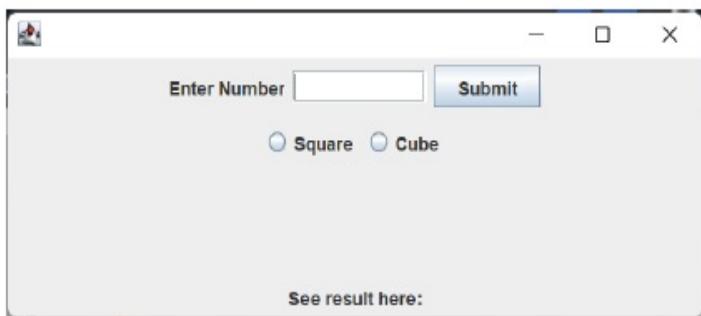
        sq = new JRadioButton("Square");
        cube = new JRadioButton("Cube");
        opPanel = new JPanel();
        // sq and cube are added to opPanel

        label2 = new JLabel("See result here:");
        outputPanel = new JPanel();
        // label2 is added to outputPanel

        setVisible(true);
        //CODE BLOCK
    }
    public static void main(String[] args) {
        new GUITest();
    }
}

```

Choose the correct option to be filled in place of CODE BLOCK such that the above program produces the GUI given below:



Options :

add(inputPanel,"Center");
 add(opPanel,"North");
6406531886162. ✘ add(outputPanel,"South");

6406531886163. ✘

```
add(inputPanel,"North");
add(opPanel,"South");
add(outputPanel,"Center");
```

6406531886164. ✓ add(inputPanel,"North");
add(opPanel,"Center");
add(outputPanel,"South");

6406531886165. ✗ add(inputPanel,"South");
add(opPanel,"Center");
add(outputPanel,"North");

Question Number : 90 Question Id : 640653564264 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 program given below.

```

class Counter implements Runnable{
    boolean stopRequested = false;
    long count = 0;
    public void run() {
        while (!stopRequested) {
            count++;
            if (count==1000000) {
                stopRequested = true;
            }
        }
    }
    public void setStop(boolean stop){
        stopRequested = stop;
    }
    public long getCount(){
        return count;
    }
}
public class ThreadEx {
    public static void main(String[] args) throws InterruptedException {
        Counter ctr = new Counter();
        Thread backgroundThread = new Thread(ctr);
        backgroundThread.start();
        Thread.sleep(1);
        ctr.setStop(true);
        System.out.println(ctr.getCount());
    }
}

```

What will the output be?

Options :

6406531886166. ✘ 0

6406531886167. ✘ 1000000

6406531886168. ✓ Some whole number between 0 and 1000000

6406531886169. ✘ 999999

Sub-Section Number : 3

Sub-Section Id : 64065380483

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 91 Question Id : 640653564253 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 code given below.

```
interface Storable{
    void store();
}

interface Transferable{
    void transfer();
}

class Laptop{
    public HardDisk getDisk() {
        return new HardDisk();
    }

    private class HardDisk implements Storable,Transferable {
        public void store() {
            System.out.println("Stores data");
        }

        public void transfer() {
            System.out.println("Transfers data");
        }
    }
}

public class PrivateTest {
    public static void main(String[] args) {
        // CODE BLOCK
    }
}
```

Choose the correct option to be filled in place of CODE BLOCK so that the output is:

Stores data
Transfers data

Options :

```
Storable obj1 = new Laptop().getDisk();
Transferable obj2 = new Laptop().getDisk();
obj1.store();
6406531886121. ✓ obj2.transfer();
```

```
Storable obj1 = new Laptop().getDisk();
obj1.store();
obj1.transfer();
```

6406531886122. ❌

```
Transferable obj1 = new Laptop().getDisk();
obj1.store();
obj1.transfer();
```

6406531886123. ❌

```
HardDisk obj1 = new Laptop().getDisk();
obj1.store();
obj1.transfer();
```

6406531886124. ❌

Sub-Section Number : 4

Sub-Section Id : 64065380484

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 92 Question Id : 640653564244 Question Type : MSQ Is Question

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

Correct Marks : 5 Selectable Option : 0

Question Label : Multiple Select Question

Consider the code given below.

```
1 interface Readable{
2     void read();
3 }
4 interface Displayable{
5     void display();
6 }
7 interface Computable extends Displayable, Readable{
8     void compute();
9 }
10 abstract class Calculator implements Computable{
11     public void compute(){
12         System.out.println("Calculator computes");
13     }
14 }
15 class Phone extends Calculator{
16     public void read(){
17         System.out.println("Phone reads");
18     }
19     public void display(){
20         System.out.println("Phone display");
21     }
22 }
23 public class Test{
24     public static void main(String[] args){
25         Readable r = new Phone();
26         r.read();
27     }
28 }
```

Choose the correct option/s

Options :

6406531886084. ❌ Compilation error at LINE 7 because an interface cannot *extend* two interfaces.

6406531886085. ❌ Compilation error in LINE 10 to LINE 14 because the abstract class Calculator cannot implement an interface.

6406531886086. ❌ Compilation error at LINE 25 because a reference variable of interface Readable cannot refer to an object of class Phone.

6406531886087. ✓ The program generates the output: Phone reads

Question Number : 93 Question Id : 640653564247 Question Type : MSQ Is Question

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

Correct Marks : 5 Selectable Option : 0

Question Label : Multiple Select Question

Consider the Java code given below that prints the seating capacity of each vehicle in a list of vehicles. From among the options, identify the appropriate function header for function printSeating that takes as input a list of Vehicle objects and prints the seating capacity of each.

```
import java.util.*;
abstract class Vehicle{
    abstract void capacity();
}
class Bike extends Vehicle{
    public void capacity() {
        System.out.println("Capacity is two");
    }
}
class Auto extends Vehicle{
    public void capacity() {
        System.out.println("Capacity is three");
    }
}
public class Test {
    // LINE 1: FUNCTION HEADER
    {
        // invokes method capacity()
        // to print the capacity of each vehicle
    }
    public static void main(String[] args) {
        List<Vehicle> vlist = new ArrayList<Vehicle>();
        vlist.add(new Bike());
        vlist.add(new Auto());
        seating(vlist);
    }
}
```

Choose the correct option(s).

Options :

6406531886096. ❌ public static void seating(List<Bike> obj)

6406531886097. ✓ public static <T extends Vehicle> void seating(List<T> obj)

6406531886098. ❌ public static void seating(List<Auto> obj)

6406531886099. ✓ public static void seating(List<? extends Vehicle> obj)

Question Number : 94 Question Id : 640653564248 Question Type : MSQ Is Question

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

Correct Marks : 5 Selectable Option : 0

Question Label : Multiple Select Question

Which of the following statements counts the number of integers between 100 and 150 (including 100 and 150) that are not divisible by 2?

Options :

Stream.iterate(100, n -> n + 1).limit(51).filter(n -> n % 2 != 0)
6406531886100. ✓ .count();

Stream.iterate(100, n -> n + 1).filter(n -> n % 2 != 0)
6406531886101. ❌ .count();

Stream.iterate(100, n-> n <= 150, n -> n + 1).filter(n -> n % 2 != 0)
6406531886102. ✓ .count();

Stream.filter(100, n-> n < 150, n -> n + 1).iterate(n -> n % 2 == 0)
6406531886103. ❌ .count();

Question Number : 95 Question Id : 640653564249 Question Type : MSQ Is Question

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

Time : 0

Correct Marks : 5 Selectable Option : 0

Question Label : Multiple Select Question

Consider the code given below.

```
import java.util.*;
class Account{
    int balance;
    public synchronized void withdraw(int amount) {
        if(balance > amount)
            balance = balance - amount;
        System.out.println("After withdrawing, balance = "+balance);
    }
    public synchronized void deposit(int amount) {
        balance = balance + amount;
        System.out.println("After depositing, balance = "+balance);
    }
}
class User extends Thread{
    Account acc;
    public User(Account obj){
        acc = obj;
    }
    public void run() {
        acc.withdraw(500);
        acc.deposit(1000);
    }
}
public class Test{
    public static void main(String args[]) {
        Account my_acc = new Account();
        User u1 = new User(my_acc);
        User u2 = new User(my_acc);
        u1.start();
        u2.start();
    }
}
```

Choose all the options that would NEVER occur as a result of execution of this code.

Options :

After withdrawing, balance = 0
After depositing, balance = 1000
After withdrawing, balance = 500
After depositing, balance = 1500

6406531886104. ✘

After withdrawing, balance = 0
After withdrawing, balance = 0
After depositing, balance = 1000
After depositing, balance = 2000

6406531886105. ✘

After withdrawing, balance = 0
After depositing, balance = 1000
After depositing, balance = 2000
After withdrawing, balance = 1000

6406531886106. ✓

After depositing, balance = 1000
After withdrawing, balance = 500
After withdrawing, balance = 1000
After depositing, balance = 2000

6406531886107. ✓

Question Number : 96 Question Id : 640653564251 Question Type : MSQ Is Question

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

Correct Marks : 5 Selectable Option : 0

Question Label : Multiple Select Question

Consider the code given below.

```

import java.util.*;
public class Person{
    private String name;
    private int age;
    public Person(String n, int a) {
        name = n;
        age = a;
    }
    public int getAge(){
        return age;
    }
    public void print() {
        System.out.println(name + " : " + age);
    }
}

public class FClass{
    public static void main(String[] args) {
        var list = new ArrayList<Person>();
        list.add(new Person("Robin", 33));
        list.add(new Person("Indra", 76));
        list.add(new Person("Smita", 35));
        list.add(new Person("Rikki", 26));
        Collections.sort(list, _____); LINE 1
        for(var l: list)
            l.print();
    }
}

```

Identify the appropriate option(s) to fill in the blank at LINE 1, such that the output is:

Indra : 76
 Smita : 35
 Robin : 33
 Rikki : 26

Options :

6406531886113. ❌ (a, b) -> a.getAge() - b.getAge()

6406531886114. ✓ (a, b) -> b.getAge() - a.getAge()

6406531886115. ✓ (Person a, Person b) -> a.getAge() - b.getAge()

6406531886116. * (a, b) -> { return b.getAge() - a.getAge(); }

Question Number : 97 Question Id : 640653564254 Question Type : MSQ Is Question

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

Correct Marks : 5 Selectable Option : 0

Question Label : Multiple Select Question

Consider the code given below.

```
import java.util.*;
public class ListExample {
    public static void main(String[] args) {
        ----- //LINE 1
        ----- //LINE 2
        list1 = new ArrayList<String>();
        list1.add("India");
        list1.add("Hyderabad");
        list2 = new LinkedList<String>(list1);
        for(String s : list1)
            System.out.println(s);
        for(String s : list2)
            System.out.println(s);
    }
}
```

If the code given above produces the output:

```
India
Hyderabad
India
Hyderabad
```

What should be the correct choice for LINE 1 and LINE 2?

Options :

List<String> list1;
6406531886125. ✓ List<String> list2;

```
AbstractSequentialList<String> list1;
```

```
AbstractSequentialList<String> list2;
```

6406531886126. ❌

```
AbstractList<String> list1;
```

```
SequentialList<String> list2;
```

6406531886127. ❌

```
AbstractList<String> list1;
```

```
AbstractSequentialList<String> list2;
```

6406531886128. ✓

Question Number : 98 Question Id : 640653564255 Question Type : MSQ Is Question

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

Correct Marks : 5 Selectable Option : 0

Question Label : Multiple Select Question

Consider the Java code given below.

```

import java.util.*;
public class SetTest {
    public static void main(String[] args) {
        ArrayList<String> list = new ArrayList<String>();
        list.add("Java");
        list.add("Programming");
        list.add("Python");
        list.add("Script");
        // CODE BLOCK
        for(String str:list) {
            set1.add(str);
            set2.add(str);
        }
        for(String str:set1)
            System.out.print(str+" ");
        System.out.println();
        for(String str:set2)
            System.out.print(str+" ");
    }
}

```

Choose the correct option(s) to be filled in place of CODE BLOCK so that the program always generates the following output:

Java Programming Python Script
 Java Programming Python Script

Options :

6406531886129. ❌
 var set1 = new HashSet<String>();
 var set2 = new TreeSet<String>();

6406531886130. ✓
 var set1 = new LinkedHashSet<String>();
 var set2 = new TreeSet<String>();

6406531886131. ✓
 var set1 = new TreeSet<String>();
 var set2 = new TreeSet<String>();

6406531886132. ❌
 var set1 = new LinkedHashSet<String>();
 var set2 = new HashSet<String>();

MLT

Section Id :	64065338337
Section Number :	5
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	21
Number of Questions to be attempted :	21
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 :	64065380485
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 99 Question Id : 640653564265 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 (COMPUTER BASED EXAM)"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?

CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

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

REGISTERED BY YOU)

Options :

6406531886170. ✓ YES

6406531886171. ✘ NO

Sub-Section Number : 2

Sub-Section Id : 64065380486

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 100 Question Id : 640653564266 Question Type : MCQ Is Question

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

Correct Marks : 5

Question Label : Multiple Choice Question

A kernel k is defined as

$$k : \mathbb{R}^2 \times \mathbb{R}^2 \rightarrow \mathbb{R}$$
$$k([x_1, x_2]^T, [y_1, y_2]^T) = 1 + 2x_1^2y_1^2 + 2x_2^2y_2^2$$

Which of the following transformation mappings corresponds to this kernel function?

Options :

6406531886172. ✘ $\phi([x_1, x_2]^T) = [1, x_1^2 + x_2^2]^T$

6406531886173. ✘ $\phi([x_1, x_2]^T) = [1, \sqrt{2}x_1^2 + \sqrt{2}x_2^2]^T$

6406531886174. ✓ $\phi([x_1, x_2]^T) = [1, \sqrt{2}x_1^2, \sqrt{2}x_2^2]^T$

6406531886175. ✘ $\phi([x_1, x_2]^T) = [1, x_1^2, x_2^2]^T$

Question Number : 101 Question Id : 640653564267 Question Type : MCQ Is Question

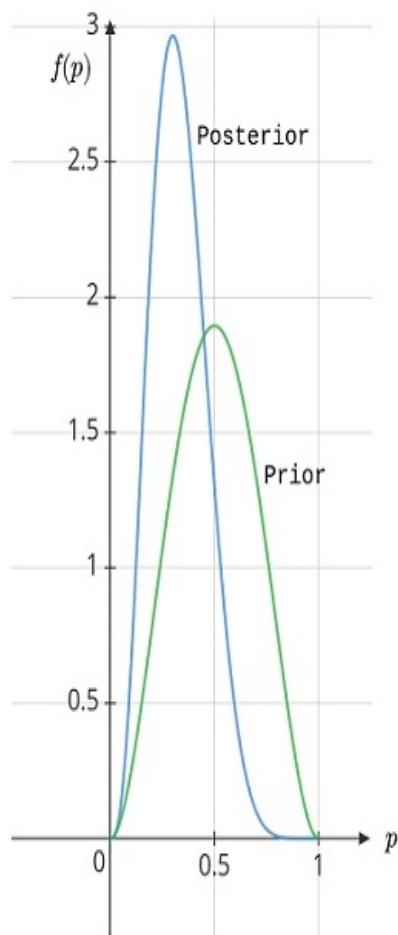
Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Correct Marks : 5

Question Label : Multiple Choice Question

Consider a Bayesian estimation problem for a dataset of six observations, where each observation is either one or zero. The prior (green) and posterior (blue) distributions are shown below. Recall that both are Beta distributions in this case. p denotes the parameter and $f(p)$ denotes its pdf. Also recall that the observations are sampled from a Bernoulli distribution with parameter p



What can you say about the number of ones in the dataset? Choose the most appropriate option.

Options :

6406531886176. ✓ 1

6406531886177. ✗ 3

6406531886178. ✗ 5

Question Number : 102 Question Id : 640653564268 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

In regularized linear regression, what is a common issue that can occur when the regularization parameter λ is set too low?

Options :

6406531886179. ✓ Overfitting

6406531886180. ✗ Underfitting

Question Number : 103 Question Id : 640653564269 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 training dataset for a binary classification problem in \mathbb{R}^2 :

x_1	x_2	y
1	2	1
1	-2	1
-5	0	1
5	0	-1
-2	1	-1
-2	-1	-1

If we try to learn a perceptron model for this dataset, will the algorithm ever converge to a weight vector? Select the most appropriate answer with the information available to you.

Options :

6406531886181. ✗ Yes, it will certainly converge to a weight vector.

6406531886182. ✓ No, it will never converge.

Question Number : 104 Question Id : 640653564270 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

While training a perceptron model, the weight vector at some iteration t is \mathbf{w}^t . The next data-point picked up by the perceptron algorithm in the course of its execution is (\mathbf{x}, y) , where y is the true label:

$$\mathbf{w}^t = \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \end{bmatrix}, \quad \mathbf{x} = \begin{bmatrix} -1 \\ 0 \\ 1 \\ -1 \end{bmatrix}, \quad y = 1$$

What is the value of \mathbf{w}^{t+1} ?

Options :

$$\begin{bmatrix} 0 \\ 2 \\ 4 \\ 3 \end{bmatrix}$$

6406531886183. ✓

$$\begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \end{bmatrix}$$

6406531886184. ✗

$$\begin{bmatrix} 2 \\ 2 \\ 2 \\ 5 \end{bmatrix}$$

6406531886185. ✗

6406531886186. ✗ No update will happen as the point (\mathbf{x}, y) is not a mistake with respect to \mathbf{w}^t

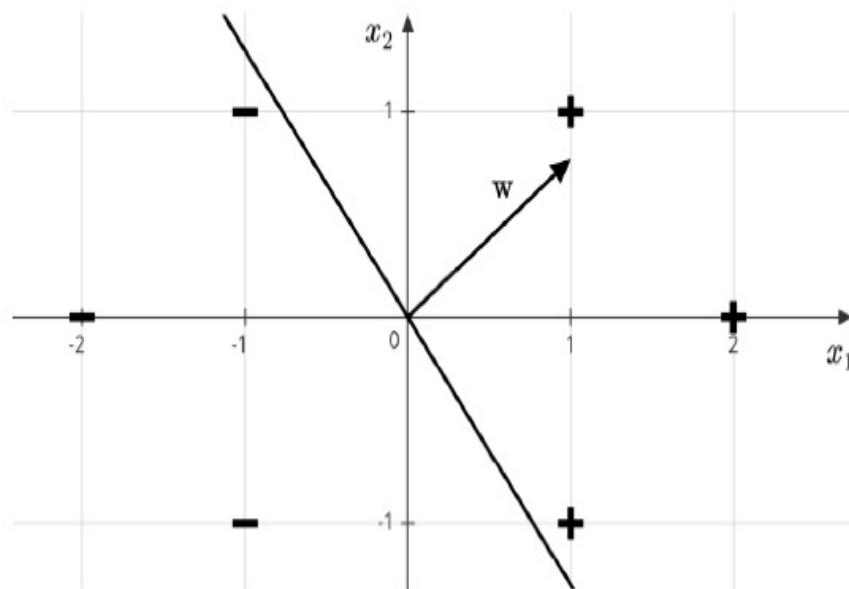
Question Number : 105 Question Id : 640653564271 Question Type : MCQ Is Question

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

Correct Marks : 5

Question Label : Multiple Choice Question

Consider a linearly separable binary classification problem. The training dataset is shown below. Is \mathbf{w} the optimal weight vector corresponding to a hard-margin, linear-SVM? The symbol + corresponds to label 1 and - corresponds to label -1.



Options :

6406531886187. ❌ \mathbf{w} shown in this diagram is the optimal weight vector for a hard-margin, linear-SVM

6406531886188. ✓ \mathbf{w} shown in this diagram is **not** the optimal weight vector for a hard-margin, linear-SVM

Question Number : 106 Question Id : 640653564272 Question Type : MCQ Is Question

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

Correct Marks : 5

Question Label : Multiple Choice Question

Consider a linearly separable binary classification problem in which the data-points are in \mathbb{R}^{10} . The training dataset has 50 data-points, 20 from the positive class and 30 from the negative class. Now, consider a hard-margin linear-SVM. How many constraints does the primal problem have? Select the most appropriate answer.

Options :

6406531886189. ✓ 50

6406531886190. ✗ 20

6406531886191. ✗ 30

6406531886192. ✗ 10

Sub-Section Number : 3

Sub-Section Id : 64065380487

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 107 Question Id : 640653564273 Question Type : MSQ Is Question

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

Correct Marks : 5 Selectable Option : 0

Question Label : Multiple Select Question

A clustering of 200 data points in \mathbb{R}^2 was done using Lloyd's algorithm with $K = 3$. You are told that the points $[1, 1]^T$, $[4, 1]^T$, and $[3, 3]^T$ are in the same cluster. Which of the following points will definitely lie in the same cluster? (If there are any ties with this cluster, they should be assigned exclusively to this cluster.)

Options :

6406531886193. ✗ $[4, 2]^T$

6406531886194. ✓ $[3, 2]^T$

6406531886195. ✗ $[0, 0]^T$

6406531886196. ✓ $[2, 2]^T$

Question Number : 108 Question Id : 640653564274 Question Type : MSQ Is Question

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

Correct Marks : 5 Selectable Option : 0

Question Label : Multiple Select Question

Consider a linear regression model that was trained on dataset X of shape (d, n) . Which of the following techniques could potentially decrease the loss on the training data (assuming the loss is the squared error)?

Options :

6406531886197. ✓ Adding a dummy feature in the dataset and learning the intercept w_0 as well.

6406531886198. ✗ Penalizing the model weights with L2 regularization.

6406531886199. ✗ Penalizing the model weights with L1 regularization.

6406531886200. ✓ Training the kernel regression model of degree 2.

Question Number : 109 Question Id : 640653564275 Question Type : MSQ Is Question

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

Correct Marks : 5 Selectable Option : 0

Question Label : Multiple Select Question

There are 100 data-points at some node in a decision tree. If the entropy of this node is 0.722, which of the following could be the number of data-points that belong to the positive class in this node? Choose all appropriate answers. Use \log_2 as always.

Options :

6406531886201. ✓ 80

6406531886202. ✓ 20

6406531886203. ✗ 70

6406531886204. ✗ 30

6406531886205. ✗ 50

6406531886206. ✗ 100

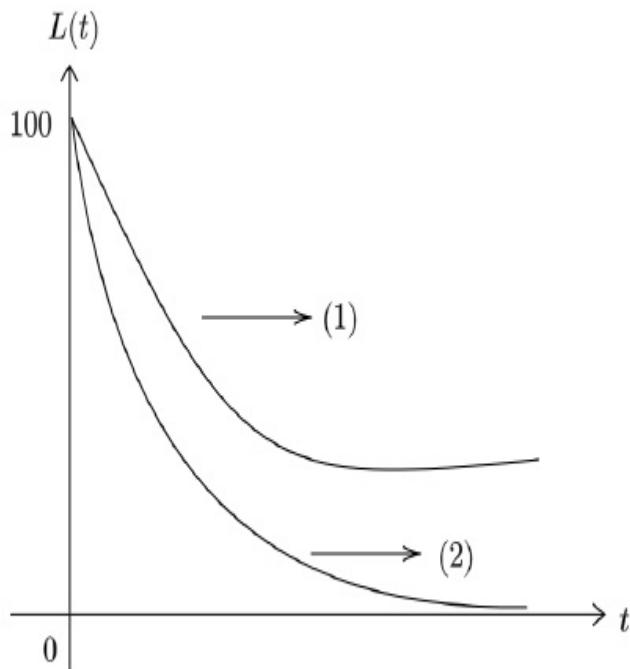
Question Number : 110 Question Id : 640653564278 Question Type : MSQ Is Question

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

Correct Marks : 5 Selectable Option : 0

Question Label : Multiple Select Question

Consider a supervised ML problem that has a training dataset and a validation dataset. A ML model is being trained on the training dataset using gradient descent and its performance is monitored on the validation dataset. The loss function $L(t)$ at time step t is plotted against t .



One of these curves corresponds to the model's loss on the training dataset and the other corresponds to the model's loss on the validation dataset. Identify the two curves. Consider a general scenario and not an extreme instance while answering this problem. Exactly two options are correct.

Options :

6406531886215. ✓ (1) is the loss on the validation dataset

6406531886216. ✓ (2) is the loss on the training dataset

6406531886217. ❌ (1) is the loss on the training dataset

6406531886218. ❌ (2) is the loss on the validation dataset

Sub-Section Number : 4

Sub-Section Id : 64065380488

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 111 Question Id : 640653564276 Question Type : MSQ Is Question

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

Correct Marks : 3 Selectable Option : 0

Question Label : Multiple Select Question

Which of the following statements are true about ' C ' in SVM?

Options :

6406531886207. ❌ As C approaches 0, the soft margin SVM is equal to the hard margin SVM.

6406531886208. ✓ As C approaches ∞ , the soft margin SVM is equal to the hard margin SVM.

6406531886209. ✓ A smaller value of C tends to create a larger margin.

6406531886210. ❌ C can be negative, as long as the bribe(ξ) each data point pays is nonnegative.

Question Number : 112 Question Id : 640653564277 Question Type : MSQ Is Question

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

Correct Marks : 3 Selectable Option : 0

Question Label : Multiple Select Question

In a random forest model, let $p < d$ be the number of randomly selected features that are used to identify the best split at any node of a tree. Which of the following is/are true? (d is the total number of features)

Options :

6406531886211. ❌ Increasing p reduces the correlation between any two trees in the forest.

6406531886212. ✓ Decreasing p reduces the correlation between any two trees in the forest.

6406531886213. ✓ Increasing p increases the performance of individual trees in the forest.

6406531886214.

- Decreasing p increases the performance of individual trees in the forest.

Sub-Section Number :	5
Sub-Section Id :	64065380489
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 113 Question Id : 640653564279 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 the following dataset of 4 points in \mathbb{R}^5 :

$$\{-2\mathbf{u}, -\mathbf{u}, \mathbf{u}, 2\mathbf{u}\}$$

where $\mathbf{u} = [0.5 \ 0 \ 0.5 \ -0.5 \ -0.5]^T$. What is the variance along the first principal component after performing standard PCA on this dataset?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2.5

Question Number : 114 Question Id : 640653564280 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 logistic regression model that has been trained for a binary classification problem on a dataset in \mathbb{R}^2 . The weight vector is $\begin{bmatrix} 3/5 \\ 4/5 \end{bmatrix}$. Given a test data-point as input to the model, it returns 1 as the predicted label if the probability output by the model is greater than 0.75 and 0 otherwise. What is the predicted label for the test data-point $\begin{bmatrix} 1 \\ 0 \end{bmatrix}$? Note that the probability output by a logistic regression model is $P(y = 1 | \mathbf{x})$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Question Number : 115 **Question Id :** 640653564281 **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 binary classification problem for a linearly separable dataset in \mathbb{R}^4 . The optimal weight vector for a hard-margin linear-SVM classifier is given to be \mathbf{w}^* . The data-point (\mathbf{x}, y) belongs to the training dataset:

$$\mathbf{w}^* = \begin{bmatrix} 1 \\ 0 \\ -1 \\ 2 \end{bmatrix}, \quad \mathbf{x} = \begin{bmatrix} 1 \\ -5 \\ -3 \\ 0 \end{bmatrix}, \quad y = 1$$

What is the value of α^* corresponding to this data-point? If you think the answer cannot be determined with this information, enter -1. If you think it can be determined, enter the correct value of α^* . Note that α^* is the Lagrange multiplier corresponding to this data-point.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Question Number : 116 Question Id : 640653564282 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 the following architecture for a neural network:

Layer	Neurons
Input	10
Hidden Layer-1	20
Hidden layer-2	30
Output layer	1

How many weights does this network have? Assume that there is no bias associated with any neuron.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

830

Question Number : 117 Question Id : 640653564283 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 a data-point (\mathbf{x}, y) is correctly classified by a logistic regression model with weight vector \mathbf{w} , what could be the maximum value of the logistic loss associated with it?

Assume that the model predicts the label 1 if $P(y = 1 | \mathbf{x}) \geq 0.5$ and -1 otherwise. Note that $y \in \{-1, 1\}$ as we are looking at the logistic loss. Use \log_e , the natural logarithm, while calculating the logistic loss. Enter your answer correct to three decimal places.

Hint: Geometry leads, algebra follows

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.68 to 0.70

Sub-Section Number : 6

Sub-Section Id : 64065380490

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653564284 **Question Type :** COMPREHENSION **Sub Question Shuffling Allowed :** No **Group Comprehension Questions :** No **Question Pattern Type :** NonMatrix **Calculator :** None **Response Time :** N.A **Think Time :** N.A **Minimum Instruction Time :** 0
Question Numbers : (118 to 119)

Question Label : Comprehension

Consider the binary classification problem with 5 binary features. The training dataset contains the following five points belonging to $\{0, 1\}^5$:

$$[1, 0, 1, 0, 1]^T, [1, 1, 1, 0, 1]^T, [0, 0, 1, 1, 0]^T, [0, 1, 0, 1, 0]^T, [1, 1, 0, 0, 0]^T$$

The labels of the points are 0, 1, 1, 1 and 0, respectively. Assume that the naive condition holds true. Do not apply any smoothing on the dataset.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 118 Question Id : 640653564285 Question Type : SA Calculator : None

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

Correct Marks : 2

Question Label : Short Answer Question

How many parameters need to be estimated to make a prediction for a data point using a naive Bayes algorithm?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

11

Question Number : 119 Question Id : 640653564286 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

With what probability does the first feature of a point take the value 0 given that the point is labeled 1? Enter your 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 :

0.64 to 0.68

Sub-Section Number : 7

Sub-Section Id : 64065380491

Question Shuffling Allowed :

No

Is Section Default? :

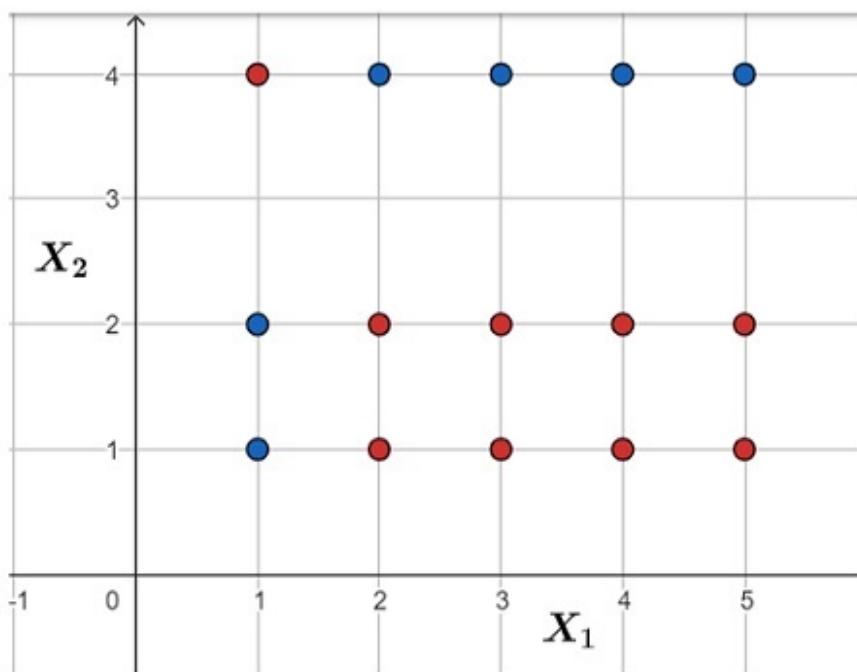
null

Question Id : 640653564287 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (120 to 122)

Question Label : Comprehension

Consider the following two-dimensional dataset with two classes: +1 for blue points and -1 for red points. An AdaBoost algorithm was run on this dataset using decision stumps as weak learners.



When training the new weak learner $h_t(x)$ (decision stump at t^{th} iteration), we choose the split that minimizes the weighted misclassification error with respect to current weights D_t i.e. choose h_t that minimizes

$$\sum_{i=1}^n D_t(i) \mathbb{1}(h_t(x_i) \neq y_i).$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 120 Question Id : 640653564288 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 misclassification error incurred by the first decision stump?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0.2

Question Number : 121 Question Id : 640653564289 Question Type : MSQ Is Question

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

Correct Marks : 3 Selectable Option : 0

Question Label : Multiple Select Question

To train the second decision stump, which pair of points will be assigned equal weights to create the training dataset?

Options :

6406531886227. ✓ $[2, 2]^T, [2, 4]^T$

6406531886228. ✗ $[2, 2]^T, [1, 4]^T$

6406531886229. ✓ $[1, 1]^T, [1, 4]^T$

6406531886230. ✓ $[3, 1]^T, [4, 1]^T$

Question Number : 122 Question Id : 640653564290 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 weight will be assigned to the point $[1, 1]^T$ when training the second decision stump, assuming the weights are not normalized to add up to one?
Please enter your answer rounded to two decimal places.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.11 to 0.15

AppDev1

Section Id : 64065338338

Section Number : 6

Section type : Online

Mandatory or Optional : Mandatory

Number of Questions : 28

Number of Questions to be attempted : 28

Section Marks : 100

Display Number Panel : Yes

Group All Questions : No

Enable Mark as Answered Mark for Review and Yes

Clear Response :

Maximum Instruction Time : 0
Sub-Section Number : 1
Sub-Section Id : 64065380492
Question Shuffling Allowed : No
Is Section Default? : null

Question Number : 123 Question Id : 640653564291 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 (COMPUTER BASED EXAM)"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?

CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

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

Options :

6406531886232. ✓ YES

6406531886233. ✘ NO

Sub-Section Number : 2
Sub-Section Id : 64065380493
Question Shuffling Allowed : Yes
Is Section Default? : null

Question Number : 124 Question Id : 640653564292 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 two HTML files home.html and about.html. The correct way of embedding a link within the text "Click here" in home.html that redirects to the about.html page is _____.

Options :

```
<a href= "about.html">Click here</a>
```

6406531886234. ✓

```
<a src="about.html">Click here</a>
```

6406531886235. ✗

```

```

6406531886236. ✗

```
<input onclick="about.html" name="Click here" value="Click here">
```

6406531886237. ✗

Question Number : 125 Question Id : 640653564296 Question Type : MCQ Is Question

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

Correct Marks : 2

Question Label : Multiple Choice Question

Consider the following statements regarding Continuous Integration and Continuous Deployment and select the correct option.

Statement 1: As part of continuous integration, frequent, isolated changes are tested and reported on as soon as they are added to a larger code base.

Statement 2: When a change is made to an application, it is automatically deployed into production using a continuous deployment strategy.

Options :

6406531886250. ❌ Statement 1 is correct and statement 2 is incorrect.

6406531886251. ❌ Statement 1 is incorrect and statement 2 is correct.

6406531886252. ✓ Statement 1 and statement 2 both are correct.

6406531886253. ❌ Statement 1 and statement 2 both are incorrect.

Question Number : 126 Question Id : 640653564297 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 linked list is used to store data elements in an unsorted manner. What is the worst time complexity for searching an element in memory? [N is the number of elements in the linked list]

Options :

6406531886254. ❌ O(1)

6406531886255. ❌ O(logN)

6406531886256. ✓ O(N)

6406531886257. ❌ O(NlogN)

Question Number : 127 Question Id : 640653564300 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 types of testing with their functionality.

A. Unit testing	1. Focuses primarily on input and output of the software application.
B. Black box testing	2. Analyzes the internal structures, the data structures, internal design, code structure, and the working of the software.
C. White box testing	3. Testing the functionality of the software. In the event of errors, they can access the software code.
D. Grey box testing	4. Tests individual pieces of source code.

Which of the following is the correct matching?

Options :

6406531886266. ✖ A → 1, B → 2, C → 3, D → 4

6406531886267. ✖ A → 4, B → 3, C → 2, D → 1

6406531886268. ✓ A → 4, B → 1, C → 2, D → 3

6406531886269. ✖ A → 3, B → 2, C → 1, D → 4

Question Number : 128 Question Id : 640653564302 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Consider the following code:

```
{% extends 'base.html' %}  
{% block title%} My Title {% endblock %}  
{% block body %} My body {% endblock %}
```

The above code is an example of _____.

Options :

6406531886274. ✘ Controller function

6406531886275. ✘ Model class

6406531886276. ✓ Template Inheritance

6406531886277. ✘ View function

Question Number : 129 Question Id : 640653564304 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 correctly represents the components of the given URL?

`https://www.mywebsite.com/home?user=Mad1&key=madkey123`

Options :

`https` : Domain name;
`www.mywebsite.com` : Request parameter;
`/home` : Directory;
`user=Mad1&key=madkey123` : domain name

6406531886282. ✘

`https` : Protocol;
`www.mywebsite.com` : Directory;
`/home` : Domain name;
`user=Mad1&key=madkey123` : Request parameters

6406531886283. ✘

`https` : Protocol;
`www.mywebsite.com` : Domain name;
`/home` : Directory;
`user=Mad1&key=madkey123` : Request parameters

6406531886284. ✓

`https : IP Address;
www.mywebsite.com : Domain name;
/home : Directory;
user=Mad1&key=madkey123 : Local Host`

6406531886285. ✎

Question Number : 130 Question Id : 640653564316 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

Read the following statements regarding web accessibility principles and choose the correct option.

Statement 1: The web pages with captions and alternative for multimedia makes the user interface operable and easy to navigate

Statement 2: A web page with robust content and reliable interpretation refers to its content being compatible with current and future user tools

Options :

6406531886326. ✎ Both statement 1 and statement 2 are correct.

6406531886327. ✎ Both statement 1 and statement 2 are incorrect

6406531886328. ✎ Statement 1 is correct but statement 2 is incorrect.

6406531886329. ✓ Statement 1 is incorrect but statement 2 is correct.

Sub-Section Number : 3

Sub-Section Id : 64065380494

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 131 Question Id : 640653564293 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following Table subjects in SQLite database created using model class “Subjects” and the python file main.py given below.

subjects:

id	name	subjects
1	Pradip	CSE
2	Kumar	CIVIL
3	Pradip	ECE
4	Kumar	EE
5	Murmu	Mining

main.py

```
from jinja2 import Template
templates = """
    {% if result %}
    <ol>
        {% for student in result %}
            <li>{{student.name}}</li>
            <li>{{student.subjects}}</li>
        {% endfor %}
    </ol>
    {% endif %}
"""

Sub = Subjects.query.filter_by(name = 'Pradip').all()

Templates = Template(templates)
result = Templates.render(result = Sub)
print(result)
```

What will be the output on the terminal?

Options :

Pradip CSE
Pradip ECE

6406531886238. *

```
<ol>
    <li>Pradip CSE</li>
    <li>Pradip ECE</li>
</ol>
```

6406531886239. ✘

```
<ol>
    <li>Pradip</li>
    <li>CSE</li>
    <li>Pradip</li>
    <li>ECE</li>
</ol>
```

6406531886240. ✓

Pradip
CSE
Pradip
ECE

6406531886241. ✘

Question Number : 132 Question Id : 640653564294 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 two python files `main.py` and `test_sample.py`.

`main.py`

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

@app.route('/hello')
def hello():
    return 'Hello World'

@app.route('/home')
def home():
    return 'Hello Home'

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

`test_sample.py`

```
import pytest, requests

@pytest.fixture
def get_url_response():
    response = requests.get('http://127.0.0.1:5000/hello')
    return response

def test_statuscode(get_url_response):
    assert get_url_response.status_code == 200

def test_text(get_url_response):
    assert get_url_response.text == 'Hello Home'
```

Assuming `main.py` is running locally in the terminal. In another local terminal run “`pytest`” command. What will be the output of the `test_sample.py` file?

Options :

6406531886242. ✘ 2 passed

6406531886243. ✓ 1 failed 1 passed

6406531886244. ✘ 2 failed

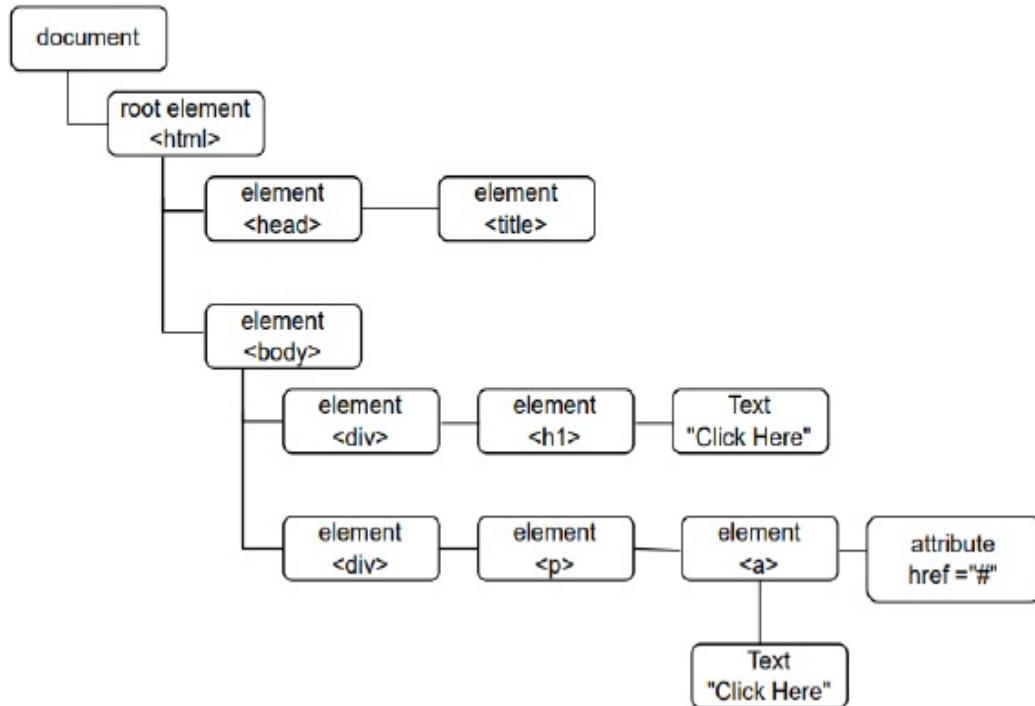
6406531886245. ✘ No tests

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 HTML code is correctly represented by the DOM structure below?



Options :

```
<html>
  <head>
    <title>My website</title>
  </head>
  <body>
    <div>
      <h1> Header </h1>
      <p><a href="#"> Click Here </a></p>
    </div>
  </body>
</html>
```

6406531886270. *

6406531886271. ✓

```
<html>
<head>
    <title>My website</title>
</head>
<body>
    <div>
        <h1> Header </h1>
    </div>
    <div>
        <p> <a href="#"> Click Here </a> </p>
    </div>
</body>
</html>
```

```
<html>
<head>
    <title>My website</title>
</head>
<body>
    <div>
        <h1> Header </h1>
    </div>
    <div>
        <p>Paragraph</p>
        <a href="#"> Click Here </a>
    </div>
</body>
</html>
```

6406531886272. *

```
<html>
<head>
    <title>My website</title>
</head>
<body>
    <h1> Header </h1>
        <p><a href="#"> Click Here </a></p>
</body>
</html>
```

6406531886273. *

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

Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

An HTML code and its rendered output is given below. Which of the following CSS code correctly represent(s) the content of `style.css`

HTML code:

```
<!DOCTYPE html>
<html>
  <head>
    <link href="style.css" rel="stylesheet" type="text/css"/>
    <style>
      body{background-color: lavender; text-align: center;}
      h2{color: blue;}
    </style>
  </head>
  <body>
    <h2>Welcome to IIT</h2>
    <p class="blue">My color is blue </p>
    <p class="red">My color is red </p>
    <p class="green">My color is green</p>

  </body>
</html>
```

Output:



Options :

6406531886278. *

```
.blue{color: red;}  
.red{color: green;}  
.green{color: blue;}
```

```
.blue{color: green;}  
.red{color: blue;}  
.green{color: red;}
```

6406531886279. ✘

```
.blue{color: blue;}  
.red{color: red;}  
.green{color: green;}
```

6406531886280. ✓

6406531886281. ✘ All of these

Question Number : 135 Question Id : 640653564305 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following table “emp” created in SQLite database corresponding to model class “Employee” using flask_sqlalchemy .

Id	Name	Designation	Gender	Salary
1	Raji	Headmaster	Female	4500
2	Ram	Teacher	Male	5000
3	Raveena	Teacher	Female	3000
4	Reshma	Technical staff	Female	2000
5	Ravi	Teacher	Male	1000

Which of the following code snippets correctly increases the salary of all the female workers by 500 Rupees when typed in the Python console?

Options :

```
>>> emp = Employee.query.filter_by(Designation = 'Teacher').all()
>>> for staff in emp:
...     staff.Salary += 500
...
>>> db.session.commit()
```

6406531886286. ✘

```
>>> emp = Employee.query.filter_by(Gender = 'Female').all()
>>> staff.Salary += 500
>>> db.session.commit()
```

6406531886287. ✘

```
>>> emp = Employee.query.filter_by(Gender = 'Female').all()
>>> for staff in emp:
...     staff.Salary += 500
...
>>> db.session.commit()
```

6406531886288. ✓

```
>>> emp = Employee.query.filter(Employee.Gender.like('M%')).all()
>>> for staff in emp:
...     staff.Salary += 500
...
>>> db.session.commit()
```

6406531886289. ✘

Question Number : 136 Question Id : 640653564306 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

What will be the output on the terminal for the given Python code snippet.

```
def f1(a=4,b=5):
    def f2(x, y):
        if y==5:
            print("HiFive")
            print("inside f2_func")
    print("inside f1_func")
    f2(a,b)

@f1
def f3():
    pass
print(f3)
```

Options :

inside f2_func
pass
inside f1_func
None

6406531886290. ✘

inside f1_func
inside f2_func
f3

6406531886291. ✘

inside f2_func
HiFive
inside f1_func
f3

6406531886292. ✘

inside f1_func
HiFive
inside f2_func
None

6406531886293. ✓

Question Number : 137 Question Id : 640653564307 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following table “stud_table” in SQLite database.

ID	Name	Age	Mark	course
Filter	Filter	Filter	Filter	Filter
1	Vishnu	20	98	M1
2	Kumar	18	90	M2
3	Leela	20	90	M1
4	Naren	18	98	M2
5	Vishal	19	95	M1
6	Pranav	20	95	M2
7	Vinu	19	90	M1
8	Viki	18	95	M2

What will be the output of the following SQL queries given below?

```
CREATE UNIQUE INDEX IF NOT EXISTS index_name  
ON stud_table (Name ASC, Mark ASC) WHERE Age>18;  
SELECT ID, Name, Age, Mark, course FROM stud_table WHERE  
Age>18;
```

Options :

index_name will be created

ID	Name	Age	Mark	course
2	Kumar	18	90	M2
4	Naren	18	98	M2

6406531886294. ✗

index_name will be created

ID	Name	Age	Mark	course
3	Leela	20	90	M1
6	Pranav	20	95	M2
7	Vinu	19	90	M1
5	Vishal	19	95	M1
1	Vishnu	20	98	M1

6406531886295. ✓

index_name will not be created

ID	Name	Age	Mark	course
2	Kumar	18	90	M2
4	Naren	18	98	M2
8	Viki	18	95	M2
3	Leela	20	90	M1
6	Pranav	20	95	M2
7	Vinu	19	90	M1
5	Vishal	19	95	M1
1	Vishnu	20	98	M1

6406531886296. ✘

index_name will not be created

ID	Name	Age	Mark	course
1	Vishnu	20	98	M1
2	Kumar	18	90	M2
3	Leela	20	90	M1
4	Naren	18	98	M2

6406531886297. ✘

Question Number : 138 Question Id : 640653564309 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_x is a number N represented in the base 'x' and the equation.

$$110_a = 420_b = 272_c$$

Holds for a specific set of a, b and c. The correct values of a, b and c that satisfy the above equation are:

Options :

6406531886302. ✘ a = 8; b = 10; c = 16;

6406531886303. ✘ a = 10; b = 8; c = 16;

6406531886304. ✓ a = 16; b = 8; c = 10;

6406531886305. ✘ a = 10; b = 16; c = 8;

Question Number : 139 Question Id : 640653564314 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 IPv4 address given as 95.24.123.45 If each bit of its binary equivalent is complemented and converted back to decimal, what will be the new IPv4 address formed?

Options :

6406531886318. ✘ 127.35.231.55

6406531886319. ✘ 95.251.127.45

6406531886320. ✓ 160.231.132.210

6406531886321. ✘ 160.123.210.231

Question Number : 140 Question Id : 640653564315 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

How will the browser render the following HTML document?

```
<html>
  <body>
    <div>Hello from div 1</div>
    <div>Hello from div 2</div>
    <span>Hello from span 1</span>
    <span>Hello from span 2</span>
  </body>
</html>
```

Options :

Hello from div 1
Hello from div 2
Hello from span 1
6406531886322. ✘ Hello from span 2

Hello from div 1
Hello from div 2
6406531886323. ✓ Hello from span 1 Hello from span 2

Hello from div 1 Hello from div 2
Hello from span 1
6406531886324. ✘ Hello from span 2

6406531886325. ✘ Hello from div 1 Hello from div 2 Hello from span 1 Hello from span 2

Question Number : 141 Question Id : 640653564326 Question Type : MCQ Is Question

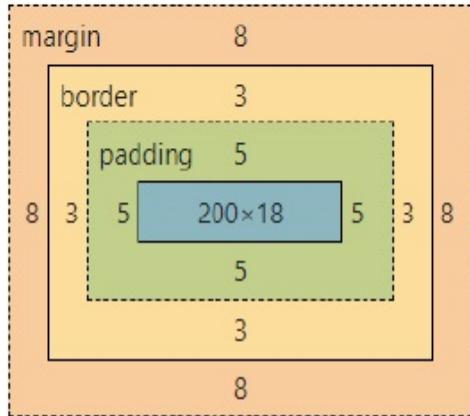
Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

An element `<div>` with id `my_div` whose initial box model is given below. The box model of the element is altered by DOM manipulation using the script given below.

Initial box model of the `<div>` element

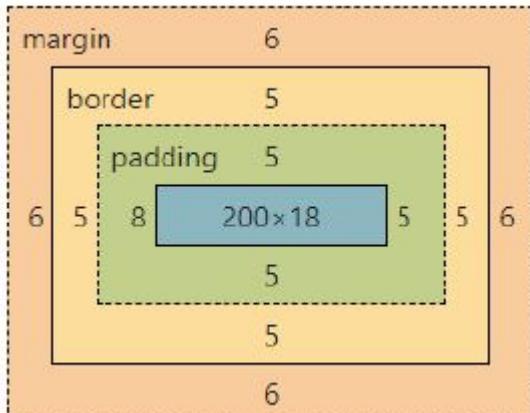


Script:

```
<script>
    el = document.getElementById('my_div')
    el.style.paddingLeft = '8px';
    el.style.marginRight = '6px';
    el.style.borderWidth = '5px';
</script>
```

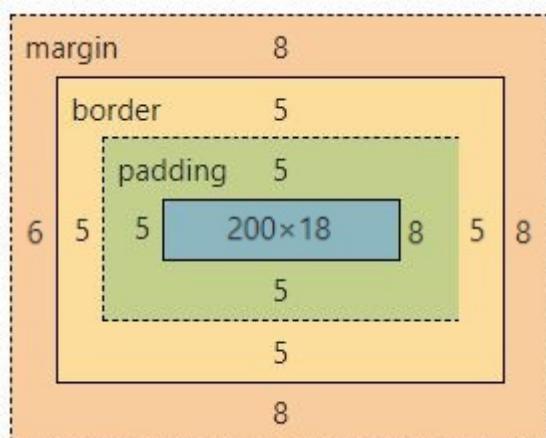
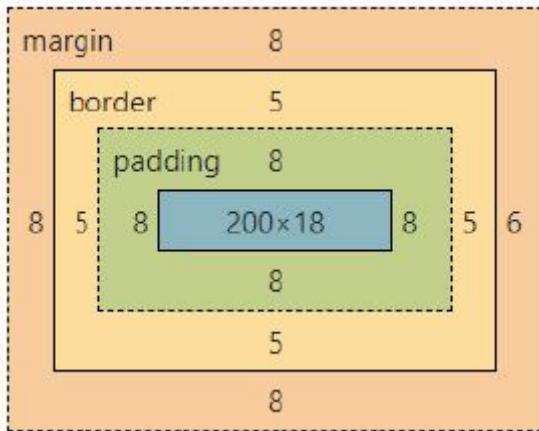
What will be the modified box model?

Options :

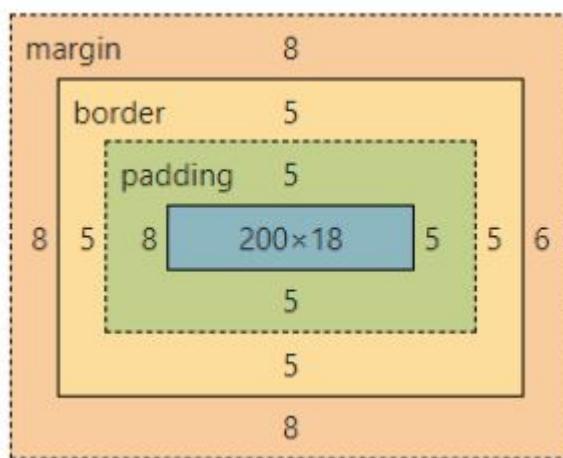


6406531886354. *

6406531886355. *



6406531886356. *



6406531886357. ✓

Sub-Section Number : 4

Sub-Section Id : 64065380495

Question Shuffling Allowed : Yes

Is Section Default? : null

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

Correct Marks : 2 Selectable Option : 0

Question Label : Multiple Select Question

In terms of logging, which of the following statements is/are true?

Options :

6406531886246. ✓ Helps in identifying unexpected issues in the application and debugging them.

6406531886247. ✗ Maintains the source code version.

6406531886248. ✗ Detect the test file and test functions automatically.

6406531886249. ✓ Keeping track of the application's events.

Sub-Section Number : 5

Sub-Section Id : 64065380496

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 143 Question Id : 640653564298 Question Type : MSQ Is Question

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

Correct Marks : 3 Selectable Option : 0

Question Label : Multiple Select Question

Consider following flask app.

```
from flask import Flask
from flask_restful import Resource, Api

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

class Testing(Resource):
    def get(self):
        return {'data': 'GET'}

    def post(self, data):
        return {'data': 'POST'}

api.add_resource(Testing, '/', '/<string:data>')

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

The flask app is running locally in the terminal. Which of the following command(s) will return the response without any error?

Options :

curl http://127.0.0.1:5000/Peekay -X POST -H 'Content-Type: application/json'
6406531886258. ✓

curl http://127.0.0.1:5000/Peekay -X GET -H 'Content-Type: application/json'

6406531886259. ✗

curl http://127.0.0.1:5000/ -X GET -H 'Content-Type: application/json'
6406531886260. ✓

curl http://127.0.0.1:5000/ -X POST -H 'Content-Type: application/json'
6406531886261. ✗

Question Number : 144 Question Id : 640653564308 Question Type : MSQ Is Question

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

Time : 0

Correct Marks : 3 Selectable Option : 0

Question Label : Multiple Select Question

Consider the following flask application running on the base URL and is accessed through a browser. Select the correct option(s).

```
from flask import Flask, abort, request

app = Flask(__name__)

users = {
    1 : {"Name": "Ritu", "role": "Admin", "access": True},
    2 : {"Name": "Ramesh", "role": "User", "access": True},
    3 : {"Name": "Tejas", "role": "Admin", "access": True},
    4 : {"Name": "Manisha", "role": "User", "access": False}
}

@app.route('/login')
def auth():
    cred = request.args
    if users[int(cred["id"])].get("access"):
        id = int(cred["id"])
        user = users[id]
        return "Welcome, " + user.get("Name")+", you have "+user.get("role")+" access"
    else:
        abort(403)

@app.errorhandler(403)
def no_access(error):
    return "Looks like you are not an authorized user!"

app.run(debug = True)
```

Options :

For the URL: `http://127.0.0.1:5000/login?id=2`, The browser will render;
6406531886298. ✓ Welcome, Ramesh, you have User access.

For the URL: `http://127.0.0.1:5000?id=3`, The browser will render;
6406531886299. ✗ Welcome, Tejas, you have Admin access.

For the URL: <http://127.0.0.1:5000/login?id=4>, The browser will render;
6406531886300. ✓ Looks like you are not an authorized user!

For the URL: <http://127.0.0.1:5000/login?id=5>, The browser will render;
6406531886301. ✗ Looks like you are not an authorized user!

Question Number : 145 Question Id : 640653564327 Question Type : MSQ Is Question

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

Correct Marks : 3 Selectable Option : 0

Question Label : Multiple Select Question

Which of the following statements regarding the version control system git is/are correct?

Options :

6406531886358. ✗ The command `git rm <filename>` removes the file from staging only.

The command `git rm <filename>` removes the file from staging as well as deletes the
6406531886359. ✓ file from the directory.

The command `git checkout <branch_name>` creates a new branch with the given
6406531886360. ✓ name.

The command `git checkout <branch_name>` creates a new branch with the given
6406531886361. ✗ name and also moves the control in the newly created branch.

Sub-Section Number : 6

Sub-Section Id : 64065380497

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 146 Question Id : 640653564299 Question Type : MCQ Is Question

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

Correct Marks : 4.5

Question Label : Multiple Choice Question

Consider the following Python code snippet.

```
from jinja2 import Template

data = [
    {"vehicle_id": "ev101", "vehicle_name": "electroN", "fuel_type": "electric"},  
    {"vehicle_id": "pt201", "vehicle_name": "discover", "fuel_type": "petrol"},  
    {"vehicle_id": "dz301", "vehicle_name": "apex", "fuel_type": "diesel"},  
]

this_text = """  
    <h1> Ordered Vehicles </h1>  
    {% set keys = data[0].keys() %}  
    {% set keys = keys|list %}  
    {% for i in range(data|length) %}  
        {{keys[i]}} : {{data[i][keys[i]]}}  
    {% endfor %}  
    <h3> Total: {{ data|length }} </h3>  
"""

this_temp = Template(this_text)
rendered = this_temp.render(data = data)
print(rendered)
```

How will the browser render the output of the above given Python code?

Options :

Ordered Vehicles

vehicle_id : pt201

vehicle_name : discover

fuel_type : petrol

Total: 3

6406531886262. *

6406531886263. *

Ordered Vehicles

vehicle_id : ev101

vehicle_name : electroN

fuel_type : electric

Total: 3

Ordered Vehicles

vehicle_id : ev101

vehicle_name : discover

fuel_type : diesel

6406531886264. ✓ **Total: 3**

Ordered Vehicles

vehicle_id : dz301

vehicle_name : discover

fuel_type : electric

6406531886265. ✖ **Total: 3**

Sub-Section Number : 7

Sub-Section Id : 64065380498

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653564310 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Question Numbers : (147 to 149)

Question Label : Comprehension

An API resource created using flask_restful is shown below. Answer the given subquestions if the app is running locally on <http://127.0.0.1:5000>

```
from flask import Flask, make_response
from flask_restful import Resource, Api, reqparse
from werkzeug.exceptions import HTTPException

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

objects = {
    "bot101": {"obj_code": "BOT01", "obj_name": "bottles"},
    "sop109": {"obj_code": "SOP09", "obj_name": "soaps"},
    "can103": {"obj_code": "CAN03", "obj_name": "candles"}
}

to_parse = reqparse.RequestParser()
to_parse.add_argument("obj_code")
to_parse.add_argument("obj_name")

class NoObjectError(HTTPException):
    def __init__(self, status, error):
        self.response = make_response({"Error": error}, status)

class BadRequest(HTTPException):
    def __init__(self, status, error):
        self.response = make_response({"Error": error}, status)

class Objects(Resource):
    def get(self, id):
        args = to_parse.parse_args()
        if id in objects:
            my_obj = objects[id]
            if args["obj_code"] == None:
                raise BadRequest(404, "Object code missing.")
            if args["obj_name"] == None:
                raise BadRequest(404, "Object name missing.")
            else:
                my_obj["obj_code"] = args["obj_code"]
                my_obj["obj_name"] = args["obj_name"]
            return my_obj
        else:
            raise NoObjectError(404, "Object doesn't exist in the database.")

api.add_resource(Objects, "/get_object/<id>")

app.run(debug = True)
```

Sub questions

Question Number : 147 Question Id : 640653564311 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 the output on the terminal

for the request:

```
curl http://127.0.0.1:5000/get_object/sop109 -X GET -d "{\"obj_code\" : \"MOP02\", \"obj_name\" : \"mop\"}" -H "Content-Type: application/json"
```

Options :

```
{  
    "Error": "Object doesn't exist in the database."  
}
```

6406531886306. *

```
{  
    "obj_code": "SOP09",  
    "obj_name": "soaps"  
}
```

6406531886307. *

```
{  
    "obj_code": "MOP02",  
    "obj_name": "mop"  
}
```

6406531886308. ✓

```
{  
    "Error": "Object name missing."  
}
```

6406531886309. *

Question Number : 148 Question Id : 640653564312 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 the output on the terminal
for the request:

```
curl http://127.0.0.1:5000/get_object/sop190 -X GET -d "{\"obj_name\":\n\"new bottles\"}" -H "Content-Type: application/json"
```

Options :

```
{\n    "Error": "Object code missing."\n}
```

6406531886310. ✘

```
{\n    "Error": "Object name missing."\n}
```

6406531886311. ✘

```
{\n    "obj_name": "new bottles"\n}
```

6406531886312. ✘

```
{\n    "Error": "Object doesn't exist in the database."\n}
```

6406531886313. ✓

Question Number : 149 Question Id : 640653564313 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 the output on the terminal
for the request:

```
curl http://127.0.0.1:5000/get_object/can103 -X GET -H "Content-Type:\napplication/json"
```

Options :

```
{  
    "obj_code": "CAN03",  
    "obj_name": "candles"  
}
```

6406531886314. ✘

```
{  
    "Error": "Object code missing."  
    "Error": "Object name missing."  
}
```

6406531886315. ✘

```
{  
    "Error": "Object code missing."  
}
```

6406531886316. ✓

```
{  
    "Error": "Object name missing."  
}
```

6406531886317. ✘

Sub-Section Number :

8

Sub-Section Id :

64065380499

Question Shuffling Allowed :

No

Is Section Default? :

null

Question Id : 640653564317 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (150 to 151)

Question Label : Comprehension

A machine client M makes multiple requests to three different servers A, B and C in the order A then B followed by C. However, it can make a request to server B only after receiving the response

from server A and same with server C i.e the client can make a request to server C only after receiving response from server B. If the servers A, B and C are located at 1200 kms, 1800 kms and 2400 kms respectively, answer the given subquestions.[Consider speed of light in air to be 3×10^8 m/s]

Sub questions

Question Number : 150 Question Id : 640653564318 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 is the maximum number of requests that can be made to B per second?

Options :

6406531886330. ✘ 20

6406531886331. ✓ 27

6406531886332. ✘ 83

6406531886333. ✘ 125

Question Number : 151 Question Id : 640653564319 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

What is the round trip time (RTT) in milliseconds for server C?

Options :

6406531886334. ✘ 8

6406531886335. ✘ 12

6406531886336. ✓ 16

Question Id : 640653564320 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (152 to 153)

Question Label : Comprehension

Consider the following tables 'product' and 'category' that represent models 'Product' and 'Category' in SQLite database and answer the given subquestions.

```
class Product(db.Model):
    product_id = db.Column(db.Integer(), primary_key = True)
    product_name = db.Column(db.String(50), unique = True)
    category = db.Column(db.Integer(),db.ForeignKey('category.category_id'))
    cat = db.relationship('Category', back_populates = 'products')

class Category(db.Model):
    category_id = db.Column(db.Integer(), primary_key = True)
    category_name = db.Column(db.String(50), unique = True)
    products = db.relationship('Product', back_populates = 'cat')
```

Sub questions

Question Number : 152 Question Id : 640653564321 Question Type : MCQ Is Question

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

Correct Marks : 4.5

Question Label : Multiple Choice Question

Which of the following statements about the tables 'product' and 'category' is correct?

Options :

6406531886338. ✓ Multiple instances of Product can belong to a single instance of Category.

6406531886339. ✧ Multiple instances of Category can belong to a single instance of Product but the converse is not true.

6406531886340. ❀ Multiple instances of Product can belong to a single instance of Category and vice versa.

6406531886341. ❀ One instance of Category can belong to any one instance of Product only.

Question Number : 153 Question Id : 640653564322 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 'C1', an instance of table 'category' whose category_id is 2. The correct way of adding a product 'compass' to this category is:

Options :

```
>>> p1 = Product(product_id = 2, product_name = 'compass')
>>> db.session.add(p1)
>>> db.session.commit()
```

6406531886342. ❀

```
>>> p1 = Product(product_name = 'compass', category = 1)
>>> db.session.add(p1)
>>> db.session.commit()
```

6406531886343. ✓

```
>>> p1 = Product(product_name = 'compass', category = C1)
>>> db.session.add(p1)
>>> db.session.commit()
```

6406531886344. ❀

```
>>> p1 = Product(product_name = 'compass')
>>> C1.products.append(p1)
>>> db.session.commit()
```

6406531886345. ❀

Sub-Section Id : 64065380500

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653564323 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (154 to 155)

Question Label : Comprehension

Consider the following resource API created with help of flask_restful.

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

app = Flask(__name__)

api = Api(app)

class TestApi(Resource):
    def post(self, state, city):
        return {"state": state, "capital": city}

    def get(self):
        info = request.args
        return info

api.add_resource(TestApi, '/united_states','/united_states/<state>/<city>')

app.run(debug = True)
```

If the above application is running locally on <http://127.0.0.1:5000>, answer the given subquestions.

Sub questions

Question Number : 154 Question Id : 640653564324 Question Type : MCQ Is Question

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

Correct Marks : 4.5

Question Label : Multiple Choice Question

Which of the following URL will return
a **200** OK for GET HTTP method?

Options :

http://127.0.0.1:5000/massachusetts/boston
6406531886346. ✘

http://127.0.0.1:5000/united_states/massachusetts/boston
6406531886347. ✘

http://127.0.0.1:5000/united_states?state=massachusetts&capital=boston
6406531886348. ✓

http://127.0.0.1:5000?state=massachusetts&capital=boston
6406531886349. ✘

Question Number : 155 Question Id : 640653564325 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4.5

Question Label : Multiple Choice Question

Which of the following URL will return
a **200** OK for POST HTTP method?

Options :

http://127.0.0.1:5000/florida/tallahassee
6406531886350. ✘

http://127.0.0.1:5000/united_states/florida/tallahassee
6406531886351. ✓

6406531886352. ✘

http://127.0.0.1:5000/united_states?state=florida&capital=tallahassee

6406531886353. ✘

<http://127.0.0.1:5000?state=florida&capital=tallahassee>

TDS

Section Id :	64065338339
Section Number :	7
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	62
Number of Questions to be attempted :	62
Section Marks :	70
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 :	64065380501
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 156 Question Id : 640653564328 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 :TOOLS IN DATA SCIENCE
(COMPUTER BASED EXAM)"**

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?

CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

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

Options :

6406531886362. ✓ YES

6406531886363. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 64065380502

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 157 Question Id : 640653564329 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 dataset consists of geographic, demographic information about countries and their respective GDPs. You would like to visualize this data and study the relationship between the location of countries and their GDPs. You decide to use Power BI to visualize the dataset. But you would also like to generate a summary of the data. Choose the most suitable answer among the given options.

Options :

6406531886364. ✗ The summary can be generated using Quill and this is possible because Quill can be used as an extension in Power BI.

6406531886365.

* Quill can only be used for visualization. Therefore a summary of the dataset cannot be generated.

6406531886366. * Power BI does not support generation of summary. Therefore using other visualization tools such as Tableau would work.

6406531886367. ✓ None of the options are appropriate for the generation of summary for the given question.

Question Number : 158 Question Id : 640653564330 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

Your project requires you to study the districts and their respective health indicators. You have a shapefile with you that provides the required details. The objective of the project is to identify and carve out districts that present high levels of health indicators. Choose the most suitable answer among the given options.

Options :

6406531886368. ✓ QGIS can be used to create the shapefiles for districts with high levels of health indicators.

6406531886369. * While QGIS can be used to create shapefiles for the requirement, it cannot be used to identify the districts with high levels of health indicators.

6406531886370. * QGIS cannot be used to meet the objectives of the project.

6406531886371. * None of the options are suitable to meet the objectives of the project.

Question Number : 159 Question Id : 640653564331 Question Type : MCQ Is Question

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

Correct Marks : 1

Question Label : Multiple Choice Question

What are the two outputs provided by the Excel Azure Machine Learning plugin?

Options :

6406531886372. ✘ Percentage, Score

6406531886373. ✘ Sentiment, Percentage

6406531886374. ✓ Sentiment, Score

6406531886375. ✘ Score, Labels

Question Number : 160 Question Id : 640653564334 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 dataset consists of year, annual cotton production, annual rainfall, loan interest rates and fuel prices. You would like to compute the correlation coefficient between annual cotton production and other variables in the dataset to analyze the effects of various variables on the target variable. Choose the most suitable option among the following choices:

Options :

6406531886384. ✘ Excel cannot be used to compute correlation coefficients. Although we can use excel to visualize the data using scatter plots to study the relationships.

6406531886385. ✘ The CORREL() function in Excel is not suitable for this analysis because it doesn't take more than two variables as inputs.

6406531886386. ✘ Correlation coefficients cannot be computed for continuous variables.

6406531886387. ✓ None of the options are appropriate.

Question Number : 161 Question Id : 640653564335 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

You would like to prepare your dataset before analysis. You choose python pandas-profiling library to perform exploratory analysis. Choose the most suitable option among the given choices:

Options :

6406531886388. ❌ Your choice of pandas-profiling library is not appropriate because it does not provide information about outliers.

6406531886389. ✓ Your choice is appropriate because the pandas-profiling library provides information about outliers.

6406531886390. ❌ pandas-profiling library is appropriate because it helps build models.

Question Number : 162 Question Id : 640653564337 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

Comicgen is a useful tool in narrating data stories using comics. Which of the following is not a function of comicgen?

Options :

6406531886395. ❌ Comicgen creates comic characters

6406531886396. ❌ Comicgen provides options to custom create different comic characters and their emotions and pose

6406531886397. ❌ Comicgen can be easily integrated into Google sheets or Excel to narrate your data stories

6406531886398. ✓ You can type in your data story into comicgen to get your comic in return

Question Number : 163 Question Id : 640653564338 Question Type : MCQ Is Question

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

Correct Marks : 1

Question Label : Multiple Choice Question

A very large Matrix **A** has a lot of zero entries in it.Which function from the *scipy* library is useful in efficient storage of such a matrix **A**?

Options :

6406531886399. ✘ compressed_mat

6406531886400. ✘ comp_mat

6406531886401. ✓ csr_matrix

6406531886402. ✘ zip_mat

Question Number : 164 Question Id : 640653564339 Question Type : MCQ Is Question

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

Correct Marks : 1

Question Label : Multiple Choice Question

Which of the following libraries has functions and tools that are useful in the analysis of large graphs?

Options :

6406531886403. ✓ scikit-network

6406531886404. ✘ pandas-network

6406531886405. ✘ numpy-network

6406531886406. ✘ pd-network

Question Number : 165 Question Id : 640653564340 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

Kumu is a tool that allows you to:

Options :

6406531886407. ✘ Visualize project management charts

6406531886408. ✘ create stunning dashboards for large projects

6406531886409. ✘ merge Comicgen characters into a comic

6406531886410. ✓ Visualize complex network data

Question Number : 166 Question Id : 640653564341 Question Type : MCQ Is Question

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

Correct Marks : 1

Question Label : Multiple Choice Question

Which of the following libraries has functions extensively written to extract data from Wikipedia pages?

Options :

6406531886411. ✘ BeautifulSoup

6406531886412. ✘ wikimedia

6406531886413. ✓ wikipedia

6406531886414. ✘ wiki_scrape

Question Number : 167 Question Id : 640653564342 Question Type : MCQ Is Question

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

Correct Marks : 1

Question Label : Multiple Choice Question

A dataset provided to you has information about countries and respective populations. You plan to visualize the data in Tableau using the map representation. But you are unable to do so because the map representation is not activated for you to choose. What might be the issue?

Provided below is a snapshot of the dataset column names and types. Choose the most appropriate option that would solve the problem.

Column Name	Column Type
Country	String
Population	Integer

Options :

6406531886415. ❌ The provided dataset is incomplete

6406531886416. ❌ We also need Latitude and Longitude information to activate the map representation

6406531886417. ✓ There might be column type incompatibility issues

6406531886418. ❌ The above information provided would not have caused any issues. It is sufficient for map representation

Question Number : 168 Question Id : 640653564344 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

_____ is helpful to understand the structure of (or inspect) a website before writing a scraping script.

Options :

6406531886421. ❌ BeautifulSoup

6406531886422. ✓ Developer Tools

6406531886423. ❌ Airflow

6406531886424. ❌ Pycaret

Question Number : 169 Question Id : 640653564345 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

_____ library has tools to get a webpage's html contents into Python.

Options :

6406531886425. ✘ BeautifulSoup

6406531886426. ✘ numpy

6406531886427. ✓ requests

6406531886428. ✘ get

Question Number : 170 Question Id : 640653564347 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

Type of location (tourist/historic/etc.) can be retrieved using Nominatim in Python

Options :

6406531886433. ✓ TRUE

6406531886434. ✘ FALSE

Question Number : 171 Question Id : 640653564348 Question Type : MCQ Is Question

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

Correct Marks : 1

Question Label : Multiple Choice Question

Which of the following delimiters cannot be used in text-to-column function in Excel?

Options :

6406531886435. ✘ Comma (,)

6406531886436. ✘ Tab (\t)

6406531886437. ✘ Semi colon (;)

6406531886438. ✘ Tilde (~)

6406531886439. ✓ None of these

Question Number : 172 Question Id : 640653564349 Question Type : MCQ Is Question

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

Correct Marks : 1

Question Label : Multiple Choice Question

What is the y-axis in autocorrelation plot?

Options :

6406531886440. ✓ Correlation

6406531886441. ✘ Covariance

6406531886442. ✘ Standard deviation

6406531886443. ✘ Variance

6406531886444. ✘ None of these

Question Number : 173 Question Id : 640653564350 Question Type : MCQ Is Question

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

Correct Marks : 1

Question Label : Multiple Choice Question

Which of the following tools cannot be used for anonymising the data?

Options :

6406531886445. ❌ Anonimatron

6406531886446. ❌ ARX anonymization tool

6406531886447. ✓ PowerBI

6406531886448. ❌ Amnesia

6406531886449. ❌ sdcMicro

Question Number : 174 Question Id : 640653564351 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 one-time anonymization, static anonymization is sufficient. Is this statement true or false?

Options :

6406531886450. ✓ TRUE

6406531886451. ❌ FALSE

Question Number : 175 Question Id : 640653564356 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 variable X, which can take values AA, BB, or CC. The first 4 values of this variable in a dataset are CC, AA, BB, AA. This information is represented as shown below.

AA	BB	CC
0	0	1
1	0	0
0	1	0
1	0	0

To convert a variable to this format in Python, one can use:

Options :

6406531886464. ✓ `pandas.get_dummies`

6406531886465. ✗ `from sklearn.preprocessing import BinaryEncoder`

6406531886466. ✗ `import numpy as np`

6406531886467. ✗ `import seaborn as sb`

Question Number : 176 Question Id : 640653564357 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

k-means is typically influenced by the start values. What option in `sklearn.cluster.KMeans` helps reduce the impact?

Options :

6406531886468. ✗ `verbose`

6406531886469.

* algorithm

6406531886470. ✓ n_init

6406531886471. * init

Question Number : 177 Question Id : 640653564358 Question Type : MCQ Is Question

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

Correct Marks : 1

Question Label : Multiple Choice Question

A Pandas dataframe *DF* has a column named *salary_range* which contains the salary details of 10000 employees of a firm binned as *medium, high, and very high*. You are interested in finding out the number of employees in each category of *salary_range*. Which of the following commands will help you to achieve this goal?

Options :

6406531886472. * DF['salary_range'].bin_count()

6406531886473. ✓ DF['salary_range'].value_counts()

6406531886474. * DF\$'salary_range.bin_count()'

6406531886475. * DF\$'salary_range.value_counts()'

Question Number : 178 Question Id : 640653564359 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

Scikit-learn has a DecisionTreeClassifier module that is useful in building decision tree classifiers. Suppose, our dataset is imbalanced in class. Which feature in the DecisionTreeClassifier() will help us tackle this problem?

Options :

6406531886476. ✘ random_state

6406531886477. ✘ min_sample_split

6406531886478. ✘ class_balance

6406531886479. ✓ class_weight

Question Number : 179 Question Id : 640653564360 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 predictions (y_{hat}) on a train dataset of 100 records. Let y be the true value. We are interested in calculating $\text{Sum}_{i=1 \text{ to } 100} |y_i - y_{\text{hat}}_i| / 100$. Which of the following functions will help you in achieving this easily?

Options :

6406531886480. ✓ from sklearn.metrics import mean_absolute_error

6406531886481. ✘ from sklearn.metrics import median_absolute_error

6406531886482. ✘ from sklearn.metrics import median_absolute_percentage_error

6406531886483. ✘ from sklearn.metrics import average_absolute_percentage_error

Question Number : 180 Question Id : 640653564361 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 are interested in fitting an ARIMA model to our time series data. Specifically, we are interested in a moving average model of 0, setting a lag value of 4 for autoregression, and a difference order of 1. Which of the following gives you such a model?

Options :

6406531886484. ❌ ARIMA(..., trend = (4,1,0))

6406531886485. ✓ ARIMA(..., order = (4,1,0))

6406531886486. ❌ ARIMA(..., order = (0,4,1))

6406531886487. ❌ ARIMA(..., trend = (0,4,1))

Question Number : 181 Question Id : 640653564362 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

pycaret is a

Options :

6406531886488. ❌ Visualization tool

6406531886489. ❌ Dashboard helper

6406531886490. ✓ low-code machine learning library

6406531886491. ❌ Data cleaning solution

Question Number : 182 Question Id : 640653564363 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

subjectivity and *polarity* are two properties returned by the sentiment function of library:

Options :

6406531886492. ❌ TextBulb

6406531886493. ❌ NLPText

6406531886494.

✓ TextBlob

6406531886495. ✖ NLP

Question Number : 183 Question Id : 640653564364 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Multiple Choice Question

A subjectivity score of 0.8 means that the text statement:

Options :

6406531886496. ✖ has a positive sentiment

6406531886497. ✖ has a negative sentiment

6406531886498. ✓ is more of an opinion statement

6406531886499. ✖ is more of a factual statement

Question Number : 184 Question Id : 640653564365 Question Type : MCQ Is Question

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

Correct Marks : 1

Question Label : Multiple Choice Question

A polarity score of negative 0.5 means that the text statement:

Options :

6406531886500. ✖ has a positive sentiment

6406531886501. ✓ has a negative sentiment

6406531886502. ✖ is more of an opinion statement

6406531886503. ✖ is more of a factual statement

Question Number : 185 Question Id : 640653564366 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

You are working on a piece of code that classifies different fruits into its respective groups (citrus, berries, melons, apples & pears, and tropical & exotic). Which of the following loss functions from Keras would you pick for the task?

Options :

6406531886504. ❌ binary_crossentropy

6406531886505. ✓ categorical_crossentropy

6406531886506. ❌ mean_squared_error

6406531886507. ❌ mean_absolute_error

Question Number : 186 Question Id : 640653564367 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

classification_report function from the `sklearn.metrics` module

Options :

6406531886508. ❌ builds a decision tree classifier and prints the accuracy of the classifier

6406531886509. ❌ reports the root mean square error of the model

6406531886510. ❌ runs different classification models and compares the results

6406531886511. ✓ builds a text report displaying the main classification metrics

Question Number : 187 Question Id : 640653564368 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

csr_matrix from the *scipy* library:

Options :

6406531886512. ❌ always helps reduce matrix space

6406531886513. ✓ helps reduce matrix space when there are a lot of zero entries in the matrix

6406531886514. ❌ helps reduce matrix space when there are a lot of negative entries in the matrix

6406531886515. ❌ makes matrix multiplication more meaningful and powerful

Question Number : 188 Question Id : 640653564370 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

Google Studio is a tool that allows you to

Options :

6406531886520. ❌ merge Comicgen characters into a comic

6406531886521. ❌ visualize complex network data

6406531886522. ✓ create dashboards for small scale projects

6406531886523. ❌ Edit photographs and videos

Question Number : 189 Question Id : 640653564371 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 1

Question Label : Multiple Choice Question

Which of the following tabs is used to identify API calls in the Inspect element in any browser?

Options :

6406531886524. ✓ Network

6406531886525. ✗ Elements

6406531886526. ✗ Console

6406531886527. ✗ Sources

Question Number : 190 Question Id : 640653564372 Question Type : MCQ Is Question

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

Correct Marks : 1

Question Label : Multiple Choice Question

Which of the following libraries is used to construct API urls?

Options :

6406531886528. ✓ Urllib

6406531886529. ✗ BeautifulSoup

6406531886530. ✗ Requests

6406531886531. ✗ Pandas

Question Number : 191 Question Id : 640653564373 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 final output from the BBC Weather Location Service API is in JSON format:

Options :

6406531886532. ✓ TRUE

6406531886533. ❌ FALSE

Question Number : 192 Question Id : 640653564374 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Multiple Choice Question

Which among the following excel charts is the most suitable for detecting outliers in the data?

Options :

6406531886534. ❌ Bar chart

6406531886535. ❌ Line chart

6406531886536. ✓ Box and Whisker chart

6406531886537. ❌ Histogram

Question Number : 193 Question Id : 640653564376 Question Type : MCQ Is Question

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

Correct Marks : 1

Question Label : Multiple Choice Question

Which among the following features in excel enables you to scrape data from websites?

Options :

6406531886540. ❌ Data Analysis Toolpak

6406531886541. ❌ Connections

6406531886542. ❌ Data Validation

6406531886543. ✓ None of these

Question Number : 194 Question Id : 640653564377 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 the data provided to you has a column that consists of sales dates. You would want to extract the week number from the column for further analysis.

Which among the following excel function enables you to perform the above-mentioned task?

Options :

6406531886544. ❌ WEEKGET()

6406531886545. ❌ GETWEEKNUM()

6406531886546. ✓ WEEKNUM()

6406531886547. ❌ NUMWEEK()

Question Number : 195 Question Id : 640653564378 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 data consists of caloric intake, weight and BMI of individuals. To compute the correlation coefficients between these three variables, excel 'data analysis toolpak' requires you to specify the input variables and target variables.

Options :

6406531886548. ❌ TRUE

6406531886549. ✓ FALSE

Question Number : 196 Question Id : 640653564379 Question Type : MCQ Is Question

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

Correct Marks : 1

Question Label : Multiple Choice Question

What is the purpose of using the "find" method in Beautiful Soup?

Options :

6406531886550. ❌ To locate all instances of a particular HTML tag in a document.

6406531886551. ❌ To retrieve the text content of a specific HTML element.

6406531886552. ❌ To extract the value of a particular attribute of an HTML tag.

6406531886553. ✓ To search for a tag with a specific name or id within an HTML document.

Question Number : 197 Question Id : 640653564380 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 1

Question Label : Multiple Choice Question

Which of the following is true about the k-means clustering algorithm?

Options :

6406531886554. ❌ It is a supervised learning algorithm.

6406531886555. ❌ It is only applicable for datasets with a small number of features.

6406531886556. ✓ It is sensitive to the initial choice of centroids.

6406531886557. ❌ It is not suitable for datasets with categorical variables.

Question Number : 198 Question Id : 640653564382 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

Nominatim api can be used to find the type of place for a given latitude and longitude.

Options :

6406531886562. ✓ TRUE

6406531886563. ✗ FALSE

Question Number : 199 Question Id : 640653564383 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Multiple Choice Question

A time series with a significant autocorrelation at lag 1 implies that:

Options :

6406531886564. ✓ The current observation is correlated with the previous observation

6406531886565. ✗ The current observation is correlated with the observation two time steps ago

6406531886566. ✗ The current observation is correlated with the observation three time steps ago

6406531886567. ✗ None of these

Question Number : 200 Question Id : 640653564384 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 sentiment analysis function in TextBlob

Options :

6406531886568. ✗ Classifies text as either positive or negative

6406531886569. ✗ Classifies text into multiple categories of sentiment

6406531886570. ✓ Calculates a numerical score for the sentiment of the text

6406531886571. ✘ None of these

Question Number : 201 Question Id : 640653564385 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

From the below options identify the correct one that provides explanation of the file structure in Tableau

1. worksheet	a. contains a sequence of worksheets or dashboards that work together to convey information.
2. dashboard	b. contains a single view along with shelves, legends, and the Data pane.
3. story	c. is a collection of views from multiple worksheets.

Options :

6406531886572. ✘ 1a,2b,3c

6406531886573. ✓ 1b,2c,3a

6406531886574. ✘ 1c,2a,3b

6406531886575. ✘ 1a,3c,2b

Question Number : 202 Question Id : 640653564386 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

Identify the type of join used below

Options :

6406531886576. ❌ Outer

6406531886577. ❌ Left

6406531886578. ✓ Inner

6406531886579. ❌ Right

Question Number : 203 Question Id : 640653564388 Question Type : MCQ Is Question

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

Correct Marks : 1

Question Label : Multiple Choice Question

Which attribute does not belong to the category of data while categorizing data based on specifics of the disclosure risks from which a dataset is to be protected?

Options :

6406531886584. ❌ Identifying attributes

6406531886585. ❌ Quasi-identifying attributes

6406531886586. ❌ Sensitive attributes

6406531886587. ❌ Insensitive attributes

6406531886588. ✓ Non identifying attributes

Question Number : 204 Question Id : 640653564389 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

One of the methods of removing outliers for continuous data is:

Options :

6406531886589. ✓ IQR analysis

6406531886590. ✗ EQR analysis

6406531886591. ✗ OQR analysis

6406531886592. ✗ None of these

Question Number : 205 Question Id : 640653564390 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

You decided to encode a categorical variable using one-hot encoding. What happens to your dataframe when it is done:

Options :

6406531886593. ✓ Number of columns will increase

6406531886594. ✗ Number of rows will increase

6406531886595. ✗ Both rows and columns will increase

6406531886596. ✗ None of these

Question Number : 206 Question Id : 640653564391 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

_____ table in Excel is a way of quickly summarizing your data

Options :

6406531886597. ✓ Pivot table

6406531886598. ✘ Pilot table

6406531886599. ✘ Summary table

6406531886600. ✘ Summarize table

Sub-Section Number :	3
Sub-Section Id :	64065380503
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 207 Question Id : 640653564332 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

Provided below is an incomplete code snippet that enables you to compute distance between two locations. Choose the most appropriate option that can be used in place of <missing line> to compute the distance. Assume the coordinates of location one is stored in the variable "location1" and the coordinates of location 2 is stored in the variable "location2".

Code Snippet:

```
distances_km = []

for row in df.itertuples(index=False):
    distances_km.append(
        <missing line>
    )

df['Distance'] = distances_km
df.head(10)
```

Options :

6406531886376. ✘ geopy.distance(location1, location2).km

6406531886377. ✘ geopy.distance(location1, location2)

6406531886378. ✓ geopy.distance.distance(location1, location2).km

6406531886379. ✘ geopy.distance.distance.distance(location1_coord, location2_coord).km

Question Number : 208 Question Id : 640653564333 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

Provided below is a snippet of the code block of HTML tags from a website providing weather forecast. Your goal is to scrape the high and low values for the 10-day temperature forecast.

```
<div class="wr-day-temperaturehigh">
    <span class="wr-day-temperature__high-label wr-hide-visually">High</span>
        <span class="wr-day-temperature__high-value">
            <span class="wr-value--temperature ">
                <span class="wr-value--temperature--c">31°</span>
                <span class="wr-hide"> </span>
                <span class="wr-value--temperature--f">87°</span>
            </span>
        </span>
    </div>
<div class="wr-day-temperaturelow">
    <span class="wr-day-temperature__low-label wr-hide-visually">Low</span>
        <span class="wr-day-temperature__low-value">
            <span class="wr-value--temperature ">
                <span class="wr-value--temperature--c">21°</span>
                <span class="wr-hide"> </span>
                <span class="wr-value--temperature--f">71°</span>
            </span>
        </span>
    </div>
```

Also provided below, is the python code to extract values from the tags. But the tags represented as `<A>` and `` are missing. Choose the most appropriate tag that will get you the high and low values for the 14-day temperature forecast..

#Daily High Values

```
daily_high_values = soup.find_all('span', attrs={'class': '<B>'})
```

#Daily Low Values

```
daily_low_values = soup.find_all('span', attrs={'class': '<A>'})
```

Options :

6406531886380. *

<A> = wr-value--temperature--f
 = wr-value--temperature--c

<A> = wr-value--temperature--c
6406531886381. ✘ = wr-value--temperature--c

<A> = wr-day-temperature low
6406531886382. ✓ = wr-day-temperature high

<A> = low-label wr-hide-visually
6406531886383. ✘ = high-label wr-hide-visually

Question Number : 209 Question Id : 640653564336 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

The given piece of code extracts and displays details of **9 scheduled airlines.** in India. Identify which block of code executes without any errors.

Options :

```
import requests

import pandas as pd

from bs4 import BeautifulSoup
website_url =
    requests.get('https://web.archive.org/web/20220603020500/https://en.
    wikipedia.org/wiki/List_of_airlines_of_India').text

soup = BeautifulSoup(website_url,'html.parser')

required_table = soup.find_all('table')[0]

df = pd.read_html(str(required_table))

df=pd.DataFrame(df[0])

6406531886391. ✓ df
```

```
import requests  
  
import pandas as pd  
  
from bs4 import BeautifulSoup  
website_url =  
    requests.get('https://web.archive.org/web/20220603020500/https://en.  
wikipedia.org/wiki/List_of_airlines_of_India').text  
  
required_table = soup.find_all('table')[1]  
  
df = pd.read_html(str(required_table))  
  
df=pd.DataFrame(df[0])
```

6406531886392. ✖ df

```
import get  
  
import pandas as pd  
  
from bs4 import BeautifulSoup  
website_url = get.requests  
('https://web.archive.org/web/20220603020500/https://en.wikipedia.or  
g/wiki/List_of_airlines_of_India').text  
  
soup = BeautifulSoup(website_url,'html.parser')  
  
df = pd.read_html(str(required_table))  
  
df=pd.DataFrame(df[0])
```

6406531886393. ✖ df

```
import requests  
  
import pandas as pd  
  
from bs4 import BeautifulSoup  
  
soup = BeautifulSoup(website_url,python.html')  
  
required_table = soup.find_all('table')[0]  
  
df = pd.read_html(str(required_table))  
  
df=pd.DataFrame(df[0])
```

6406531886394. ✖ df

Question Number : 210 Question Id : 640653564343 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

Logical calculations in tableau helps to determine if a certain condition is true or false. Is the following expression valid ?

```
IF [Profit] > 0 THEN 'Profitable' ELSEIF [Profit] = 0 THEN  
'Breakeven' ELSE 'Loss'
```

Options :

6406531886419. ✘ TRUE

6406531886420. ✓ FALSE

Question Number : 211 Question Id : 640653564346 Question Type : MCQ Is Question

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

Correct Marks : 2

Question Label : Multiple Choice Question

Which among the following code blocks will get you the latitude and longitude of "IIT Madras"?

Assume the Nominatim library is imported using the command given below:

```
from geopy.geocoders import Nominatim
```

Options :

```
location = locator.geocode("IIT Madras, Chennai, India")  
print("Latitude = {}, Longitude = {}".format(location.latitude,  
6406531886429. ✘ location.longitude))
```

```
locator = Nominatim(user_agent="myGeocoder")  
location = locator.geocode("IIT Madras, Chennai, India")  
6406531886430. ✘ print("Latitude = {}, Longitude = {}")
```

```
locator = Nominatim(user_agent="myGeocoder")
location = locator.geocode("IIT Madras, Chennai, India")
print("Latitude = {}, Longitude =
6406531886431. ✓ {}".format(location.latitude, location.longitude))
```

```
locator = Nominatim(user_agent="myGeocoder")
print("Latitude = {}, Longitude =
{}".format(location.latitude, location.longitude))
6406531886432. ✖
```

Question Number : 212 Question Id : 640653564355 Question Type : MCQ Is Question

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

Correct Marks : 2

Question Label : Multiple Choice Question

We have a variable X, which can take values AA, BB, or CC. The first 4 values of this variable in a dataset are CC, AA, BB, AA. The format of representing this information as shown in the table below is called:

AA	BB	CC
0	0	1
1	0	0
0	1	0
1	0	0

Options :

6406531886460. ✖ multi-col format

6406531886461. ✓ one - hot encoding

6406531886462. ✗ long format

6406531886463. ✗ integer

Question Number : 213 Question Id : 640653564375 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

Provided below is a snapshot of the dataset which consists of movie reviews and respective labels.

	A	B
1	review	sentiment
2	One of the other reviewers has	positive
3	A wonderful little production.	< positive
4	I thought this was a wonderful	v positive
5	Basically there's a family where	negative
6	Petter Mattei's "Love in the Tim	positive
7	Probably my all-time favorite	m positive
8	I sure would like to see a resurre	positive
9	This show was an amazing, fresh	negative
10	Encouraged by the positive com	negative
11	If you like original gut wrenchin	positive

To compute the sentiment scores the Azure Machine Learning add-in requires input and output values. In the figure provided below the input and output cells need to be populated with appropriate values to obtain sentiment scores.

2. PREDICT

Input: input1

Type range or click button to select 

My data has headers

Output: output1

Enter output cell (e.g. A20)

Include headers

Choose the most appropriate option that enables you to predict sentiment scores using the Excel Azure Machine Learning add-in.

Options :

6406531886538. ✓ Input: Sheet1!A1:A11

Output: Sheet!C1

6406531886539. ✗ Input: Sheet1!B1:B11

Output: Sheet!C1

Question Number : 214 Question Id : 640653564387 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 Streamlit, how do you create the following image

[assumption : import streamlit as st]

Hobbies:

Dancing

Dancing

Reading

Sports

Options :

6406531886580. ✓ st.selectbox("Hobbies: ",['Dancing','Reading','Sports'])

6406531886581. ✗ st.selectbox("Hobbies: ",{'Dancing','Reading','Sports'})

6406531886582. ✗ st.write("Hobbies: ",['Dancing','Reading','Sports'])

6406531886583. ✗ None of these

Sub-Section Number : 4

Sub-Section Id : 64065380504

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 215 Question Id : 640653564369 Question Type : MSQ Is Question

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

Correct Marks : 1 Selectable Option : 0

Question Label : Multiple Select Question

scikit-network package contains functions for (select all correct sentences):

Options :

6406531886516. ❌ analysis of faults in a computer network

6406531886517. ✓ social network analysis

6406531886518. ✓ analysis of large graphs

6406531886519. ❌ enhancing one's social network

Question Number : 216 Question Id : 640653564381 Question Type : MSQ Is Question

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

Correct Marks : 1 Selectable Option : 0

Question Label : Multiple Select Question

Which of the following are methods of the BeautifulSoup object?

Options :

6406531886558. ✓ find()

6406531886559. ❌ get()

6406531886560. ✓ find_all()

6406531886561. ✓ prettify()

Sub-Section Number : 5

Sub-Section Id : 64065380505

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653564352 Question Type : COMPREHENSION Sub Question Shuffling

Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (217 to 218)

Question Label : Comprehension

Answer the given subquestions.

Sub questions

Question Number : 217 Question Id : 640653564353 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 are analyzing how much the number of lecture hours attended by students affects their exam scores. Which Excel function would you use as a starting point in this analysis?

Options :

6406531886452. ❌ STDEV.P()

6406531886453. ❌ STDEV.S()

6406531886454. ✓ SLOPE()

6406531886455. ❌ EXACT()

Question Number : 218 Question Id : 640653564354 Question Type : MCQ Is Question

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

Correct Marks : 1

Question Label : Multiple Choice Question

In the previous question, we plan to run a regression analysis after the preliminary analysis. Which of the following features provide you with the capability to do this?

Options :

6406531886456. ✓ Data Analysis Toolpak

6406531886457. ❌ Regression Analyzer

6406531886458. ❌ Regression ToolBokz

6406531886459. ❌ OptSol finder

BDM

Section Id :	64065338340
Section Number :	8
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	15
Number of Questions to be attempted :	15
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 :	64065380506
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 219 Question Id : 640653564392 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 (COMPUTER BASED EXAM)"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?

CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

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

REGISTERED BY YOU)

Options :

6406531886601. ✓ YES

6406531886602. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 64065380507

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 220 Question Id : 640653564393 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

When does marginal utility become negative?

Options :

6406531886603. ✗ When a consumer consumes the first unit of a good

6406531886604. ✗ When the total utility of a good is zero.

6406531886605. ✗ When the total utility of a good is at its maximum.

6406531886606. ✓ When the consumer reaches the point of overconsumption.

Question Number : 221 Question Id : 640653564395 Question Type : MCQ Is Question

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

Correct Marks : 2

Question Label : Multiple Choice Question

The current ratio is a measure of:

Options :

6406531886611. ✘ A company's ability to pay its long-term debt obligations.

6406531886612. ✓ A company's liquidity and short-term solvency.

6406531886613. ✘ A company's ability to generate profits.

6406531886614. ✘ A company's efficiency in managing its inventory.

Question Number : 222 Question Id : 640653564396 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 Company has current assets of \$500,000 and current liabilities of \$250,000. What is the current ratio of the company?

Options :

6406531886615. ✓ 2

6406531886616. ✘ 0.5

6406531886617. ✘ 1

6406531886618. ✘ 1.5

Question Number : 223 Question Id : 640653564397 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

1	Pricing Decisions	A	Process that integrates various business processes, functions, and departments within an organisation into a single system
2	Production Function	B	Measure of manufacturing efficiency that calculates the percentage of actual productive manufacturing time, as compared to the planned production time
3	Enterprise Resource Planning System	C	Choices Businesses makes when setting prices for their products or services
4	Overall Equipment Effectiveness	D	Relationship between inputs (such as labour and capital) and output (such as the quantity of goods or services produced)

Options :

6406531886619. ✘ 1-A, 2-B, 3-C, 4-D

6406531886620. ✓ 1-C, 2-D, 3-A, 4-B

6406531886621. ✘ 1-B, 2-C, 3-D, 4-A

6406531886622. ✘ 1-D, 2-A, 3-B, 4-C

Question Number : 224 Question Id : 640653564398 Question Type : MCQ Is Question

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

Correct Marks : 2

Question Label : Multiple Choice Question

What do regional tables signify?

Options :

6406531886623. ✘ It tells which region brought the most revenue and volume sales.

6406531886624. ✘ It tells which production unit gave the highest revenue and volume sales.

6406531886625. ✘ It organizes data based on geographic regions and areas.

6406531886626. ✓ Both It tells which region brought the most revenue and volume sales & It organizes data based on geographic regions and areas.

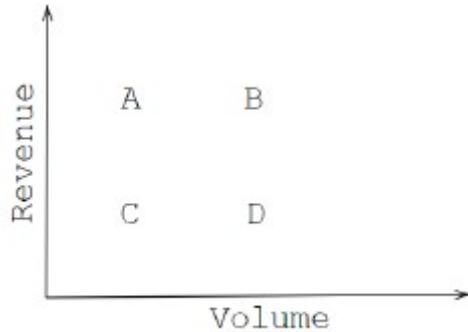
Question Number : 225 Question Id : 640653564400 Question Type : MCQ Is Question

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 SKU should be placed closer to the processing center?



Options :

6406531886631. ✘ A

6406531886632. ✓ B

6406531886633. ✘ C

6406531886634. ✘ D

Question Number : 226 Question Id : 640653564409 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

1	Ashmit who has not got his KYC done, applied for a credit of 120 rupees but got rejected.	A	Eligibility
2	Beena has defaulted in paying her EMIs for 5 straight months now, but is sad now that her Pay Later Option isn't enabled	B	Fraud Risk
3	Chetan gets notified because his transaction amount was too high and the location of this request was from some obsolete island near Caribbean	C	Credit Risk
4	Divya who is just graduated from Std. 4B to Std. 5A in School tried applying for credit but got rejected.	D	Compliance Issue

Options :

6406531886641. ❌ 1-A, 2-B, 3-C, 4-D

6406531886642. ✓ 1-D, 2-C, 3-B, 4-A

6406531886643. ❌ 1-B, 2-C, 3-D, 4-A

6406531886644. ❌ 1-D, 2-A, 3-B, 4-C

Question Number : 227 Question Id : 640653564412 Question Type : MCQ Is Question

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

Correct Marks : 2

Question Label : Multiple Choice Question

Suppose you have an Excel cell containing the following text string: "03/12/2022 14:36:00". Which of the following formulas will return the date "03/12/2022" from this cell using the LEFT function?

Options :

6406531886653. ❌ =LEFT(A1, 10)

6406531886654. ✓ =LEFT(A1, 8)

6406531886655. ❌ =LEFT(A1, 5)

6406531886656. ❌ =LEFT(A1, 7)

Sub-Section Number :

3

Sub-Section Id :

64065380508

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 228 Question Id : 640653564394 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

If the price of a product increases by 10% and the quantity demanded decreases by 20%, what is the price elasticity of demand?

Options :

6406531886607. ✓ 2

6406531886608. ✗ 0.5

6406531886609. ✗ 1

6406531886610. ✗ 1.5

Question Number : 229 Question Id : 640653564399 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 dataset. Rank the candidates, and choose the option correctly. Here appraisal score, duration in the current post, and count of skills are higher the better, whereas the joining possibility is lower the better.

Candidates	Appraisal Score	Duration in the current Post (in yrs)	Count of Skills	Joining Possible (in Months)
A	2	3	3	1
B	3	3	3	1
C	2	4	2	2
D	1	2	2	2

Options :

6406531886627. ✘ D > C > B > A

6406531886628. ✘ C > D > B > A

6406531886629. ✓ B > A > C > D

6406531886630. ✘ A > B > C > D

Question Number : 230 Question Id : 640653564410 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

Give the preference order in which the following people are most likely to get their credit request approved

Customer Name	Cust Engagement	Application Credit Score	Application Amount
Alya	Mid	444	100
Bobby	Low	630	120
Catty	Mid	500	210
Deepak	High	613	100

Options :

6406531886645. ✓ Deepak > Bobby > Catty > Alya

6406531886646. ✘ Alya > Deepak > Catty > Bobby

6406531886647. ✘ Bobby > Catty > Alya > Deepak

6406531886648. ✘ Deepak > Alya > Catty > Bobby

Question Number : 231 Question Id : 640653564411 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 table provides the number of credit applications approved or declined in 4 months in 2021

Month	Approved	Declined
July	500	488
August	488	474
September	520	516
October	660	650

Which Month has the highest approval rate?

Options :

6406531886649. ✘ July

6406531886650. ✓ August

6406531886651. ✘ September

6406531886652. ✘ October

Sub-Section Number : 4

Sub-Section Id : 64065380509

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653564401 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (232 to 235)

Question Label : Comprehension

Calculate the given subquestions for Gear Hobbing Process for Week 1

Parameters	Week 1
No. of Shifts/ Day (No Holiday on any day of the week)	3
No. of Hours/Shift	8
Number of Shifts lost due to maintenance	6
Designed Speed of Hobbing Process (per hour)	60
Total Product Output	6200
Scrap (S)	422

Sub questions

Question Number : 232 Question Id : 640653564402 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

Availability - _____ %

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

70 to 73

Question Number : 233 Question Id : 640653564403 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

Performance _____ %

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

85 to 87

Question Number : 234 Question Id : 640653564404 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

Quality _____ %

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

92.5 to 94

Question Number : 235 Question Id : 640653564405 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

OEE _____ (Enter a number between 0 and 1 up to 3 decimal places)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.560 to 0.583

Sub-Section Number : 5

Sub-Section Id : 64065380510

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653564406 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (236 to 237)

Question Label : Comprehension

Answer the given subquestions concerning the Hobbing process of gear manufacturing?

	Shift 1	Shift 2								
Week -1 Broaching Scrap	11	8	13	0	7	6	11	8	4	6

Total Output of Gear Casts after Broaching: 2300

Cost of Broaching: INR 27 per Gear cast, Raw Material Cost: INR 43 per Gear Cast

Sub questions

Question Number : 236 Question Id : 640653564407 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

Scrap Percentage after broaching process_____%

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

3.15 to 3.25

Question Number : 237 Question Id : 640653564408 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

Loss due to scrap after broaching_____

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5050 to 5300

System Commands

Section Number :	9
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	14
Number of Questions to be attempted :	14
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 :	64065380511
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 238 Question Id : 640653564413 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 (COMPUTER BASED EXAM)"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?

CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

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

Options :

6406531886657. ✓ YES

6406531886658. ✘ NO

Sub-Section Number :	2
Sub-Section Id :	64065380512
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 239 Question Id : 640653564414 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

```
$ help echo
echo: echo [-neE] [arg ...]
      Write arguments to the standard output.
```

Display the ARGs, separated by a single space character and followed by a newline, on the standard output.

Options:

- n do not append a newline
- e enable interpretation of the following backslash escapes
- E explicitly suppress interpretation of backslash escapes

`echo` interprets the following backslash-escaped characters:
.....
\n new line
.....
\t horizontal tab
.....

What will be the output of the following script?

```
echo -ne "a\tb"
echo -ne " \tc"
echo -ne " \td"
echo -ne " \te\tf"
```

Options :

6406531886659. ✘

a b
c
d
e f

6406531886660. ✓

a b c d e f

a b
c
d
e f

6406531886661. *

a\tb
\tc
\td
\te\tf

6406531886662. *

Question Number : 240 Question Id : 640653564415 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

Following entry is made to a crontab. When is the script /home/garima/premodel.sh scheduled to get executed.

```
5 0 * * 1 /home/garima/premodel.sh
```

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 :

6406531886663. ✓ Every Monday at 00:05

6406531886664. ✗ Every Monday at 05:00

6406531886665. ✗ Everyday at 08:00

6406531886666. ✗ Everyday at 08:05 in May

Question Number : 241 Question Id : 640653564429 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

file.csv

```
Sahni,151-8534,sahni@hotmail.ca,KA  
Mahajan,1-548-689-8736,mahajan@icloud.co.uk,Bihar  
Rana,1-528-385-7783,rana4716@yahoo.org,AN
```

Given a CSV file `file.csv` with contents as shown above. Select AWK command(s) which can produce the output as shown below.

Expected Output

```
Sahni  
151-8534  
Mahajan  
1-548-689-8736  
Rana  
1-528-385-7783
```

Hint:

```
$ man awk | cat  
...  
FS The input field separator, a space by default.  
See Fields, above.  
...  
OFS The output field separator, a space by default.  
...  
ORS The output record separator, by default a newline.  
...
```

Options :

6406531886717. ✓ `awk -F, '{print $1"\n"$2}' file.csv`

6406531886718. ✗ `awk 'BEGIN{FS=",";OFS="\n"}{print $1 $2}' file.csv`

6406531886719. ✗ `awk 'BEGIN{FS=",";ORS="\n"}{print $1,$2}' file.csv`

6406531886720. ✗ `awk -F, '{print $1"\n",$2}' file.csv`

Question Number : 242 Question Id : 640653564430 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 6

Question Label : Multiple Choice Question

In a working directory number of text files are present with varying sizes (varying number of lines). For the following AWK script executed in the working directory, what is true for the output from the following options?

```
#!/usr/bin/awk -f

n < FNR {
    n = FNR
    nf = FILENAME
}
END {
    print nf
}
```

Hint:

```
$ man awk | cat
...
FILENAME The name of the current input file. If no files
are specified on the command line, the value of
FILENAME is “-”. However, FILENAME is undefined
inside the BEGIN rule (unless set by getline).

FNR      The input record number in the current input file.
...
```

Options :

6406531886721. ✓ The file name with the maximum number of lines among the files that are passed as arguments is printed

6406531886722. ✗ The file name that has the minimum number of lines among the files that are passed as arguments is printed

6406531886723. ✗ The file name that is passed as the first file argument is printed

6406531886724. ✘ The file name that is passed as the last file argument is printed

Sub-Section Number :	3
Sub-Section Id :	64065380513
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 243 Question Id : 640653564420 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

```
while read -r line; do
    if [[ $line =~ ^[:digit:]*[[:digit:]]$ ]]; then
        echo $line
    fi
done < file1 > file2
diff file1 file2
```

Select a scenario from the following options such that upon execution of the above script, no lines will be printed to the terminal.

Options :

6406531886683. ✘ file1 and file2 have the same number of lines

6406531886684. ✘ file2 being the copy of file1

6406531886685. ✘ file2 containing all the lines that start and end with a number

6406531886686. ✓ file1 containing all the lines that start and end with a number

Sub-Section Number :	4
Sub-Section Id :	64065380514
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 244 Question Id : 640653564428 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 8

Question Label : Multiple Choice Question

What will be the output of the following command?

```
echo {a..c}{1..3} | tr ' ' '\n' | awk '{  
    count+=NF  
    count2+=NR  
    count3+=length+1  
}  
END {  
    print count, count2, count3  
}  
'
```

Hint:

```
$ tr --help  
Usage: tr [OPTION]... SET1 [SET2]  
Translate, squeeze, and/or delete characters from standard input,  
writing to standard output.  
...  
  
$ awk --help  
Usage: awk [POSIX or GNU style options] -f progfile [--] file ...  
Usage: awk [POSIX or GNU style options] [--] 'program' file ...  
POSIX options:           GNU long options: (standard)  
      -f progfile          --file=progfile  
      -F fs                --field-separator=fs  
...  
  
$ man awk | cat  
...  
length([s]) Return the length of the string s, or  
the length of $0 if s is not supplied.  
As a non-standard extension, with an  
array argument, length() returns the  
number of elements in the array.  
...
```

Options :

6406531886714. ✘ 9 9 18

6406531886715. ✘ 9 27 27

6406531886716. ✘ 9 27 18

Sub-Section Number :	5
Sub-Section Id :	64065380515
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 245 Question Id : 640653564421 Question Type : MSQ Is Question

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

Correct Marks : 6 Selectable Option : 0

Question Label : Multiple Select Question

Which of the following command would print lines with Alice or Rabbit with total count of their occurrences at the end of the output from alice.txt file.

Hint:

- The pipe character do not have special meaning in Basic Regular Expression Engine(BRE) unless escaped with backslash
- -E option in grep enables Extended Regular Expression Engine(ERE)
- -c option gives the count of the line that have matches

Options :

6406531886687. ✘ grep 'Alice|Rabbit' alice.txt | grep -c 'Alice|Rabbit'

6406531886688. ✘ grep -E 'Alice|Rabbit' alice.txt| grep -E -c 'Alice|Rabbit'

6406531886689. ✓ grep 'Alice\\|Rabbit' alice.txt; grep -c 'Alice\\|Rabbit'

6406531886690. ✓ grep -E 'Alice|Rabbit' alice.txt; grep -E -c 'Alice|Rabbit'

Question Number : 246 Question Id : 640653564426 Question Type : MSQ Is Question

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

Time : 0

Correct Marks : 6 Selectable Option : 0

Question Label : Multiple Select Question

Given the file `test.csv` with content shown below. Select the sed command(s) that will filter lines with abbreviated regions.

```
$ cat test.csv
name,phone,email,region
Madan,1-158-662-4996,madan-raja@outlook.ca,GA
Persaud,1-877-704-5869,persaud@google.edu,Meghalaya
Srivas,1-516-922-8416,k-srivas@icloud.com,HR
Swami,761-1395,swami@google.co.uk,Haryana
Subram,981-5610,subram3142@yahoo.org,Karnataka
Nirmal,474-7526,nirmal@icloud.org,Madhya Pradesh
Sahni,151-8534,sahni@hotmail.ca,KA
Mahajan,1-548-689-8736,mahajan@icloud.co.uk,Bihar
Rana,1-528-385-7783,rana4716@yahoo.org,AN
```

Expected output

```
Madan,1-158-662-4996,madan-raja@outlook.ca,GA
Srivas,1-516-922-8416,k-srivas@icloud.com,HR
Sahni,151-8534,sahni@hotmail.ca,KA
Rana,1-528-385-7783,rana4716@yahoo.org,AN
```

Options :

6406531886705. ✓ `sed -n '/[A-Z]\{1\}\$/ p' test.csv`

6406531886706. ✓ `sed -n '/,[[:upper:]]\{2\}\$/ p' test.csv`

6406531886707. ❌ `sed -n '/[:alnum:]\{2\}\$/ p' test.csv`

6406531886708. ✓ `sed -n '/[[:upper:]]\{2\}\$/ p' test.csv`

Question Number : 247 Question Id : 640653564427 Question Type : MSQ Is Question

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

Time : 0

Correct Marks : 6 Selectable Option : 0

Question Label : Multiple Select Question

Which of the following SED command(s) would print lines with Alice or Rabbit from alice.txt file.

Hint:

- The pipe character do not have special meaning in Basic Regular Expression Engine(BRE) unless escaped with a backslash
- -E option in grep enables Extended Regular Expression Engine(ERE)
- -n option prevent the default printing in sed

Options :

6406531886709. ❌ `sed -E 's/Alice\|Rabbit//' alice.txt`

6406531886710. ❌ `sed -E -n 's/Alice|Rabbit//' alice.txt`

6406531886711. ✓ `sed -n '/Alice\|Rabbit/ p' alice.txt`

6406531886712. ✓ `sed -En '/Alice|Rabbit/ p' alice.txt`

Sub-Section Number : 6

Sub-Section Id : 64065380516

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 248 Question Id : 640653564419 Question Type : MSQ Is Question

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

Time : 0

Correct Marks : 8 Selectable Option : 0

Question Label : Multiple Select Question

Contents of the current working directory are given below.

```
$ ls -R
.:
a b

./a:
file0 file1 file2 file3 file4

./b:
file10 file3 file4 file5 file6
```

Select all the file(s) that will be present in the current working directory after the execution of the following script.

```
cd a
for i in *; do
    ls ../b | grep $i && mv $i ../b
done
```

Options :

6406531886675. ✓ file0

6406531886676. ✗ file1

6406531886677. ✓ file2

6406531886678. ✗ file3

6406531886679. ✗ file4

6406531886680. ✗ file5

6406531886681. ✗ file6

6406531886682. ✗ file10

Question Number : 249 Question Id : 640653564422 Question Type : MSQ Is Question

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

Correct Marks : 8 Selectable Option : 0

Question Label : Multiple Select Question

For the given regular expression (regex) identify the correct statement(s) from the following options. Note that the Extended Regular Expression (ERE) is used.

Hint:

The group number starts from the outer to inner and left to right respectively.

Note: a word, phrase, or sequence that reads the same backwards as forwards e.g.

Noon, Anna

```
^((.)\2|(.).\3|(.)\5\4)$
```

Options :

6406531886691. ❌ This regex will match with 1 character palindrome

6406531886692. ✓ This regex will match with 2 character palindrome

6406531886693. ✓ This regex will match with 3 character palindrome

6406531886694. ✓ This regex will match with 4 character palindrome

Sub-Section Number : 7

Sub-Section Id : 64065380517

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653564416 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (250 to 251)

Question Label : Comprehension

```
$ xargs --help
Usage: xargs [OPTION]... COMMAND [INITIAL-ARGS]...
Run COMMAND with arguments INITIAL-ARGS and more arguments read from
input.
...

$ seq 5
1
2
3
4
5

$ seq 5 | xargs echo
1 2 3 4 5

$ ls --help
Usage: ls [OPTION]... [FILE]...
List information about the FILEs (the current directory by default).
Sort entries alphabetically if none of -cftuvSUX nor --sort is specified.

Mandatory arguments to long options are mandatory for short options too.

-a, --all                  do not ignore entries starting with .
-A, --almost-all           do not list implied . and ..
--author                   with -l, print the author of each file
-b, --escape                print C-style escapes for nongraphic
characters
--block-size=SIZE          with -l, scale sizes by SIZE when printing
them;                      e.g., '--block-size=M'; see SIZE format
below
-B, --ignore-backups       do not list implied entries ending with ~
-c                         with -lt: sort by, and show, ctime (time of
last                          modification of file status information);
                               with -l: show ctime and sort by name;
                               otherwise: sort by ctime, newest first
-C                         list entries by columns
--color[=WHEN]              colorize the output; WHEN can be 'always'
```

```
(default
          if omitted), 'auto', or 'never'; more info
below
  -d, --directory           list directories themselves, not their
contents
  -D, --direfd             generate output designed for Emacs' direfd
mode
  -f
  -F, --classify           do not sort, enable -aU, disable -ls --color
                           append indicator (one of */=>@|) to entries
                           likewise, except do not append '*'
                           across -x, commas -m, horizontal -x, long -
l,
  --full-time              single-column -l, verbose -l, vertical -c
                           like -l --time-style=full-iso
  -g                       like -l, but do not list owner
  --group-directories-first
                           group directories before files;
                           can be augmented with a --sort option, but
any
                           use of --sort=none (-U) disables grouping
                           in a long listing, don't print group names
                           with -l and -s, print sizes like 1K 234M 2G
etc.
  --si                     likewise, but use powers of 1000 not 1024
  -H, --dereference-command-line
                           follow symbolic links listed on the command
line
  --dereference-command-line-symlink-to-dir
                           follow each command line symbolic link
                           that points to a directory
  --hide=PATTERN           do not list implied entries matching shell
PATTERN
                           (overridden by -a or -A)
  --hyperlink[=WHEN]       hyperlink file names; WHEN can be 'always'
                           (default if omitted), 'auto', or 'never'
  --indicator-style=WORD   append indicator with style WORD to entry
names:
                           none (default), slash (-p),
                           file-type (--file-type), classify (-F)
  -i, --inode               print the index number of each file
  -I, --ignore=PATTERN     do not list implied entries matching shell
PATTERN
  -k, --kibibytes          default to 1024-byte blocks for disk usage;
```

used only with -s and per directory totals
-l
use a long listing format
-L, --dereference
when showing file information for a symbolic
link, show information for the file the

link
-m
references rather than for the link itself
entries
fill width with a comma separated list of
-n, --numeric-uid-gid
like -l, but list numeric user and group IDs
-N, --literal
print entry names without quoting
-o
like -l, but do not list group information
-p, --indicator-style=slash
append / indicator to directories
-q, --hide-control-chars
print ? instead of nongraphic characters
--show-control-chars
show nongraphic characters as-is (the
default,
unless program is 'ls' and output is a
terminal)
-Q, --quote-name
enclose entry names in double quotes
--quoting-style=WORD
use quoting style WORD for entry names:
literal, locale, shell, shell-always,
shell-escape, shell-escape-always, c,

escape
(overrides QUOTING_STYLE environment
variable)
-r, --reverse
reverse order while sorting
-R, --recursive
list subdirectories recursively
-s, --size
print the allocated size of each file, in
blocks
-S
sort by file size, largest first
--sort=WORD
sort by WORD instead of name: none (-U),
size (-S),
time (-t), version (-v), extension (-X)
change the default of using modification
times;
access time (-u): atime, access, use;
change time (-c): ctime, status;
birth time: birth, creation;
with -l, WORD determines which time to show;
with --sort=time, sort by WORD (newest
first)
--time-style=TIME_STYLE time/date format with -l; see TIME_STYLE
below

```

-t                      sort by time, newest first; see --time
-T, --tabsize=COLS      assume tab stops at each COLS instead of 8
-u                      with -lt: sort by, and show, access time;
                        with -l: show access time and sort by
name;
                        otherwise: sort by access time, newest
first
-U                      do not sort; list entries in directory order
-v                      natural sort of (version) numbers within
text
-w, --width=COLS        set output width to COLS.  0 means no limit
-x                      list entries by lines instead of by columns
-X                      sort alphabetically by entry extension
-Z, --context           print any security context of each file
-1                      list one file per line.  Avoid '\n' with -q
or -b
--help      display this help and exit
--version   output version information and exit
...

```

Based on the information provided above, answer the given subquestions.

Sub questions

Question Number : 250 Question Id : 640653564417 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 bash function `cdlmd` that
changes the current working directory
to the recently modified directory in the
current directory.

Options :

```

cdlmd() {
    ls | head -1 | cd
}

```

6406531886667. *

6406531886668.

```
cdlmd() {  
    ls -t -d */ | xargs cd  
}
```

✖

```
cdlmd() {  
    ls -t -d */ | head -1 | xargs cd  
}
```

6406531886669. ✓

```
cdlmd() {  
    ls -g | head -1 | xargs cd  
}
```

6406531886670. ✖

Question Number : 251 Question Id : 640653564418 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 6

Question Label : Multiple Choice Question

Which of the following command prints all the keys present in an bash associative array.

Options :

6406531886671. ✖ \$arr

6406531886672. ✖ \${arr[@]}

6406531886673. ✓ \${!arr[@]}

6406531886674. ✖ \${arr[@]}

Sub-Section Id : 64065380518

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653564423 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (252 to 253)

Question Label : Comprehension

A student named Meena wrote a shell script `exoc.sh` such that everytime `main.py` is changed (change in modification time) the shell script is executed on python script file.

Script: `exoc.sh`

```
#!/usr/bin/python3

while true; do
    lmt=$(stat -c %Y "$1")
    if [[ "$lmt" == "$plmt" ]]; then
        clear
        echo "[$(date +"%H:%M:%S") STARTED]"
        python3 "$1"
        echo "[$(date +"%H:%M:%S") ENDED]"
    fi
    plmt="$lmt"
    sleep 1
done
```

Execution

```
$ ls -l
total 16K
drwxrwxr-x  2 meena meena 4.0K Apr  9 10:53 .
drwxr-xr-x 34 meena meena 12K Apr  9 10:52 ../
-rwxrwxr-x  1 meena meena   52 Apr  9 10:52 exoc.sh
-rw-rw-r--  1 meena meena  462 Apr  9 10:53 main.py
$ echo main.py | ./exoc.sh
```

Hints

```
$ stat --help
Usage: stat [OPTION]... FILE...
Display file or file system status.
```

```
Mandatory arguments to long options are mandatory for short options too.
-L, --dereference      follow links
-f, --file-system      display file system status instead of file status
```

```
--cached=MODE      specify how to use cached attributes;  
                   useful on remote file systems. See MODE below  
-c --format=FORMAT use the specified FORMAT instead of the default;  
                   output a newline after each use of FORMAT  
--printf=FORMAT   like --format, but interpret backslash escapes,  
                   and do not output a mandatory trailing newline;  
                   if you want a newline, include \n in FORMAT  
-t, --terse        print the information in terse form  
--help            display this help and exit  
--version         output version information and exit
```

The --cached MODE argument can be; always, never, or default.
'always' will use cached attributes if available, while
'never' will try to synchronize with the latest attributes, and
'default' will leave it up to the underlying file system.

The valid format sequences for files (without --file-system):

```
%a  permission bits in octal (note '#' and '0' printf flags)  
%A  permission bits and file type in human readable form  
%b  number of blocks allocated (see %B)  
%B  the size in bytes of each block reported by %b  
%C  SELinux security context string  
%d  device number in decimal  
%D  device number in hex  
%f  raw mode in hex  
%F  file type  
%g  group ID of owner  
%G  group name of owner  
%h  number of hard links  
%i  inode number  
%m  mount point  
%n  file name  
%N  quoted file name with dereference if symbolic link  
%o  optimal I/O transfer size hint  
%s  total size, in bytes  
%t  major device type in hex, for character/block device special files  
%T  minor device type in hex, for character/block device special files  
%u  user ID of owner  
%U  user name of owner  
%w  time of file birth, human-readable; - if unknown  
%W  time of file birth, seconds since Epoch; 0 if unknown  
%x  time of last access, human-readable
```

```
%X time of last access, seconds since Epoch  
%y time of last data modification, human-readable  
%Y time of last data modification, seconds since Epoch  
%z time of last status change, human-readable  
%Z time of last status change, seconds since Epoch
```

Valid format sequences for file systems:

```
%a free blocks available to non-superuser  
%b total data blocks in file system  
%c total file nodes in file system  
%d free file nodes in file system  
%f free blocks in file system  
%i file system ID in hex  
%l maximum length of filenames  
%n file name  
%s block size (for faster transfers)  
%S fundamental block size (for block counts)  
%t file system type in hex  
%T file system type in human readable form
```

--terse is equivalent to the following FORMAT:

```
%n %s %b %f %u %g %D %i %h %t %T %X %Y %Z %W %o %C
```

--terse --file-system is equivalent to the following FORMAT:

```
%n %i %l %t %s %S %b %f %a %c %d
```

NOTE: your shell may have its own version of stat, which usually
supersedes

the version described here. Please refer to your shell's documentation
for details about the options it supports.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 252 Question Id : 640653564424 Question Type : MSQ Is Question

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

Correct Marks : 8 Selectable Option : 0

Question Label : Multiple Select Question

Apparently, her code had some issues. Identify all the flaws from the following options to facilitate debugging the script and the execution steps.

Options :

6406531886695. ✓ Incorrect interpreter in the first line on `exoc.sh`

6406531886696. ✓ Incorrect condition in if statement

6406531886697. ✗ Incorrect assignment to the variable `lmt`

6406531886698. ✗ Incorrect assignment to the variable `plmt`

6406531886699. ✓ Incorrect execution; The proper execution
should be `./exoc.sh main.py`

6406531886700. ✗ Incorrect execution; The proper execution
should be `exoc.sh main.py`

Question Number : 253 Question Id : 640653564425 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 outcome of the
command `sed -i '/.,,$!d' file.txt`?

Options :

6406531886701. ✗ Delete all empty lines in the file `file.txt`

6406531886702. ✗

Delete all lines with '.' character in
the file file.txt

Delete all empty lines before the
first non-empty line in the file file.txt

6406531886703. ✓

Delete all empty lines after the
last non-empty line in the file file.txt

6406531886704. ✘

MLP

Section Id :	64065338342
Section Number :	10
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	37
Number of Questions to be attempted :	37
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 :	64065380519
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 254 Question Id : 640653564431 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 (COMPUTER BASED EXAM)"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?

CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

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

Options :

6406531886725. ✓ YES

6406531886726. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 64065380520

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 255 Question Id : 640653564432 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

To load datasets from openml.org, which method will be appropriate?

Options :

6406531886727. ✗ load_openml()

6406531886728. ✘ `read_openml()`

6406531886729. ✘ `read_data()`

6406531886730. ✓ `fetch_openml()`

6406531886731. ✘ `load_data()`

6406531886732. ✘ `load_csv()`

6406531886733. ✘ `fetch_csv()`

Question Number : 256 Question Id : 640653564434 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

Why is data preprocessing necessary?

Options :

6406531886738. ✘ Some columns have values only between 0 and 1.

6406531886739. ✓ A column has same entities with different names, e.g. "India", "In", "IN".

6406531886740. ✘ The data has only numbers in all the columns.

Question Number : 257 Question Id : 640653564438 Question Type : MCQ Is Question

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

Correct Marks : 2

Question Label : Multiple Choice Question

Consider the following code block:

```
X = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i']
from sklearn.model_selection import KFold
kf = KFold(n_splits = 3)
for train, test in kf.split(X):
    print(train, test)
```

Which of the following may be the correct output of the above code?

Options :

[3 4 5 6 7 8] [0 3 4]
[0 1 2 6 7 8] [2 4 6]

6406531886755. ✘ [0 1 2 3 4 5] [0 5 8]

[3 4 5] [6 7 8] [0 1 2]
[0 1 2] [6 7 8] [3 4 5]

6406531886756. ✘ [0 1 2] [3 4 5] [6 7 8]

[0 1 2] [3 4 5 6 7 8]
[3 4 5] [0 1 2 6 7 8]

6406531886757. ✘ [6 7 8] [0 1 2 3 4 5]

[3 4 5 6 7 8] [0 1 2]
[0 1 2 6 7 8] [3 4 5]

6406531886758. ✓ [0 1 2 3 4 5] [6 7 8]

Question Number : 258 Question Id : 640653564439 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 classes will be the most suitable for examining the effect of the number of samples on the training and testing errors?

Options :

6406531886759. ✘ `sklearn.model_selection.train_test_split`

6406531886760. ✘ `sklearn.model_selection.cross_validate`

6406531886761. ✘ `sklearn.model_selection.cross_val_score`

6406531886762. ✓ `sklearn.model_selection.learning_curve`

Question Number : 259 Question Id : 640653564443 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 not a hyper parameter?

Options :

6406531886772. ✘ `degree` in Polynomial Regression

6406531886773. ✘ `k` in KNN

6406531886774. ✓ `intercept value` in linear regression

6406531886775. ✘ `depth of tree` in a decision tree

Question Number : 260 Question Id : 640653564447 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Consider following two statements:

Statement 1: The multinomial Naive Bayes classifier is suitable for classification with discrete features

Statement 2: Two dependent features impact GaussianNB performance because internally it calculates the conditional probability.

Options :

6406531886789. ✓ Both statements are True

6406531886790. ✗ Only statement 1 is True

6406531886791. ✗ Only statement 2 is True

6406531886792. ✗ Both statements are False

Question Number : 261 Question Id : 640653564450 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Given below code to load a huge file name as filename.csv and this file is not loading at once in the system which parameter should be added to pd.read_csv to load this file ?

```
import pandas as pd
from sklearn.linear_model import SGDRegressor
for train_df in pd.read_csv("filename.csv", _____=1024):
    X = train_df.iloc[:, :-1]
    y = train_df.iloc[:, -1]
    model = SGDRegressor()
    model.partial_fit(X,y)
```

Options :

6406531886801. ✗ max_depth

6406531886802. ✘ C

6406531886803. ✓ chunkszie

6406531886804. ✘ warm_start

Question Number : 262 Question Id : 640653564451 Question Type : MCQ Is Question

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

Correct Marks : 2

Question Label : Multiple Choice Question

Which of the following is true for a hard margin SVM algorithm ?

Options :

6406531886805. ✘ It does not create hyperplanes as decision boundary

6406531886806. ✓ It can only work for linearly separable data

6406531886807. ✘ It is robust to outliers

6406531886808. ✘ It is mostly used for clustering the data

Question Number : 263 Question Id : 640653564454 Question Type : MCQ Is Question

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

Correct Marks : 2

Question Label : Multiple Choice Question

What will the output for below code

```
from sklearn.feature_extraction.text import CountVectorizer
corpus = [ 'This is the first document.',
           'This document is the second document.']
vectorizer = CountVectorizer()
vectorizer.fit_transform(corpus)
print(vectorizer.get_feature_names_out())
```

Options :

6406531886817. ✓ ['document' 'first' 'is' 'second' 'the' 'this']

6406531886818. ✗ { 'this': 5, 'is': 2, 'the': 4, 'first': 1, 'document': 0, 'second': 3}

6406531886819. ✗ [3,1,2,1,2,2]

6406531886820. ✗ [0,1,2,3,4,5]

Sub-Section Number : 3

Sub-Section Id : 64065380521

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 264 Question Id : 640653564435 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 APIs can be used to construct an ML pipeline that has numerical and categorical features both? Choose the most suitable answer.

Options :

6406531886741. ✗ Pipeline alone

6406531886742. ✗ ColumnTransformer with pipeline

6406531886743. ✓ FeatureUnion with ColumnTransformer and/or pipeline

6406531886744. ✗ All of these

Question Number : 265 Question Id : 640653564436 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 preprocessing steps:

1. Read the data from a file (named 'dataset.csv'). It has 4 columns, with following column names 'city', 'title', 'expert_rating' and 'user_rating' in this order.
2. Drop rows with missing values.
3. Apply 'CountVectorizer' on 'title'.
4. Apply one hot encoding to 'city'.
5. Drop the remaining columns.
6. Fit and transform the data and print it.

Which of the following code snippets correctly accomplishes the above task? Assume necessary imports.

Options :

```
data = pd.read_csv('dataset.csv')
data = data.dropna()
column_trans = ColumnTransformer(
    [('categories', OneHotEncoder(dtype='int'), ['city']),
     ('title_bow', CountVectorizer(), 'title')],
    remainder='drop')
```

6406531886745. ✓ `print(column_trans.fit_transform(data))`

6406531886746. ✗

```
data = pd.read_csv('dataset.csv')
data.dropna()
column_trans = ColumnTransformer(
    [('categories', OneHotEncoder(dtype='int'), ['city']),
     ('title_bow', CountVectorizer(), 'title')],
    remainder='drop')

print(column_trans.fit_transform(data))
```

```
data = pd.read_csv('dataset.csv')
data = data.dropna()
column_trans = ColumnTransformer(
    [('categories', OneHotEncoder(dtype='int'), ['Title']),
     ('title_bow', CountVectorizer(), 'City')],
    remainder='drop')
```

6406531886747. ✘ print(column_trans.fit_transform(data))

```
data = pd.read_csv('dataset.csv')
data = data.dropna()
column_trans = ColumnTransformer(
    [('categories', OneHotEncoder(dtype='int'), ['city']),
     ('title_bow', CountVectorizer(), 'title')],
    remainder='passthrough')
```

6406531886748. ✘ print(column_trans.fit_transform(data))

```
data = pd.read_csv('dataset.csv')
data = data.dropna()
column_trans = ColumnTransformer(
    [('categories', OneHotEncoder(dtype='int'), ['city']),
     ('title_bow', CountVectorizer(), 'title')],
    remainder='drop')
```

6406531886749. ✘ print(column_trans.fit(data))

6406531886750. ✘ None of these

Question Number : 266 Question Id : 640653564441 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 block:

```
from sklearn.datasets import make_regression
X, y = make_regression(n_samples = 1000,
                       n_features = 5,
                       n_informative = 2,
                       random_state=42)

from sklearn.linear_model import SGDRegressor
sgd1 = SGDRegressor(alpha=1e-3,
                     random_state=42,
                     penalty='-----', )
sgd1.fit(X, y)
print(sgd1.coef_)

sgd2 = SGDRegressor(alpha=1e-3,
                     random_state=42,
                     penalty='-----')
sgd2.fit(X, y)
print(sgd2.coef_)
```

What are the most suitable values to be filled in the two blank spaces (in that order) in the code to expect the following output?:

[1.68059576e+01, 1.89752021e+01, 7.49212536e-04, -6.53455275e-04, 3.01471918e-04]

[16.82258106, 18.99248887, 0., 0., 0.]

Options :

6406531886764. ✘ 'l1', 'l2'

6406531886765. ✘ 'l1', None

6406531886766. ✓ 'l2', 'l1'

6406531886767. ✘ 'l2', None

Question Number : 267 Question Id : 640653564442 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

What will be the output of the following code?:

```
from sklearn.datasets import make_regression
X, y = make_regression(n_samples = 10, n_features = 2)
from sklearn.preprocessing import PolynomialFeatures
poly_transform = PolynomialFeatures(degree=2, interaction_only=True)

X_trans = poly_transform.fit_transform(X)
print(X_trans.shape)
```

Options :

6406531886768. ✘ (10, 2)

6406531886769. ✓ (10, 4)

6406531886770. ✘ (10, 5)

6406531886771. ✘ (10, 6)

Question Number : 268 Question Id : 640653564445 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 following model:

```
estimator = SGDClassifier(loss='log',
                           penalty='l2',
                           max_iter=1,
                           warm_start=True,
                           eta0=0.01,
                           alpha=0,
                           learning_rate='constant',
                           random_state=1729)
pipe_sgd= make_pipeline(MinMaxScaler(), estimator)
```

Which of the following code snippets will plot the learning curve for training for 100 epochs? Assume necessary imports and the variable names suggest the data they hold/- point to.

Options :

6406531886780. ✓

```
Loss=[]
iterations= 100
for i in range(iterations):
    pipe_sgd.fit(x_train,y_train)
    y_pred = pipe_sgd.predict_proba(x_train)
    Loss.append(log_loss(y_train,y_pred))
plt.plot(np.arange(iterations),Loss)
```

6406531886781. ✗

```
Loss=[]
iterations= 100
for i in range(iterations):
    pipe_sgd.fit(x_train,y_train)
    y_pred = pipe_sgd.predict(x_train)
    Loss.append(log_loss(y_train,y_pred))
plt.plot(np.arange(iterations),Loss)
```

6406531886782. ✗

```
Loss=[]
iterations= 100
for i in range(iterations):
    pipe_sgd.fit(x_train,y_train)
    y_pred = pipe_sgd.predict(x_test)
    Loss.append(log_loss(y_train,y_pred))
plt.plot(np.arange(iterations),Loss)
```

6406531886783. ✗

```
Loss=[]
iterations= 100
for i in range(iterations):
    pipe_sgd.fit(x_train,y_train)
    y_pred = pipe_sgd.predict(x_test)
    Loss.append(log_loss(y_test,y_pred))
plt.plot(np.arange(iterations),Loss)
```

6406531886784. ✘ None of these

Question Number : 269 Question Id : 640653564458 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 we need quick results during the testing phase, then which classification techniques may not be appropriate?

Options :

6406531886833. ✘ `sklearn.linear_model.LogisticRegression`

6406531886834. ✓ `sklearn.neighbors.KNeighborsClassifier`

6406531886835. ✘ `sklearn.tree.DecisionTreeClassifier`

6406531886836. ✘ `sklearn.naive_bayes.GaussianNB`

Question Number : 270 Question Id : 640653564462 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

Following is the code to tune the degree parameter of a polynomial regression model.

```
from sklearn.model_selection import GridSearchCV
from sklearn.pipeline import Pipeline
from sklearn.preprocessing import PolynomialFeatures
from sklearn.linear_model import SGDRegressor

param_grid = [{_____: [2, 3, 4, 5, 6, 7, 8, 9]}]
pipeline = Pipeline(steps=[('poly', PolynomialFeatures()),
                           ('sgd', SGDRegressor())])
grid_search = GridSearchCV(pipeline, param_grid, cv=5,
                           scoring='neg_mean_squared_error',
                           return_train_score=True)
grid_search.fit(X_train, y_train)
```

What should the blank space contain?

Options :

6406531886850. ✘ 'degree'

6406531886851. ✘ 'sgd_degree'

6406531886852. ✘ 'sgd__degree'

6406531886853. ✘ 'poly-degree'

6406531886854. ✓ 'poly__degree'

Sub-Section Number :	4
Sub-Section Id :	64065380522
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 271 Question Id : 640653564457 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 code produces an output of 0.9125. How is the output expected to change if we increase the max_depth value?:

```
from sklearn.datasets import load_wine
from sklearn.tree import DecisionTreeClassifier
from sklearn.model_selection import train_test_split
X,y = load_wine(as_frame = True, return_X_y = True)

X_train,X_test,y_train,y_test = train_test_split(X,
                                                y,
                                                test_size = 0.10,
                                                random_state = 12)

clf = DecisionTreeClassifier(max_depth = 2,
                             min_samples_split = 2,
                             min_samples_leaf=3,
                             random_state = 81)

clf.fit(X_train, y_train)
print(clf.score(X_train, y_train))
```

Options :

6406531886829. ✓ Output score is likely to increase.

6406531886830. ✗ Output score is likely to decrease.

6406531886831. ✗ Output score may increase or decrease.

6406531886832. ✗ Output score will remain the same.

Question Number : 272 Question Id : 640653564459 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

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

```
from sklearn.tree import DecisionTreeClassifier
from sklearn.model_selection import GridSearchCV
param_grid = [ {'max_depth':range(1, 10, 2),
               'min_samples_split': range(1, 10, 3)}]
gs = GridSearchCV(DecisionTreeClassifier(),
                  param_grid, cv = 5)
gs.fit(X,y)
```

Options :

6406531886837. ✘ 20

6406531886838. ✓ 75

6406531886839. ✘ 8

6406531886840. ✘ 15

6406531886841. ✘ 40

Question Number : 273 Question Id : 640653564461 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 two classifiers as shown in the following block of code:

```

from sklearn.datasets import load_wine
from sklearn.tree import DecisionTreeClassifier
from sklearn.model_selection import train_test_split
X,y = load_wine(as_frame = True,
                 return_X_y = True)
X_train,X_test,y_train,y_test = train_test_split(X, y,
                                                 test_size = 0.2,
                                                 random_state = 1)
clf1 = DecisionTreeClassifier(min_samples_split = 7,
                               min_samples_leaf = 4,
                               random_state = 5)
clf1.fit(X_train, y_train)

clf2 = DecisionTreeClassifier(min_samples_split = 4,
                               min_samples_leaf = 2,
                               random_state = 5)
clf2.fit(X_train, y_train)

```

What can we say about the depths of the classifiers clf1 and clf2?

Options :

6406531886846. ❌ depth(clf1) ≥ depth(clf2)

6406531886847. ✓ depth(clf1) ≤ depth(clf2)

6406531886848. ❌ depth(clf1) = depth(clf2)

6406531886849. ❌ Insufficient Information

Sub-Section Number : 5

Sub-Section Id : 64065380523

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 274 Question Id : 640653564433 Question Type : MSQ Is Question

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

Correct Marks : 2 Selectable Option : 0

Question Label : Multiple Select Question

Consider the following code:

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

The sizes of X and y are (150, 4) and (150,) respectively. Which of the following would be the correct code snippet to split X and y into training and test data such that test data has 45 samples?

Options :

6406531886734. ✓ `train_X, test_X, train_y, test_y = train_test_split(X, y,
test_size=45, random_state=42)`

6406531886735. ✓ `train_X, test_X, train_y, test_y = train_test_split(X, y,
train_size=105, random_state=42)`

6406531886736. ✓ `train_X, test_X, train_y, test_y = train_test_split(X, y,
test_size=0.3, random_state=42)`

6406531886737. ✓ `train_X, test_X, train_y, test_y = train_test_split(X, y,
train_size=0.7, random_state=42)`

Question Number : 275 Question Id : 640653564437 Question Type : MSQ Is Question

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

Correct Marks : 2 Selectable Option : 0

Question Label : Multiple Select Question

Consider the following code block with respect to some dataset contained in X and y.

```
from sklearn.linear_model import linear_regression
from sklearn.model_selection import cross_val_score
from sklearn.model_selection import ShuffleSplit
lin_reg = linear_regression()
shuffle_split = ShuffleSplit(n_splits=5, test_size=0.2, random_state=42)
score = cross_val_score(lin_reg, X, y, cv=shuffle_split,
scoring='-----')
```

Which of the following may be appropriate to be filled in the blank space?

Options :

6406531886751. ✓ r²

6406531886752. ✗ neg_r2

6406531886753. ✗ mean_absolute_error

6406531886754. ✓ neg_mean_absolute_error

Question Number : 276 Question Id : 640653564446 Question Type : MSQ Is Question

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

Correct Marks : 2 Selectable Option : 0

Question Label : Multiple Select Question

Which of the following models are inherently multiclass models?

Options :

6406531886785. ✓ KNN

6406531886786. ✓ Decision trees

6406531886787. ✗ Perceptron

6406531886788. ✗ Logistic regression

Question Number : 277 Question Id : 640653564452 Question Type : MSQ Is Question

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

Correct Marks : 2 Selectable Option : 0

Question Label : Multiple Select Question

Which of the following is/are correct regarding Radius Neighbors Classifier

Options :

6406531886809. ❌ Only 5 neighbours in the range of some radius are used to compute the label of a sample.

6406531886810. ✓ All the neighbours in the range of some radius are used to compute the label of a sample.

6406531886811. ❌ It is sensitive to outliers.

6406531886812. ✓ It is not sensitive to outliers.

Question Number : 278 Question Id : 640653564456 Question Type : MSQ Is Question

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

Correct Marks : 2 Selectable Option : 0

Question Label : Multiple Select Question

Which options are correct for large datasets that don't fit into the system's main memory?

Options :

6406531886825. ❌ No data preprocessing can be performed.

6406531886826. ✓ One hot encoding can not be applied directly or by iteratively learning one hot encoder's parameters and then applying one hot encoding in batches.

6406531886827. ✓ Standard scaling parameters can be learnt iteratively then standard scaling can be applied in batches.

6406531886828. ❌ One hot encoding and standard scaling can be applied directly or iteratively.

Question Number : 279 Question Id : 640653564466 Question Type : MSQ Is Question

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

Correct Marks : 2 Selectable Option : 0

Question Label : Multiple Select Question

Which of the following class(es) is/are used to instantiate a neural network in Sklearn.

Options :

6406531886864. ❌ SGDClassifier()

6406531886865. ✓ MLPClassifier()

6406531886866. ❌ NNClassifier()

6406531886867. ✓ MLPRegressor()

Sub-Section Number : 6

Sub-Section Id : 64065380524

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 280 Question Id : 640653564444 Question Type : MSQ Is Question

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

Correct Marks : 3 Selectable Option : 0

Question Label : Multiple Select Question

Which of the following is correct?

Options :

6406531886776. ✓ SGDClassifier(loss="perceptron") is stochastic version of a perceptron model

6406531886777. ❌ SGDClassifier(loss="percept") is stochastic version of a perceptron model

6406531886778. ✓ SGDClassifier(loss="log_loss") is stochastic version of a logistic classifier model

6406531886779. ✓ SGDClassifier() is stochastic version of a SVM model

Question Number : 281 Question Id : 640653564448 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3 Selectable Option : 0

Question Label : Multiple Select Question

Which of the following processes should be done if we get an imbalanced dataset? Data is imbalanced when the target class has an uneven distribution of label values.

Options :

6406531886793. ❌ Remove all the minority classes

6406531886794. ❌ Remove all the majority classes

6406531886795. ✓ Up-sample the minority classes

6406531886796. ✓ down-sample the majority classes

Question Number : 282 Question Id : 640653564449 Question Type : MSQ Is Question

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

Correct Marks : 3 Selectable Option : 0

Question Label : Multiple Select Question

Which of the following is true about Naive Bayes algorithm ?

Options :

6406531886797. ❌ It is primarily used for regression problems

6406531886798. ✓ It is primarily used for classification problems

6406531886799. ❌ Hyperparameter tuning is required

6406531886800. ✓ Hyperparameter tuning is not required

Question Number : 283 Question Id : 640653564453 Question Type : MSQ Is Question

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

Correct Marks : 3 Selectable Option : 0

Question Label : Multiple Select Question

In which of the following cases we should use `partial_fit` instead of `fit` method ?

Options :

6406531886813. ✓ Data is continuously being generated

6406531886814. ✓ Data is generated every month

6406531886815. ✓ Whole data is generated and its in a huge file size

6406531886816. ✗ For very small dataset

Question Number : 284 Question Id : 640653564455 Question Type : MSQ Is Question

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

Correct Marks : 3 Selectable Option : 0

Question Label : Multiple Select Question

Which options are correct for Support Vectors in SVM ?

Options :

6406531886821. ✓ Support vectors are the data points nearest to the hyperplane

6406531886822. ✓ Using these support vectors, we maximize the margin of the classifier.

6406531886823. ✗ Using these support vectors, we minimize the margin of the classifier.

6406531886824. ✗ None of these

Sub-Section Number :

7

Sub-Section Id :

64065380525

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 285 Question Id : 640653564460 Question Type : MSQ Is Question

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

Correct Marks : 4 Selectable Option : 0

Question Label : Multiple Select Question

Consider the following block of code:

```
from sklearn.datasets import load_breast_cancer
from sklearn.tree import DecisionTreeClassifier
from sklearn.model_selection import train_test_split
X,y = load_breast_cancer(as_frame = True,
                         return_X_y = True)
X_train,X_test,y_train,y_test = train_test_split(X,y,
                                                test_size = 0.2,
                                                random_state = 1)

clf = DecisionTreeClassifier(min_samples_split = 6,
                             min_samples_leaf = 4,
                             random_state = 5)

clf.fit(X_train, y_train)
print(clf.score(X_test, y_test))
```

In which of the following scenarios, the split will be done at node N?

Options :

6406531886842. ✓ Number of samples at node N = 15. If it is split, it will result in 9 nodes in the left child and 6 nodes in the right child.

6406531886843. ✗ Number of samples at node N = 5. If it is split, it will result in 4 nodes in the left child and 2 nodes in the right child.

6406531886844. ✓ Number of samples at node N = 7. If it is split, it will result in 4 nodes in the left child and 3 nodes in the right child.

6406531886845. ✗ Number of samples at node N = 12. If it is split, it will result in 3 nodes in the left child and 9 nodes in the right child.

Question Number : 286 Question Id : 640653564464 Question Type : MSQ Is Question

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

Time : 0

Correct Marks : 4 Selectable Option : 0

Question Label : Multiple Select Question

Suppose we want to choose the best value of k in k -means clustering algorithm using Silhouette Coefficient values. Which of the following are required to compute the coefficient value? Note: Labels (cluster number) of the samples are random. There is no functional relationship between a sample and its label

Options :

6406531886856. ✓ All the samples in the dataset

6406531886857. ✗ A few randomly selected samples in the dataset

6406531886858. ✓ The number of clusters k , such that $k \geq 2$

6406531886859. ✗ The number of clusters k , such that $k \geq 1$

Question Number : 287 Question Id : 640653564465 Question Type : MSQ Is Question

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

Time : 0

Correct Marks : 4 Selectable Option : 0

Question Label : Multiple Select Question

Which of the following approach(es) is(are) helpful to find a good value for k in k -means clustering algorithm?

Options :

6406531886860. ✓ Plotting an Elbow curve

6406531886861. ✗ Using GridSearchCV or RandomizedSearchCV for various values of k

6406531886862. ✓ Plotting Silhouette coefficient for various values of k

6406531886863. ✗ Using k -fold cross validation

Question Number : 288 Question Id : 640653564467 Question Type : MSQ Is Question

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

Correct Marks : 4 Selectable Option : 0

Question Label : Multiple Select Question

The following line of code create a neural network (assume necessary imports)

```
regr = MLPRegressor(hidden_layer_size= (5,3),max_iter=5).fit(X_train, y_train)
```

Select the correct statements from the following list of statements

Options :

6406531886868. ❌ The neural network contains 3 hidden layers with 5 neurons in each hidden layer

6406531886869. ❌ The neural network contains 5 hidden layers with 3 neurons in each hidden layer

6406531886870. ✓ The neural network contains 2 hidden layers with 3 neurons in the second hidden layer

6406531886871. ✓ The neural network contains 2 hidden layers with 5 neurons in the first hidden layer

6406531886872. ❌ None of the given options are correct

Sub-Section Number : 8

Sub-Section Id : 64065380526

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 289 Question Id : 640653564440 Question Type : SA Calculator : None

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

Correct Marks : 2

Question Label : Short Answer Question

What will be the output of the following code?:

```
from sklearn.metrics import max_error
y_true = [0.5, 0.2, 0.7, 1]
y_pred = [0.4, 0.2, 1, 0.1]
max_error(y_true, y_pred)
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.85 to 0.95

Sub-Section Number : 9

Sub-Section Id : 64065380527

Question Shuffling Allowed : Yes

Is Section Default? : null

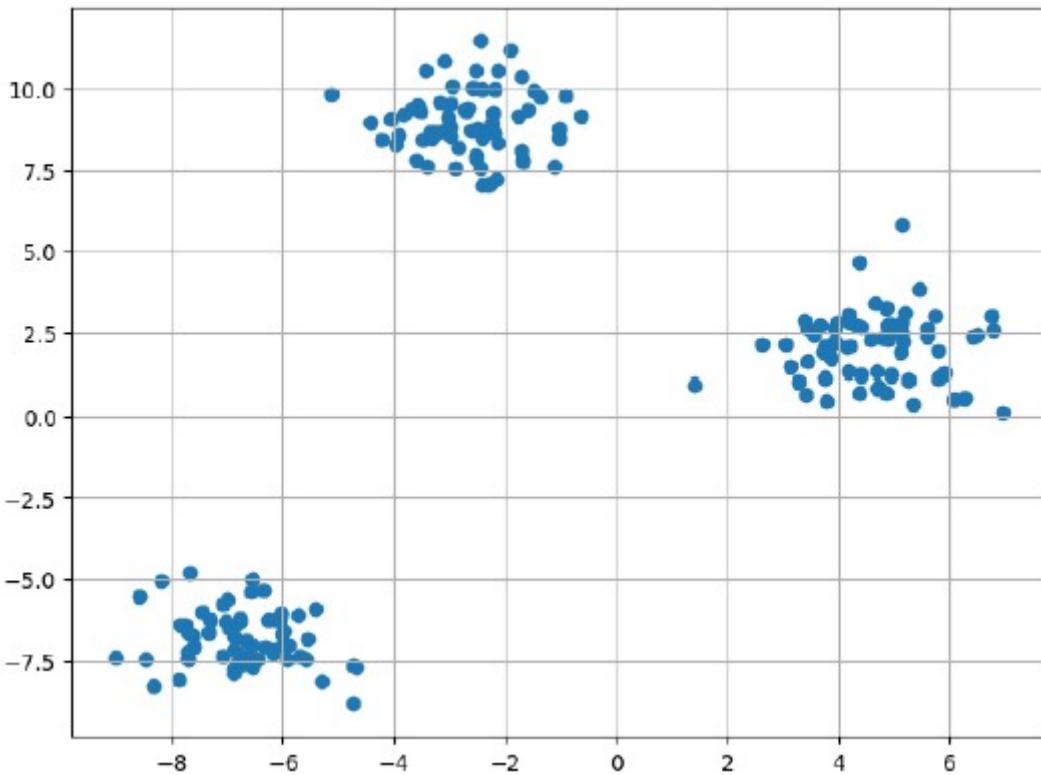
Question Number : 290 **Question Id :** 640653564463 **Question Type :** SA **Calculator :** None

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

Correct Marks : 4

Question Label : Short Answer Question

The plot below shows a distribution of 200 samples with 2 features in Euclidean space. Suppose we use the K-means clustering algorithm to group these data points into individual clusters. Enter the value of K for which the inertia (Sum Square Error) will be zero. If you conclude, there is no such value for K , then enter -1.



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

200

PDSA

Section Id : 64065338343

Section Number : 11

Section type : Online

Mandatory or Optional : Mandatory

Number of Questions : 28

Number of Questions to be attempted : 28

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 :	64065380528
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 291 Question Id : 640653564468 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 (COMPUTER BASED EXAM)"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?

CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

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

Options :

6406531886873. ✓ YES

6406531886874. ✘ NO

Sub-Section Number :	2
Sub-Section Id :	64065380529
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 292 Question Id : 640653564469 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

$$f1(n) = 2^n$$

$$f2(n) = n^{3/2}$$

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

$$f4(n) = n^{\log n}$$

Arrange the above functions in increasing order of asymptotic complexity.

Options :

6406531886875. ❌ $f4(n), f3(n), f2(n), f1(n)$

6406531886876. ✓ $f3(n), f2(n), f4(n), f1(n)$

6406531886877. ❌ $f3(n), f4(n), f2(n), f1(n)$

6406531886878. ❌ $f3(n), f4(n), f1(n), f2(n)$

Question Number : 293 Question Id : 640653564471 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 two integer lists `L1` and `L2` of same size `n`. `L1` contains all distinct integers and `L2` contains all distinct integers, but there can be some elements common between `L1` and `L2`.

What would be the time complexity of the best known algorithm to find the common elements in both list ?

Options :

6406531886883. ✘ $O(n)$

6406531886884. ✘ $O(n^2)$

6406531886885. ✓ $O(n \log n)$

6406531886886. ✘ $O(n^2 \log n)$

Question Number : 294 Question Id : 640653564478 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 weighted, directed acyclic graph $G = (V, E, w)$ in which edges that leave the source vertex s may have negative weights and all other edges weights are non-negative.

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

I. Dijkstra's algorithm correctly computes the shortest-path weight $\delta(s, t)$ from s to every vertex t in this graph G .

II. Dijkstra's algorithm may compute an incorrect shortest-path weight $\delta(s, t)$ from s to at least one vertex t in this graph G .

III. Bellman's Ford algorithm correctly computes the shortest-path weight $\delta(s, t)$ from s to every vertex t in this graph G .

Options :

6406531886910. ✘ Only I

6406531886911. ✘ II and III

6406531886912. ✘ Only III

6406531886913. ✓ I and III

Question Number : 295 Question Id : 640653564480 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 $G = (V, E)$ is an undirected graph having distinct positive edge weights. Let V be partitioned into two non-empty sets X and Y . Let S be the set of all the edges, where one end of each edge belongs to X and another end belongs to Y .

Consider a single edge e which has the strictly lowest weight among all edges in set S . Which one of the following is true?

Options :

6406531886918. ✓ Edge e would be present in all the MSTs of the graph.

6406531886919. ✗ Edge e would not be present in any MST of the graph.

6406531886920. ✗ Edge e would be not present in all the MSTs of the graph, but would be present in some of the MSTs of the graph.

Question Number : 296 Question Id : 640653564488 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 strategy to solve a problem of input size n .

Divide the problem into 4 sub-problems, each of size $\frac{n}{4}$. Number of steps required to combine these 4 solutions is $2n$. We apply this strategy recursively till the sub-problems can not be further divided into sub-problems.

What will be the nearest upper bound for the above algorithm?

Options :

6406531886944. ✗

$O(n^2)$

6406531886945. ✘ $O(n^4)$

6406531886946. ✓ $O(n \log n)$

6406531886947. ✘ $O(n)$

Question Number : 297 Question Id : 640653564496 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Given a flow network (G, s, t, c) and a flow f , how will you determine if f is maximum flow?

Options :

6406531886970. ✘ If there is any edge that is not saturated to full capacity, then we can conclude that f is not a maximum flow.

6406531886971. ✓ If the residual graph does not have any augmenting paths then f is a maximum flow.

6406531886972. ✘ If the value of the flow f is not the sum of the capacities of the edges coming out of the source s then f is not a maximum flow.

6406531886973. ✘ If the value of the flow f is not the sum of the capacities of the edges coming into the sink t then f is not a maximum flow.

Sub-Section Number :	3
Sub-Section Id :	64065380530
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 298 Question Id : 640653564473 Question Type : MCQ Is Question

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

Correct Marks : 4

Question Label : Multiple Choice Question

Let `s` be a stack and `q` be a queue supporting the following operations:

Stack operation:

- `Push(d)` : Insert element `d` in stack
- `Pop()` : Remove element from the stack and return the removed element

Queue Operation:

- `Enqueue(d)` : Insert element `d` in queue
- `dequeue()` : Remove element from the queue and return the removed element

Suppose initially elements A, B, C, D, E, F and G are pushed onto stack `s` in reverse order, i.e., starting from G.

The following sequence of operations is performed on stack `s` and queue `q`:

- ```

1 Q.Enqueue(S.Pop())
2 Q.Enqueue(S.Pop())
3 Q.Enqueue(S.Pop())
4 Q.Enqueue(S.Pop())
5 Q.Enqueue(S.Pop())
6 S.Push(Q.Dequeue())
7 S.Push(Q.Dequeue())
8 Result = S.Pop()

```

What would be the value of `Result` after completion of operations ?

**Options :**

6406531886891. ✘ A

6406531886892. ✓ B

6406531886893. ✗ E

6406531886894. ✗ G

6406531886895. ✗ F

**Question Number : 299 Question Id : 640653564475 Question Type : MCQ Is Question**

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

**Correct Marks : 4**

Question Label : Multiple Choice Question

Let  $G$  be a simple graph with 16 vertices and 8 connected components. If we delete one vertex from  $G$ , then the minimum and maximum number of possible connected components are

\_\_\_\_\_.

**Options :**

6406531886901. ✗ 7 and 16

6406531886902. ✗ 8 and 15

6406531886903. ✓ 7 and 15

6406531886904. ✗ 8 and 16

**Question Number : 300 Question Id : 640653564476 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 **BFS traversal** of an undirected connected graph  $G$ . Let  $u_1, u_2, \dots, u_n$  be the order in which the vertices of  $G$  are visited for the first time during BFS traversal. Let  $u_i$  and  $u_{i+1}$  be two consecutively visited vertices during the BFS traversal for some  $i$ , where  $1 \leq i < n$ . Which of the following option is correct?

**Options :**

6406531886905. ❌  $(u_i, u_{i+1})$  must be an edge in  $G$ .

6406531886906. ✓  $(u_i, u_{i+1})$  may not be an edge in  $G$ .

6406531886907. ❌ If  $(u_i, u_{i+1})$  is not an edge in  $G$ , then there must exist at least one vertex which is adjacent to both  $u_i$  and  $u_{i+1}$  in  $G$ .

6406531886908. ❌ Vertex  $u_n$  must be a leaf in  $G$  (i.e. degree of  $u_n$  must be 1 in  $G$ ).

**Question Number : 301 Question Id : 640653564479 Question Type : MCQ Is Question**

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

**Correct Marks : 4**

Question Label : Multiple Choice Question

Consider a undirected graph  $G$  with the following edges where each tuple  $(u, v, w)$  represent one edge between vertex  $u$  and  $v$  with weight  $w$ :

$[(A, B, 1), (A, C, 1), (B, C, 2), (B, D, 6), (C, E, 5), (D, E, 4), (D, F, 3), (E, F, 3)]$

Which of the following statement(s) is/are correct for given graph  $G$  ?

- I. The cost of the minimum spanning tree for graph  $G$  is 13.
- II. More than one minimum spanning tree are possible with same cost, because edges weights are not distinct in given graph  $G$
- III. Edge  $(C, E)$  will not be the part of minimum spanning tree

**Options :**

6406531886914. ❌ I and III

6406531886915. ✓ Only I

6406531886916. ❌ Only II

6406531886917.

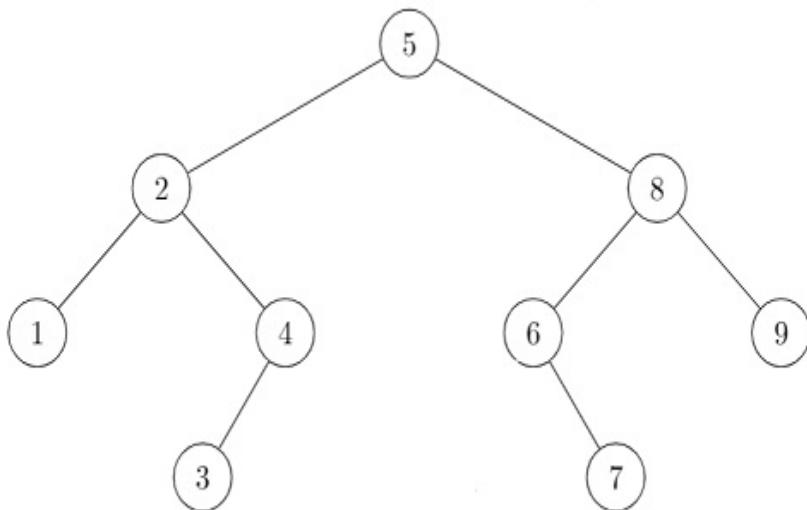
\* II and III

**Question Number : 302 Question Id : 640653564483 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 binary tree.



Which of the following order is represented **pre-order traversal** for the given binary tree ?

**Options :**

6406531886927. \* 5 2 1 3 4 8 6 7 9

6406531886928. \* 5 2 1 4 3 7 6 8 9

6406531886929. ✓ 5 2 1 4 3 8 6 7 9

6406531886930. \* 1 3 4 2 7 6 9 8 5

**Question Number : 303 Question Id : 640653564487 Question Type : MCQ Is Question**

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

**Time : 0**

**Correct Marks : 4**

**Question Label : Multiple Choice Question**

Let  $A$  be a list of  $n$  integers. The function `findMaxMin(i, j, A)` returns maximum `maxA` and minimum `minA` in  $A[i:j]$  where  $i \leq j$ .

```
1 def findMaxMin(i, j, A):
2 if (i == j):
3 maxA = minA = A[i]
4 if (i == j - 1):
5 if (A[i] < A[j]):
6 maxA, minA = A[j], A[i]
7 else:
8 maxA, minA = A[i], A[j]
9 else:
10 m = (i + j) // 2
11 maxL, minL = findMaxMin(i, m, A)
12 maxR, minR = findMaxMin(m + 1, j, A)
13 maxA = max(maxL, maxR)
14 minA = min(minL, minR)
15 return maxA, minA
```

Let  $T(n)$  denote the worst case running time of the algorithm. Which of the following is a **valid** recurrence for given function ?

**Options :**

$$T(1) = T(2) = 1$$

6406531886940. ✓ *For  $n > 2$ ,  $T(n) = 2T(n/2) + 1$*

$$T(1) = T(2) = 1$$

*For  $n > 2$ ,  $T(n) = 2T(n/2) + n$*

6406531886941. ❌

$$T(1) = T(2) = 1$$

*For  $n > 2$ ,  $T(n) = T(n/2) + 1$*

6406531886942. ❌

6406531886943. ❌

$$T(1) = T(2) = 1$$

$$\text{For } n > 2, T(n) = T(n/2) + n$$

**Question Number : 304 Question Id : 640653564492 Question Type : MCQ Is Question**

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

**Time : 0**

**Correct Marks : 4**

Question Label : Multiple Choice Question

Which of the following combination of input text T and pattern P will exhibit the worst case running time behavior for **Boyer-Moore skipping heuristic?**

**Options :**

6406531886956. ❌ T = `baabaabaabaabaa` and P = `abb`

6406531886957. ❌ T = `aaaaaaaaaaaaaaaaaa` and P = `abb`

6406531886958. ✓ T = `aaaaaaaaaaaaaaaaaa` and P = `baa`

6406531886959. ❌ T = `aaaaaaaaaaaaaaaaaa` and P = `bbb`

**Sub-Section Number :** 4

**Sub-Section Id :** 64065380531

**Question Shuffling Allowed :** Yes

**Is Section Default? :** null

**Question Number : 305 Question Id : 640653564470 Question Type : MSQ Is Question**

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

**Time : 0**

**Correct Marks : 3 Selectable Option : 0**

Question Label : Multiple Select Question

Which of the following statements is/are **true** about the sorting algorithms ?

**Options :**

6406531886879. ✓ The complexity of Selection sort remains the same irrespective of the sequence of elements.

6406531886880. ✗ The complexity of Insertion sort remains the same irrespective of the sequence of elements.

6406531886881. ✓ The complexity of Merge sort remains the same irrespective of the sequence of elements.

6406531886882. ✓ The complexity of Heap sort remains the same irrespective of the sequence of elements.

**Question Number : 306 Question Id : 640653564472 Question Type : MSQ Is Question**

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

**Correct Marks : 3 Selectable Option : 0**

Question Label : Multiple Select Question

Which of the following statements is/are **true** about the **Quicksort algorithm** to sort elements in ascending order? Assume that the first element in the list selected as pivot for partitioning each time.

**Options :**

6406531886887. ✓ The best case is when the pivot element always divides the list into two equal halves.

6406531886888. ✗ The best case is when the input list is already sorted in ascending order.

6406531886889. ✓ The worst case is when the input list is arranged in descending order.

6406531886890. ✓ The worst case is when the input list is arranged in ascending order.

**Question Number : 307 Question Id : 640653564485 Question Type : MSQ Is Question**

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

Time : 0

Correct Marks : 3 Selectable Option : 0

Question Label : Multiple Select Question

Which of the following are possible **valid** codes for the character set  $S = \{A, B, C, D, E, F\}$ , generated using the **Huffman algorithm**?

Options :

| Character    | A   | B    | C    | D  | E  | F  |
|--------------|-----|------|------|----|----|----|
| Huffman code | 000 | 0010 | 0101 | 01 | 10 | 11 |

6406531886935. ✘

| Character    | A   | B    | C    | D  | E  | F  |
|--------------|-----|------|------|----|----|----|
| Huffman code | 000 | 0010 | 0011 | 01 | 10 | 11 |

6406531886936. ✓

| Character    | A   | B    | C    | D   | E   | F   |
|--------------|-----|------|------|-----|-----|-----|
| Huffman code | 100 | 1011 | 1001 | 011 | 101 | 000 |

6406531886937. ✘

| Character    | A   | B   | C   | D   | E  | F  |
|--------------|-----|-----|-----|-----|----|----|
| Huffman code | 000 | 001 | 010 | 011 | 10 | 11 |

6406531886938. ✓

Question Number : 308 Question Id : 640653564493 Question Type : MSQ Is Question

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

Correct Marks : 3 Selectable Option : 0

Question Label : Multiple Select Question

Which of the following statement(s) is/are true about Knuth-Morris-Pratt (KMP) algorithm for string matching? Consider that  $n$  and  $m$  are the length of text and pattern.

**Options :**

6406531886960. ✓ Complexity for computing `fail function` is  $O(m)$

6406531886961. ✗ Overall KMP algorithm's complexity is  $O(nm)$

6406531886962. ✓ Overall KMP algorithm's complexity is  $O(n + m)$

6406531886963. ✓ KMP algorithm efficiently computes the automaton describing prefix matches in the pattern.

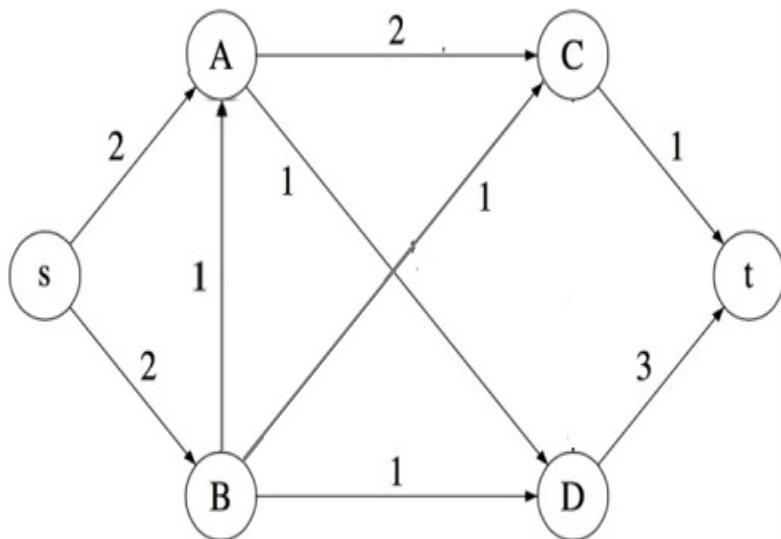
**Question Number : 309 Question Id : 640653564497 Question Type : MSQ Is Question**

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

**Correct Marks : 3 Selectable Option : 0**

Question Label : Multiple Select Question

Consider the following network with source  $s$  and sink  $t$ , with the numbers on the edges denoting maximum capacity across a particular edge.



Suppose we want to increase the flow from the vertex  $s$  to  $t$ . An edge is called a bottleneck edge if the flow from  $s$  to  $t$  increases upon increasing the capacity of that edge. Select the bottleneck edge(s) from the below given options.

**Note:** If there are multiple bottleneck edges in the given options then select all of them.

**Options :**

6406531886974. ❌ (B,C)

6406531886975. ✓ (A,D)

6406531886976. ✓ (B,D)

6406531886977. ❌ (B, A)

**Sub-Section Number :** 5

**Sub-Section Id :** 64065380532

**Question Shuffling Allowed :** Yes

**Is Section Default? :** null

**Question Number : 310 Question Id : 640653564474 Question Type : MSQ Is Question**

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

**Correct Marks : 4 Selectable Option : 0**

**Question Label : Multiple Select Question**

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

Consider the given hash table with hash function  $h(key) = key \bmod 10$  which uses **linear probing** for solving collisions.

| Index | Key |
|-------|-----|
| 0     |     |
| 1     |     |
| 2     |     |
| 3     | 63  |
| 4     | 23  |
| 5     | 45  |
| 6     | 25  |
| 7     | 37  |
| 8     | 15  |
| 9     |     |

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

**Options :**

6406531886896. ✓ 45, 63, 37, 25, 23, 15

6406531886897. ✗ 45, 23, 25, 37, 63, 15

6406531886898. ✗ 45, 37, 63, 15, 23, 25

6406531886899. ✓ 37, 45, 25, 63, 23, 15

6406531886900. ✓ 63, 45, 23, 25, 37, 15

**Question Number : 311 Question Id : 640653564482 Question Type : MSQ Is Question**

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

**Time : 0**

**Correct Marks : 4 Selectable Option : 0**

Question Label : Multiple Select Question

Consider the max-heap [30, 25, 20, 5, 15, 8, 10, 3, 2, 12] built by repeatedly inserting values into an empty heap. Which of the following could not have been the last element inserted into this heap?

**Options :**

6406531886922. ✘ 15

6406531886923. ✘ 25

6406531886924. ✓ 20

6406531886925. ✓ 5

6406531886926. ✘ 30

**Question Number : 312 Question Id : 640653564484 Question Type : MSQ Is Question**

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

**Correct Marks : 4 Selectable Option : 0**

Question Label : Multiple Select Question

Which of the following is/are true about **AVL Tree**? Assume that the height of the empty tree is 0.

**Options :**

In AVL tree, the absolute difference between the number of nodes in the left subtree and the

6406531886931. ✘ number of nodes in the right subtree of any node can't be more than 1.

6406531886932. ✓ The complexity of searching in an AVL tree is  $O(\log n)$ .

6406531886933. ✘ The complexity of both insertion and deletion in AVL tree is  $O(n)$ .

6406531886934. ✓ If the height of an AVL tree is  $h$ , the maximum number of nodes will be  $2^h - 1$ .

**Question Number : 313 Question Id : 640653564495 Question Type : MSQ Is Question**

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

**Correct Marks : 4 Selectable Option : 0**

Question Label : Multiple Select Question

A plant manufactures two types of products  $A$  and  $B$  and sells them at a profit of Rs. 5 per item on type  $A$  and Rs. 3 per item on type  $B$ . Each product is processed on two machines  $G$  and  $H$ . One item of type  $A$  requires one minute of processing time on  $G$  and two minutes on  $H$ ; One item of type  $B$  requires one minute on  $G$  and one minute on  $H$ . The machine  $G$  is available for not more than 5 hours 40 minutes, while machine  $H$  is available for 7 hours 20 minutes during any working day. Let  $X_1$  be the number of item produced of type  $A$  and  $X_2$  be the number of item produced of type  $B$ .

Objective function to maximize the total profit  $Z = 5X_1 + 3X_2$

Which of the following is/are **not a valid** constraint for the given problem?

**Options :**

6406531886965. ✘  $X_1 + X_2 \leq 340$

6406531886966. ✓  $X_1 + 2X_2 \leq 440$

6406531886967. ✘  $X_1 \geq 0, X_2 \geq 0$

6406531886968. ✘  $2X_1 + X_2 \leq 440$

6406531886969. ✓  $X_1 + X_2 \geq 340$

**Sub-Section Number :** 6

**Sub-Section Id :** 64065380533

**Question Shuffling Allowed :** Yes

**Is Section Default? :**

null

**Question Number : 314 Question Id : 640653564477 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 house is being rewired. The house has 10 rooms named from A to J. To avoid wires getting entangled and creating short circuits, the electricians have been asked to observe the following rules.

- Room A must be rewired before rooms D and E.
- Room B must be rewired before rooms D and E.
- Room C must be rewired before room H.
- Room D must be rewired before rooms C and F.
- Room E must be rewired before rooms F and G.
- Room F must be rewired before rooms H and J.
- Room G must be rewired before room I.
- Room H must be rewired before room J.
- Room I must be rewired before room J.

It takes one full day to rewire a room. There are enough electricians to rewire as many rooms as can be rewired in parallel, keeping in mind the constraints above. What is the minimum number of days required to complete the job?

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

5

**Question Number : 315 Question Id : 640653564481 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 a binary tree with 30 nodes, where the number of nodes which have one child is 11. The number of leaf nodes is \_\_\_\_\_.

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number : 316 Question Id : 640653564486 Question Type : SA Calculator : None**

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

**Correct Marks : 4**

Question Label : Short Answer Question

In a list  $L$ , two elements  $L[i]$  and  $L[j]$  form a **significant inversion** if  $L[i] \geq 2 * L[j]$  and  $i < j$ .

The total number of significant inversions for  $L = [6, 4, 5, 2, 1, 3]$  is \_\_\_\_.

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

8

**Question Number : 317 Question Id : 640653564494 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 **Rabin-Karp algorithm** using modulo arithmetic to match the pattern in base 10.

Taking modulo  $q = 11$ , how many **false positives** matches does the Rabin-Karp matcher encounter while searching pattern 24 in the text 3241572653579324?

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

4

**Sub-Section Number :** 7

**Sub-Section Id :** 64065380534

**Question Shuffling Allowed :** No

**Is Section Default? :** null

**Question Id :** 640653564489 **Question Type :** COMPREHENSION **Sub Question Shuffling Allowed :** No **Group Comprehension Questions :** No **Question Pattern Type :** NonMatrix **Calculator :** None **Response Time :** N.A **Think Time :** N.A **Minimum Instruction Time :** 0

**Question Numbers :** (318 to 319)

Question Label : Comprehension

Your final End term exams are going to be over and you are catching up on Netflix. You have a schedule of interesting live shows during the next day. You hate to start or stop watching a show midway, so your aim is to watch as many complete shows as possible during the day.

Suppose there are  $n$  such shows  $S_1, S_2, \dots, S_n$  available during the coming day. The shows are ordered by starting time, so for each  $i \in 1, 2, \dots, n - 1$ ,  $S_i$  starts before  $S_{i+1}$ . However, show  $S_i$  may not end before  $S_{i+1}$  starts, so for each  $i \in 1, 2, \dots, n - 1$ ,  $\text{Next}[i]$  is the smallest  $j > i$  such that  $S_j$  starts after  $S_i$  finishes if such a  $j$  exists, otherwise -1.

Given the sequence  $S_1, S_2, \dots, S_n$  and the values  $\text{Next}[i]$  for each  $i \in 1, 2, \dots, n$ , your aim is to compute the maximum number of complete shows that can be watched.

Based on the above data, answer the given subquestions.

**Sub questions**

**Question Number : 318 Question Id : 640653564490 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 dynamic programming approach:

Let  $Watch[i]$  denote the maximum number of complete shows that can be watched among  $S_i, S_{i+1}, \dots, S_n$ . Which of the following is a correct inductive formulation of  $Watch[i]$  for  $i \in n-1, n-2, \dots, 2, 1$ ? Consider initially  $Watch[n] = 1$ .

**Options :**

$$Watch[i] = \begin{cases} Watch[i + 1], & \text{if } Next[i] = -1 \\ \max(Watch[Next[i]], Watch[i + 1]), & \text{if } Next[i] \neq -1 \end{cases}$$

6406531886948. \*

$$Watch[i] = \begin{cases} Watch[i + 1], & \text{if } Next[i] = -1 \\ \max(Watch[Next[i]], 1 + Watch[i + 1]), & \text{if } Next[i] \neq -1 \end{cases}$$

6406531886949. \*

$$Watch[i] = \begin{cases} Watch[i + 1], & \text{if } Next[i] = -1 \\ \max(1 + Watch[Next[i]], Watch[i + 1]), & \text{if } Next[i] \neq -1 \end{cases}$$

6406531886950. ✓

$$Watch[i] = \begin{cases} 1 + Watch[i + 1], & \text{if } Next[i] = -1 \\ \max(Watch[Next[i]], Watch[i + 1]), & \text{if } Next[i] \neq -1 \end{cases}$$

6406531886951. \*

**Question Number : 319 Question Id : 640653564491 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

How much time will the given dynamic programming approach take to compute the answer?

Assume you have direct access to the *Next* list as well, and you don't have to worry about computing it on your own.

**Options :**

6406531886952. ✘  $O(n^2)$

6406531886953. ✘  $O(n^3)$

6406531886954. ✘  $O(n \log n)$

6406531886955. ✓  $O(n)$

## DBMS

**Section Id :** 64065338344

**Section Number :** 12

**Section type :** Online

**Mandatory or Optional :** Mandatory

**Number of Questions :** 23

**Number of Questions to be attempted :** 23

**Section Marks :** 50

|                                                                     |             |
|---------------------------------------------------------------------|-------------|
| <b>Display Number Panel :</b>                                       | Yes         |
| <b>Group All Questions :</b>                                        | No          |
| <b>Enable Mark as Answered Mark for Review and Clear Response :</b> | Yes         |
| <b>Maximum Instruction Time :</b>                                   | 0           |
| <b>Sub-Section Number :</b>                                         | 1           |
| <b>Sub-Section Id :</b>                                             | 64065380535 |
| <b>Question Shuffling Allowed :</b>                                 | No          |
| <b>Is Section Default? :</b>                                        | null        |

**Question Number : 320 Question Id : 640653564498 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 (COMPUTER BASED EXAM)"**

**ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?**

**CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.**

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

**Options :**

6406531886978. ✓ YES

6406531886979. ✗ NO

|                                     |             |
|-------------------------------------|-------------|
| <b>Sub-Section Number :</b>         | 2           |
| <b>Sub-Section Id :</b>             | 64065380536 |
| <b>Question Shuffling Allowed :</b> | Yes         |
| <b>Is Section Default? :</b>        | null        |

**Question Number : 321 Question Id : 640653564499 Question Type : MCQ Is Question**

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

**Correct Marks : 2**

Question Label : Multiple Choice Question

Choose the correct order of execution of SQL clauses.

**Options :**

6406531886980. ❌ FROM → WHERE → HAVING → GROUP BY → SELECT → ORDER BY

6406531886981. ✓ FROM → WHERE → GROUP BY → HAVING → SELECT → ORDER BY

6406531886982. ❌ SELECT → FROM → WHERE → GROUP BY → HAVING → ORDER BY

6406531886983. ❌ SELECT → FROM → WHERE → ORDER BY → GROUP BY → HAVING

**Question Number : 322 Question Id : 640653564509 Question Type : MCQ Is Question**

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

**Correct Marks : 2**

Question Label : Multiple Choice Question

Consider a magnetic disk with 16 platters, 2 surfaces/platter, 1024 tracks/surface, 2048 sectors/track, and 1024 bytes/sector. The disk rotates with 6000 revolutions per minute. What is the capacity of the disk?

**Options :**

6406531887009. ✓ 64 GB

6406531887010. ❌ 32 GB

6406531887011. ❌ 32 MB

6406531887012. ❌ 64 MB

**Question Number : 323 Question Id : 640653564517 Question Type : MCQ Is Question**

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

**Time : 0**

**Correct Marks : 2**

Question Label : Multiple Choice Question

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

$$\mathcal{F} = \{P \rightarrow QR, Q \rightarrow S, S \rightarrow T\}$$

Which of the following options is a dependency-preserving decomposition of the relation A into A1 and A2?

**Options :**

6406531887032. ✘ A1( $P, R$ ), A2( $Q, S, T$ )

6406531887033. ✓ A1( $P, Q, R$ ), A2( $Q, S, T$ )

6406531887034. ✘ A1( $P, Q, R$ ), A2( $R, S, T$ )

6406531887035. ✘ A1( $P, Q, R$ ), A2( $S, T$ )

**Question Number : 324 Question Id : 640653564519 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

Insert the key values in the following order into an empty 2-3-4 tree: 20, 45, 12, 34, 25, 56, 74, 2, 96 in reverse order. The internal nodes of the resultant 2-3-4 tree must contain which of the following key values. [Note: Using early splitting strategy]

**Options :**

6406531887040. ✘ 2, 20, 34, 56, 96

6406531887041. ✘ 25, 45, 74

6406531887042. ✘ 2, 12, 34, 56

6406531887043. ✓ 45, 12, 25, 74

|                                     |             |
|-------------------------------------|-------------|
| <b>Sub-Section Number :</b>         | 3           |
| <b>Sub-Section Id :</b>             | 64065380537 |
| <b>Question Shuffling Allowed :</b> | No          |
| <b>Is Section Default? :</b>        | null        |

**Question Id : 640653564500 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Question Numbers : (325 to 326)**

Question Label : Comprehension

Consider the following schema diagram of **IPLt20** and answer the given subquestions.

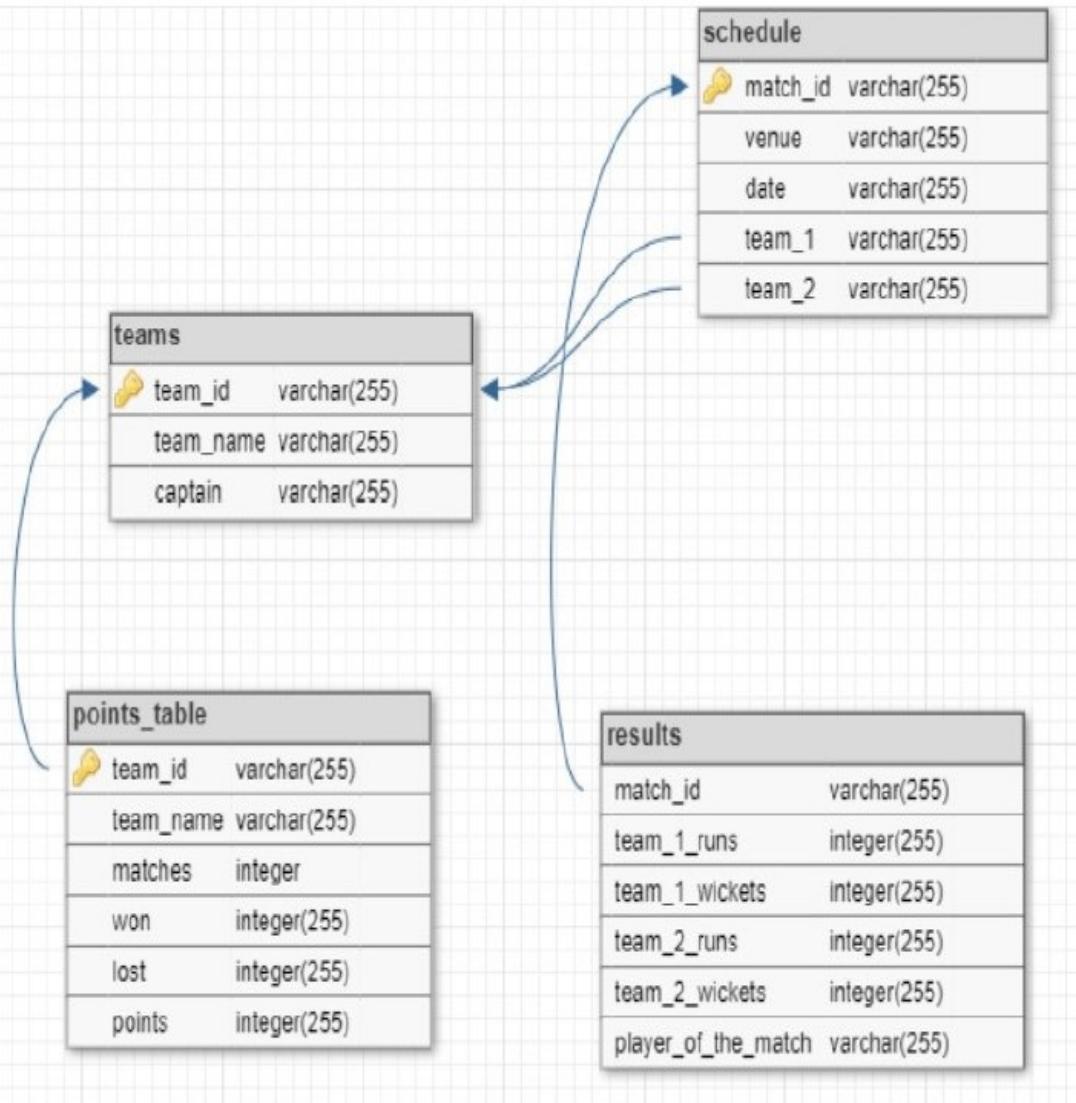


Figure 1: IPLt20

## Sub questions

**Question Number : 325 Question Id : 640653564501 Question Type : MSQ Is Question**

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

**Correct Marks : 3 Selectable Option : 0**

Question Label : Multiple Select Question

Choose the correct SQL code which is used to create the table **schedule**.

**Options :**

```
CREATE table schedule (match_id varchar(255) primary key,
venue varchar(255), date varchar(255), team_1 varchar(255),
team_2 varchar(255), foreign key (team_1) references teams(team_id),
foreign key (team_2) references teams(team_id))
```

6406531886984. ✓

```
CREATE table schedule (match_id varchar(255) primary key,
venue varchar(255), date varchar(255), team_1 varchar(255),
team_2 varchar(255), foreign key (team_1) references teams(team_id),
foreign key (team_2) references teams(team_id),
foreign key (match_id) references results(match_id))
```

6406531886985. ✘

```
CREATE table schedule (match_id varchar(255) primary key,
venue varchar(255), date varchar(255), team_1 varchar(255),
team_2 varchar(255),
```

6406531886986. ✘

```
foreign key (team_1, team_2) references teams(team_id))
```

```
CREATE table schedule (match_id varchar(255),
venue varchar(255), date varchar(255), team_1 varchar(255),
team_2 varchar(255), primary key (match_id),
foreign key (team_1) references teams(team_id),
foreign key (team_2) references teams(team_id))
```

6406531886987. ✓

**Question Number : 326 Question Id : 640653564502 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

Consider a scenario when the team named 'Mumbai Indians' captain 'Rohit Sharma' gets injured, and he is out of the team. The team management has decided to make 'Surya Kumar Yadav' as the captain of 'Mumbai Indians'. Which of the following SQL query is used to update the captain of the team 'Mumbai Indians'?

**Options :**

```
update teams
set captain = 'Surya Kumar Yadav'
where team_name = 'Mumbai Indians'
```

6406531886988. ✓

6406531886989. ✘

```
update teams
where team_name = 'Mumbai Indians'
set captain = 'Surya Kumar Yadav'
```

6406531886990. \*

```
update table teams
set captain = 'Surya Kumar Yadav'
where team_name = 'Mumbai Indians'
```

6406531886991. \*

```
update teams
alter captain = 'Surya Kumar Yadav'
where team_name = 'Mumbai Indians'
```

**Question Id : 640653564521 Question Type : COMPREHENSION Sub Question Shuffling**

**Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix**

**Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Question Numbers : (327 to 328)**

Question Label : Comprehension

Consider a RAID-4 system with 5 disks which stores the following data shown in Figure 2 and answer the given subquestions.

| DISK - 1 | DISK - 2 | DISK - 3 | DISK - 4 | DISK - 5 |         |
|----------|----------|----------|----------|----------|---------|
| 0111     | 0010     | XXXX     | 0001     | 0010     | BLOCK A |
| 0110     | 1101     | XXXX     | 0000     | 1100     | BLOCK B |

Figure 2: RAID-4 data

### Sub questions

**Question Number : 327 Question Id : 640653564522 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

According to the figure disk-3 has crashed. What data is present in the two blocks of disk-3?

*Note: Assume block size is 4 bits*

**Options :**

6406531887048. ✘ block A: 0101, block B: 0101

6406531887049. ✘ block A: 0010, block B: 0100

6406531887050. ✘ block A: 0001, block B: 0000

6406531887051. ✓ block A: 0110, block B: 0111

**Question Number : 328 Question Id : 640653564523 Question Type : MCQ Is Question**

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

**Correct Marks : 2**

Question Label : Multiple Choice Question

Assume that the binary values represent 8 bit ASCII code. What is the data word present inside this RAID-4 storage system?

*Note: The ASCII value of 'A' is 65 and 'a' is 97.*

**Options :**

6406531887052. ✓ ramp

6406531887053. ✘ RAMP

6406531887054. ✘ ROCK

6406531887055. ✘ rock

**Sub-Section Number :**

4

**Sub-Section Id :**

64065380538

**Question Shuffling Allowed :**

No

**Is Section Default? :**

null

**Question Id : 640653564503 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Question Numbers : (329 to 330)**

Question Label : Comprehension

Consider the table **score** as shown below and answer the given subquestions.

| roll_no | m1 | m2 | m3 | s1   | s2   |
|---------|----|----|----|------|------|
| 21f1    | 34 | 45 | 67 | 78   | 33   |
| 21f2    | 34 | 44 | 62 | 78   | 33   |
| 21f3    | 34 | 35 | 67 | 83   | 33   |
| 21f4    | 34 | 45 | 17 | 78   | 23   |
| 21f5    | 14 | 45 | 27 | 78   | 33   |
| 21f9    | 23 | 45 | 66 | 78   | NULL |
| 21f7    | 23 | 45 | 78 | NULL | NULL |

Table: Score

### **Sub questions**

**Question Number : 329 Question Id : 640653564504 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 3**

Question Label : Multiple Choice Question

Match the below SQL queries with the correct output.

**SQL queries:**

- A: `SELECT count(s2) FROM score`
- B: `SELECT count(*) FROM score`
- C: `SELECT m1 + m2 + m3 as maths_score, s1 + s2 as stats_score  
FROM score WHERE roll_no = '21f9'`
- D: `SELECT avg(s2) FROM score`

**Output:**

- 1. 7
- 2. 5
- 3. 31
- 4. 22.14

5. 

|  | maths_score | stats_score |
|--|-------------|-------------|
|  | 134         | NULL        |

6. 

|  | maths_score | stats_score |
|--|-------------|-------------|
|  | 134         | 78          |

**Options :**

6406531886992. ✘ A-1, B-2, C-5, D-4

6406531886993. ✘ A-1, B-2, C-6, D-3

6406531886994. ✓ A-2, B-1, C-5, D-3

6406531886995. ✘ A-2, B-1, C-6, D-4

**Question Number : 330 Question Id : 640653564505 Question Type : MSQ Is Question**

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

**Correct Marks : 2 Selectable Option : 0**

Question Label : Multiple Select Question

Which of the following SQL query can be used to retrieve the roll numbers and average marks ( $m1, m2, m3$ ) of all students who have scored more than 60 in subject  $s1$ , sorted in descending order of their average marks?

**Options :**

```
SELECT roll_no, avg(m1 + m2 + m3) AS average_marks
FROM score
WHERE s1 > 60
ORDER BY average_marks DESC
```

6406531886996. ✘

```
SELECT roll_no, (m1 + m2 + m3)/3 AS average_marks
FROM score
WHERE s1 > 60
ORDER BY average_marks DESC
```

6406531886997. ✓

```
SELECT roll_no, (m1 + m2 + m3)/3 AS average_marks
FROM score
WHERE s1 > 60
ORDER BY average_marks
```

6406531886998. ✘

```
SELECT roll_no, Sum(m1,m2,m3)/3 AS average_marks
FROM score
WHERE s1 > 60
ORDER BY average_marks DESC
```

6406531886999. ✘

**Sub-Section Number :** 5

**Sub-Section Id :** 64065380539

**Question Shuffling Allowed :** Yes

**Is Section Default? :** null

**Question Number : 331 Question Id : 640653564506 Question Type : MSQ Is Question**

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

**Time : 0**

**Correct Marks : 2 Selectable Option : 0**

Question Label : Multiple Select Question

Consider a **nested loop join** for the two relations **instructor** and **department**.

| Relation            | instructor | department |
|---------------------|------------|------------|
| Number of tuples(n) | 2000       | 100        |
| Number of blocks(b) | 600        | 70         |

Assuming the worst-case memory availability and considering **instructor** as the outer relation, which of the following options is/are correct?

**Options :**

6406531887000. ✗ Number of block transfers = 60070

6406531887001. ✓ Number of block transfers = 140600

6406531887002. ✗ Number of seeks = 2070

6406531887003. ✓ Number of seeks = 2600

**Question Number : 332 Question Id : 640653564513 Question Type : MSQ Is Question**

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

**Correct Marks : 2 Selectable Option : 0**

Question Label : Multiple Select Question

Consider three transaction  $T_5, T_{10}, T_{15}$  having time-stamps 5, 10 and 15 respectively. Which of the following options is/are correct according to deadlock prevention Wait-Die Scheme?

**Options :**

6406531887019. ✓ If  $T_5$  requests a data item held by  $T_{10}$  then  $T_5$  will "wait"

6406531887020. ✗ If  $T_5$  requests a data item held by  $T_{10}$  then  $T_{10}$  will "wait"

6406531887021. ✗ If  $T_{15}$  requests a data item held by  $T_{10}$ , then  $T_{10}$  will be killed ("die")

6406531887022. ✓ If  $T_{15}$  requests a data item held by  $T_{10}$ , then  $T_{15}$  will be killed ("die")

**Question Number : 333 Question Id : 640653564524 Question Type : MSQ Is Question**

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

**Correct Marks : 2 Selectable Option : 0**

Question Label : Multiple Select Question

Consider the given timeline of five transactions T1, T2, T3, T4, T5 respectively as shown in Figure 3.

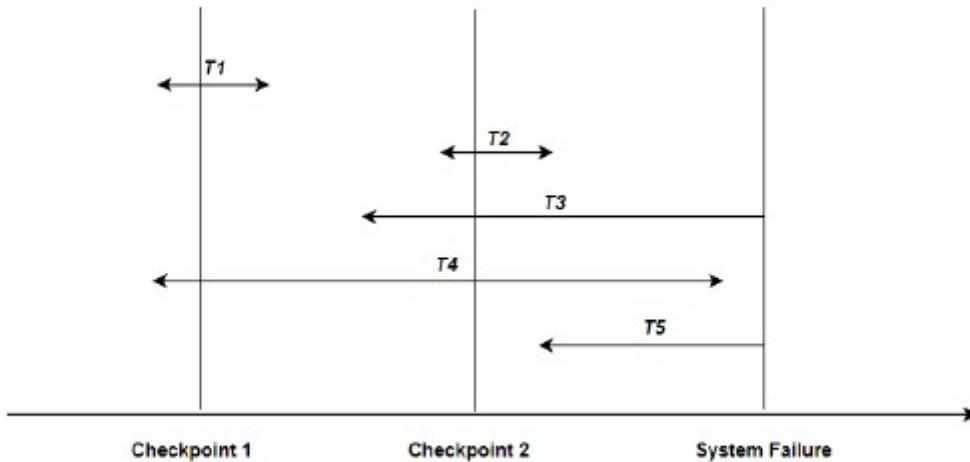


Figure 3: State of Transactions

Which of the following actions will be taken by the recovery manager?

**Options :**

6406531887056. ✓ Transaction T2 and T4 needs to be redone.

6406531887057. ✗ Transaction T1 and T2 are ignored.

6406531887058. ✗ Transaction T3 and T4 needs to be redone.

6406531887059. ✓ Transaction T3 and T5 needs to be undone.

6406531887060. ✗ Transaction T1 needs to be redone.

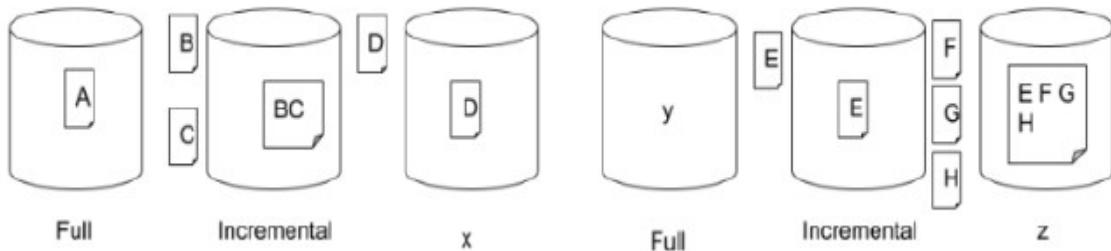
**Question Number : 334 Question Id : 640653564525 Question Type : MSQ Is Question**

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

**Correct Marks : 2 Selectable Option : 0**

Question Label : Multiple Select Question

Consider the diagram below indicating the files that should be backed up in each respective type of backup.



Which of the following options is/are correct?

**Options :**

6406531887061. ❌ x should be a differential backup

6406531887062. ✓ y must be ABCD

6406531887063. ❌ z must be a full backup

6406531887064. ✓ x should be an incremental backup

**Sub-Section Number :** 6

**Sub-Section Id :** 64065380540

**Question Shuffling Allowed :** Yes

**Is Section Default? :** null

**Question Number : 335 Question Id : 640653564507 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**

Consider the relational schema `instructor(id, name, dept_name, salary)` and relational algebra expression is given below:

$$\prod_{name} (\sigma_{salary > 80000 \wedge dept\_name = 'Music'}(instructor))$$

Choose the equivalent relational algebra expression.

**Options :**

6406531887004.

✖  $\prod_{name}(\sigma_{dept\_name='Music'}(instructor))$

6406531887005. ✖  $\prod_{name}(\sigma_{salary>80000}(instructor))$

6406531887006. ✓  $\prod_{name}(\sigma_{salary>80000}(\sigma_{dept\_name='Music'}(instructor)))$

6406531887007. ✖ None of these

**Question Number : 336 Question Id : 640653564518 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

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

$$\mathcal{F} = \{A \rightarrow BCD, BC \rightarrow DE, D \rightarrow E\}$$

The relation  $R$  is decomposed into  $R1(B, C, D)$  and  $R2(A, D, E)$ . Which of the following conditions is/are not satisfied for a decomposition to be lossless?

**Options :**

6406531887036. ✖  $R1 \cup R2 = R$

6406531887037. ✖  $R1 \cap R2 \neq \emptyset$

6406531887038. ✓  $R1 \cap R2 \rightarrow R1$  or  $R1 \cap R2 \rightarrow R2$

6406531887039. ✖ None of these

|                                     |             |
|-------------------------------------|-------------|
| <b>Sub-Section Number :</b>         | 7           |
| <b>Sub-Section Id :</b>             | 64065380541 |
| <b>Question Shuffling Allowed :</b> | Yes         |
| <b>Is Section Default? :</b>        | null        |

**Question Number : 337 Question Id : 640653564508 Question Type : SA Calculator : None**

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

**Correct Marks : 1**

Question Label : Short Answer Question

The following numbers are inserted into an empty binary search tree in the given order: 21, 32, 1, 8, 9, 10, 15, 16, 27. What is the height of the resulting binary search tree?

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

6

**Question Number : 338 Question Id : 640653564510 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

Consider the following schedule S with three transactions T1, T2 and T3.

S: R3(D); W3(D); R1(A); W1(A); R2(C); W2(C);

The number of serial schedule for given schedule S is \_\_\_\_\_

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

6

**Sub-Section Number :** 8

**Sub-Section Id :** 64065380542

**Question Shuffling Allowed :** Yes

**Is Section Default? :** null

**Question Number :** 339 **Question Id :** 640653564511 **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 following schedule S with four transactions T1, T2, T3, T4.

S: R1(B); R3(A); W3(A)R4(A); W4(A); W2(A); R3(C); W3(C); W1(C);

Where, Ri(A) denotes a read operation by transaction Ti on a data item A, Wi(A) denotes a write operation by transaction Ti on a data item A.

What is the possible number of conflict serializable schedule of the above schedule S?

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

3

**Question Number :** 340 **Question Id :** 640653564514 **Question Type :** SA **Calculator :** None

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

**Correct Marks :** 3

Question Label : Short Answer Question

Let  $R(U, V, W, X, Y, Z)$  be a given relation with the following functional dependencies:

$$\mathcal{F} = \{W \rightarrow VX, X \rightarrow W, V \rightarrow U, Y \rightarrow Z\}$$

Find the total number of super keys of  $R$ .

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

24

**Sub-Section Number :** 9

**Sub-Section Id :** 64065380543

**Question Shuffling Allowed :** Yes

**Is Section Default? :** null

**Question Number :** 341 **Question Id :** 640653564512 **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 schedule **S**.

S:W1(A), W3(A), W3(C), R2(A), W2(A), W1(B), W3(B)

Consider the following statements.

Statement 1: The given schedule S is Conflict serializable.

Statement 2: All Conflict serializable schedules are 2-P lockable.

Statement 3: The given schedule is 2-P lockable.

Which of the following options is correct?

**Options :**

6406531887015. ✓ Statement 1 is correct

6406531887016. ✗ Statement 2 is correct

6406531887017. ✗ Statement 3 is correct

6406531887018. ✗ All of these statements are correct

**Question Number : 342 Question Id : 640653564516 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 schema.

airport (a\_code, a\_name, city)  
flights (f\_id, f\_name, fdate, source, destination)  
passengers (p\_id, p\_name, gender)  
bookings (b\_id, f\_id, p\_id, seat\_no)

Consider the following SQL queries.

1. 

```
SELECT f_id, f_name FROM flights
WHERE source = 'Delhi' AND destination = 'Mumbai'
```
2. 

```
SELECT p_id FROM passengers
WHERE p_id NOT IN (SELECT p_id FROM bookings)
```
3. 

```
SELECT p.p_id, p.gender FROM flights f
INNER JOIN bookings b ON b.f_id = f.f_id
INNER JOIN passengers p ON p.p_id = b.p_id
WHERE f.f_name = 'Indigo' AND f.fdate > '2023-05-10'
```

Using the following expressions, determine the equivalent RA (relational algebra), TRC (tuple relational calculus), or DRC (domain relational calculus) expressions for the above SQL queries.

- a.  $\Pi_{f\_id, f\_name}(\sigma_{source='Delhi' \wedge destination='Mumbai'}(flights))$
- b.  $\{< d, e > | \exists d, e, f, g, h (< d, e, f, g, h > \in flights \wedge g = 'Delhi' \wedge h = 'Mumbai')\}$
- c.  $\Pi_{p\_id}(\Pi_{p\_id}(passengers) - \Pi_{p\_id}(passengers \bowtie bookings))$
- d.  $\{t | \exists p \in passengers \exists b \in bookings (p.p\_id = t.p\_id \wedge p.p\_id = b.p\_id)\}$
- e.  $\{t | \exists p \in passengers \exists b \in bookings \exists f \in flights (p.p\_id = b.p\_id \wedge f.f\_id = b.f\_id \wedge p.p\_id = t.p\_id \wedge p.gender = t.gender \wedge f.f\_name = 'Indigo' \wedge f.fdate > '2023 - 05 - 10')\}$
- f.  $\{< p, r > | \exists p, q, r (< p, q, r > \in passengers) \wedge \exists a, b, c, d, e (< a, b, c, d, e > \in flights \wedge b = 'Indigo' \wedge c > '2023 - 05 - 10') \wedge \exists x, y, z, w (< x, y, z, w > \in bookings)\}$

Choose the correct option.

**Options :**

6406531887028. ✘ 1-b, 2-d, 3-f

6406531887029. ✘ 1-a, 2-c, 3-e

6406531887030. ✓ 1-b, 2-c, 3-e

6406531887031. ✘ 1-a, 2-d, 3-f

**Question Number : 343 Question Id : 640653564520 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 B-tree based index with an order  $p = 25$ . Assume that each node in the B-tree is 80% full. What is the maximum number of keys that can be accommodated in the given B-tree if the height of the tree is 4?

**Options :**

6406531887044. ✘ 32,99,999

6406531887045. ✘ 35,40,000

6406531887046. ✘ 30,40,000

6406531887047. ✓ 31,99,999

**Sub-Section Number :** 10

**Sub-Section Id :** 64065380544

**Question Shuffling Allowed :** Yes

**Is Section Default? :** null

**Question Number : 344 Question Id : 640653564515 Question Type : MSQ Is Question**

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

**Correct Marks : 1 Selectable Option : 0**

Question Label : Multiple Select Question

Which of the following statements is/are true regarding weak entities in an ER diagram?

**Options :**

6406531887024. ✓ Weak entities always depend on strong entity for their existence.

6406531887025. ✘ Weak entities cannot have attributes of their own.

6406531887026. ✘ Weak entities are always part of a one-to-many relationship.

6406531887027. ✓ Weak entity sets are represented by a double rectangle symbol.

|                                     |             |
|-------------------------------------|-------------|
| <b>Sub-Section Number :</b>         | 11          |
| <b>Sub-Section Id :</b>             | 64065380545 |
| <b>Question Shuffling Allowed :</b> | Yes         |
| <b>Is Section Default? :</b>        | null        |

**Question Number : 345 Question Id : 640653564526 Question Type : MCQ Is Question**

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

**Correct Marks : 1**

Question Label : Multiple Choice Question

What is the percentage of space utilization in RAID 1?

**Options :**

6406531887065. ✘ 100%

6406531887066. ✓ 50%

6406531887067. ✘ 75%

6406531887068. ✘ 25%

## Business Analytics

|                                              |             |
|----------------------------------------------|-------------|
| <b>Section Id :</b>                          | 64065338345 |
| <b>Section Number :</b>                      | 13          |
| <b>Section type :</b>                        | Online      |
| <b>Mandatory or Optional :</b>               | Mandatory   |
| <b>Number of Questions :</b>                 | 15          |
| <b>Number of Questions to be attempted :</b> | 15          |
| <b>Section Marks :</b>                       | 45          |
| <b>Display Number Panel :</b>                | Yes         |

|                                                                     |             |
|---------------------------------------------------------------------|-------------|
| <b>Group All Questions :</b>                                        | No          |
| <b>Enable Mark as Answered Mark for Review and Clear Response :</b> | Yes         |
| <b>Maximum Instruction Time :</b>                                   | 0           |
| <b>Sub-Section Number :</b>                                         | 1           |
| <b>Sub-Section Id :</b>                                             | 64065380546 |
| <b>Question Shuffling Allowed :</b>                                 | No          |
| <b>Is Section Default? :</b>                                        | null        |

**Question Number : 346 Question Id : 640653564527 Question Type : MCQ Is Question**

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

**Correct Marks : 0**

Question Label : Multiple Choice Question

**THIS IS QUESTION PAPER FOR THE SUBJECT "[DIPLOMA LEVEL : BUSINESS ANALYTICS \(COMPUTER BASED EXAM\)](#)"**

**ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?**

**CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.**

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

**Options :**

6406531887069. ✓ YES

6406531887070. ✗ NO

|                                     |             |
|-------------------------------------|-------------|
| <b>Sub-Section Number :</b>         | 2           |
| <b>Sub-Section Id :</b>             | 64065380547 |
| <b>Question Shuffling Allowed :</b> | Yes         |
| <b>Is Section Default? :</b>        | null        |

**Question Number : 347 Question Id : 640653564529 Question Type : MCQ Is Question**

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

**Correct Marks : 1**

Question Label : Multiple Choice Question

What is the satiating price for a Constant-elasticity price response function?

**Options :**

6406531887075. ❌ Zero

6406531887076. ✓ Does not exist

6406531887077. ❌ Equal to the Market size

6406531887078. ❌ Can be anything

**Sub-Section Number :** 3

**Sub-Section Id :** 64065380548

**Question Shuffling Allowed :** Yes

**Is Section Default? :** null

**Question Number : 348 Question Id : 640653564528 Question Type : MSQ Is Question**

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

**Correct Marks : 1 Selectable Option : 0**

Question Label : Multiple Select Question

What does the term "Multicollinearity" refer to? (Select all that are applicable)

**Options :**

6406531887071. ❌ The dependent and independent variables are not-related

6406531887072. ❌ The dependent and independent variables are linearly related

6406531887073. ❌ The dependent variable is linearly related to another dependent variable

6406531887074. ✓ None of these

**Sub-Section Number :**

|                                     |             |
|-------------------------------------|-------------|
| <b>Sub-Section Id :</b>             | 64065380549 |
| <b>Question Shuffling Allowed :</b> | Yes         |
| <b>Is Section Default? :</b>        | null        |

**Question Number : 349 Question Id : 640653564558 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 productive efficiency frontier?

**Options :**

6406531887120. ❖ It is an aspect of economic efficiency focussing on maximizing the output under given constraints

6406531887121. ❖ Productive efficiency frontier does not worry about optimal allocation, or choice of products

6406531887122. ❖ Effective usage of technology for allocating resources optimally

6406531887123. ✓ Consists of all combinations of outputs such that the production of one product cannot be increased without sacrificing the output of the other (without any change in technology)

**Question Number : 350 Question Id : 640653564559 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 2**

Question Label : Multiple Choice Question

Let the objective function of the DEA problem for the DMU  $k$  be

Maximize:  $y_{1k}O_{1k} + y_{2k}O_{2k} + y_{3k}O_{3k} + \dots + y_{Mk}O_{Mk}$

Which is not a constraint for the DEA problem

**Options :**

6406531887124. ✘ Normalizing constraint for the denominator

6406531887125. ✓ DMU  $k$  cannot have an efficiency of less than 1

6406531887126. ✘ Non-negativity constraint for the decision variables

6406531887127. ✘ None of these

**Question Number : 351 Question Id : 640653564561 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 DEA, we make inefficient DMUs efficient by:

**Options :**

6406531887132. ✘ Moving horizontally towards the efficiency frontier

6406531887133. ✘ Moving vertically towards the efficiency frontier

6406531887134. ✘ By moving towards Hypothetical Composite Unit (HCU)

6406531887135. ✓ Includes Moving horizontally towards the efficiency frontier,Moving vertically towards the efficiency frontier & By moving towards Hypothetical Composite Unit (HCU)

6406531887136. ✘ Only Moving horizontally towards the efficiency frontier and Moving vertically towards the efficiency frontier

**Sub-Section Number :** 5

**Sub-Section Id :** 64065380550

**Question Shuffling Allowed :** Yes

**Is Section Default? :** null

**Question Number : 352 Question Id : 640653564557 Question Type : MSQ Is Question**

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

**Correct Marks : 2 Selectable Option : 0**

Question Label : Multiple Select Question

What kind of data is unsuitable for performing the conjoint analysis using the Statistical or Linear Regression Approach?

**Options :**

6406531887116. ❌ Consumer Choice Data is Ratings

6406531887117. ✓ Consumer Choice Data is Pairwise Comparison

6406531887118. ✓ Value of the attributes are continuous

6406531887119. ❌ Value of the product attributes are categorical

**Question Number : 353 Question Id : 640653564560 Question Type : MSQ Is Question**

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

**Correct Marks : 2 Selectable Option : 0**

Question Label : Multiple Select Question

There are 7 business units and you are using the DEA to compare them. You solve the LP for business unit 2. You find from the constraint expression that business unit 3 has obtained an efficiency of 1 and business unit 6 has obtained an efficiency of 1 with the optimal weights of business unit 2. Which of the following statements is correct?

**Options :**

6406531887128. ❌ Business unit 3 may be inefficient

6406531887129. ✓ Business unit 3 will be efficient

6406531887130. ❌ Business unit 7 may be inefficient

6406531887131. ✓ Business unit 6 will be efficient

**Question Number : 354 Question Id : 640653564563 Question Type : MSQ Is Question**

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

**Correct Marks : 2 Selectable Option : 0**

Question Label : Multiple Select Question

What kind of data is unsuitable for performing the conjoint analysis using the Linear Programming Approach?

**Options :**

6406531887138. ✓ Consumer Choice Data is Ratings

6406531887139. ✗ Consumer Choice Data is Pairwise Comparison

6406531887140. ✗ Values of the attributes are continuous

6406531887141. ✓ Values of the product attributes are categorical

**Sub-Section Number :** 6

**Sub-Section Id :** 64065380551

**Question Shuffling Allowed :** Yes

**Is Section Default? :** null

**Question Number : 355 Question Id : 640653564542 Question Type : SA Calculator : None**

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

**Correct Marks : 2**

Question Label : Short Answer Question

A multiple linear regression model that uses Price, quantity and rating score is built to predict the sales in a company. In the multiple linear regression, it is found that the direct effect of price on sales is 0.3, the direct effect of quantity on sales is 0.2 and the direct effect of rating score on sales is 0.4. Moreover, it is known that the effect of price on quantity is 0.2, and the effect of price on rating score is 0.1. Then what is the total effect of price on sales?

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Range

**Text Areas :** PlainText

**Possible Answers :**

0.4 to 0.44

**Question Number : 356 Question Id : 640653564562 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

There are 6 business units. There are two outputs and one input under consideration. You are solving the optimization problem for business unit 4 and find that the efficiency is 0.8. You find that the dual variables corresponding to the constraints of business units 3 and 5 are non-zero and the dual variables corresponding to the constraints of other units are zero. The dual variables corresponding to the constraints of business units 3 and 5 are 0.3 and 0.5 respectively. You are given the following table where sales and number of leads are the two outputs. What is the No. of leads in HCU 4?

|       | Sales | No. of leads |
|-------|-------|--------------|
| DMU 3 | 12000 | 12           |
| DMU 5 | 8000  | 10           |

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Range

**Text Areas :** PlainText

**Possible Answers :**

13 to 14

**Sub-Section Number :** 7

**Sub-Section Id :** 64065380552

**Question Shuffling Allowed :** No

**Is Section Default? :** null

**Question Id : 640653564530 Question Type : COMPREHENSION Sub Question Shuffling**

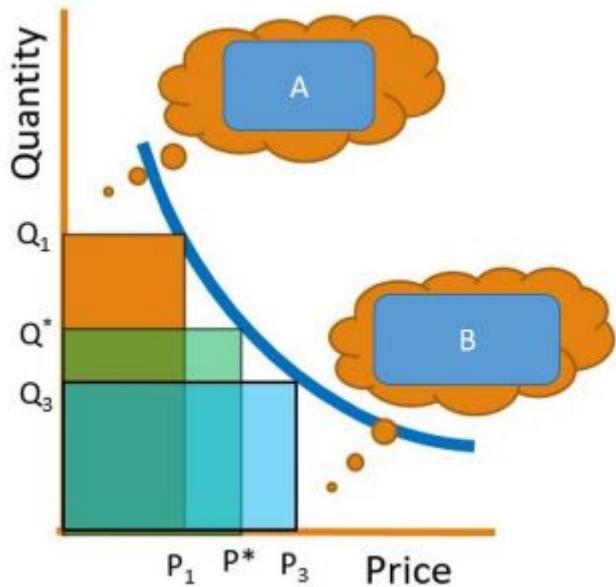
**Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix**

**Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Question Numbers : (357 to 359)**

Question Label : Comprehension

For the figure given below, answer the subquestions.



**Sub questions**

**Question Number : 357 Question Id : 640653564531 Question Type : MCQ Is Question**

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

**Correct Marks : 1**

Question Label : Multiple Choice Question

What does region "A" represent?

**Options :**

6406531887079. ❌ Market Size

6406531887080. ✓ Latent demand

6406531887081. ❌ Consumer Surplus

6406531887082. ❌ None of these

**Question Number : 358 Question Id : 640653564532 Question Type : MCQ Is Question**

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

**Correct Marks : 1**

Question Label : Multiple Choice Question

What does region "B" represent?

**Options :**

6406531887083. ✘ Market Size

6406531887084. ✘ Latent demand

6406531887085. ✓ Consumer Surplus

6406531887086. ✘ None of these

**Question Number : 359 Question Id : 640653564533 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

Say the curve in the figure is modelled as a constant elasticity curve. If  $Q_1$  is 2400,  $Q_3$  is 1500,  $P_1$  is 100 and  $P_3$  is 200, then what is the elasticity of the curve?

**NOTE:** If your answer is in decimal, enter it rounded to two decimal places. For example, if your answer is "10.256", enter it as "10.26"

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Range**

**Text Areas : PlainText**

**Possible Answers :**

2.28 to 2.36

**Sub-Section Number :**

**Sub-Section Id :** 64065380553

**Question Shuffling Allowed :** No

**Is Section Default? :** null

**Question Id : 640653564549 Question Type : COMPREHENSION Sub Question Shuffling**

**Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix**

**Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Question Numbers : (360 to 366)**

Question Label : Comprehension

A logistic regression model is fit to predict if a student will fail the BA course (Y=0 pass, Y=1 fail).

The results of the fitted model are given in the table below. Then answer the given subquestions.

*(Note: For all questions in this comprehension, enter the answer as a numeric percentage value rounded to two decimal places without the % symbol. For example, if your answer is "10.256 %", enter it as "10.26")*

| <i>Student ID</i> | <i>Actual "Pass" or "Fail"</i> | <i>Probability of Passing based on the logistic model</i> |
|-------------------|--------------------------------|-----------------------------------------------------------|
| ABC101            | Fail                           | 0.79                                                      |
| ABC102            | Pass                           | 0.72                                                      |
| ABC103            | Fail                           | 0.45                                                      |
| ABC104            | Fail                           | 0.47                                                      |
| ABC105            | Fail                           | 0.73                                                      |
| ABC106            | Pass                           | 0.78                                                      |

### **Sub questions**

**Question Number : 360 Question Id : 640653564550 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

Considering a threshold of 0.7, how many "True Positives" are present in the confusion matrix if the aim is to predict if a student will pass the course?

**NOTE:** Enter the answer as a numeric percentage value rounded to the nearest integer without the % symbol.

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

2

**Question Number :** 361 **Question Id :** 640653564551 **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

Considering a threshold of 0.7, how many “False Positives” are present in the confusion matrix if the aim is to predict if a student will fail the course?

**NOTE:** Enter the answer as a numeric percentage value rounded to the nearest integer without the % symbol.

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

2

**Question Number :** 362 **Question Id :** 640653564552 **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

Considering a threshold of 0.7, how many “False Negatives” are present in the confusion matrix if the aim is to predict if a student will fail the course?

**NOTE:** Enter the answer as a numeric percentage value rounded to the nearest integer without the % symbol.

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

2

**Question Number :** 363 **Question Id :** 640653564553 **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

Considering a threshold of 0.7, how many “True Negatives” are present in the confusion matrix if the aim is to predict if a student will pass the course?

**NOTE:** Enter the answer as a numeric percentage value rounded to the nearest integer without the % symbol.

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

0

**Question Number :** 364 **Question Id :** 640653564554 **Question Type :** SA **Calculator :** None

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

**Correct Marks :** 1

**Question Label :** Short Answer Question

What is the accuracy of the built logistic model for predicting if a student will **fail** the course if a threshold of 0.7 is taken?

**NOTE:** Enter the answer as a numeric percentage value rounded to two decimal places without the % symbol. For example, if your answer is "10.256 %", enter it as "10.26"

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Range

**Text Areas :** PlainText

**Possible Answers :**

33.00 to 34.00

**Question Number :** 365 **Question Id :** 640653564555 **Question Type :** SA **Calculator :** None

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

**Correct Marks :** 1

Question Label : Short Answer Question

What is the precision of the built logistic model for predicting if a student will **pass** the course if a threshold of 0.7 is taken?

**NOTE:** Enter the answer as a numeric percentage value rounded to the nearest integer without the % symbol.

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

0

**Question Number : 366 Question Id : 640653564556 Question Type : SA Calculator : None**

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

**Correct Marks : 1**

Question Label : Short Answer Question

What is the recall of the built logistic model for predicting if a student will **fail** the course if a threshold of 0.7 is taken?

**NOTE:** Enter the answer as a numeric percentage value rounded to two decimal places without the % symbol. For example, if your answer is "10.256 %", enter it as "10.26"

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Range

**Text Areas :** PlainText

**Possible Answers :**

50.00 to 50.50

**Sub-Section Number :** 9

**Sub-Section Id :** 64065380554

**Question Shuffling Allowed :** No

**Is Section Default? :** null

**Question Id : 640653564534 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Question Numbers : (367 to 373)**

Question Label : Comprehension

Given the regression model (from excel) for predicting sales given price and income, answer the given subquestions

| Regression Statistics |              |
|-----------------------|--------------|
| Multiple R            | 0.156176746  |
| R Square              | 0.024391176  |
| Adjusted R Square     | -0.090386333 |
| Standard Error        | 6.212632834  |
| Observations          | 20           |

#### ANOVA

|            | df | SS          | MS       | F  | Significance F |
|------------|----|-------------|----------|----|----------------|
| Regression | A1 | 16.40428549 | 8.202143 | A5 | 0.810669095    |
| Residual   | A2 | 656.1457145 | A4       |    |                |
| Total      | A3 | A6          |          |    |                |

|           | Coefficients | Standard Error | t Stat   | P-value  | Lower 95%    | Upper 95%   | Lower 95.0%  | Upper 95.0% |
|-----------|--------------|----------------|----------|----------|--------------|-------------|--------------|-------------|
| Intercept | 55.8459249   | 9.257705483    | 6.032372 | 1.35E-05 | 36.31387366  | 75.37797614 | 36.31387366  | 75.37797614 |
| Price     | 0.198655711  | 0.407861203    | 0.487067 | 0.632432 | -0.661856209 | 1.059167631 | -0.661856209 | 1.059167631 |
| Income    | 0.004272622  | 0.006852519    | 0.623511 | 0.541225 | -0.010184929 | 0.018730174 | -0.010184929 | 0.018730174 |

### Sub questions

**Question Number : 367 Question Id : 640653564535 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 for "A1"?

**NOTE:** Enter your answer to the nearest integer.

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

2

**Question Number : 368 Question Id : 640653564536 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 for "A2"?

**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 :**

17

**Question Number :** 369 **Question Id :** 640653564537 **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 for "A3"?

**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 :**

19

**Question Number :** 370 **Question Id :** 640653564538 **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 for "A4"?

**NOTE:** If your answer is in decimal, enter it rounded to two decimal places. For example, if your answer is "10.256", enter it as "10.26"

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Range

**Text Areas :** PlainText

**Possible Answers :**

36.00 to 40.00

**Question Number :** 371 **Question Id :** 640653564539 **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 for "A5"?

**NOTE:** If your answer is in decimal, enter it rounded to two decimal places. For example, if your answer is "10.256", enter it as "10.26"

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Range

**Text Areas :** PlainText

**Possible Answers :**

0.10 to 0.30

**Question Number :** 372 **Question Id :** 640653564540 **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 for "A6"?

**NOTE:** If your answer is in decimal, enter it rounded to two decimal places. For example, if your answer is "10.256", enter it as "10.26"

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Range

**Text Areas :** PlainText

**Possible Answers :**

672 to 673

**Question Number : 373 Question Id : 640653564541 Question Type : MSQ Is Question**

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

**Correct Marks : 2 Selectable Option : 0**

Question Label : Multiple Select Question

Which of the following inferences is/are correct? (Choose all that are applicable)

**Options :**

6406531887094. ✘ The model is significant

6406531887095. ✓ The model is insignificant

6406531887096. ✘ The intercept is insignificant

6406531887097. ✓ The intercept is significant

6406531887098. ✘ Price, the dependent variable, is insignificant

6406531887099. ✘ Price, the dependent variable, is significant

6406531887100. ✘ None of these

**Question Id : 640653564543 Question Type : COMPREHENSION Sub Question Shuffling**

**Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix**

**Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Question Numbers : (374 to 378)**

Question Label : Comprehension

The owner of a cycle shop is curious to know about his customer base. Hence, he collects data on the total sales made to different age groups in the year 2022. This data is given in the table below. He hires you as a data analyst and asks for your opinion. Then answer the given subquestions.

| Age group             | Actual number of cycles sold |
|-----------------------|------------------------------|
| less than 10 years    | 30                           |
| 11 to 15 years        | 50                           |
| 16 to 20 years        | 90                           |
| 21 to 24 years        | 40                           |
| 25 to 30 years        | 12                           |
| 31 to 40 years        | 25                           |
| greater than 41 years | 12                           |

**Sub questions**

**Question Number : 374 Question Id : 640653564544 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

Based on the given table, you think the data is **normally distributed** such that the buckets split the distribution into areas that have equal probability. Then what is the probability of selling a cycle in any given bucket?

**NOTE:** If your answer is in decimal, enter it rounded to two decimal places. For example, if your answer is "10.256", enter it as "10.26"

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Range**

**Text Areas : PlainText**

**Possible Answers :**

0.13 to 0.15

**Question Number : 375 Question Id : 640653564545 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**

Based on the given table, you think the data is **normally distributed** such that the buckets split the distribution into areas that have equal probability. Then what is the expected number of cycles that will be sold to the age group of "25 to 30 years"?

**NOTE:** If your answer is in decimal, enter it rounded to two decimal places. For example, if your answer is "10.256", enter it as "10.26"

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Range**

**Text Areas : PlainText**

**Possible Answers :**

36 to 38

**Question Number : 376 Question Id : 640653564546 Question Type : SA Calculator : None**

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

**Correct Marks : 2**

**Question Label : Short Answer Question**

What is the value of the computed test statistic?

**NOTE:** If your answer is in decimal, enter it rounded to two decimal places. For example, if your answer is "10.256", enter it as "10.26"

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count :** Yes

**Answers Type :** Range

**Text Areas :** PlainText

**Possible Answers :**

144 to 148

**Question Number :** 377 **Question Id :** 640653564547 **Question Type :** SA **Calculator :** None

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

**Correct Marks :** 1

Question Label : Short Answer Question

How many degrees of freedom does the test have?

**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

**Question Number :** 378 **Question Id :** 640653564548 **Question Type :** MCQ Is Question

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

**Correct Marks :** 1

Question Label : Multiple Choice Question

Given that the “Null Hypothesis” is rejected at the significance level of 0.5, then what will be the conclusion at a significance level of 0.1?

**Options :**

6406531887106. ✘ Cannot say, insufficient data

6406531887107. ✓ Null Hypothesis is rejected

6406531887108. ✗ Null Hypothesis is not rejected

## AppDev2

|                                                                     |             |
|---------------------------------------------------------------------|-------------|
| <b>Section Id :</b>                                                 | 64065338346 |
| <b>Section Number :</b>                                             | 14          |
| <b>Section type :</b>                                               | Online      |
| <b>Mandatory or Optional :</b>                                      | Mandatory   |
| <b>Number of Questions :</b>                                        | 33          |
| <b>Number of Questions to be attempted :</b>                        | 33          |
| <b>Section Marks :</b>                                              | 100         |
| <b>Display Number Panel :</b>                                       | Yes         |
| <b>Group All Questions :</b>                                        | No          |
| <b>Enable Mark as Answered Mark for Review and Clear Response :</b> | Yes         |
| <b>Maximum Instruction Time :</b>                                   | 0           |
| <b>Sub-Section Number :</b>                                         | 1           |
| <b>Sub-Section Id :</b>                                             | 64065380555 |
| <b>Question Shuffling Allowed :</b>                                 | No          |
| <b>Is Section Default? :</b>                                        | null        |

**Question Number : 379 Question Id : 640653564564 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 (COMPUTER BASED EXAM)"**

**ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?**

**CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.**

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

**Options :**

6406531887142. ✓ YES

6406531887143. ✘ NO

**Sub-Section Number :** 2

**Sub-Section Id :** 64065380556

**Question Shuffling Allowed :** Yes

**Is Section Default? :** null

**Question Number : 380 Question Id : 640653564565 Question Type : MSQ Is Question**

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

**Correct Marks : 2 Selectable Option : 0**

Question Label : Multiple Select Question

Which of the following statement(s) is/are true regarding javascript language?

**Options :**

6406531887144. ✘ Hoisting moves the declaration of arrow functions to the top of their scopes.

6406531887145. ✓ All 3 keywords, i.e., "var", "let" and "const" can be used to declare global variables.

6406531887146. ✓ The functions are treated as first class citizens in the language.

6406531887147. ✘ Node.js is an example of a javascript engine.

**Question Number : 381 Question Id : 640653564568 Question Type : MSQ Is Question**

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

**Time : 0**

**Correct Marks : 2 Selectable Option : 0**

Question Label : Multiple Select Question

Which of the following statement(s) is/are true about VueJS framework?

**Options :**

6406531887156. ✓ VueJS is a framework built on top of HTML, CSS and javascript.

6406531887157. ✓ VueJS is built on a component based architecture.

6406531887158. ✗ It cannot be installed/used via npm (node package manager).

6406531887159. ✗ All of these

**Question Number : 382 Question Id : 640653564583 Question Type : MSQ Is Question**

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

**Time : 0**

**Correct Marks : 2 Selectable Option : 0**

Question Label : Multiple Select Question

Suppose a script is downloaded from the origin '<http://example.com>'. The script can make a request to which of the following origins, assuming none of the origins allow cross-origin requests?

**Options :**

6406531887214. ✓ <http://example.com/profile>

6406531887215. ✗ <http://new.example.com>

6406531887216. ✓ <http://example.com>

6406531887217. ✗ <http://new.example.com/profile>

**Question Number : 383 Question Id : 640653564584 Question Type : MSQ Is Question**

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

**Correct Marks : 2 Selectable Option : 0**

Question Label : Multiple Select Question

Which of the following statement(s) is/are true about pub/sub messaging?

**Options :**

6406531887218. ❌ Publisher has to know about all the subscribers.

6406531887219. ✓ Publisher does not have to know about the subscribers.

6406531887220. ✓ Communication between publisher and subscribers is asynchronous.

6406531887221. ❌ Communication between publishers and subscribers is synchronous.

**Question Number : 384 Question Id : 640653564585 Question Type : MSQ Is Question**

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

**Correct Marks : 2 Selectable Option : 0**

Question Label : Multiple Select Question

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

**Options :**

6406531887222. ❌ In short polling, the server does not respond until the data is available or the request times out.

6406531887223. ✓ In long polling, the server does not respond until the data is available or the request times out.

6406531887224. ✓ In short polling, the server responds immediately with or without data.

6406531887225. ❌ In long polling, the server responds immediately with or without data.

**Sub-Section Number :** 3

**Sub-Section Id :** 64065380557

**Question Shuffling Allowed :** Yes

**Is Section Default? :**

null

**Question Number : 385 Question Id : 640653564566 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 shows the correct output if the javascript program written below is executed?

```
const a = [2, 5, 8, 3, 5, 7]
const b = a.map(element => element ** 2)
const c = b.filter(element => element % 2)
const d = c.find(element => element % 3 == 1)
console.log(d)
```

**Options :**

6406531887148. ✘ [25, 25, 49]

6406531887149. ✘ [25, 25]

6406531887150. ✓ 25

6406531887151. ✘ 25 25

**Question Number : 386 Question Id : 640653564573 Question Type : MCQ Is Question**

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

**Correct Marks : 3**

Question Label : Multiple Choice Question

Which of the following statements is true in the context of REST?

**Options :**

6406531887176. ✘ Both the HTTP request methods, "GET" and "POST" are idempotent.

6406531887177.

\* In general, an HTTP "PUT" request is used to make incremental changes to an existing resource.

6406531887178. \* A "DELETE" request that randomly deletes a resource is idempotent.

6406531887179. ✓ None of these

**Question Number : 387 Question Id : 640653564578 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 shows the correct output if the javascript program written below is executed?

```
async function demo () {
 let prom = await new Promise((res, rej) => {
 setTimeout(() => res(40), 2000)
 })
 console.log(prom)
 console.log("Statement 2") // Statement 2
 return prom
}

demo().then(result => console.log(result))
console.log("Statement 1") // Statement 1
```

**Options :**

- 40
- Statement 2
- 40
- Statement 1

6406531887196. \*

- Statement 1
- 40
- Statement 2

6406531887197. ✓ 40

Statement 1  
Statement 2  
40

6406531887198. ✘ 40

Statement 2  
Statement 1  
40

6406531887199. ✘ 40

**Question Number : 388 Question Id : 640653564580 Question Type : MCQ Is Question**

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

**Correct Marks : 3**

Question Label : Multiple Choice Question

Which of the following statements is correct regarding Vue.js framework?

**Options :**

6406531887204. ✓ In Vue 2, the “el” property of the Vue constructor can be used to refer to an HTML element via an ID or a class.

6406531887205. ✘ The components of Vue must define “data” property as an object.

6406531887206. ✘ A Vue component cannot implement lifecycle hooks (i.e., created, mounted, etc.), if they are already implemented in the Vue instance.

6406531887207. ✘ All of these

**Question Number : 389 Question Id : 640653564589 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 application with markup “index.html” and javascript file “app.js”.

index.html:

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

app.js:

```
const Player = {
 template: `<div><div>{{striker.name}}*</div>
<div>{{nonStriker.name}}</div>
</div>`,
 data() {
 return {
 player1: {name: 'Rohit'},
 player2: {name: 'Virat'},
 }
 },
 props: {
 run: { type: Number, default: 0 },
 },
 computed: {
 striker() {
 return this.run % 2 == 0 ? this.player1 : this.player2
 },
 nonStriker() {
 return this.run % 2 == 1 ? this.player1 : this.player2
 },
 },
}

const Run = {
 template: `<button @click="$emit('run-changed',
run)">{{run}}</button>`,
 props: { run: Number },
}

new Vue({
 el: '#app',
 template: `<div>
 <Player :run='score' />
 <div style='display: flex'>
 <Run :run="3" @run-changed = 'runChanged' />
 <Run :run="4" @run-changed = 'runChanged' />
 </div>
 </div>`,
 components: { Run, Player },
 data: {
 score: 0,
 },
 methods: {
 runChanged(run) {
 this.score = run
 },
 },
})
```

Suppose the user clicks on the buttons with text "4" and then "3". What will be rendered inside the Player component?

**Options :**

Rohit\*

6406531887238. ✘ Virat

Virat\*

6406531887239. ✓ Rohit

Virat\*

6406531887240. ✘ Rohit\*

Rohit\*

6406531887241. ✘ Virat\*

**Question Number : 390 Question Id : 640653564590 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 application with markup “index.html” and javascript file “app.js”.

index.html:

```
<div id="app"></div>
<script
src="https://cdn.jsdelivr.net/npm/vue@2/dist/vue.js"></script>
<script
src="https://unpkg.com/vue-router@3.0.0/dist/vue-router.js"></script>
<script src="app.js" type="module"></script>
```

app.js:

```
const data = {
 1: { totalRun: 1000, totalMatches: 20 },
 2: { totalRun: 7000, totalMatches: 100 },
}

const NotFound = { template: `<div> Player Not Found</div>` }
const Profile = {
 template: `<div>Run: {{stat.totalRun}}, Matches: {{stat.totalMatches}}, Average: {{average}}</div>`,
 data() {
 return {
 stat: data[this.$route.params.id],
 }
 },
 computed: {
 average() {
 return this.stat.totalRun / this.stat.totalMatches
 },
 },
}
const router = new VueRouter({
 routes: [
 { path: '/profile/:id', component: Profile },
 { path: '*', component: NotFound },
],
})
new Vue({
 el: '#app',
 template: '<div><router-view /></div>',
 router,
})
```

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

## Options :

6406531887242. ✓ Player Not Found

6406531887243. ✗ Run: 1000, Matches: 20, Average: 50

6406531887244. ✘ Run: 7000, Matches: 100, Average: 70

6406531887245. ✘ None of these

**Question Number : 391 Question Id : 640653564591 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 application with markup “index.html” and javascript file “app.js”.

index.html:

```
<div id="app"></div>
<script
src="https://cdn.jsdelivr.net/npm/vue@2/dist/vue.js"></script>
<script
src="https://unpkg.com/vue-router@3.0.0/dist/vue-router.js"></script>
<script src="app.js" type="module"></script>
```

app.js:

```
const data = {
 1: { totalRun: 1000, totalMatches: 20 },
 2: { totalRun: 7000, totalMatches: 100 },
}

const NotFound = { template: `<div> Player Not Found</div>` }
const Profile = {
 template: `<div>Run: {{stat.totalRun}}, Matches:
{{stat.totalMatches}}, Average: {{average}}</div>`,
 data() {
 return {
 stat: data[this.$route.params.id],
 }
 },
 computed: {
 average() {
 return this.stat.totalRun / this.stat.totalMatches
 },
 },
}
const router = new VueRouter({
 routes: [
 { path: '/profile/:id', component: Profile },
 { path: '*', component: NotFound },
],
})
new Vue({
 el: '#app',
 template: '<div><router-view /></div>',
 router,
})
```

Suppose the application is running on "<http://127.0.0.1:8080>". What will be displayed for the URL "<http://127.0.0.1:8080/#/profile/2>"?

## Options :

6406531887246. ❌ Player Not Found

6406531887247. ❌ Run: 1000, Matches: 20, Average: 50

6406531887248. ✓ Run: 7000, Matches: 100, Average: 70

6406531887249. ✘ None of these

**Question Number : 392 Question Id : 640653564592 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 application with markup “index.html” and javascript file “app.js”.

index.html:

```
<body>
 <div id="app"></div>
 <script
src="https://cdn.jsdelivr.net/npm/vue@2/dist/vue.js"></script>
 <script
src="https://unpkg.com/vue-router@3.0.0/dist/vue-router.js"></script>
 <script src="app.js" type="module"></script>
</body>
```

app.js:

```
const overs = {
 1: [2, 3, 4, 6, 2],
 2: [3, 2, 5, 3, 1],
}

const NotFound = { template: `<div> Over Not Found</div>` }
const MatchNotStarted = { template: `<div>Match has not yet started.
</div>` }

const currentOver = {
 template: `<div style='display: flex'>
<div v-for='run in over' style='padding: 10px'>{{run}}</div>
</div>`,
 data() {
 return {
 over: overs[this.$route.params.overNo]
 ? overs[this.$route.params.overNo]
 : overs[2],
 }
 },
}

const liveScore = {
 template: `<div>Total Score:{{totalScore}} <routerview /></div>`,
 data() {
 return {
 totalScore: 100,
 }
 },
}

const router = new VueRouter({
 routes: [
 {
 path: '/live-score',
 component: liveScore,
 children: [
 { path: '', component: MatchNotStarted },
 { path: 'over/:overNo', component: currentOver },
],
 },
],
})

new Vue({
 el: '#app',
 template: `<div><routerview /></div>`,
 router,
})
```

Suppose the application is running on "<http://127.0.0.1:8080>". What will be rendered in the "routerview" component of the "live-score" component for URL "<http://127.0.0.1:8080/#/live-score>"?

## Options :

6406531887250. ✖ Total Score:100

6406531887251. ✓ Match has not yet started.

6406531887252.

✖ 2 3 4 6 2

6406531887253. ✖ 3 2 5 3 1

**Question Number : 393 Question Id : 640653564593 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 application with markup “index.html” and javascript file “app.js”.

index.html:

```
<body>
 <div id="app"></div>
 <script
src="https://cdn.jsdelivr.net/npm/vue@2/dist/vue.js"></script>
 <script
src="https://unpkg.com/vue-router@3.0.0/dist/vue-router.js"></script>
 <script src="app.js" type="module"></script>
</body>
```

app.js:

```
const overs = {
 1: [2, 3, 4, 6, 2],
 2: [3, 2, 5, 3, 1],
}

const NotFound = { template: `<div> Over Not Found</div>` }
const MatchNotStarted = { template: `<div>Match has not yet started.
</div>` }

const currentOver = {
 template: `<div style='display: flex'>
<div v-for='run in over' style='padding: 10px'>{{run}}</div>
</div>`,
 data() {
 return {
 over: overs[this.$route.params.overNo]
 ? overs[this.$route.params.overNo]
 : overs[2],
 }
 },
}

const liveScore = {
 template: `<div>Total Score:{{totalScore}} <router-view /></div>`,
 data() {
 return {
 totalScore: 100,
 }
 },
}

const router = new VueRouter({
 routes: [
 {
 path: '/live-score',
 component: liveScore,
 children: [
 { path: '', component: MatchNotStarted },
 { path: 'over/:overNo', component: currentOver },
],
 },
],
})
new Vue({
 el: '#app',
 template: `<div><router-view /></div>`,
 router,
})
```

Suppose the application is running on "<http://127.0.0.1:8080>". What will be rendered in the "router-view" component of the "live-score" component for URL "<http://127.0.0.1:8080/#/live-score/over/1>"?

## Options :

6406531887254. ✖ Total Score:100

6406531887255. ✖ Match has not yet started.

6406531887256. ✓ 2 3 4 6 2

6406531887257. ✗ 3 2 5 3 1

**Question Number : 394 Question Id : 640653564594 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 application with markup “index.html” and javascript file “app.js”.

index.html:

```
<body>
 <div id="app"></div>
 <script
 src="https://cdn.jsdelivr.net/npm/vue@2/dist/vue.js"></script>
 <script
 src="https://unpkg.com/vue-router@3.0.0/dist/vue-router.js"></script>
 <script src="app.js" type="module"></script>
</body>
```

app.js:

```
const overs = {
 1: [2, 3, 4, 6, 2],
 2: [3, 2, 5, 3, 1],
}

const NotFound = { template: `<div> Over Not Found</div>` }
const MatchNotStarted = { template: `<div>Match has not started yet</div>` }
const currentOver = {
 template: `<div style='display: flex'>
<div v-for='run in over' style='padding: 10px'>{{run}}</div>
</div>`,
 data() {
 return {
 over: overs[this.$route.params.overNo]
 ? overs[this.$route.params.overNo]
 : overs[2],
 }
 },
}
}

const liveScore = {
 template: `<div>Total Score:{{totalScore}} <router-view /></div>` ,
 data() {
 return {
 totalScore: 100,
 }
 },
}
const router = new VueRouter({
 routes: [
 {
 path: '/live-score',
 component: liveScore,
 children: [
 { path: '', component: MatchNotStarted },
 { path: 'over/:overNo', component: currentOver },
],
 },
 {
 path: '*',
 component: NotFound,
 },
],
})
new Vue({
 el: '#app',
 template: `<div><router-view /></div>` ,
 router,
})
```

Suppose the application is running on "<http://127.0.0.1:8080>". What will be rendered in the "router-view" component of the "root" component for URL "<http://127.0.0.1:8080/#/over/1>"?

## Options :

6406531887258. ✖ Total Score:100

6406531887259. ✖ Match has not started yet

6406531887260. ✘ 2 3 4 6 2

6406531887261. ✓ Over Not Found

**Sub-Section Number :** 4

**Sub-Section Id :** 64065380558

**Question Shuffling Allowed :** Yes

**Is Section Default? :** null

**Question Number : 395 Question Id : 640653564567 Question Type : MSQ Is Question**

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

**Correct Marks : 3 Selectable Option : 0**

Question Label : Multiple Select Question

Which of the following is/are the correct ways to always apply “errorClass”, but “activeClass” should only be applied when the Vue data variable “isActive” is truthy?

**Options :**

6406531887152. ✓ <div :class="['activeClass' : isActive, 'errorClass']"></div>

6406531887153. ✓ <div :class="['activeClass' : isActive, 'errorClass']"></div>

6406531887154. ✘ <div :class="['activeClass' ? isActive : '', 'errorClass']"></div>

6406531887155. ✘ <div :class="['activeClass' : isActive, 'errorClass']"></div>

**Question Number : 396 Question Id : 640653564572 Question Type : MSQ Is Question**

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

**Correct Marks : 3 Selectable Option : 0**

Question Label : Multiple Select Question

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

**Options :**

6406531887172. ✓ A Vuex store provides a single source of truth that can drive the application.

6406531887173. ✗ It provides a variable named “this.\$vuexstore” to allow components to access the store data.

6406531887174. ✗ A component cannot have its own local state, if the application uses Vuex.

6406531887175. ✓ The mutations and actions are some constructs of a Vuex store.

**Question Number : 397 Question Id : 640653564575 Question Type : MSQ Is Question**

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

**Correct Marks : 3 Selectable Option : 0**

Question Label : Multiple Select Question

Which of the following statement(s) is/are true regarding forward and reverse proxy?

**Options :**

6406531887184. ✗ A forward proxy is used to protect the server(s) from the outside world.

6406531887185. ✓ A reverse proxy can be used to cache the responses, and reuse for similar subsequent requests.

6406531887186. ✓ A load balancer becomes irrelevant, where there is not more than 1 server.

6406531887187. ✗ All of these

**Question Number : 398 Question Id : 640653564579 Question Type : MSQ Is Question**

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

**Correct Marks : 3 Selectable Option : 0**

Question Label : Multiple Select Question

Suppose you are building an application which requires sending emails to all the users stored in the database at regular intervals. Given below are the two approaches to satisfy the requirement.

Approach 1:

```
@celery.task
def send_bulk_emails():
 all_users = User.query.all() // Get all the user objects from the
 database
 for user in all_users:
 // send email to the user

send_bulk_emails.delay() // invokes celery task
```

Approach 2:

```
@celery.task
def send_email(email):
 // send email to the user

all_users = User.query.all() // Get all the user objects from the database
for user in all_users:
 send_email.delay(user.email) // invokes celery task
```

Choose the correct statement(s).

**Options :**

6406531887200. ✓ Approach 1 will take more time than approach 2, if more than 2 celery workers are available.

6406531887201. ✗ Approach 2 will take more time than approach 1, if more than 2 celery workers are available.

6406531887202. ✓ Both the approaches will take same time (approx), if only 1 celery worker is available.

6406531887203. ✗ None of these

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

**Correct Marks : 3 Selectable Option : 0**

Question Label : Multiple Select Question

Which of the following is/are the potential benefits of using a message broker?

**Options :**

6406531887210. ❌ A message broker allows two servers in a network to directly communicate with each other, without an intermediary.

6406531887211. ✓ A message broker makes the network scalable for adding more servers to the network.

6406531887212. ✓ A message broker can be used for batch processing of messages.

6406531887213. ✓ A message broker is well suited in case of traffic spikes, as messages are retained in the queue until processed.

**Question Number : 400 Question Id : 640653564586 Question Type : MSQ Is Question**

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

**Correct Marks : 3 Selectable Option : 0**

Question Label : Multiple Select Question

Which of the following statement(s) is correct regarding the prototype in JavaScript?

**Options :**

6406531887226. ✓ Every constructor function has a property named 'prototype'.

6406531887227. ✓ Any object created using the new keyword and the constructor function, will inherit from the constructor's prototype object.

6406531887228. ✓ Prototype of an object can be accessed using the '\_\_proto\_\_' property of the object.

6406531887229. ❌ The prototype of an object can be accessed using the 'prototype' property of the object.

<b>Sub-Section Number :</b>	5
<b>Sub-Section Id :</b>	64065380559
<b>Question Shuffling Allowed :</b>	Yes
<b>Is Section Default? :</b>	null

**Question Number : 401 Question Id : 640653564569 Question Type : MCQ Is Question**

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

**Correct Marks : 4.5**

Question Label : Multiple Choice Question

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

index.html:

```
<div id = "app">
 <my-comp>
 <template #header>
 This is header content
 </template>

 <template #footer>
 This is footer content
 </template>

 <p> This is some content </p>
 </my-comp>
</div>
<script src = "app.js"> </script>
```

app.js:

```
Vue.component("myComp", {
 template : `<div>
 <p>
 <slot></slot>
 </p>
 <p>
 <slot name="header"></slot>
 </p>
 </div>
 `,
})

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

Suppose you open the “index.html” file in a browser. What will be rendered by the browser?

**Options :**

- This is header content
- This is footer content
- 6406531887160. ❌ This is some content

- This is header content
- 6406531887161. ❌ This is some content

6406531887162. ✖ This is header content

This is some content

6406531887163. ✓ This is header content

**Question Number : 402 Question Id : 640653564570 Question Type : MCQ Is Question**

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

**Correct Marks : 4.5**

Question Label : Multiple Choice Question

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

```

new Promise((str1, str2) => {
 if (5 == "5") str1(5)
 else str2(8)
}).
then(d => {
 console.log("Checkpoint 4", d);
 throw new Error(20);
 return d * 5;
})
.then(d => {
 console.log("Checkpoint 2", d);
 return d;
}, d => {
 console.log("Checkpoint 5", d.message);
 return d.message * 2;
}).catch(e => {
 console.log("Checkpoint 3", e.message);
 return e.message * 2;
}).finally(d => {
 console.log("Checkpoint 1", d);
 return d * 5;
}).then(d => {
 console.log("Checkpoint 6", d);
 return d * 5;
})

```

## Options :

Checkpoint 4 5  
 Checkpoint 3 20  
 Checkpoint 1 undefined  
 6406531887164. ✘ Checkpoint 6 NaN

Checkpoint 4 5  
 Checkpoint 5 20  
 Checkpoint 1 undefined  
 6406531887165. ✓ Checkpoint 6 40

Checkpoint 4 8  
 Checkpoint 3 20  
 Checkpoint 1 undefined  
 6406531887166. ✘ Checkpoint 6 40

Checkpoint 4 5  
Checkpoint 5 20  
Checkpoint 1 40  
6406531887167. ❌ Checkpoint 6 200

**Question Number : 403 Question Id : 640653564571 Question Type : MCQ Is Question**

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

**Correct Marks : 4.5**

Question Label : Multiple Choice Question

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

index.html:

```
<div id = "app">
 <input v-model = "text" @input = "save_data">
 <p> {{content}} </p>
</div>
<script scr = "app.js"></script>
```

app.js:

```
new Vue({
 el : "#app",
 data : {
 text : "",
 content : ""
 },
 mounted () {
 try {
 this.text = localStorage.getItem("value1").split("abhi").slice(1,-1),join("");
 this.content =
localStorage.getItem("value1").split("abhi").slice(1),join("");
 }
 catch {
 this.text = "";
 this.content = "";
 }
 },
 methods : {
 save_data() {
 localStorage.setItem("value1", this.text);
 localStorage.setItem("value2", this.content);
 }
 }
})
```

Suppose you open “index.html” file in a browser, and type the text “abhishekabhinavabhi” in the text box shown (after removing the previous text, if any), and hard refresh the page twice, without clicking anywhere. What will be the value shown in the text box, and the “age” placeholder, respectively?

**Options :**

6406531887168. ✓ sheknav, sheknav

6406531887169. ✘ nav, nav

**Question Number : 404 Question Id : 640653564577 Question Type : MCQ Is Question**

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

**Correct Marks : 4.5**

Question Label : Multiple Choice Question

Which of the following shows the correct output if the javascript program written below is executed?

```
let num = 50

const a = {
 num : 10,
 func : function (num) {
 console.log("Function A:", this.num)
 }
}

const b = {
 num : 20,
 func : function () {
 console.log("Function B:", this.num)
 a.func.bind(this)(num = 40)
 }
}

b.func.apply(a, [40])
```

**Options :**

Function B: 20

6406531887192. ✶ Function A: 10

Function B: 40

6406531887193. ✘ Function A: 40

Function B: 10

6406531887194. ✓ Function A: 10

Function B: 10

6406531887195. ✘ Function A: 40

**Question Number : 405 Question Id : 640653564587 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 application with markup “index.html” and javascript file “app.js”.

index.html:

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

app.js:

```
new Vue({
 el: '#app',
 template: `<div>
<ol type='1'>
 <li v-for='fruit in fruits'>{{fruit}}

</div>`,
 data: {
 fruits: ['Banana', 'Mango'],
 },
 beforeCreate() {
 this.fruits.push('Orange')
 },
 created() {
 this.fruits.push('Apple')
 },
})
```

Suppose you open the file “index.html” in a browser. What will be rendered by the browser?

**Options :**

1) Banana

6406531887230. ✘ 2) Mango

1) Banana

2) Mango

6406531887231. ✘ 3) Orange

6406531887232. ✓

- 1) Banana
- 2) Mango
- 3) Apple

- 1) Banana
- 2) Mango
- 3) Orange
- 4) Apple

6406531887233. ✘ 4) Apple

**Question Number : 406 Question Id : 640653564588 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 application with markup “index.html” and javascript file “app.js”.

index.html:

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

app.js:

```
const Player = {
 template: `<div style='background-color:red'><slot></slot></div>`,
 data() {
 return {
 scores: [
 { name: 'Rohit', run: 50 },
 { name: 'Virat', run: 20 },
],
 }
 },
}

new Vue({
 el: '#app',
 template: `<div>
 <h1> Score Board</h1>
 <Player>
 <ol type='1'>
 <li v-for='score in scores'>{{score.name}}:
{{score.run}}

 </Player>
 </div>`,
 data: {
 scores: [
 { name: 'Rohit', run: 20 },
 { name: 'Virat', run: 50 },
],
 },
 components: {
 Player,
 },
})
```

Suppose you open the file “index.html” in a browser. What will be rendered inside the slot, by the browser?

### Options :

- 1) Rohit: 20
- 6406531887234. ✓ 2) Virat: 50

- 1) Rohit: 50
- 6406531887235. ✘ 2) Virat: 20

1) Rohit: 50

6406531887236. ✘ 2) Virat: 50

1) Rohit: 20

6406531887237. ✘ 2) Virat: 20

**Question Number : 407 Question Id : 640653564595 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 flask application.

app.py:

```
from flask import Flask
from flask_caching import Cache
from time import sleep

config = {
 "CACHE_TYPE": "RedisCache",
 "CACHE_REDIS_URL": 'redis://localhost:6379/1'
}

app = Flask(__name__)
app.config.from_mapping(config)
cache = Cache(app)

@cache.memoize(timeout=120)
def get_score(name):
 sleep(10)
 return 0

@app.route('/match/<int:match_id>/player/<name>/score')
def score(match_id, name):
 score = get_score(name)
 return f"IND Vs AUS- SKY: {score}"

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

If the Redis server is running on “localhost:6379” and application is running on [“http://127.0.0.1:5000”](http://127.0.0.1:5000). If User visits the URL [“http://127.0.0.1:5000/match/1/player/sky/score”](http://127.0.0.1:5000/match/1/player/sky/score) twice within 2 minutes. What will be the approximate absolute difference between the response time of the requests?

#### Options :

6406531887262. ✓ 10 seconds

6406531887263. ✗ 0 seconds

6406531887264. ✗ 20 seconds

6406531887265. ✗ 120 Seconds

**Question Number : 408 Question Id : 640653564596 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 flask application.

app.py:

```
from flask import Flask
from flask_caching import Cache
from time import sleep

config = {
 "CACHE_TYPE": "RedisCache",
 "CACHE_REDIS_URL": 'redis://localhost:6379/1'
}

app = Flask(__name__)
app.config.from_mapping(config)
cache = Cache(app)

@cache.memoize(timeout=120)
def get_score(name):
 sleep(10)
 return 0

@app.route('/match/<int:match_id>/player/<name>/score')
def score(match_id, name):
 score = get_score(name)
 return f"IND Vs AUS- SKY: {score}"

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

If the Redis server is running on “localhost:6379” and application is running on [“http://127.0.0.1:5000”](http://127.0.0.1:5000). If User visits the URL [“http://127.0.0.1:5000/match/1/player/sky/score”](http://127.0.0.1:5000/match/1/player/sky/score) first and then [“http://127.0.0.1:5000/match/1/player/rohit/score”](http://127.0.0.1:5000/match/1/player/rohit/score) within 2 minutes. What will be the approximate absolute difference between the response time of the requests?

#### Options :

6406531887266. ❌ 10 seconds

6406531887267. ✓ 0 seconds

6406531887268. ❌ 20 seconds

6406531887269. ❌ 120 Seconds

<b>Sub-Section Number :</b>	6
<b>Sub-Section Id :</b>	64065380560
<b>Question Shuffling Allowed :</b>	Yes
<b>Is Section Default? :</b>	null

**Question Number : 409 Question Id : 640653564574 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 true regarding webhooks?

**Options :**

6406531887180. ✘ A webhook should deliver data to other apps, as it happens.

6406531887181. ✘ A webhook is primarily meant for a server to server communication.

6406531887182. ✘ A webhook typically uses an HTTP POST request to deliver the response.

6406531887183. ✓ All of these

**Question Number : 410 Question Id : 640653564576 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 true about cookies and CORS?

**Options :**

6406531887188. ✘ A session cookie expires as soon as the application tab is closed, and not the browser.

6406531887189. ✓ The CORS mechanism reduces the chances of malicious actions by explicitly saying which URLs can be the originators of data.

6406531887190.

\* A browser sandbox causes any browser based malware to directly affect the user's system.

6406531887191. \* All of these

**Question Number : 411 Question Id : 640653564581 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 an endpoint in your flask application triggers a celery task, which generates a CSV file named "data.csv" and saves it in the static folder of a flask application. The file generator takes anywhere between 20 and 40 seconds to generate and save the CSV file.

The below fetch call is used to get the file generated by the above explained celery task.

```
fetch("/static/data.csv").then(response => response.blob()
).then(data => {
 // does something with the response data
})
```

Which of the following is the most efficient way to make the above fetch call so that it doesn't fail and return the desired response?

**Options :**

6406531887208. ✓ Use short polling to check the state of the celery task after every 5 seconds, and make the fetch call, when the task succeeds.

6406531887209. \* Use javascript function "setTimeout" to make the fetch after 41 seconds, which makes sure that the file is generated and saved to the desired location.

**MLF**

**Section Id :** 64065338347

**Section Number :** 15

**Section type :** Online

<b>Mandatory or Optional :</b>	Mandatory
<b>Number of Questions :</b>	17
<b>Number of Questions to be attempted :</b>	17
<b>Section Marks :</b>	50
<b>Display Number Panel :</b>	Yes
<b>Group All Questions :</b>	No
<b>Enable Mark as Answered Mark for Review and Clear Response :</b>	Yes
<b>Maximum Instruction Time :</b>	0
<b>Sub-Section Number :</b>	1
<b>Sub-Section Id :</b>	64065380561
<b>Question Shuffling Allowed :</b>	No
<b>Is Section Default? :</b>	null

**Question Number : 412 Question Id : 640653564597 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 0**

Question Label : Multiple Choice Question

**THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL : MACHINE LEARNING FOUNDATIONS (COMPUTER BASED EXAM)"**

**ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?**

**CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.**

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

**Options :**

6406531887270. ✓ YES

6406531887271. ✗ NO

**Sub-Section Id :** 64065380562

**Question Shuffling Allowed :** Yes

**Is Section Default? :** null

**Question Number : 413 Question Id : 640653564598 Question Type : MSQ Is Question**

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

**Correct Marks : 2 Selectable Option : 0**

Question Label : Multiple Select Question

Which of the following statements regarding classification and regression models are correct ?

**Options :**

6406531887272. ✓ In Regression, the output variable must be of continuous nature or real value but In Classification, the output variable is categorical.

6406531887273. ✓ In Regression, we try to find the best fit line, which can predict the output more accurately but In Classification, we try to find the decision boundary, which can divide the dataset into different classes.

6406531887274. ❗ The Classification Algorithm can be further divided into Linear and Non-linear classifier and the regression algorithms can be divided into Binary regression and Multi-class regression.

6406531887275. ✓ Regression algorithms can be used to solve the regression problems such as Weather Prediction, House price prediction, etc and Classification Algorithms can be used to solve classification problems such as Identification of spam emails, Speech Recognition, Identification of cancer cells, etc.

**Sub-Section Number :** 3

**Sub-Section Id :** 64065380563

**Question Shuffling Allowed :** Yes

**Is Section Default? :** null

**Question Number : 414 Question Id : 640653564599 Question Type : MSQ Is Question**

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

**Time : 0**

**Correct Marks : 3 Selectable Option : 0**

Question Label : Multiple Select Question

Which of the following can be the equation of the line passing through point  $(1, 1, 1)$  and normal to the tangent of the function  $x^2 + yz + z^2$  at the point  $(1, 1, 1)$ ?

**Options :**

6406531887276. ✓  $[1, 1, 1]^T + \lambda * [1, 1, -1]^T$

6406531887277. ✓  $[1, 1, 1]^T + \lambda * [-2, 1, 1]^T$

6406531887278. ✗  $[1, 1, 1]^T + \lambda * [2, 1, 1]^T$

6406531887279. ✓  $[1, 1, 1]^T + \lambda * [1, -5, 1]^T$

**Question Number : 415 Question Id : 640653564600 Question Type : MSQ Is Question**

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

**Time : 0**

**Correct Marks : 3 Selectable Option : 0**

Question Label : Multiple Select Question

Which among the following options are correct?

**Options :**

6406531887280. ✗ If the columns of  $A$  are linearly independent, then  $Ax = b$  has exactly one solution for every  $b$ .

6406531887281. ✓ If the columns of  $A$  are linearly independent and if the solution for  $Ax = b$  exists, then it is unique.

6406531887282. ✗ If  $Ax = b$  has a unique solution, then  $A$  is a square matrix.

6406531887283. ✓ If the columns of a matrix  $A$  are linearly dependent, then  $Ax = 0$  has a nontrivial

solution.

**Question Number : 416 Question Id : 640653564601 Question Type : MSQ Is Question**

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

**Correct Marks : 3 Selectable Option : 0**

Question Label : Multiple Select Question

Which among the following statement is/are true?

**Options :**

6406531887284. ✓ If  $A$  and  $Q$  are orthogonal matrices then  $AQ$  is also an orthogonal matrix.

6406531887285. ✓ If  $Q$  is an orthogonal matrix and  $x$  is any vector then  $\|Qx\| = \|x\|$

6406531887286. ✓ If  $\lambda$  is an eigenvalue of an orthogonal matrix, then  $|\lambda| = 1$

6406531887287. ✗ If  $\lambda$  is an eigenvalue of an orthogonal matrix, then  $\lambda = 0$

**Question Number : 417 Question Id : 640653564603 Question Type : MSQ Is Question**

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

**Correct Marks : 3 Selectable Option : 0**

Question Label : Multiple Select Question

Suppose  $A$  is a symmetric positive definite matrix and  $Q$  is orthogonal matrix, then which of the following statements is/are true?

**Options :**

6406531887292. ✗  $Q^T A Q$  is a diagonal matrix.

6406531887293.

✓  $Q^T A Q$  is positive definite.

6406531887294. ✓  $Q^T A Q$  has the same eigenvalues as A.

6406531887295. ✗  $Q^T A Q$  is skew-symmetric.

**Question Number : 418 Question Id : 640653564606 Question Type : MSQ Is Question**

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

**Correct Marks : 3 Selectable Option : 0**

Question Label : Multiple Select Question

Which among the following is a convex function?

**Options :**

6406531887298. ✓  $x \log_2 x, x > 0$

6406531887299. ✓  $-\log(1 + x), x > 1$

6406531887300. ✓  $5x^6 + 3x^2 - 1000, x \in \mathbb{R}$

6406531887301. ✗  $x^3, x \in \mathbb{R}$

**Sub-Section Number :** 4

**Sub-Section Id :** 64065380564

**Question Shuffling Allowed :** Yes

**Is Section Default? :** null

**Question Number : 419 Question Id : 640653564602 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  $A$  be a Hermitian matrix. Then, which of the following statements are false?

**Options :**

6406531887288. ✘ The diagonal entries of  $A$  are all real.

6406531887289. ✘ There exists a unitary  $U$  such that  $U \square A U$  is a diagonal matrix.

6406531887290. ✘ If  $A^3 = I$ , then  $A = I$

6406531887291. ✓ If  $A^2 = I$ , then  $A = I$

**Question Number : 420 Question Id : 640653564609 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 consumer wants to maximize his utility subject to some constraints. He consumes two goods  $x$  and  $y$  and the utility function is the product of  $x$  and  $y$ . His budget is Rs.1000. The per unit price of goods  $x$  and  $y$  are Rs.15 and Rs.20 respectively. For the given optimization problem, choose the equivalent Lagrange function.

**Options :**

6406531887307. ✘  $L(x, y, z) = x + y - \lambda(15x + 20y - 1000)$

6406531887308. ✘  $L(x, y, z) = x + y + \lambda(15x + 20y - 1000)$

6406531887309. ✓  $L(x, y, \lambda) = xy + \lambda(15x + 20y - 1000)$

6406531887310. ✘  $L(x, y, \lambda) = xy - \lambda(15x + 20y + 1000)$

**Question Number : 421 Question Id : 640653564611 Question Type : MCQ Is Question**

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

**Correct Marks : 3**

Question Label : Multiple Choice Question

Let  $X_1, X_2, \dots, X_{15}$  i.i.d. Geometric( $\frac{1}{3}$ ). Find the probability that  $(X_1 = 5, X_2 = 5, \dots, X_{15} = 5)$ .

**Options :**

6406531887312. ✓  $\left(\frac{2}{3}\right)^{60} \left(\frac{1}{3}\right)^{15}$

6406531887313. ✗  $\left(\frac{2}{3}\right)^{14} \left(\frac{1}{3}\right)$

6406531887314. ✗  $\left(\frac{2}{3}\right)^{75}$

6406531887315. ✗  $\left(\frac{2}{3}\right)^{15}$

**Sub-Section Number :** 5

**Sub-Section Id :** 64065380565

**Question Shuffling Allowed :** Yes

**Is Section Default? :** null

**Question Number : 422 Question Id : 640653564604 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 you have a two-dimensional dataset  $x_1, x_2, x_3, \dots, x_n$  with mean zero.

Suppose the covariance matrix  $C = \sum_{i=1}^n x_i x_i^T = \begin{bmatrix} 4 & 2 \\ 2 & 4 \end{bmatrix}$

Using PCA, project the data onto a line, What is the projected variance ?

Enter the answer as integer.

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

6

**Question Number :** 423 **Question Id :** 640653564607 **Question Type :** SA **Calculator :** None

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

**Correct Marks :** 3

Question Label : Short Answer Question

What is the minimum possible distance from the point  $(4, 0)$  to a point on the circle  $x^2 + y^2 = 1$  is

Enter the answer as integer.

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

3

**Sub-Section Number :** 6

**Sub-Section Id :** 64065380566

**Question Shuffling Allowed :** Yes

**Is Section Default? :**

null

**Question Number : 424 Question Id : 640653564605 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**

By using first order taylor series approximation, what would be the value of  $f([1, 2, 3]^T)$ , if  $f([1, 1, 1]^T) = 10$  and  $\nabla f([1, 1, 1]^T) = [2, 1, 3]^T$ ? Enter the answer as integer.

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

17

**Sub-Section Number :** 7

**Sub-Section Id :** 64065380567

**Question Shuffling Allowed :** Yes

**Is Section Default? :** null

**Question Number : 425 Question Id : 640653564608 Question Type : MSQ Is Question**

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

**Correct Marks : 4 Selectable Option : 0**

**Question Label : Multiple Select Question**

A student wants to purchase a snack from a bakery to meet certain dietary requirements by choosing the best combination of brownies and cheesecake. The student is following some new diet trend which requires her to eat at maximum of 8 brownies and maximum of 12 cakes. Also total number of cakes and chocolates together a student can eat should exceed 14. The cost of 1 piece of brownie( $x_1$ ) and 1 piece of cake( $x_2$ ) is 50 units and 80 units respectively. Her goal is to satisfy these requirements at minimal cost.

**Options :**

6406531887303. ✓ In primal linear program, the function to be minimized is  $50x_1 + 80x_2$ .

6406531887304. ✓ Constraints of primal linear program are  $x_1 \leq 8$ ,  $x_2 \leq 12$ , and  $x_1 + x_2 > 14$ .

6406531887305. ✘ In primal linear program, the function to be minimized is  $6x_1 + 10x_2 + 8x_3$ .

6406531887306. ✘ Constraints of primal linear program are  $x_1 \geq 8$ ,  $x_2 \geq 12$ , and  $x_1 + x_2 > 14$ .

**Sub-Section Number :** 8

**Sub-Section Id :** 64065380568

**Question Shuffling Allowed :** Yes

**Is Section Default? :** null

**Question Number : 426 Question Id : 640653564610 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 joint density function of random variables  $X$  and  $Y$  is given by

$$f_{XY}(x, y) = \begin{cases} 2(x^3 + y^3), & 0 < x < 1, 0 < y < 1, \\ 0, & \text{otherwise} \end{cases}$$

What is the value of  $P(0 < X < 0.5, 0 < Y < 0.5)$ ? Enter the answer correct to three decimals accuracy.

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Range**

**Text Areas : PlainText**

**Possible Answers :**

0.029 to 0.033

**Question Number : 427 Question Id : 640653564613 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

Suppose you want to estimate the average marks  $\mu$  of Class 10 students in India. To this end, you randomly select  $n$  students from the entire population. The standard deviation of Class 10 marks of the population is known to be 10. Find the minimum value of  $n$  so that Chebyshev's inequality guarantees the estimate to be within 5 marks from  $\mu$ , with probability at least 0.99. Enter the answer as integer.

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

400

**Sub-Section Number : 9**

**Sub-Section Id : 64065380569**

**Question Shuffling Allowed : Yes**

**Is Section Default? : null**

**Question Number : 428 Question Id : 640653564612 Question Type : MCQ Is Question**

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

**Correct Marks : 4**

Question Label : Multiple Choice Question

Let  $Z_1, Z_2 \sim$  i.i.d.  $\text{Normal}(0, 1)$ . Define

$$X_1 = Z_1 + 3Z_2 - 2$$

$$X_2 = Z_1 - 2Z_2 + 1$$

What will be the distribution of  $X = (X_1, X_2)$ ?

**Options :**

6406531887316. ❌  $X \sim \text{Normal} \left( \begin{bmatrix} -2 \\ 1 \end{bmatrix}, \begin{bmatrix} 1 & 3 \\ 1 & -2 \end{bmatrix} \right)$

6406531887317. ✓  $X \sim \text{Normal} \left( \begin{bmatrix} -2 \\ 1 \end{bmatrix}, \begin{bmatrix} 10 & -5 \\ -5 & 5 \end{bmatrix} \right)$

6406531887318. ❌  $X \sim \text{Normal} \left( \begin{bmatrix} 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 1 & 3 \\ 1 & -2 \end{bmatrix} \right)$

6406531887319. ❌  $X \sim \text{Normal} \left( \begin{bmatrix} 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 10 & -5 \\ -5 & 5 \end{bmatrix} \right)$