

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 AN EXAM QDD4 27 Oct 2024
Subject Name :	2024 Oct27: IIT M AN EXAM QDD4
Creation Date :	2024-10-16 15:38:02
Duration :	240
Total Marks :	770
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 :	64065321611
Group Maximum Duration :	0
Group Minimum Duration :	90

Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	770
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
Revisit Section :	Yes
Action on Revisit Section :	View and Edit
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

MLF

Section Id :	64065369430
Section Number :	1
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	13
Number of Questions to be attempted :	13
Section Marks :	40
Display Number Panel :	Yes
Section Negative Marks :	0
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	No
Section Maximum Duration :	0
Section Minimum Duration :	0
Section Time In :	Minutes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653146947
Question Shuffling Allowed :	No

Question Number : 1 Question Id : 640653995987 Question Type : MCQ

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL : MACHINE LEARNING FOUNDATIONS (COMPUTER BASED EXAM)"

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Options :

6406533362137. ✓ YES

6406533362138. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 640653146948

Question Shuffling Allowed : Yes

Question Number : 2 Question Id : 640653995988 Question Type : MSQ

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following 3×3 matrices have rank 2 with column space equal to row space?

Options :

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

6406533362139. ✓

$$\begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 5 \\ 3 & 5 & 6 \end{bmatrix}$$

6406533362140. ✗

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

6406533362141. ✗

$$\begin{bmatrix} 2 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 2 \end{bmatrix}$$

6406533362142. ✓

Question Number : 3 Question Id : 640653995992 Question Type : MSQ

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider a matrix $B = A^4 - 3A - 2I$, where $A = \begin{bmatrix} 1 & 1 & 1 \\ 0 & 2 & 1 \\ 0 & 0 & 3 \end{bmatrix}$. Which of the following options is/are true?

Options :

6406533362157. ✓ B has eigenvalues -4, 8, 70.

6406533362158. ✗ A has eigenvalues 1, 16, 81.

6406533362159. ✓ B is an upper triangular matrix.

6406533362160. ✗ B is a lower triangular matrix.

Sub-Section Number :

3

Sub-Section Id :

640653146949

Question Shuffling Allowed :

Yes

Question Number : 4 Question Id : 640653995989 Question Type : MSQ

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider a matrix $A = \begin{bmatrix} 6 & 3 \\ -2 & 1 \end{bmatrix}$ and a set $S = \{v_1 = (1, -1), v_2 = (1, 1)\}$.

Which of the following options is/are correct?

Options :

6406533362143. ✗ S is the set of eigenvectors of A .

6406533362144. ✓ Only v_1 is an eigenvector of A .

$$6406533362145. \checkmark A^{50} = \begin{pmatrix} 1 & 3 \\ -1 & -2 \end{pmatrix} \begin{pmatrix} 3^{50} & 0 \\ 0 & 4^{50} \end{pmatrix} \begin{pmatrix} -2 & -3 \\ 1 & 1 \end{pmatrix}$$

$$6406533362146. ✗ A^{50} = \begin{pmatrix} 3 & 1 \\ -2 & -1 \end{pmatrix} \begin{pmatrix} 3^{50} & 0 \\ 0 & 4^{50} \end{pmatrix} \begin{pmatrix} 1 & 1 \\ -2 & -3 \end{pmatrix}$$

Question Number : 5 Question Id : 640653995990 Question Type : MSQ

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider two vectors $a = \begin{bmatrix} 1 \\ -1 \\ 0 \end{bmatrix}$ and $b = \begin{bmatrix} 1 \\ 2 \\ -1 \end{bmatrix}$. Let P be the projection

matrix that projects a vector onto the line through the vector a . Which of the following options is/are true?

Options :

6406533362147. ✓ P is symmetric matrix.

6406533362148. ✗ Projection of b onto a is $\frac{1}{4}(-a)$.

6406533362149. ✓ P is rank one matrix.

6406533362150. ✓ Plane $x = y$ is orthogonal to a .

Question Number : 6 Question Id : 640653995991 Question Type : MSQ

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following options is/are correct for the following dataset?

x	1	1	-1
y	1	1	1

Options :

6406533362151. ✓ The best-fit line for the dataset given using the least squares method is, $\hat{y} = 1$.

6406533362152. ✗ The best-fit line for the dataset given using the least squares method is, $\hat{y} = -1$.

The best-fit line for the dataset given using the least squares method is, $\hat{y} = x - 1$.

6406533362153. ✗

6406533362154. ✗ The best-fit line for the dataset given using the least squares method is, $\hat{y} = x + 1$.

Error vector (the difference between predicted value and actual value) is $\begin{bmatrix} 0 \\ 0 \\ -2 \end{bmatrix}$.
6406533362155. ✗

Error vector (the difference between predicted value and actual value) is $\begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$.
6406533362156. ✓

Question Number : 7 Question Id : 640653995997 Question Type : MSQ

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Determine which of the following limits yields a finite value.

Options :

6406533362173. ✓ $\lim_{x \rightarrow 1} \frac{x^{\frac{1}{3}} - 1}{x^{\frac{1}{2}} - 1}$

6406533362174. ✓ $\lim_{x \rightarrow 1} \frac{1 - x^{\frac{1}{2}}}{1 - x}$

6406533362175. ✗ $\lim_{x \rightarrow \infty} \frac{x^2 - 7x}{x + 1}$

6406533362176. ✓ $\lim_{x \rightarrow a} \frac{x^2 - a^2}{x^4 - a^4}$, where $a > 0$

6406533362177. ✗ None of these

Sub-Section Number :

4

Sub-Section Id :

640653146950

Question Shuffling Allowed :

Yes

Question Number : 8 Question Id : 640653995993 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Let $A = \begin{bmatrix} 2 & 0 & 0 \\ 0 & 2 & 1 \\ 0 & 0 & 6 \end{bmatrix}$. Is A diagonalizable?

Options :

6406533362161. ✓ Yes

6406533362162. ✗ No

6406533362163. ✗ Insufficient information

Question Number : 9 Question Id : 640653995994 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following input data points:

X	Y
[0, 1, 1]	-1
[0, 1, 0]	-1
[1, 1, 3]	+1
[1, 0, 5]	+1
[0, 0, 6]	+1
[1, 0, 4]	+1

Which among the following models has the least misclassification error?

Hint: Consider $\text{Sign}(0) = 1$

Options :

6406533362164. ✓ $\text{Sign}(x_1 + x_2 + x_3 - 5)$

6406533362165. ✗ $\text{Sign}(x_1 + x_2 - 2)$

6406533362166. ✗ $\text{Sign}(x_1 + x_2 + x_3)$

6406533362167. ✗ $\text{Sign}(x_3 - x_2 - x_1)$

Question Number : 10 Question Id : 640653995996 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

For what value of b is

$$f(x) = \begin{cases} \frac{x-b}{b+1}, & \text{if } x < 0 \\ x^2 + b, & \text{if } x \geq 0 \end{cases}$$

continuous at every x ?

Options :

6406533362169. ✗ 3

6406533362170. ✗ 2

6406533362171. ✓ -2

6406533362172. ✗ 1

Question Number : 11 Question Id : 640653995999 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the function, $f(x, y) = x^2 + 3y^2$, in which direction does the maximum directional derivative occur at the point $(1, 2)$?

Options :

6406533362179. ❌ $\left(\frac{1}{\sqrt{10}}, \frac{3}{\sqrt{10}}\right)$

6406533362180. ✓ $\left(\frac{1}{\sqrt{37}}, \frac{6}{\sqrt{37}}\right)$

6406533362181. ❌ $\left(\frac{2}{\sqrt{5}}, \frac{24}{\sqrt{5}}\right)$

6406533362182. ❌ $\left(\frac{1}{\sqrt{5}}, \frac{2}{\sqrt{5}}\right)$

Sub-Section Number :

5

Sub-Section Id :

640653146951

Question Shuffling Allowed :

Yes

Question Number : 12 Question Id : 640653995995 Question Type : SA

Correct Marks : 3

Question Label : Short Answer Question

Consider the function, $f(x, y) = e^x \cos(y)$. Let $L(x, y)$ be the linear approximation of $f(x, y)$ at the point $(0, 0)$, then find the value $L(0.5, 0)$. Enter the answer correct to one decimal place.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1.5

Question Number : 13 Question Id : 640653995998 Question Type : SA

Correct Marks : 3

Question Label : Short Answer Question

Let $f : \mathbb{R} \rightarrow \mathbb{R}$ be the function, $f(x) = 1 + e^{-x}$. What is the value of the derivative of f at x where $f(x) = 1.4$? Enter the answer correct to one decimal place.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0.4

MLT

Section Id :	64065369431
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	12
Number of Questions to be attempted :	12
Section Marks :	50
Display Number Panel :	Yes
Section Negative Marks :	0
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	No
Section Maximum Duration :	0
Section Minimum Duration :	0
Section Time In :	Minutes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653146952
Question Shuffling Allowed :	No

Question Number : 14 **Question Id :** 640653996000 **Question Type :** MCQ

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL : MACHINE LEARNING TECHNIQUES (COMPUTER BASED EXAM)"

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Options :

6406533362183. ✓ YES

6406533362184. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 640653146953

Question Shuffling Allowed : Yes

Question Number : 15 Question Id : 640653996006 Question Type : MCQ

Correct Marks : 4

Question Label : Multiple Choice Question

Let $\mathbf{x} = \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$ and $\mathbf{y} = \begin{bmatrix} y_1 \\ y_2 \end{bmatrix}$ be vectors in \mathbb{R}^2 . Define the functions k_1 and k_2 as:

$$k_1(\mathbf{x}, \mathbf{y}) = x_1y_1 + x_2y_2 + (x_1 + x_2)(y_1 + y_2)$$

$$k_2(\mathbf{x}, \mathbf{y}) = x_1y_1 + x_2y_2 + (x_1^2 + y_2^2) + 3$$

Which of the following statements is true?

Options :

6406533362192. ✗ Both k_1 and k_2 are valid kernels.

6406533362193. ✓ k_1 is a valid kernel, but k_2 is not a valid kernel.

6406533362194. ✗ k_2 is a valid kernel, but k_1 is not a valid kernel.

6406533362195. ✗ Neither k_1 nor k_2 is a valid kernel.

Question Number : 16 Question Id : 640653996008 Question Type : MCQ

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the following kernel:

$$k : R^2 \times R^2 \rightarrow R$$

$$k(x, y) = (x^T y)^2 + 1$$

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

Options :

6406533362198. ✓ $\phi([x_1, x_2]^T) = [x_1^2, \sqrt{2}x_1x_2, x_2^2, 1]^T$

6406533362199. ✘ $\phi([x_1, x_2]^T) = [x_1^2, x_1 + x_2, x_2^2, 1]^T$

6406533362200. ✘ $\phi([x_1, x_2]^T) = [x_1, \sqrt{2}x_1^2x_2^2, x_2, 1]^T$

6406533362201. ✘ $\phi([x_1, x_2]^T) = [x_1, x_1x_2, x_2, 1]^T$

Sub-Section Number :

3

Sub-Section Id :

640653146954

Question Shuffling Allowed :

Yes

Question Number : 17 Question Id : 640653996007 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Given n data points in a d -dimensional space with a non-linear relationship, we apply kernel PCA to reduce the dimensionality and select the first k principal components. Is it possible for k to be greater than d ?

Options :

6406533362196. ✓ yes

6406533362197. ✘ No

Sub-Section Number :

4

Sub-Section Id :

640653146955

Question Shuffling Allowed :

Yes

Question Number : 18 Question Id : 640653996004 Question Type : MSQ

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following expressions is the reconstruction error for a dataset of n points, with respect to a line passing through the origin represented by the vector w . Note that $\|w\| = 1$.

Options :

$$\frac{1}{n} \sum_{i=1}^n \|x_i - (x_i^T w)w\|^2$$

6406533362187. ✓

$$\frac{1}{n} \sum_{i=1}^n [x_i - (x_i^T w)w]^T [x_i - (x_i^T w)w]$$

6406533362188. ✓

$$\frac{1}{n} \sum_{i=1}^n [\mathbf{x}_i^T \mathbf{x}_i + (\mathbf{x}_i^T \mathbf{w})^2]$$

6406533362189. ✘

$$-\frac{1}{n} \sum_{i=1}^n (\mathbf{x}_i^T \mathbf{w})^2$$

6406533362190. ✘

Sub-Section Number :

5

Sub-Section Id :

640653146956

Question Shuffling Allowed :

Yes

Question Number : 19 Question Id : 640653996013 Question Type : MSQ

Correct Marks : 5 Max. Selectable Options : 0

Question Label : Multiple Select Question

Let X_1, X_2, \dots, X_n be n i.i.d. samples with parameter θ , which follows one of the following PDFs:

For $\theta = -1$, we have

$$f(x | \theta) = \begin{cases} 5x^4, & \text{if } 0 < x < 1 \\ 0, & \text{otherwise} \end{cases}.$$

For $\theta = 1$, we have

$$f(x | \theta) = \begin{cases} 1, & \text{if } 0 < x < 1 \\ 0, & \text{otherwise} \end{cases}.$$

Suppose we wish to find the maximum likelihood estimate of θ , then which among the following are true?

Options :

6406533362211. ✓ If $\prod_{i=1}^n 5x_i^4 < 1$, then $\hat{\theta}_{MLE} = 1$

6406533362212. ✘ If $\prod_{i=1}^n 5x_i^4 > 1$, then $\hat{\theta}_{MLE} = 1$

6406533362213. ✘ If $\prod_{i=1}^n 5x_i^4 < 1$, then $\hat{\theta}_{MLE} = -1$

6406533362214. ✓ If $\prod_{i=1}^n 5x_i^4 > 1$, then $\hat{\theta}_{MLE} = -1$

Sub-Section Number :

6

Sub-Section Id : 640653146957

Question Shuffling Allowed : Yes

Question Number : 20 Question Id : 640653996005 Question Type : SA

Correct Marks : 3

Question Label : Short Answer Question

The eigenvalues of the covariance matrix of a centered dataset in \mathbb{R}^5 are 30, 10, 10, 0, 0. Standard PCA is performed on this dataset. What is the variance captured by the top two principal components expressed as a percentage of total variance?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

80

Sub-Section Number : 7

Sub-Section Id : 640653146958

Question Shuffling Allowed : Yes

Question Number : 21 Question Id : 640653996012 Question Type : SA

Correct Marks : 5

Question Label : Short Answer Question

Consider the following data points for k-means clustering.

$$(-1, 0), (-1, 1), (-1, -1), (2, 0), (3, 1), (3, -1), (4, 0)$$

In the initialization step of k-means with $k = 2$, suppose $\mu_1^0 = (-1, 0)$ and $\mu_2^0 = (2, 0)$. Distances of datapoints from initial cluster means is tabulated below:

x_i	$\ x_i - \mu_1^0\ _2^2$	$\ x_i - \mu_2^0\ _2^2$
(-1, 0)	0	3
(-1, 1)	1	10
(-1, -1)	1	10
(2, 0)	3	0
(3, 1)	17	2
(3, -1)	17	2
(4, 0)	5	2

As per these cluster centers, the data points are then assigned to either cluster 1 or cluster 2. After this assignment, what will be the value of the objective function?

Note: Objective function is given by

$$F(z_1, z_2, \dots, z_n) = \sum_{i=1}^n \|x_i - \mu_{z_i}\|_2^2$$

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 : 640653146959

Question Shuffling Allowed : Yes

Question Number : 22 **Question Id :** 640653996014 **Question Type :** SA

Correct Marks : 4

Question Label : Short Answer Question

Consider a GMM for 5 points:

$$x_1 = 1, x_2 = 1.2, x_3 = 2, x_4 = 1.5, x_5 = 0.5$$

At some time-step in the EM algorithm, following are the values of λ_k^i for the k -th mixture after the E-step:

$$\lambda_k^1 = 0.3, \lambda_k^2 = 0.1, \lambda_k^3 = 2.5, \lambda_k^4 = 0.6, \lambda_k^5 = 0.8$$

What is the estimate of μ_k after the M-step? 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 :

1.50 to 1.60

Question Number : 23 **Question Id :** 640653996015 **Question Type :** SA

Correct Marks : 4

Question Label : Short Answer Question

Consider a dataset with 100 total data points. Each data point is classified as either type A or type B. We model this using a Bernoulli distribution, where p is the probability of a data point being type A. If the maximum likelihood estimate (MLE) of p based on the dataset is 0.4, how many data points of type B are there in this dataset?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

60

Sub-Section Number : 9

Sub-Section Id : 640653146960

Question Shuffling Allowed : No

Question Id : 640653996001 **Question Type :** COMPREHENSION **Sub Question Shuffling Allowed :** No **Group Comprehension Questions :** No **Question Pattern Type :** NonMatrix

Question Numbers : (24 to 25)

Question Label : Comprehension

Given the vector $\mathbf{x} = \begin{bmatrix} 3 \\ 4 \end{bmatrix}$ and the line passing through the origin represented

by the vector $\mathbf{w} = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$.

Answer the given subquestions.

Sub questions

Question Number : 24 **Question Id :** 640653996002 **Question Type :** SA

Correct Marks : 3

Question Label : Short Answer Question

Find the length of the projection of x onto the line defined by w .

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 :

4.8 to 5.1

Question Number : 25 Question Id : 640653996003 Question Type : SA

Correct Marks : 4

Question Label : Short Answer Question

Calculate the magnitude(norm) of reconstruction error after projecting x onto the line defined by w .

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 :

0.5 to 0.9

Question Id : 640653996009 Question Type : COMPREHENSION Sub Question Shuffling

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

Question Numbers : (26 to 27)

Question Label : Comprehension

A k-means++ algorithm with $k = 3$ is applied on the following 2D points:

$$(0, 1), (1, 0), (1, 2), (2, 1), (2, 3), (2, 4), (3, 2)$$

First cluster mean μ_1^0 is chosen as $(2, 1)$.

Suppose the point with the highest score is chosen as the 2nd cluster mean μ_2^0 .

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 26 Question Id : 640653996010 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

What is μ_2^0 ? Use squared distance to calculate the scores.

Options :

6406533362202. ✘ (0,1)

6406533362203. ✘ (2,3)

6406533362204. ✘ (3,2)

6406533362205. ✓ (2,4)

Question Number : 27 Question Id : 640653996011 Question Type : MCQ

Correct Marks : 4

Question Label : Multiple Choice Question

Which point has the lowest probability of being chosen as the 3rd cluster mean? Use squared distance to calculate the scores.

Options :

6406533362206. ✘ (1,0)

6406533362207. ✓ (2,3)

6406533362208. ✘ (3,2)

6406533362209. ✘ (1,2)

MLP

Section Id :	64065369432
Section Number :	3
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	18
Number of Questions to be attempted :	18
Section Marks :	50
Display Number Panel :	Yes
Section Negative Marks :	0
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	No
Section Maximum Duration :	0
Section Minimum Duration :	0
Section Time In :	Minutes
Maximum Instruction Time :	0

Sub-Section Number : 1
Sub-Section Id : 640653146961
Question Shuffling Allowed : No

Question Number : 28 Question Id : 640653996016 Question Type : MCQ

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL : MACHINE LEARNING PRACTICE (COMPUTER BASED EXAM)"

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Options :

6406533362217. ✓ YES

6406533362218. ✗ NO

Sub-Section Number : 2
Sub-Section Id : 640653146962
Question Shuffling Allowed : No

Question Id : 640653996017 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Question Numbers : (29 to 33)

Question Label : Comprehension

```
1 >>> import pandas as pd
2 >>> df = pd.read_csv('dataset.csv')
3 >>> print(df)
```

	FlightID	Airline	FlightNumber	Origin	Destination	DelayMinutes	DelayReason	Cancelled	Diverted	AircraftType	TailNumber	Distance
0	1	United	4558	ORD	MIA	8	Weather	True	False	Boeing 737	N71066	1031
1	2	Delta	8021	LAX	MIA	2	Air Traffic Control	True	True	Airbus A320	N22657	1006
2	3	Southwest	7520	DFW	SFO	14	Weather	True	True	Boeing 737	N95611	2980
3	4	Delta	2046	ORD	BOS	-10	NaN	False	False	Boeing 777	N90029	1408
4	5	Delta	6049	LAX	SEA	24	Air Traffic Control	False	True	Boeing 737	N27417	2298
5	6	Southwest	6311	LAX	JFK	-5	NaN	False	False	Boeing 777	N92652	1386
6	7	Southwest	4188	ORD	JFK	7	Weather	False	True	Boeing 777	N25382	1674
7	8	Southwest	3179	DFW	MIA	24	Weather	False	True	Boeing 777	N65410	2931
8	9	American Airlines	3613	ORD	MIA	2	Weather	False	False	Airbus A320	N45570	2337
9	10	Southwest	2186	LAX	BOS	25	Maintenance	True	False	Boeing 777	N15724	605
10	11	American Airlines	9317	JFK	MIA	-6	NaN	True	True	Airbus A320	N54905	2848
11	12	American Airlines	5251	DFW	BOS	30	Weather	False	False	Airbus A320	N94983	131

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 29 Question Id : 640653996018 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

Which option will give the total count of canceled flights in the dataset?

Options :

6406533362219. ✓ df['Cancelled'].sum()

6406533362220. ✗ df['Cancelled'].count()

6406533362221. ✗ df['Cancelled'].isnull().sum()

6406533362222. ✗ df['Cancelled'].len()

Question Number : 30 Question Id : 640653996019 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

Which of the following code snippets will add a new column 'OnTime' that shows True if the flight was not delayed, else False?

Options :

6406533362223. ✓ df['OnTime'] = df['DelayMinutes'] <= 0

6406533362224. ✗ df['OnTime'] = df['DelayMinutes'] >= 0

6406533362225. ✗ df['OnTime'] = df['Cancelled'] == False

6406533362226. ✗ df['OnTime'] = df['Diverted'] == False

Question Number : 31 Question Id : 640653996020 Question Type : MSQ

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

How can you filter the flights that have a delay due to 'Weather'?

Options :

6406533362227. ✗ df[df['DelayReason'].str.contains('Weather')]

6406533362228. ✓ df.loc[df['DelayReason'] == 'Weather']

6406533362229. ✓ df[df['DelayReason'] == 'Weather']

6406533362230. ✗ df[df['Weather'] == True]

Question Number : 32 Question Id : 640653996021 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Which option will sort the flights first by `Airline` in ascending order, then by DelayMinutes in descending order?

Options :

6406533362231. ✓ df.sort_values(by=['Airline', 'DelayMinutes'], ascending=[True, False])

6406533362232. ✗ df.sort(by=['Airline', 'DelayMinutes'], ascending=[True, False])

6406533362233. ✗ df.sort_values(by=['Airline', 'DelayMinutes'], ascending=[False, True])

6406533362234. ✗ df.sort(['Airline', 'DelayMinutes'], ascending=False)

Question Number : 33 Question Id : 640653996022 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Which option will give the count of flights that have a delay greater than the average delay?

Options :

6406533362235. ✓ df[df['DelayMinutes'] > df['DelayMinutes'].mean()].shape[0]

6406533362236. ✗ df[df['DelayMinutes'] > df['DelayMinutes'].median()].count()

6406533362237. ✗ df[df['DelayMinutes'] > df['DelayMinutes'].mean()].count()

6406533362238. ✗ df[df['DelayMinutes'] < df['DelayMinutes'].mean()].shape[0]

Sub-Section Number :

3

Sub-Section Id :

640653146963

Question Shuffling Allowed :

No

Question Id : 640653996027 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Question Numbers : (34 to 35)

Question Label : Comprehension

Consider the following dataset and transformer pipeline:

```
1 from sklearn.compose import ColumnTransformer
2 from sklearn.preprocessing import MinMaxScaler, OneHotEncoder
3 from sklearn.impute import KNNImputer
4 from sklearn.pipeline import Pipeline
5
6 X = np.array([[2.5, 'red', 1],
7                 [2.85, 'blue', np.nan],
8                 [4.0, 'green', 2],
9                 [3.2, 'red', 1]])
10
11 pipe = Pipeline([('impute', KNNImputer(n_neighbors=2)),
12                   ('scale', MinMaxScaler())])
13
14 ct = ColumnTransformer([('num', pipe, [0, 2]),
15                         ('cat', OneHotEncoder(), [1])])
16
17 transformed_X = ct.fit_transform(X)
```

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 34 Question Id : 640653996028 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

What will be the shape of the transformed array `transformed_X` after fitting the pipeline?

Options :

6406533362256. ✓ (4, 5)

6406533362257. ✗ (4, 6)

6406533362258. ✗ (4, 7)

6406533362259. ✗ (4, 8)

6406533362260. ✗ None of these

Question Number : 35 Question Id : 640653996029 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

What is the value of `transformed_X[1, 2]`?

Options :

- 6406533362261. ✘ 0.0
- 6406533362262. ✘ 0.5
- 6406533362263. ✘ -0.5
- 6406533362264. ✓ 1
- 6406533362265. ✘ None of these

Sub-Section Number :

4

Sub-Section Id :

640653146964

Question Shuffling Allowed :

Yes

Question Number : 36 Question Id : 640653996023 Question Type : MSQ**Correct Marks : 2 Max. Selectable Options : 0**

Question Label : Multiple Select Question

Which of the following preprocessing techniques helps in handling categorical features in a dataset?

Options :

- 6406533362239. ✓ One-hot encoding
- 6406533362240. ✘ StandardScaler
- 6406533362241. ✓ Label encoding
- 6406533362242. ✘ MinMaxScaler

Question Number : 37 Question Id : 640653996024 Question Type : MSQ**Correct Marks : 2 Max. Selectable Options : 0**

Question Label : Multiple Select Question

Which of the following imputation strategies can be used for handling missing values?

Options :

- 6406533362243. ✓ Filling with mean or median
- 6406533362244. ✓ Deleting the rows with missing values
- 6406533362245. ✓ Using a predictive model to estimate missing values
- 6406533362246. ✘ Using a random generator to fill missing values

Question Number : 38 Question Id : 640653996025 Question Type : MSQ**Correct Marks : 2 Max. Selectable Options : 0**

Question Label : Multiple Select Question

Which of the following is correct about cross-validation in machine learning?

Options :

- 6406533362247. ✓ Cross-validation helps prevent overfitting.
- 6406533362248. ✘ It is a technique to improve the model's accuracy.
- 6406533362249. ✓ K-Fold cross-validation is one of the most popular types of cross-validation.
- 6406533362250. ✘ Cross-validation is not suitable for small datasets.

Question Number : 39 Question Id : 640653996037 Question Type : MSQ

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following are valid loss functions for SGDClassifier?

Options :

6406533362294. ❌ Squared Loss

6406533362295. ✓ Hinge Loss

6406533362296. ✓ Log Loss

6406533362297. ❌ Mean Absolute Error

Question Number : 40 Question Id : 640653996039 Question Type : MSQ

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following could be a correct output from the following code?

```
1 import numpy as np
2 from sklearn.model_selection import StratifiedKFold
3 X = np.random.rand(8, 2)
4 y = np.array([0, 0, 0, 1, 1, 1, 1, 0])
5 skf = StratifiedKFold(n_splits=2)
6
7 for train_index, test_index in skf.split(X, y):
8     print("TRAIN:", train_index, "TEST:", test_index)
```

Options :

6406533362302. ✓ TRAIN: [2 5 6 7] TEST: [0 1 3 4]

6406533362303. ❌ TRAIN: [0 1 2 3 7] TEST: [4 5 6]

6406533362304. ❌ TRAIN: [0 2 4 7] TEST: [1 3 5 6]

6406533362305. ✓ TRAIN: [0 1 3 4] TEST: [2 5 6 7]

Sub-Section Number :

5

Sub-Section Id :

640653146965

Question Shuffling Allowed :

Yes

Question Number : 41 Question Id : 640653996026 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following data and code:

```
1 import numpy as np
2 data = np.array([[1, 2, 3, 4],
3                  [np.nan, 5, np.nan, 1],
4                  [3, 4, 5, np.nan],
5                  [2, 2, np.nan, 10]])
```

Which of the following pairs of data points have the second largest Manhattan distance after imputing the missing values with the column mean?

Options :

6406533362251. ✘ 0 and 1

6406533362252. ✓ 2 and 3

6406533362253. ✘ 0 and 3

6406533362254. ✘ 1 and 2

6406533362255. ✘ 1 and 3

Question Number : 42 Question Id : 640653996031 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following data and snippet:

```
1 from sklearn.preprocessing import FunctionTransformer
2 import numpy as np
3
4 data = np.array([[5, np.nan, 3],
5                  [2, 1, np.nan],
6                  [np.nan, 4, 6]])
7
8 def replace_missing(X):
9     return np.nan_to_num(X, nan=0)
10
11 ft = FunctionTransformer(replace_missing)
12 transformed_data = ft.fit_transform(data)
```

Which of the following correctly represents the value of `transformed_data[2,0]` after the transformation?

Options :

6406533362270. ✓ 0

6406533362271. ✘ 4

6406533362272. ✘ 6

6406533362273. ✘ None of these

Question Number : 43 Question Id : 640653996034 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following code where a ‘Pipeline’ is used for feature scaling, polynomial feature transformation, and applying a ‘SGDRegressor’.

The hyperparameter search is performed using ‘GridSearchCV’.

```
1 from sklearn.pipeline import Pipeline
2 from sklearn.preprocessing import StandardScaler, PolynomialFeatures
3 from sklearn.linear_model import SGDRegressor
4 from sklearn.model_selection import GridSearchCV
5 from sklearn.datasets import make_regression
6
7 # Generate synthetic data
8 X, y = make_regression(n_samples=100, n_features=5, noise=0.1)
9
10 # Define a pipeline with scaling, polynomial features, and regression
11 pipeline = Pipeline([
12     ('scaler', StandardScaler()),
13     ('poly', PolynomialFeatures()),
14     ('regressor', SGDRegressor(max_iter=1000, tol=1e-3))
15 ])
16
17 # Define parameter grid for grid search
18 param_grid = {
19     'poly__degree': [1, 2, 3],
20     'regressor_alpha': [0.01, 0.1, 1],
21     'regressor_penalty': ['l2', 'l1'],
22     'regressor_learning_rate': ['constant', 'optimal']
23 }
24
25 # Perform grid search
26 grid = GridSearchCV(estimator=pipeline, param_grid=param_grid, scoring=
27     'r2', n_jobs=-1, cv=3)
28 grid.fit(X, y)
```

How many different models will be trained during this grid search process?

Options :

6406533362282. ✓ 36

6406533362283. ✗ 54

6406533362284. ✗ 72

6406533362285. ✗ 108

Sub-Section Number :

6

Sub-Section Id :

640653146966

Question Shuffling Allowed :

Yes

Question Number : 44 Question Id : 640653996030 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

You are working on a machine learning project and have received a dataset containing numeric and categorical features. The dataset has some missing values and potential outliers. Given the following data cleaning steps:

1. Use One-Hot Encoding for categorical variables.
2. Impute missing values with feature's mean for numeric features.
3. Remove duplicates.
4. Standardize numeric features using Z-score normalization.
5. Identify and handle outliers using the IQR method.

Which of the following represents the MOST appropriate sequence for preparing the data for a machine learning model?

Options :

6406533362266. ❌ 1 → 4 → 2 → 3 → 5
6406533362267. ❌ 3 → 2 → 1 → 4 → 5
6406533362268. ❌ 2 → 3 → 1 → 5 → 4
6406533362269. ✓ 3 → 5 → 2 → 1 → 4

Question Number : 45 Question Id : 640653996032 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

Consider the following code snippet:

```
1 from sklearn.pipeline import Pipeline
2 from sklearn.preprocessing import StandardScaler
3 from sklearn.decomposition import PCA
4 from sklearn.impute import SimpleImputer
5
6 pipe = Pipeline([('impute', SimpleImputer(strategy='most_frequent')),
7                  ('scale', StandardScaler()),
8                  ('reduce', PCA(n_components=2))])
9
10 data = np.array([[3, np.nan, 5],
11                  [1, 2, np.nan],
12                  [np.nan, 4, 6]])
13
14 transformed_data = pipe.fit_transform(data)
```

How many components does the PCA reduce the data to, after transformation?

Options :

6406533362274. ✓ 2
6406533362275. ❌ 3
6406533362276. ❌ 1
6406533362277. ❌ None of these

Question Number : 46 Question Id : 640653996033 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

Consider the below code:

```
4 data = [[-3, 1],  
5     [-3, 1],  
6     [ 3, 5],  
7     [ 3, 5]]  
8  
9 from sklearn.preprocessing import StandardScaler  
10 ss = StandardScaler()  
11 print(ss.fit_transform(data))
```

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

Options :

[[0, -1],
 [0, -1],
 [1, 1],
 [1, 1]]

6406533362278. ✘

[[-0.5, -2],
 [-0.5, -2],
 [1, 2],
 [1, 2]]

6406533362279. ✘

[[0, 1],
 [0, 1],
 [0, 1],
 [0, 1]]

6406533362280. ✘

[[-1, -1],
 [-1, -1],
 [1, 1],
 [1, 1]]

6406533362281. ✓

Question Number : 47 Question Id : 640653996035 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

What is the purpose of the *tol* parameter of the SGDRegressor() in the given code below?

```
12 from sklearn.linear_model import SGDRegressor  
13 model = SGDRegressor(early_stopping=True,  
14                     validation_fraction=0.2,  
15                     tol=0.001,  
16                     n_iter_no_change=5)  
17 model.fit(X, y)
```

Options :

6406533362286. ✘ It controls the learning rate of the stochastic regressor during training.
6406533362287. ✘ It determines the maximum number of iterations for the training process.
6406533362288. ✘ It defines the fraction of the validation set used for early stopping.
6406533362289. ✓ It specifies the tolerance level for early stopping based on the change in the validation error.

Question Number : 48 Question Id : 640653996036 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

What will be the output of the following code:

```
1 from sklearn.feature_extraction import DictVectorizer
2 X = [{'feature_1': 3, 'feature_2': 1}, {'feature_1': 2, 'feature_3':
3}]
3 extractor = DictVectorizer(sparse= False)
4 print(extractor.fit_transform(X))
```

Options :

```
1 [[3. 1.]
2 [2. 3.]]
3
```

6406533362290. ✘

```
1 [[3. 1.]
2 [3. 0.]]
3
```

6406533362291. ✘

```
1 [[3. 1. 0.]
2 [2. 0. 3.]]
3
```

6406533362292. ✓

```
1 [[3. 1. 0.]
2 [2. 3. 0.]]
3
```

6406533362293. ✘

Question Number : 49 Question Id : 640653996040 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

What will be the output of the following code?

```
1 import numpy as np
2 from sklearn.linear_model import LinearRegression
3 X = np.array([[1, 1], [1, 2], [2, 2], [2, 3]])
4 y = np.dot(X, np.array([1, 2])) + 3
5
6 reg = LinearRegression().fit(X, y)
7 print(reg.intercept_, reg.coef_)
```

Options :

6406533362306. ✓ Intercept: 3.0, Coefficients: [1.0, 2.0]

6406533362307. ✗ Intercept: 3.0, Coefficients: [0.0, 2.0]

6406533362308. ✗ Intercept: 0.0, Coefficients: [1.0, 2.0]

6406533362309. ✗ Given code will return an error.

Sub-Section Number : 7

Sub-Section Id : 640653146967

Question Shuffling Allowed : Yes

Question Number : 50 Question Id : 640653996038 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

Which of the following best describes the purpose of `n_iter_no_change` parameter in `SGDRegressor()`?

Options :

6406533362298. ✗ Controls the total number of iterations.

6406533362299. ✗ Specifies the tolerance level for early stopping.

6406533362300. ✓ Defines the number of iterations with no improvement to stop training.

6406533362301. ✗ Sets the learning rate schedule.

BA

Section Id : 64065369433

Section Number : 4

Section type : Online

Mandatory or Optional : Mandatory

Number of Questions : 5

Number of Questions to be attempted : 5

Section Marks : 20

Display Number Panel : Yes

Section Negative Marks : 0

Group All Questions : No

Enable Mark as Answered Mark for Review and

Clear Response : No

Section Maximum Duration : 0

Section Minimum Duration : 0

Section Time In : Minutes

Maximum Instruction Time : 0

Sub-Section Number : 1

Sub-Section Id : 640653146968

Question Shuffling Allowed :

No

Question Number : 51 Question Id : 640653996041 Question Type : MCQ

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 :

6406533362310. ✓ YES

6406533362311. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 640653146969

Question Shuffling Allowed : Yes

Question Number : 52 Question Id : 640653996042 Question Type : MSQ

Correct Marks : 1 Max. Selectable Options : 0

Question Label : Multiple Select Question

A hypothesis test is conducted to check if a data set follows a normal distribution. If the p-value is 0.67, then which of the following statements are TRUE (select all that is applicable)

Options :

6406533362312. ✗ At a 5% level of significance **REJECT** the null hypothesis and conclude that the data does not follow a normal distribution

6406533362313. ✗ At a 5% level of significance **DO NOT REJECT** the null hypothesis and conclude that the data does not follow a normal distribution

6406533362314. ✗ At a 5% level of significance **REJECT** the null hypothesis and conclude that the data follows a normal distribution

6406533362315. ✓ At a 5% level of significance **DO NOT REJECT** the null hypothesis and conclude that the data follows a normal distribution

6406533362316. ✗ At a 10% level of significance **REJECT** the alternative hypothesis and conclude that the data does not follow a normal distribution

6406533362317. ✗ At a 10% level of significance **DO NOT REJECT** the alternative hypothesis and conclude that the data does not follow a normal distribution

6406533362318. ✗ At a 10% level of significance **REJECT** the alternative hypothesis and conclude that the data follows a normal distribution

6406533362319. ✗ At a 10% level of significance **DO NOT REJECT** the alternative hypothesis and conclude that the data follows a normal distribution

Sub-Section Number :

3

Sub-Section Id :

640653146970

Question Shuffling Allowed :

No

Question Id : 640653996043 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix**Question Numbers : (53 to 60)****Question Label : Comprehension**

MSS is a firm that specializes in social media analytics. MSS has acquired data (in Table-1) on the past movie releases of two Heroes nick-named "Manda Kasayam (MK)" and "Youth Vodhavaka (YV)" in the Tamil Film industry. The data is on the Box-Office collections for the movies of MK and YV on different dates in January-1950. Then answer the given subquestions,with the presumption that the other necessary conditions required for the questions are met.

Date	Day	Box-Office collection for MK (in INR Million)	Box-Office Collection for YV (in INR Million)
01-Jan-1950	Sunday	11	10
02-Jan-1950	Monday	9	10
03-Jan-1950	Tuesday	15	9
04-Jan-1950	Wednesday	8	6
05-Jan-1950	Thursday	18	2
06-Jan-1950	Friday	16	10
07-Jan-1950	Saturday	19	7
08-Jan-1950	Sunday	8	6
09-Jan-1950	Monday	10	1
10-Jan-1950	Tuesday	19	3
11-Jan-1950	Wednesday	19	5
12-Jan-1950	Thursday	19	8
13-Jan-1950	Friday	15	8
14-Jan-1950	Saturday	17	5
15-Jan-1950	Sunday	15	2

Table-1

Sub questions

Question Number : 53 Question Id : 640653996044 Question Type : SA**Correct Marks : 1****Question Label : Short Answer Question**

The aim is to explore if the total box-office collection during the weekends (Friday, Saturday and Sunday) and the total box-office collection during the weekdays (Monday to Thursday) are independent across the two heroes. Then how many DOFs does the test have? (*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 : Equal**

Text Areas : PlainText

Possible Answers :

1

Question Number : 54 Question Id : 640653996045 Question Type : SA

Correct Marks : 1.5

Question Label : Short Answer Question

The aim is to explore if the total box-office collection during the weekends (Friday, Saturday and Sunday) and the total box-office collection during the weekdays (Monday to Thursday) are independent across the two heroes. Then what is the expected box-office collection for MK ON WEEKENDS? (*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 :

103.00 to 105.00

Question Number : 55 Question Id : 640653996046 Question Type : SA

Correct Marks : 1.5

Question Label : Short Answer Question

The aim is to explore if the total box-office collection during the weekends (Friday, Saturday and Sunday) and the total box-office collection during the weekdays (Monday to Thursday) are independent across the two heroes. Then what is the expected box-office collection for YV ON WEEKDAYS? (*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 :

46.00 to 48.00

Question Number : 56 Question Id : 640653996047 Question Type : SA

Correct Marks : 2

Question Label : Short Answer Question

The aim is to explore if the total box-office collection during the weekends (Friday, Saturday and Sunday) and the total box-office collection during the weekdays (Monday to Thursday) are independent across the two heroes. Then what is value for 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 :

0.85 to 0.92

Question Number : 57 Question Id : 640653996048 Question Type : MSQ

Correct Marks : 1 Max. Selectable Options : 0

Question Label : Multiple Select Question

The aim is to explore if the total box-office collection during the weekends (Friday, Saturday and Sunday) and the total box-office collection during the weekdays (Monday to Thursday) are independent across the two heroes. Then given the below Table-2, at a 95% confidence level, what is the conclusion?

$\nu \setminus \alpha$.995	.990	.975	.950	.900	.500	.100	.050	.025	.010	.005
1	.00+	.00+	.00+	.00+	.02	.45	2.71	3.84	5.02	6.63	7.88
2	.01	.02	.05	.10	.21	1.39	4.61	5.99	7.38	9.21	10.60
3	.07	.11	.22	.35	.58	2.37	6.25	7.81	9.35	11.34	12.84
4	.21	.30	.48	.71	1.06	3.36	7.78	9.49	11.14	13.28	14.86
5	.41	.55	.83	1.15	1.61	4.35	9.24	11.07	12.83	15.09	16.75

Options :

6406533362324. ✓ Do Not Reject the Null

6406533362325. ✗ Reject the Null

6406533362326. ✗ Accept the Null

6406533362327. ✗ Do Not Accept the Null

6406533362328. ✗ None of these

Question Number : 58 Question Id : 640653996049 Question Type : SA

Correct Marks : 1

Question Label : Short Answer Question

There is a presumption that total box-office collection (of both actors) in Million INR on DIFFERENT DATES, follows a uniform distribution with a minimum value of 11 Million INR and maximum value of 30 Million INR. A statistical test is performed to check this presumption. The bins considered for the test are [11 to 15], [16 to 20], [21 to 25] and [26 to 30]. Then, for performing the statistical test, what is the expected frequency in any given bin? (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 : Equal

Text Areas : PlainText

Possible Answers :

3.75

Question Number : 59 Question Id : 640653996050 Question Type : SA

Correct Marks : 1

Question Label : Short Answer Question

There is a presumption that total box-office collection (of both actors) in Million INR on DIFFERENT DATES, follows a uniform distribution with a minimum value of 11 Million INR and maximum value of 30 Million INR. A statistical test is performed to check this presumption. The bins considered for the test are [11 to 15], [16 to 20], [21 to 25] and [26 to 30]. Then, for performing the statistical test, what is the DOF? (*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 : Equal

Text Areas : PlainText

Possible Answers :

3

Question Number : 60 Question Id : 640653996051 Question Type : SA

Correct Marks : 2

Question Label : Short Answer Question

There is a presumption that total box-office collection (for both actors) in Million INR on DIFFERENT DATES, follows a uniform distribution with a minimum value of 11 Million INR and maximum value of 30 Million INR. A statistical test is performed to check this presumption. The bins considered for the test are [11 to 15], [16 to 20], [21 to 25] and [26 to 30]. Then, for performing the statistical test, 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 :

1.7 to 1.9

Sub-Section Number :	4
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Sub-Section Id :	640653146971
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Question Shuffling Allowed :	No
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Question Id : 640653996052 Question Type : COMPREHENSION Sub Question Shuffling

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

Question Numbers : (61 to 63)**Question Label :** Comprehension

The linear demand response for product-A is modelled as a simple linear regression represented as $D(P) = 4500 - 30*P$, where $D(P)$ is the demand at price-P. Then, answer the given subquestions.

Sub questions**Question Number : 61 Question Id : 640653996053 Question Type : SA****Correct Marks : 1****Question Label :** Short Answer Question

What is the elasticity of the demand response curve when the price is Rs.50? (*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 :**

0.49 to 0.51

Question Number : 62 Question Id : 640653996054 Question Type : SA**Correct Marks : 1****Question Label :** Short Answer Question

What is the satiating price for the demand response 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 :**

149.99 to 150.99

Question Number : 63 Question Id : 640653996055 Question Type : SA**Correct Marks : 1****Question Label :** Short Answer Question

What is the market size for the demand response 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 :** Equal

Text Areas : PlainText

Possible Answers :

4500

Sub-Section Number : 5

Sub-Section Id : 640653146972

Question Shuffling Allowed : No

Question Id : 640653996056 Question Type : COMPREHENSION Sub Question Shuffling

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

Question Numbers : (64 to 67)

Question Label : Comprehension

You want to apply for a student visa to country "X". You can do this through any one of the five application centres, "A", "B", "C", "D" or "E". To determine which application centre to choose, you collect data. Currently, the embassy has decided to receive 15% of the applications from centre A, 10% from centre B, 25% each from centres C, D and E. Historically, 60% of the applications that come from centre A have been granted the visa, and 80% of the applications from centre B have been granted the visa. Centres C, D and E each had a 50-50 chance of granting a visa or not granting a visa respectively. Then answer the given subquestions.

Sub questions

Question Number : 64 Question Id : 640653996057 Question Type : SA

Correct Marks : 1

Question Label : Short Answer Question

What is your probability of applying for a student visa through centre A and it is granted? (*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 :

0.09 to 0.10

Question Number : 65 Question Id : 640653996058 Question Type : SA

Correct Marks : 1

Question Label : Short Answer Question

What is your probability of applying for a student visa through centre B and it is not-granted? (*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 :

0.01 to 0.03

Question Number : 66 Question Id : 640653996059 Question Type : SA

Correct Marks : 1.5

Question Label : Short Answer Question

If a total of 500 applications have been granted a visa, then how many would you expect to have come from centres "C", "D" and "E" (totally from the three centres)? (*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 :

187 to 188

Question Number : 67 Question Id : 640653996060 Question Type : SA

Correct Marks : 1.5

Question Label : Short Answer Question

Say you find Dr.MS had applied for a student visa in the past, and the application was not granted. However, Dr.MS has not told you which application centre was chosen to submit the application. Then what is the probability that Dr. MS has applied though centre C? (*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 :

0.26 to 0.28

PDSA

Section Id :	64065369434
Section Number :	5
Section type :	Online
Mandatory or Optional :	Mandatory

Number of Questions :	17
Number of Questions to be attempted :	17
Section Marks :	50
Display Number Panel :	Yes
Section Negative Marks :	0
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	No
Section Maximum Duration :	0
Section Minimum Duration :	0
Section Time In :	Minutes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653146973
Question Shuffling Allowed :	No

Question Number : 68 Question Id : 640653996061 Question Type : MCQ

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 :

6406533362339. ✓ YES

6406533362340. ✗ NO

Sub-Section Number :	2
Sub-Section Id :	640653146974
Question Shuffling Allowed :	Yes

Question Number : 69 Question Id : 640653996064 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

We have an input list of two-dimensional points [(8, 'A'), (2, 'B'), (1, 'C'), (8, 'D'), (2, 'E'), (9, 'F')]. We sort these in ascending order by the 0-th value of the tuple. Which of the following corresponds to a stable sort of this input?

Options :

6406533362346. ✗ [(1, 'C'), (2, 'B'), (2, 'E'), (8, 'D'), (8, 'A'), (9, 'F')]

6406533362347. ❌ [(1, 'c'), (2, 'E'), (2, 'B'), (8, 'D'), (8, 'A'), (9, 'F')]

6406533362348. ❌ [(1, 'c'), (2, 'E'), (2, 'B'), (8, 'A'), (8, 'D'), (9, 'F')]

6406533362349. ✓ [(1, 'c'), (2, 'B'), (2, 'E'), (8, 'A'), (8, 'D'), (9, 'F')]

Question Number : 70 Question Id : 640653996066 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Select the most appropriate data structure for the following applications.

Application	Data Structure
1. Listing out the recently opened files	a. Array/List
2. Matrix multiplication	b. Graph
3. To implement printer spooler to store print request	c. Queue
4. Friend suggestion algorithm in Social networking app	d. Stack

Options :

6406533362355. ❌ 1-d, 2-b, 3-c, 4-a

6406533362356. ✓ 1-d, 2-a, 3-c, 4-b

6406533362357. ❌ 1-d, 2-a, 3-b, 4-c

6406533362358. ❌ 1-a, 2-d, 3-c, 4-b

Question Number : 71 Question Id : 640653996068 Question Type : MCQ

Correct Marks : 3

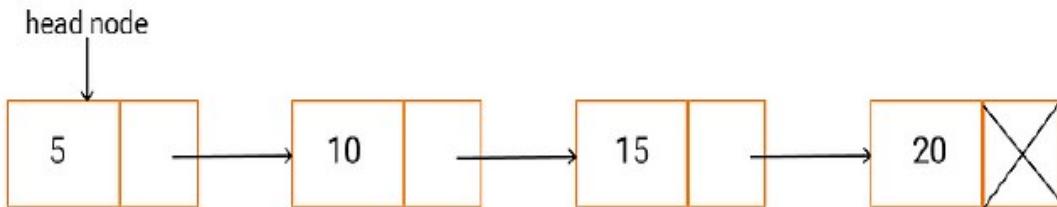
Question Label : Multiple Choice Question

```

1 class Node:
2     def __init__(self,data):
3         self.data = data
4         self.next = None

```

A stack is implemented using a linked list. Each node of the linked list is an object of class `Node`. The stack has a `head` pointer that points to the first node of the linked list, as shown in the figure.



Let `n` denote the number of nodes in the stack. Let `push()` be implemented by inserting a new node at the `head`, and `pop()` be implemented by deletion of a node from the `head`.

Which one of the following is the time complexity of the most time-efficient implementation of `push()` and `pop()`, respectively, for this data structure?

Options :

6406533362363. ✓ $O(1), O(1)$

6406533362364. ✗ $O(1), O(n)$

6406533362365. ✗ $O(n), O(1)$

6406533362366. ✗ $O(n), O(n)$

Question Number : 72 Question Id : 640653996070 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the quick sort algorithm that selects pivot element at the middle of the list. What is worst case recurrence relation and time complexity of **Quick Sort** ?

Options :

6406533362368. ✗ Recurrence is $T(n) = T(n/2) + O(n)$ and time complexity is $O(n^2)$

6406533362369. ✓ Recurrence is $T(n) = T(n - 1) + O(n)$ and time complexity is $O(n^2)$

6406533362370. ✘ Recurrence is $T(n) = 2T(n/2) + O(n)$ and time complexity is $O(n \log n)$

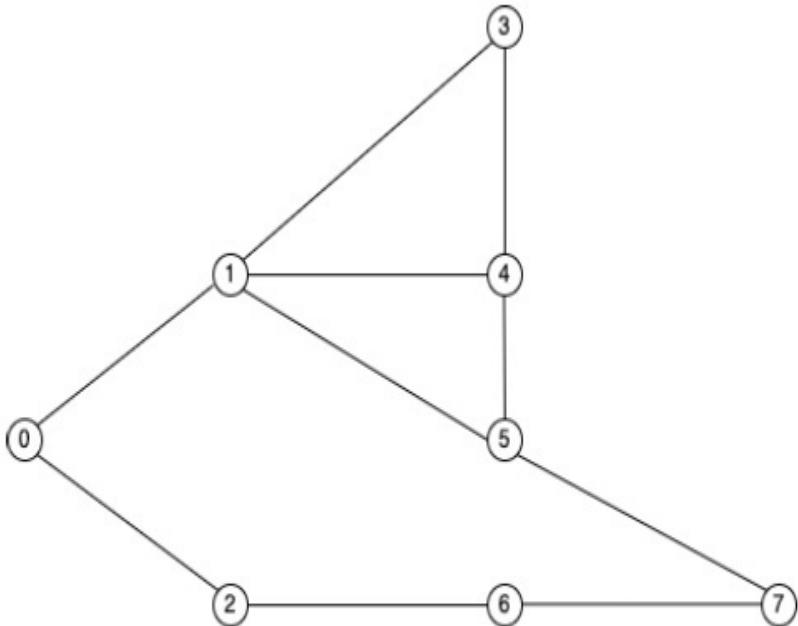
6406533362371. ✘ Recurrence is $T(n) = 2T(n/2) + O(1)$ and time complexity is $O(n \log n)$

Question Number : 73 Question Id : 640653996074 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following graph.



Which of the following vertex sequence is the **BFS** traversal on the above graph that started from node 5?

NOTE: When a node has multiple neighbours, BFS would visit the numerically smaller valued node first.

Options :

6406533362382. ✓ 5, 1, 4, 7, 0, 3, 6, 2

6406533362383. ✘ 5, 1, 4, 0, 7, 3, 6, 2

6406533362384. ✘ 5, 1, 4, 7, 0, 3, 2, 6

6406533362385. ✘ 5, 1, 4, 7, 0, 2, 3, 6

Question Number : 74 Question Id : 640653996077 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

You are trying to complete a **Diploma in Programming** with list of courses below.

```
1 | courses=["Maths-I", "Maths-II", "CT", "Python", "PDSA", "DBMS", "MAD-I", "MAD-II", "MAD-I Project", "MAD-II Project"]
```

These courses can be finished in parallel but some courses depend on others, as described below.

- Must finish **Maths-I** before **Maths-II**
- Must finish **Maths-II** and **CT** before **Python**
- Must finish **CT** and **Python** before **PDSA** and **DBMS**
- Must finish **DBMS** before **MAD-I** and **MAD-I project**
- Must finish **MAD-I** before **MAD-II**
- Must finish **MAD-I project** before **MAD-II project**

Each course takes a month to complete. What is the minimum number of months required to complete the diploma?

Options :

6406533362394. ✘ 7

6406533362395. ✓ 6

6406533362396. ✘ 5

6406533362397. ✘ 4

Sub-Section Number :

3

Sub-Section Id :

640653146975

Question Shuffling Allowed :

Yes

Question Number : 75 Question Id : 640653996067 Question Type : MCQ

Correct Marks : 4

Question Label : Multiple Choice Question

```
1 class Node:  
2     def __init__(self,data):  
3         self.data = data  
4         self.next = None
```

Suppose each node of the linked list is an object of class Node, `head` is the first node of the linked list and the list has the following elements:

10, 5, 7, 20, 18, 15, 22, 25, 30

```
1 def operation(head):  
2     p = head  
3     q = head  
4     r = head  
5     while (p.next != None):  
6         r = q  
7         q = p  
8         p = p.next  
9         r.next = p
```

What will be the updated list after calling function `operation(head)` ?

Options :

6406533362359. ❌ 10, 5, 7, 20, 18, 22, 25, 30

6406533362360. ❌ 10, 5, 7, 20, 18, 15, 25, 30

6406533362361. ✓ 10, 5, 7, 20, 18, 15, 22, 30

6406533362362. ❌ 10, 5, 7, 20, 18, 15, 22, 25

Sub-Section Number :

4

Sub-Section Id :

640653146976

Question Shuffling Allowed :

Yes

Question Number : 76 Question Id : 640653996062 Question Type : MSQ

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following functions:

- $f(n) = 10n^4 + 6n^3$
- $g(n) = 10n^3 + 2n^2$
- $h(n) = 12n^3 \log n + 6n^2$

Which of the following is/are **True**?

Options :

6406533362341. ✘ $f(n) = O(g(n))$

6406533362342. ✓ $g(n) = O(h(n))$

6406533362343. ✘ $f(n) = O(h(n))$

6406533362344. ✓ $h(n) = O(f(n))$

Question Number : 77 Question Id : 640653996065 Question Type : MSQ

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following is/are true about the **Merge Sort**?

Options :

6406533362350. ✓ The depth of the recursion tree (number of levels) in Merge Sort is $O(\log n)$

6406533362351. ✘ The depth of the recursion tree (number of levels) in Merge Sort is $O(n)$

6406533362352. ✘ Worst case time complexity of merge operation is $O(\log n)$

6406533362353. ✓ Worst case time complexity of merge operation is $O(n)$

6406533362354. ✓ Merge sort is not a inplace sorting

Question Number : 78 Question Id : 640653996072 Question Type : MSQ

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

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

connected graph?

Options :

6406533362373. ✓ BFS computes reachability in graphs.

6406533362374. ✗ Complexity of BFS algorithm is $O(n^2)$ using adjacency list.

6406533362375. ✓ BFS will traverse a graph level by level.

6406533362376. ✓ BFS can be used to detect cycles in a Graph.

6406533362377. ✗ Complexity of BFS algorithm is $O(m + n)$ using adjacency matrix.

Question Number : 79 Question Id : 640653996073 Question Type : MSQ

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following is/are possible degree sequence(s) of vertices of a connected undirected graph with four vertices

Note: Degree sequence is a series of positive integer a_1, a_2, \dots, a_n where a_i is the degree of the i^{th} vertex in the graph.

Options :

6406533362378. ✗ 1, 1, 2, 3

6406533362379. ✓ 2, 2, 3, 3

6406533362380. ✗ 1, 1, 3, 3

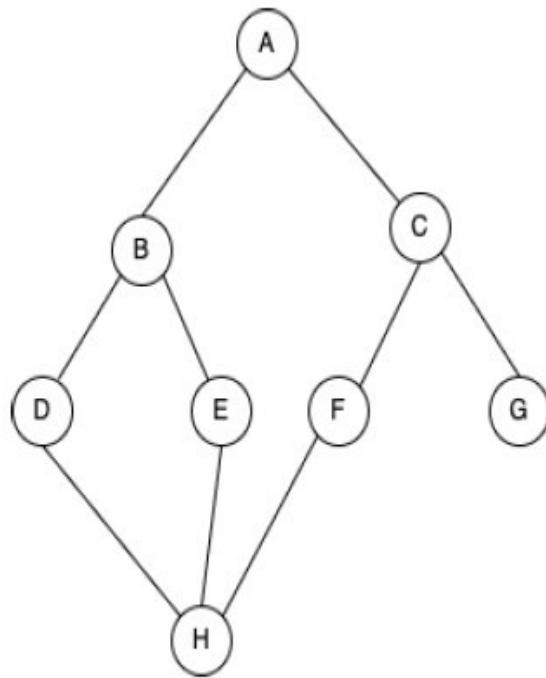
6406533362381. ✓ 3, 3, 3, 3

Question Number : 80 Question Id : 640653996076 Question Type : MSQ

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following graph



A Depth First Search (DFS) is started at node A. The nodes are listed in the order they are first visited. Which of the following is/are possible output(s)?

Note : When a node has multiple neighbours, DFS would visit anyone of the neighbours.

Options :

6406533362390. ✗ A, B, D, H, E, C, F, G

6406533362391. ✓ A, C, F, H, E, B, D, G

6406533362392. ✗ A, C, F, H, D, E, B, G

6406533362393. ✓ A, B, D, H, E, F, C, G

Sub-Section Number :

5

Sub-Section Id :

640653146977

Question Shuffling Allowed :

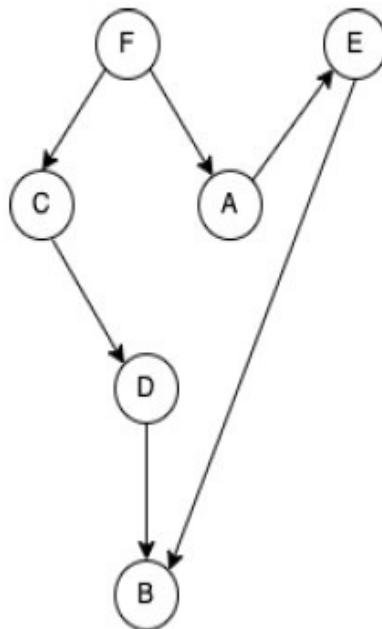
Yes

Question Number : 81 Question Id : 640653996075 Question Type : MSQ

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider a DAG with $V = \{A, B, C, D, E, F\}$, shown below. Which of the following is/are valid topological orderings?



Options :

6406533362386. ✓ F, C, A, E, D, B

6406533362387. ✓ F, A, C, E, D, B

6406533362388. ✗ F, C, A, D, B, E

6406533362389. ✗ F, A, C, D, B, E

Sub-Section Number :

6

Sub-Section Id :

640653146978

Question Shuffling Allowed :

Yes

Question Number : 82 Question Id : 640653996063 Question Type : SA

Correct Marks : 3

Question Label : Short Answer Question

Given the following sorted list:

[1, 3, 5, 8, 19, 23, 78, 159, 1621, 1701]

If we use binary search algorithm to search for element 159 in the given list, then the number of comparisons of searching element 159 with list elements done in this process is__.

Note: Assume here that binary search will compute the midpoint by using
 $(First\ index + Last\ index) // 2$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 83 Question Id : 640653996069 Question Type : SA

Correct Marks : 3

Question Label : Short Answer 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.

A hash table contains 10 buckets(0 to 9) and uses linear probing to resolve collisions. The key values are integers and the hash function used is `key % 10`. If key values 6, 16, 80, 91, 145 are inserted in to the table, in what location would the key value 190 be inserted?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 84 Question Id : 640653996071 Question Type : SA

Correct Marks : 3

Question Label : Short Answer Question

An undirected connected graph `G` has 15 vertices. The maximum number of edges in `G` is ____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

105

DBMS

Section Id :	64065369435
Section Number :	6
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	12
Number of Questions to be attempted :	12

Section Marks :	50
Display Number Panel :	Yes
Section Negative Marks :	0
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	No
Section Maximum Duration :	0
Section Minimum Duration :	0
Section Time In :	Minutes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653146979
Question Shuffling Allowed :	No

Question Number : 85 Question Id : 640653996078 Question Type : MCQ

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 :

6406533362398. ✓ YES

6406533362399. ✗ NO

Sub-Section Number :	2
Sub-Section Id :	640653146980
Question Shuffling Allowed :	Yes

Question Number : 86 Question Id : 640653996079 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

Which of the following is the correct sequence for query processing?

Options :

6406533362400. ✗ Query → Parser and Translator → Evaluation Engine → Optimizer → Query Output

6406533362401. ✗ Query → Optimizer → Evaluation Engine → Parser and Translator → Query Output

6406533362402. ✓ Query → Parser and Translator → Optimizer → Evaluation Engine → Query Output

Question Number : 87 Question Id : 640653996083 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

Match each level of abstraction (Column A) with its corresponding description (Column B).

Level of abstraction	Properties
1. Physical Level	A. Defines the database schema and relationships between tables.
2. Logical Level	B. Describes how data is actually stored on physical storage media.
3. View Level	C. Provides different perspectives of the database tailored to user needs.

Options :

6406533362416. ❖ 1-A, 2-B, 3-C

6406533362417. ✓ 1-B, 2-A, 3-C

6406533362418. ❖ 1-B, 2-C, 3-A

6406533362419. ❖ 1-C, 2-A, 3-B

Sub-Section Number :

3

Sub-Section Id :

640653146981

Question Shuffling Allowed :

Yes

Question Number : 88 Question Id : 640653996080 Question Type : MCQ

Correct Marks : 4

Question Label : Multiple Choice Question

A relational database contains two separate tables called Employee and Department.

The Employee table has the attributes (Emp_ID, Name, Dept_ID, Salary) and the Department table contains the attributes (Dept_ID, Dept_Name).

The following insert statements were executed to populate the tables:

```
Insert into Employee values(001,'Mark',1,80000)
Insert into Employee values(002,'Finn',2,60000)
Insert into Employee values(003,'Rory',1,90000)
Insert into Department values(1,'Forensics')
Insert into Department values(2,'Cyber Crime')
```

How many rows and columns will be returned by the following SQL query?

```
select *
from Employee, Department
where salary>65000
```

Options :

6406533362404. ✓ 4 rows and 6 columns

6406533362405. ❖ 2 rows and 5 columns

6406533362406. ✘ 4 rows and 5 columns

6406533362407. ✘ 2 rows and 6 columns

Question Number : 89 Question Id : 640653996081 Question Type : MCQ

Correct Marks : 4

Question Label : Multiple Choice Question

The relation Students(*Name, Total_Marks*) contains the names and marks of different students where no two students have the same name or total marks. What will the following SQL query return?

```
select name
from Students as S
where (select count(*)
       from Students as T
       where T.Total_Marks>S.Total_Marks)<3
```

Options :

6406533362408. ✘ Names of the students with the first four highest marks

6406533362409. ✘ Name of the student with the 4th highest mark

6406533362410. ✓ Names of the students with the first three highest marks

6406533362411. ✘ Name of the student with the 3rd highest mark

Question Number : 90 Question Id : 640653996082 Question Type : MCQ

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the table Faculty(*ID, Name, Department, Salary*) and the two queries Q1 and Q2 given below. Our goal is to find the IDs of faculty members whose salary is greater than the highest salary in the Computer Science department. Assume that 'Computer Science' department has more than one faculty member. Which of the following queries will give the required output?

Q1:

```
select F.ID  
from Faculty as F  
where F.salary>All(select distinct salary  
                     from Faculty as T  
                     where T.department='Computer Science')
```

Q2:

```
select F.ID  
from Faculty as F  
where not exists(select *  
                  from Faculty as T  
                  where T.department='Computer Science' and T.salary>=F.salary)
```

Options :

6406533362412. ✘ Q1 is correct but Q2 is wrong

6406533362413. ✘ Q2 is correct but Q1 is wrong

6406533362414. ✘ Both Q1 and Q2 are wrong

6406533362415. ✓ Both Q1 and Q2 are correct

Sub-Section Number :

4

Sub-Section Id :

640653146982

Question Shuffling Allowed :

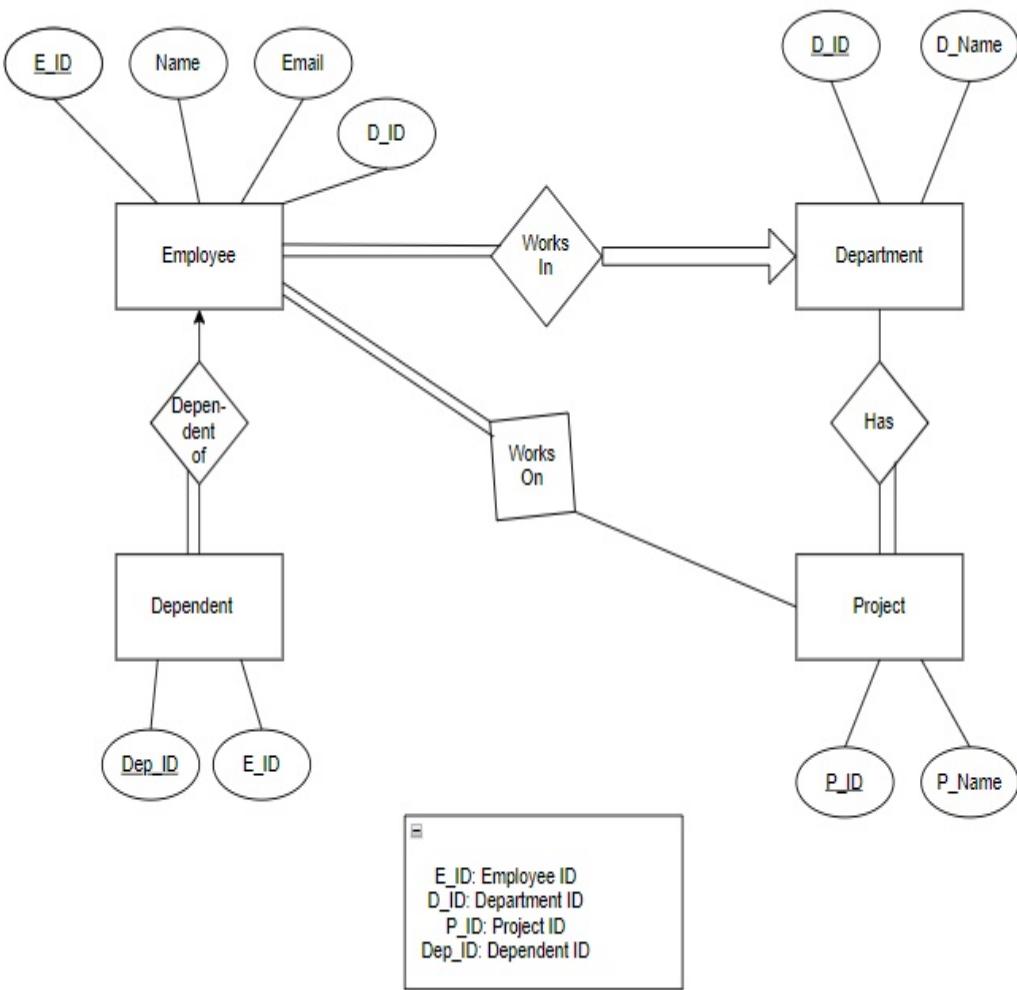
Yes

Question Number : 91 Question Id : 640653996084 Question Type : MSQ

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following Entity Relationship Diagram:



Choose the correct statements.

Options :

- 6406533362420. ✓ An employee can work on more than one project.
- 6406533362421. ✓ A project can have employees from more than one department, working on it.
- 6406533362422. ✗ A dependent, who is not dependent on any employee, can exist.
- 6406533362423. ✓ Every department must have at least one employee working in it.

Question Number : 92 Question Id : 640653996085 Question Type : MSQ

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

We want to create the table **nominee** by using following SQL statements:

```
CREATE TABLE nominee (
    nominee_id VARCHAR(20) PRIMARY KEY,
    NomineeName VARCHAR(20),
    relationship VARCHAR(20),
    ins_id VARCHAR(20),
    FOREIGN KEY (ins_id) REFERENCES insurance(ins_id) ON DELETE CASCADE);
```

Which of the following is/are the correct SQL statement that can be used to create table **insurance**?

Options :

```
CREATE TABLE insurance (
    ins_id VARCHAR(20),
    policyHolderName VARCHAR(20),
    age INT,
    premium INT);
```

6406533362424. ✘

```
CREATE TABLE insurance (
    ins_id VARCHAR NOT NULL(20),
    policyHolderName VARCHAR(20),
    age INT,
    premium INT);
```

6406533362425. ✘

```
CREATE TABLE insurance (
    ins_id VARCHAR(20) PRIMARY KEY,
    policyHolderName VARCHAR(20),
    age INT,
    premium INT);
```

6406533362426. ✓

```
CREATE TABLE insurance (
    ins_id VARCHAR(20) UNIQUE,
    policyHolderName VARCHAR(20),
    age INT,
    premium INT);
```

6406533362427. ✓

Sub-Section Number :	5
Sub-Section Id :	640653146983
Question Shuffling Allowed :	Yes

Question Number : 93 Question Id : 640653996086 Question Type : SA

Correct Marks : 4

Question Label : Short Answer Question

Consider relations Book and Author shown in Table 1 and Table 2

BookID	Title	AuthorID	Genre
1	Harry Potter and the Sorcerer's Stone	101	Fantasy
2	Pride and Prejudice	103	Fiction
3	The Great Gatsby	104	Fiction
4	The chamber of secrets	101	Adventure
5	The Catcher in the Rye	103	Fiction
6	1984	101	Dystopian

Table 1: Book Table

AuthorID	Name
101	J.K. Rowling
102	F. Scott Fitzgerald
103	Jane Austen
104	Herman Melville

Table 2: Author Table

How many tuples are returned by the following relational algebra expression?

$$\prod_{Title}(\sigma_{Genre='Fiction'}(Book) \bowtie \sigma_{Name='JaneAusten'}(Author))$$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Sub-Section Number : 6

Sub-Section Id : 640653146984

Question Shuffling Allowed : Yes

Question Number : 94 Question Id : 640653996087 Question Type : SA

Correct Marks : 3

Question Label : Short Answer Question

Consider the following relations:

Instructor(InsID, *InsName*, *email*)

Course(CID, *CName*)

Teaches(InsID, CID, *Semester*, *Year*)

If the relation Instructor and Teaches have 12, 8 rows respectively.

(Note: Consider all the attributes are having NOT NULL constraint.)

Execute the following query and compute the value of A - B where:

A = Maximum number of rows returned by the following query.

B = Minimum number of rows returned by the following query.

```
SELECT * FROM Instructor LEFT OUTER JOIN Teaches  
ON Instructor.InsID = Teaches.InsID;
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

7

Sub-Section Number : 7

Sub-Section Id : 640653146985

Question Shuffling Allowed : No

Question Id : 640653996088 **Question Type :** COMPREHENSION **Sub Question Shuffling Allowed :** No **Group Comprehension Questions :** No **Question Pattern Type :** NonMatrix

Question Numbers : (95 to 96)

Question Label : Comprehension

Consider the following relational schema and answer the given subquestions.

Player(PlayerID, *FirstName*, *LastName*, *TeamID*)

Team(TeamID, *TeamName*)

Sub questions

Question Number : 95 **Question Id :** 640653996089 **Question Type :** MSQ

Correct Marks : 4 **Max. Selectable Options :** 0

Question Label : Multiple Select Question

Questions:

1. Find the first names of players whose names start with 'A' and have at least 4 characters.
2. Find out the number of players in each team.
3. List the team names that have players with the last name 'Smith'.

SQL queries:

- a. `SELECT FirstName FROM Player WHERE FirstName LIKE 'A__%';`
- b. `SELECT FirstName FROM Player WHERE FirstName LIKE 'A___';`
- c. `SELECT TeamID, COUNT(PlayerID) FROM Player GROUP BY PlayerID;`
- d. `SELECT TeamID, COUNT(PlayerID) FROM Player GROUP BY TeamID;`
- e. `SELECT distinct t.TeamName FROM Team t INNER JOIN Player p ON t.TeamID = p.TeamID WHERE p.LastName = 'Smith';`
- f. `SELECT distinct t.TeamName FROM Team t, Player p WHERE t.TeamID = p.TeamID AND p.LastName = 'Smith';`

Match the correct SQL queries with the corresponding Questions.

Options :

6406533362430. ✓ 1-a, 2-d, 3-f

6406533362431. ✗ 1-b, 2-c, 3-e

6406533362432. ✓ 1-a, 2-d, 3-e

6406533362433. ✗ 1-a, 2-e, 3-f

Question Number : 96 Question Id : 640653996090 Question Type : MCQ

Correct Marks : 4

Question Label : Multiple Choice Question

What will be the output of the following query?

```
SELECT FirstName FROM Player
WHERE TeamID = (SELECT TeamID FROM Team WHERE TeamName = 'Warriors')
UNION
SELECT FirstName FROM Player
WHERE TeamID = (SELECT TeamID FROM Team WHERE TeamName = 'Lakers');
```

Options :

6406533362434. ✗ First names of players who are in either the Warriors or the Lakers team

6406533362435. ✗ First names of players who are in both the Warriors and the Lakers teams

6406533362436. ✗ Unique First names of players who are in both the Warriors and the Lakers teams

6406533362437. ✓ Unique First names of players who are either in the Warriors team or in the Lakers team

Sub-Section Number :

Sub-Section Id :

640653146986

Question Shuffling Allowed :

No

Question Id : 640653996091 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Question Numbers : (97 to 99)

Question Label : Comprehension

Consider the tables 3 and 4 and answer the given subquestions.

Table 3: Relation team

team_id	name	ranking	country
Cric-1	BCCI	1	India
Cric-2	ACB	3	Australia
Cric-3	PCB	10	Pakistan
Cric-4	NCB	9	Nepal
Cric-5	ECB	4	England

Table 4: Relation players

team_id	player_id	name	ranking
Cric-1	BCCI-11	Virat	1
Cric-1	BCCI-23	Rohit	3
Cric-3	PCB-22	Azam	2
Cric-2	ACB-12	David	6
Cric-2	ACB-29	Smith	3
Cric-5	ECB-88	Cris	4
Cric-5	ECB-82	Ben	1

Sub questions

Question Number : 97 Question Id : 640653996092 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the SQL query given below:

```
SELECT *
FROM players FULL OUTER JOIN team
ON players.team_id = team.team_id;
```

How many rows will be returned

by the query?

Options :

6406533362438. ✘ 7

6406533362439. ✘ 5

6406533362440. ✘ 9

6406533362441. ✓ 8

Question Number : 98 Question Id : 640653996093 Question Type : MSQ

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following SQL query:

```
SELECT p.name FROM players p, team t  
WHERE p.team_id = t.team_id and t.name = 'BCCI'
```

Which of the following DRC/TRC
expressions is/are equivalent to the
above SQL query?

Options :

6406533362442. ✘ $\{x | \exists p \in players, \exists t \in team(p.team_id = t.team_id \wedge t.name = 'BCCI')\}$

6406533362443. ✓ $\{x | \exists p \in players, \exists t \in team(p.team_id = t.team_id \wedge t.name = 'BCCI' \wedge x.name = p.name)\}$

6406533362444. ✓ $\{\langle o \rangle | \exists a, b, c, d (\langle a, b, c, d \rangle \in team \wedge b = 'BCCI') \wedge \exists m, n, o, p (\langle m, n, o, p \rangle \in players \wedge a = m)\}$

6406533362445. ✘ $\{\langle b \rangle | \exists a, b, c, d (\langle a, b, c, d \rangle \in team \wedge b = 'BCCI') \wedge \exists m, n, o, p (\langle m, n, o, p \rangle \in players \wedge a = m)\}$

Question Number : 99 Question Id : 640653996094 Question Type : MCQ

Correct Marks : 4

Question Label : Multiple Choice Question

Using the SQL query shown below, a view named **BestTeam** is created.

```
CREATE VIEW BestTeam AS  
SELECT p.player_id, p.name, t.country  
FROM players p join team t on p.team_id = t.team_id  
WHERE t.ranking < 4
```

Which among the following SQL queries will display the table shown below?

player_id	name
BCCI-11	Virat
BCCI-23	Rohit

Options :

6406533362446. ❌ `SELECT player_id, name FROM BestTeam`

6406533362447. ✓ `SELECT player_id, name FROM BestTeam where player_id like 'B%'`

6406533362448. ❌ `VIEW player_id, name FROM BestTeam where country = 'India'`

6406533362449. ❌ `VIEW player_id, name FROM BestTeam where player_id like 'B%'`

AppDev1

Section Id :	64065369436
Section Number :	7
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	16
Number of Questions to be attempted :	16
Section Marks :	50
Display Number Panel :	Yes
Section Negative Marks :	0
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	No
Section Maximum Duration :	0
Section Minimum Duration :	0
Section Time In :	Minutes

Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653146987
Question Shuffling Allowed :	No

Question Number : 100 Question Id : 640653996095 Question Type : MCQ

Correct Marks : 0

Question Label : Multiple Choice Question

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

6406533362450. ✓ YES

6406533362451. ✗ NO

Sub-Section Number :	2
Sub-Section Id :	640653146988
Question Shuffling Allowed :	Yes

Question Number : 101 Question Id : 640653996096 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

Suppose a Gamer wants to buy a Bluetooth earphone which can give him a good gaming experience, for that the delay between the action that happens in his phone and the sound heard by him for that action should be as low as possible so that he can play well. Following this scenario, which of the following option(s) is/are correct?

Options :

6406533362452. ✗ He should buy the earphones which have high latency as much possible.

6406533362453. ✗ It all depends on Internet Speed, so we can't determine anything.

6406533362454. ✓ He should buy the earphones which have low latency as much possible.

6406533362455. ✗ He should buy the earphones which have as low Bluetooth version as possible.

Question Number : 102 Question Id : 640653996107 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

Consider the below URL:

<https://www.google.com/search?q=physics+books>

Select the correct answer that identifies the different components of the given URL.

Options :

Host: http
Protocol: google.com/search
Query string: q=physics+books

6406533362493. ❌

Protocol: http
Host: google.com/search
Query string: q=physics+books

6406533362494. ✓

Protocol: http
Query string: google.com/search
6406533362495. ❌ Protocol: q=physics+books

6406533362496. ❌

Host: http
Query string: google.com/search
Protocol: q=physics+books

6406533362496. ❌

Sub-Section Number :

3

Sub-Section Id :

640653146989

Question Shuffling Allowed :

Yes

Question Number : 103 Question Id : 640653996097 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following HTML code and select the correct rendered output from the following.

```
<!DOCTYPE html>
<html lang="en">
<head>
    <title>Document</title>
</head>
<body>
    <table border="2">
        <tr>
            <th>One</th>
            <td>Four</td>
        </tr>
        <tr>
            <th> Two</th>
            <td> Three</td>
        </tr>
    </table>
</body>
</html>
```

Options :

One	Four
Two	Three

6406533362456. ✓

One	Two
Four	Three

6406533362457. ✗

One	Two
Three	Four

6406533362458. ✗

One	Four
Two	Three

6406533362459. ✗

Question Number : 104 Question Id : 640653996098 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following code block and select the correct option regarding the output when we run the python file app.py.
app.py

```
from jinja2 import Template

template='''
    Welcome to {Degree} DEGREE
    First level to clear is {{level}}
'''

rendered=Template(template)
output=rendered.render(Degree="IITM BS",level="Foundation")
print(output)
```

Options :

Welcome to IITM BS DEGREE
6406533362460. ✘ First level to clear is {{ Level }}

Welcome to {Degree} DEGREE
6406533362461. ✓ First level to clear is

Welcome to IITM BS DEGREE
6406533362462. ✘ First level to clear is Foundation

Welcome to DEGREE
6406533362463. ✘ First level to clear is {{ Level }}

Question Number : 105 Question Id : 640653996102 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

The following Python code snippet generates the output on the terminal.

```
from string import Template
greet_template = Template('Hello, $name! Welcome to $place.')

greeting1 = greet_template.substitute(name='Alice', place='Wonderland')
print(greeting1)

data = dict(name='Bob')
greeting2 = greet_template.safe_substitute(data)
print(greeting2)

greeting3 = greet_template.substitute(data)
print(greeting3)
```

Which of the following is the correct output?

Options :

6406533362472. ✘ Hello, Alice! Welcome to Wonderland.
Hello, Bob! Welcome to \$place.
Hello, Bob! Welcome to \$place.

6406533362473. ✘ Hello, Alice! Welcome to Wonderland.
Hello, Bob! Welcome to .
Hello, Bob! Welcome to \$place.

6406533362474. ✘ Hello, Alice! Welcome to Wonderland.
KeyError: 'what'
Hello, Bob! Welcome to \$place.

6406533362475. ✓ Hello, Alice! Welcome to Wonderland.
Hello, Bob! Welcome to \$place.
KeyError: 'place'

Question Number : 106 Question Id : 640653996104 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

The directory listing of a folder and the content of each of its files are given below.

Directory Listing:

```
my_dir-|  
|-- base.html  
|-- home.html  
|-- index.html
```

Filename: base.html

```
<body>  
    <h1>Welcome to MAD-I course</h1>  
</body>
```

Filename: home.html

```
<body>  
    <h1>Welcome to PDSA course</h1>  
</body>
```

Filename: index.html

```
<body>  
    <h1>Welcome to DBMS course</h1>  
</body>
```

If a simple Python HTTP server is created for this directory, what will be rendered on the browser for base URL?

Options :

6406533362480. ✘ **Welcome to PDSA course**

6406533362481. ✓ **Welcome to DBMS course**

6406533362482. ✘ **Welcome to MAD-I course**

6406533362483. ✘ **Directory listing for /**

Question Number : 107 Question Id : 640653996108 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following Python code and select correct output.

```
from jinja2 import Template

class Loan:

    def __init__(self, accno, loan_amount, interest_rate):
        self.accno = accno
        self.loan_amount = loan_amount
        self.interest_rate = interest_rate

    def get_loan_details(self):
        return (self.accno, self.loan_amount, self.interest_rate)

loan1 = Loan(101, 45900, 5)
loan2 = Loan(102, 170000, 6)

tm1 = Template("Account1 : {{l1.get_loan_details()}}")
tm2 = Template("Account2 : {{l2.get_loan_details()}}")

print(tm1.render(l1=loan1))
print(tm2.render(l2=loan2))
```

Options :

6406533362497. ✘ Account1 : (102, 170000, 6)
6406533362497. ✘ Account2 : (101, 45900, 5)

6406533362498. ✘ Account2 : (102, 170000, 6)

6406533362499. ✘ Account1 : (101, 45900, 5)

6406533362500. ✓
Account1 : (101, 45900, 5)
Account2 : (102, 170000, 6)

Question Number : 108 Question Id : 640653996112 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Which of the following flask view functions will return a 404 error for the URL:

<http://127.0.0.1:5000/communication/landline/0712> ?

Options :

6406533362513. ✘

```
@app.route('/communication/<type>/<areacode>')
def home(type, areacode):
    details = {'type': type, 'area-code': areacode}
    return details
```

```
@app.route('/communication/<string:type>/<int:areacode>')
def home(type, areacode):
    details = {'type': type, 'area-code': areacode}
```

6406533362514. ✘

```
@app.route('/communication/<string:type>/0712')
def home(type):
    details = {'type': type, 'area-code': 044}
```

6406533362515. ✘

```
@app.route('/communication/online/<string:type>/<areacode>')
def home(type, areacode):
    details = {'type': type, 'area-code': 044}
```

6406533362516. ✓

Sub-Section Number :

4

Sub-Section Id :

640653146990

Question Shuffling Allowed :

Yes

Question Number : 109 Question Id : 640653996103 Question Type : MCQ

Correct Marks : 4.5

Question Label : Multiple Choice Question

A certain network connection with a bandwidth of 10 Mbps allows making 1000 requests to a server per second. If each request is modified to have an additional data of 8 Kb, what should be the additional bandwidth required to maintain the rate of 2000 requests per second?

Options :

6406533362476. ✘ 18 Mbps

6406533362477. ✘ 16 Mbps

6406533362478. ✓ 26 Mbps

6406533362479. ✘ 36 Mbps

Question Number : 110 Question Id : 640653996105 Question Type : MCQ

Correct Marks : 4.5

Question Label : Multiple Choice Question

Consider the following Python code snippet.

Filename: app.py

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

@app.route('/home', methods = sys.argv)
def my_func():
    if request.method == 'GET':
        return "<h1>Hello from POST</h1>

    elif request.method == 'POST':
        return "<h1>Hello from GET</h1>

    else:
        return "<h1>Please enter a valid HTTP method</h1>

app.run(debug = True)
```

If the above flask app is run using the command `python app.py GET POST` in one terminal, what will be the output on another terminal for command;

`curl http://127.0.0.1:5000/home ?`

Options :

6406533362484. ✘ <h1>Hello from GET</h1>

6406533362485. ✓ <h1>Hello from POST</h1>

6406533362486. ✘ <h1>Please enter a valid HTTP method</h1>

6406533362487. ✘ <h1>Method not Allowed</h1>

Question Number : 111 Question Id : 640653996110 Question Type : MCQ

Correct Marks : 4.5

Question Label : Multiple Choice Question

A client C and the server S located, 12000 km apart are connected with the help of a cable. A request was sent by the client C to server S, but while sending back the response to the client, the cable breaks and the response is now sent back via air. This change in medium caused an additional delay of 20 msec. As compared to the Round Trip Time of the healthy network, the Round Trip Time (RTT) of the faulty system would

[The speed of light in air is 3×10^8 m/s and that on a cable is 2×10^8 m/s]

Options :

- 6406533362505. ✘ Increase
- 6406533362506. ✘ Decrease
- 6406533362507. ✓ Remain Same
- 6406533362508. ✘ Insufficient Information

Sub-Section Number : 5

Sub-Section Id : 640653146991

Question Shuffling Allowed : Yes

Question Number : 112 Question Id : 640653996106 Question Type : MSQ

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the below server response

HTTP/2.0 500 Internal Server Error

Which of the following is/are **True**?

Options :

- 6406533362488. ✓ HTTP/2.0 is the protocol and version respectively
- 6406533362489. ✘ 500 is the port number
- 6406533362490. ✓ "Internal Server Error" is the status message
- 6406533362491. ✓ 500 is the status code
- 6406533362492. ✘ HTTP/2.0 is the server failure

Question Number : 113 Question Id : 640653996109 Question Type : MSQ

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the flask code below.

```
from flask import Flask

app = Flask(__name__)

@app.route("/employee/<id>")
def get_employee(id):
    return "Employee id : " + str(id)

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

Assume that the above flask application is running on <http://127.0.0.1:5000>. Which of the following URLs will render “**Not Found**” error?

Options :

6406533362501. ✘ <http://127.0.0.1:5000/employee/102>

6406533362502. ✘ <http://127.0.0.1:5000/employee/id=102>

6406533362503. ✓ <http://127.0.0.1:5000/id=102>

6406533362504. ✓ <http://127.0.0.1:5000/102>

Sub-Section Number : 6

Sub-Section Id : 640653146992

Question Shuffling Allowed : Yes

Question Number : 114 Question Id : 640653996111 Question Type : MSQ

Correct Marks : 4.5 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following code snippet.

```
@app.route('/name/<type>')
def prod_detail(type):
    # CODE BLOCK HERE
```

Assume the database has a “product” table represented by class “Product” which has a TEXT column “type”. If we want the server to return a 404 status code when a user goes to the route ‘/name/<type>’ with a “type” that does not exist in the database, which of the following lines would give us the desired output?

Options :

6406533362509. ✘

```
type = Product.query.filter_by(type=type).first()
if type is None:
    return render_template("404.html")
return render_template('details.html', type=type)
```

```
type = Product.query.filter_by(type=type).first()
if type is None:
    abort(404)
return render_template('details.html', type=type)
```

6406533362510. ✓

```
type = Product.query.filter_by(type=type).first_or_404()
return render_template('details.html', type=type)
```

6406533362511. ✓

```
type = Product.query.filter_by(type=type).first()
if type is None:
    return render_template("404.html"), 404
return render_template('details.html', type=type)
```

6406533362512. ✓

Sub-Section Number :

7

Sub-Section Id :

640653146993

Question Shuffling Allowed :

No

Question Id : 640653996099 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Question Numbers : (115 to 116)

Question Label : Comprehension

Consider the following code and answer the given subquestions.

form.html

```
<!DOCTYPE html>
<body>
    <form method=Method>
        Enter Your Name : <input type="text" name="name">
        <button>Submit</button>
    </form>
</body>
</html>
```

app.py

```
from flask import Flask
from flask import render_template, request

app=Flask(__name__)

@app.route("/",methods=['GET','POST'])

def home():
    if request.method=="GET":
        return render_template("form.html")
    else:
        return render_template("home.html")

app.run(debug=True)
```

Sub questions

Question Number : 115 Question Id : 640653996100 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Suppose the value of Method in form.html is GET

(form method is set to GET) and in the input box

we write "Application", after submitting the form

how the URL will look? Remember server is

running on the server, <http://127.0.0.1:5000>.

Options :

6406533362464. ✓ <http://127.0.0.1:5000/?name=Application>

6406533362465. ✗ <http://127.0.0.1:5000/name=Application>

6406533362466. ✗ <http://127.0.0.1:5000/?name>

Question Number : 116 Question Id : 640653996101 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Suppose the value of **Method** in form.html is POST (form method is set to POST) and in the input box we write “Application”, after submitting the form how the URL will look? Remember server is running on the server, <http://127.0.0.1:5000>.

Options :

6406533362468. ✘ <http://127.0.0.1:5000/?name:Application>

6406533362469. ✘ <http://127.0.0.1:5000/?Application>

6406533362470. ✘ <http://127.0.0.1:5000/?name>

6406533362471. ✓ <http://127.0.0.1:5000/>

Java

Section Id :	64065369437
Section Number :	8
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	16
Number of Questions to be attempted :	16
Section Marks :	100
Display Number Panel :	Yes
Section Negative Marks :	0
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	No
Section Maximum Duration :	0
Section Minimum Duration :	0
Section Time In :	Minutes
Maximum Instruction Time :	0

Sub-Section Number :	1
Sub-Section Id :	640653146994
Question Shuffling Allowed :	No

Question Number : 117 Question Id : 640653996113 Question Type : MCQ

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 :

6406533362517. ✓ YES

6406533362518. ✗ NO

Sub-Section Number :	2
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Sub-Section Id :	640653146995
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Question Shuffling Allowed :	Yes
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Question Number : 118 Question Id : 640653996114 Question Type : MCQ

Correct Marks : 6

Question Label : Multiple Choice Question

Consider the code given below.

```
public class ActivationRecordExample {
    public static void main(String[] args) {
        int result = factorial(5);
        System.out.println("Factorial of 5 is: " + result);
    }

    public static int factorial(int n) {
        if (n == 1) {
            return 1;
        } else {
            return n * factorial(n - 1);
        }
    }
}
```

How many activation records are created on the stack during the execution of the code?

Options :

6406533362519. ✗ 2

6406533362520. ✘ 5

6406533362521. ✓ 6

6406533362522. ✘ 7

Question Number : 119 Question Id : 640653996115 Question Type : MCQ

Correct Marks : 6

Question Label : Multiple Choice Question

Match the following terms with their descriptions/properties.

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

Options :

6406533362523. ✘ A-VI, B-IV, C-I, D-II

6406533362524. ✘ A-V, B-VII, C-I, D-IV

6406533362525. ✘ A-V, B-IV, C-I, D-II

6406533362526. ✓ A-VI, B-VII, C-III, D-II

Question Number : 120 Question Id : 640653996116 Question Type : MCQ

Correct Marks : 6

Question Label : Multiple Choice Question

Consider the Java code given below.

```
public class CounterExample {  
    public static void main(String[] args) {  
        int counter = 5;  
        do {  
            counter--;  
        } while (counter > 0);  
  
        switch(counter){  
            case 0: System.out.println("counter zero");  
                    break;  
            case 1: System.out.println("counter one");  
            case 2: System.out.println("counter two");  
            case 3: System.out.println("counter three");  
            case 4: System.out.println("counter four");  
            case 5: System.out.println("counter five");  
            default:System.out.println("No counter available");  
                    break;  
        }  
    }  
}
```

What will the output be?

Options :

6406533362527. ✘ counter one

counter two

counter three

counter four

counter five

No counter available

6406533362528. ✘ counter one

6406533362529. ✓ counter zero

6406533362530. ✘ No counter available

Question Number : 121 Question Id : 640653996122 Question Type : MCQ

Correct Marks : 6

Question Label : Multiple Choice Question

Consider the code given below.

```
class Animal {  
    public void sound() {  
        System.out.println("Makes a sound");  
    }  
}  
class Dog extends Animal {  
    public void play() {  
        System.out.println("Plays fetch");  
    }  
    public void guard() {  
        System.out.println("Guards the house");  
    }  
}  
class Cat extends Dog {  
    public void guard() {  
        System.out.println("Guards the garden");  
    }  
}  
public class AnimalTest {  
    public static void main(String[] args) {  
        Dog obj = new Cat();  
        obj.sound(); // LINE 1  
        obj.play();  
        obj.guard(); // LINE 2  
    }  
}
```

Choose the correct option.

Options :

6406533362551. ❌ LINE 1 generates compilation error because method sound() cannot be invoked on obj.

This code generates the below output followed by runtime Error at LINE 2 because there is ambiguity in which guard() method is being invoked.

- Makes a sound
6406533362552. ❌ Guards the house

This code generates the output:

- Makes a sound
Plays fetch
6406533362553. ✓ Guards the garden

This code generates the output:

Makes a sound
Plays fetch
Guards the house

6406533362554. ❌ Guards the house

Question Number : 122 Question Id : 640653996127 Question Type : MCQ

Correct Marks : 6

Question Label : Multiple Choice Question

Consider the Java code given below.

```
class Pizza {  
    public void orderPizza() {  
        PizzaMaker m = new PizzaMaker(this); // LINE 1  
        m.preparePizza();  
        System.out.println("Pizza served");  
    }  
    public void alarm() {  
        System.out.println("Pizza collected");  
    }  
}  
  
class PizzaMaker {  
    Pizza piz;  
    public PizzaMaker(Pizza p) {  
        piz = p;  
    }  
    public void preparePizza() {  
        System.out.println("Pizza prepared");  
        piz.alarm(); // LINE 2  
    }  
}  
  
public class Test {  
    public static void main(String[] args) {  
        Pizza p1 = new Pizza();  
        p1.orderPizza();  
    }  
}
```

Choose the correct option.

Options :

This program generates compiler error at LINE 1

Reason: An object of `PizzaMaker` cannot be created inside method `orderPizza`

6406533362571. ❌ because it uses an object of `Pizza` in its constructor.

This program generates the output:

Pizza prepared

followed by runtime error

Reason: A method inside class Pizza is invoking method preparePizza inside class PizzaMaker, whereas preparePizza is invoking another method in class

6406533362572. ❌ Pizza.

This program generates compiler error at LINE 2

Reason: A method inside class Pizza is invoking method preparePizza inside class PizzaMaker, whereas preparePizza is invoking another method in class

6406533362573. ❌ Pizza.

This program generates the output:

Pizza prepared

Pizza collected

6406533362574. ✓ Pizza served

Sub-Section Number :

3

Sub-Section Id :

640653146996

Question Shuffling Allowed :

Yes

Question Number : 123 Question Id : 640653996117 Question Type : MCQ

Correct Marks : 7

Question Label : Multiple Choice Question

Consider the code given below that checks whether two cars are the same. Method `equals` is overridden to compare two `Car` objects as follows.

If two cars have the same model and vin (Vehicle Identification Number), then they are said to be equal.

```
class Car {  
    private String model;  
    private String vin;  
  
    // Constructor to initialize instance variables  
  
    public boolean equals(Object obj) {  
        //CODE BLOCK  
    }  
}  
  
public class Test {  
    public static void main(String[] args) {  
        Car c1 = new Car("Tesla Model S", "123456");  
        Car c2 = new Car("Tesla Model S", "123456");  
        if (c1.equals(c2))  
            System.out.println("c1 and c2 are same");  
        else  
            System.out.println("c1 and c2 are different");  
    }  
}
```

Choose the correct option to fill in place of CODE BLOCK so that the output is:
c1 and c2 are same

Options :

6406533362531. ❌ `return false;`
6406533362532. ✓ `return false;`
6406533362533. ❌ `if(this.model == obj.model && this.vin == obj.vin)
 return true;`

```
if(obj instanceof Car) {  
    Car c = obj;  
    if(this.model == c.model && this.vin == c.vin)  
        return true;  
}  
6406533362534. ✘ return false;
```

Question Number : 124 Question Id : 640653996118 Question Type : MCQ

Correct Marks : 7

Question Label : Multiple Choice Question

Consider the Java code given below.

```
class Publisher {  
    private String name;  
    public Publisher(String nm) {  
        name = nm;  
    }  
}  
class Book extends Publisher {  
    private String[] authors;  
    // ----- CODE BLOCK -----  
}  
public class Test {  
    public static void main(String[] args) {  
        String[] a = {"Author1", "Author2"};  
        Book b1 = new Book("TechPublisher", a);  
    }  
}
```

Choose the correct option to fill in place of CODE BLOCK to instantiate instance variables of class Book

Options :

```
public Book(String[] auth) {  
    authors = auth;  
}  
6406533362535. ✘ }  
  
public Book(String nm, String[] auth) {  
    this.authors = auth;  
    super(nm);  
}  
6406533362536. ✘ }  
  
6406533362537. ✘
```

```
public Book(String nm, String[] auth) {  
    this.name = nm;  
    this.authors = auth;  
}
```

```
        public Book(String nm, String[] auth) {  
            super(nm);  
            this.authors = auth;
```

6406533362538. ✓ }

Question Number : 125 Question Id : 640653996119 Question Type : MCQ

Correct Marks : 7

Question Label : Multiple Choice Question

Consider the Java code given below.

```
class Course{  
    String courseName;  
    String[] topics;  
  
    public Course(String c, String[] t){  
        courseName = c;  
        topics = t;  
    }  
    public Course(Course c){  
        this.courseName = c.courseName;  
        this.topics = c.topics;  
    }  
}  
public class Test{  
    public static void main(String[] args){  
        String[] topics = {"Inheritance", "Polymorphism", "Encapsulation"};  
        Course course1 = new Course("Java", topics);  
        Course course2 = new Course(course1);  
        course2.courseName = "Advanced Java";  
        course2.topics[1] = "Abstract Classes";  
        System.out.println(course1.courseName + ", " + course1.topics[1]);  
        System.out.println(course2.courseName + ", " + course2.topics[1]);  
    }  
}
```

What will the output be?

Options :

Java, Polymorphism

6406533362539. ❌ Advanced Java, Abstract classes

Advanced Java, Polymorphism

6406533362540. ✘ Java, Abstract classes

Java, Abstract classes

6406533362541. ✓ Advanced Java, Abstract classes

Java, Polymorphism

6406533362542. ✘ Advanced Java, Polymorphism

Question Number : 126 Question Id : 640653996120 Question Type : MCQ

Correct Marks : 7

Question Label : Multiple Choice Question

Consider the Java code given below.

```
class Instrument {  
    public void play() {  
        System.out.println("Play instrument");  
    }  
}  
class Guitar extends Instrument {  
    public void play() {  
        super.play();  
        System.out.println("Play guitar");  
    }  
    public void play(String song) {  
        System.out.println("Play guitar: " + song);  
    }  
}  
class ElectricGuitar extends Guitar {  
    public void play() {  
        super.play();  
        System.out.println("Play electric guitar");  
    }  
    public void play(String song) {  
        System.out.println("Play electric guitar: " + song);  
    }  
}  
  
public class Test {  
    public static void main(String[] args) {  
        Guitar obj = new ElectricGuitar(); // LINE 1  
        obj.play();  
        obj.play("Rock Song"); // LINE 2  
    }  
}
```

Choose the correct option.

Options :

The program generates output:

Play instrument

Play guitar

Play electric guitar

Play electric guitar: Rock Song

6406533362543. ✓

LINE 1 generates compilation error because a variable of type `Guitar` cannot

6406533362544. ❌ refer to an object of type `ElectricGuitar`.

6406533362545. ❌

This code generates the below output followed by runtime Error at LINE 2 because there is ambiguity in which play() method is being invoked.

```
Play guitar
play electric guitar
Play electric guitar: News
```

The program generates output:

```
Play instrument
Play electric guitar
Play electric guitar: Rock Song
```

6406533362546. *

Question Number : 127 Question Id : 640653996121 Question Type : MCQ

Correct Marks : 7

Question Label : Multiple Choice Question

Consider the Java program below.

```
class Vehicle {
    public void startEngine() {
        System.out.println("Vehicle engine starts");
    }
}
class Car extends Vehicle {
    public void startEngine() {
        System.out.println("Car engine starts");
    }
    public void horn() {
        System.out.println("Car horns");
    }
}
public class Test {
    public static void main(String[] args) {
        Vehicle obj = new Car(); // LINE 1
        obj.startEngine(); // LINE 2
        obj.horn(); // LINE 3
    }
}
```

Choose the correct option.

Options :

The program generates output:
Car engine starts

6406533362547. * Car horns

LINE 1 generates compilation error because a variable of type Vehicle cannot refer to an object of type Car.
6406533362548. ✘ refer to an object of type Car.

This code generates the below output followed by runtime Error at LINE 2 because there is ambiguity in which startEngine() method is being invoked.
6406533362549. ✘ Car horns

LINE 3 generates compilation error because the method horn() is not defined
6406533362550. ✓ in the Vehicle class.

Question Number : 128 Question Id : 640653996123 Question Type : MCQ

Correct Marks : 7

Question Label : Multiple Choice Question

Consider the Java code given below.

```
class Vehicle {  
    private int id;  
    private static double baseFare = 50;  
  
    public Vehicle(int id) {  
        this.id = id;  
    }  
    public final double calculateFare() {  
        return baseFare * 1.5;  
    }  
}  
class Car extends Vehicle {  
    public Car(int id) {  
        super(id);  
    }  
    public final double calculateFare() { // LINE 1  
        return baseFare * 2.5; // LINE 2  
    }  
}  
  
public class TransportTest {  
    public static void main(String[] args) {  
        Vehicle v1 = new Car(201); // LINE 3  
        Car c1 = new Vehicle(205); // LINE 4  
        System.out.println(v1.calculateFare());  
        System.out.println(c1.calculateFare());  
    }  
}
```

Which of the following statements is FALSE?

Options :

LINE 1 generates compilation error because the method `calculateFare()` cannot be overridden.

LINE 2 generates compilation error because instance variable `baseFare` cannot be accessed in class `Car`.

LINE 3 generates compilation error because a variable of type `Vehicle` cannot refer to an object of type `Car`.

LINE 4 generates compilation error because a variable of type `Car` cannot refer to an object of type `Vehicle`.

Question Number : 129 Question Id : 640653996124 Question Type : MCQ

Correct Marks : 7

Question Label : Multiple Choice Question

Consider the Java code given below.

```
interface Flyable {  
    default void fly() {  
        System.out.println("Flying");  
    }  
    void takeOff();  
}  
  
abstract class Bird implements Flyable {  
    public void fly() {  
        System.out.println("Flying high");  
    }  
}  
  
class Eagle extends Bird {  
    public void takeOff() {  
        System.out.println("Taking off");  
    }  
}  
  
public class Test {  
    public static void main(String[] args) {  
        Bird obj = new Eagle(); // LINE 1  
        obj.fly();  
        obj.takeOff(); // LINE 2  
    }  
}
```

Choose the correct option.

Options :

This code generates the output:

Flying high

6406533362559. ✓ Taking off

This code generates the output:

Flying

6406533362560. ✗ Taking off

LINE 1 generates compilation error because a variable of type Bird cannot refer to an object of type Eagle.

LINE 2 generates compilation error because the method takeOff() cannot be invoked on obj

6406533362562. ✗

Question Number : 130 Question Id : 640653996125 Question Type : MCQ

Correct Marks : 7

Question Label : Multiple Choice Question

Consider the Java code given below. Identify the correct statement to fill in the blank at LINE 1, such that the output is: Loan Rejected

```
interface LoanEligibility {  
    void printLoanStatus();  
}  
class BankCustomer {  
    private double salary;  
    public BankCustomer(double s){  
        salary = s;  
    }  
    public LoanEligibility checkLoanEligibility() {  
        if (salary > 50000)  
            return new LoanApproved();  
        return new LoanRejected();  
    }  
    private class LoanApproved implements LoanEligibility {  
        public void printLoanStatus() {  
            System.out.println("Loan Approved");  
        }  
    }  
    private class LoanRejected implements LoanEligibility {  
        public void printLoanStatus() {  
            System.out.println("Loan Rejected");  
        }  
    }  
}  
public class Main {  
    public static void main(String[] args) {  
        BankCustomer bc1 = new BankCustomer(45000);  
        BankCustomer bc2 = new BankCustomer(60000);  
        ----- // LINE 1  
    }  
}
```

Options :

6406533362563. ✘ bc1.printLoanStatus();

6406533362564. ✘ bc2.printLoanStatus();

6406533362565. ✘ bc2.checkLoanEligibility().printLoanStatus();

6406533362566. ✓ bc1.checkLoanEligibility().printLoanStatus();

Question Number : 131 Question Id : 640653996126 Question Type : MCQ

Correct Marks : 7

Question Label : Multiple Choice Question

Consider the Java code given below.

```
interface Readable {  
    void read();  
}  
interface Writable {  
    public default void write() {  
        System.out.println("Writing document");  
    }  
}  
class Document implements Readable, Writable {  
    public void read() {  
        System.out.println("Reading document");  
    }  
    public void write() {  
        System.out.println("Writing in bold");  
    }  
}  
  
public class Test {  
    public static void main(String[] args) {  
        Readable r1 = new Document();  
        r1.read(); // LINE 1  
        r1.write(); // LINE 2  
    }  
}
```

Choose the correct option.

Options :

This program generates the output:

Reading document

Writing in bold

6406533362567. ✗

This program generates the output:

Reading document

6406533362568. ✗ Writing document

LINE 1 generates compiler error because `r1` of type `Readable` cannot invoke method `read()`.
6406533362569. ❌

LINE 2 generates compiler error because `r1` of type `Readable` cannot invoke method `write()`.
6406533362570. ✓

Question Number : 132 Question Id : 640653996128 Question Type : MCQ

Correct Marks : 7

Question Label : Multiple Choice Question

Consider the code given below.

```
interface Iterator{
    public boolean has_next();
    public Object get_next();
}

abstract class Shape{
    public abstract void draw();
}

class ShapeList{
    public ShapeList(){
        private final int limit = 3;
        private Circle[] list = {new Circle("Red"), new
                                Circle("Green"), new Circle("Blue") };
    }

    private class Circle extends Shape{
        private String color;
        public Circle(String c) {
            color = c;
        }
        public void draw() {
            System.out.println("Drawing circle with color: " + color);
        }
    }

    private class ShapeIter implements Iterator{
        private int idx;
        public ShapeIter() {
            //constructor
        }
        public boolean has_next() {
            //if next element available in list return true; else false
        }
        public Object get_next() {
            //return next element from list
        }
    }

    public Iterator getIterator() {
        return new ShapeIter();
    }
}

public class IterTest{
    public static void main(String[] args) {
        ShapeList sList = new ShapeList();
        Iterator iter = sList.getIterator();

        while(iter.has_next()) {
            -----;           //LINE 1
        }
    }
}
```

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

Drawing circle with color: Red
Drawing circle with color: Green
Drawing circle with color: Blue

Options :

6406533362575. ✓ ((Shape)iter.get_next()).draw()

6406533362576. ✗ ((Circle)iter.get_next()).draw()

6406533362577. ✗ ((ShapeList)iter.get_next()).draw()

6406533362578. ✎ iter.get_next().draw();

System Commands

Section Id :	64065369438
Section Number :	9
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	16
Number of Questions to be attempted :	16
Section Marks :	105
Display Number Panel :	Yes
Section Negative Marks :	0
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	No
Section Maximum Duration :	0
Section Minimum Duration :	0
Section Time In :	Minutes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653146997
Question Shuffling Allowed :	No

Question Number : 133 Question Id : 640653996129 Question Type : MCQ

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 :

6406533362579. ✓ YES

6406533362580. ✎ NO

Sub-Section Number :	2
Sub-Section Id :	640653146998
Question Shuffling Allowed :	Yes

Question Number : 134 Question Id : 640653996130 Question Type : MCQ

Correct Marks : 6

Question Label : Multiple Choice Question

```
mkdir -p site/public; touch site/public/index.html  
touch site/public/style.css  
mkdir site/private site/static; touch site/static/image.png  
rmdir site/static
```

Select the output from the above script.

Hint

```
'''bash  
MKDIR(1)                                User  
Commands  
  
NAME  
    mkdir - make directories  
  
SYNOPSIS  
    mkdir [OPTION]... DIRECTORY...  
  
DESCRIPTION  
    Create the DIRECTORY(ies), if they do not already exist.  
  
...  
-p, --parents  
        no error if existing, make parent directories as needed  
...  
'''
```

Options :

6406533362581. ✘ Remove directory static

6406533362582. ✘ Remove directory site and static

6406533362583. ✘ Remove files from static

6406533362584. ✓ Exit with error code

Question Number : 135 Question Id : 640653996139 Question Type : MCQ

Correct Marks : 6

Question Label : Multiple Choice Question

What will be the output of the following command?

```
echo {1..3}-file_{A..C}
```

Options :

6406533362614. ✓ 1-file_A 1-file_B 1-file_C 2-file_A 2-file_B 2-file_C 3-file_A 3-file_B 3-file_C

6406533362615. ✗ 1 2 3 - file A B C

6406533362616. ✗ {1..3}-file_{A..C}

6406533362617. ✗ 1..3-file_A..C

Question Number : 136 Question Id : 640653996140 Question Type : MCQ

Correct Marks : 6

Question Label : Multiple Choice Question

Which of the following actions will delete the 7th line and save and exit in a vi editor or emacs editor?

Options :

```
$ vi filename.txt  
:7 # all following commands in vi editor  
dd #delete the line  
:wq
```

```
$ emacs filename.txt  
M-g g 7 # go to the 7th line  
C-k # delete the line  
C-x C-s # save the file  
C-x C-c # exit Emacs
```

6406533362618. ✓

6406533362619. ✗

```
$ vi filename.txt  
7 # all following commands in vi editor  
D #delete the line  
:wq
```

```
$ emacs filename.txt  
C-x 7 # go to the 7th line  
C-k # delete the line  
C-x C-s # save the file  
C-x C-c # exit Emacs
```

```
$ vi filename.txt  
:7 # all following commands in vi editor  
D #delete the line  
:wq!
```

```
$ emacs filename.txt  
M-7 # go to the 7th line  
C-d # delete the line  
C-x C-s # save the file  
C-x C-c # exit Emacs
```

6406533362620. *

```
$ vi filename.txt  
:7 # all following commands in vi editor  
dd #delete the line  
:w
```

```
$ emacs filename.txt  
M-g g 7 # go to the 7th line  
C-d # delete the line  
C-x C-s # save the file  
C-x C-c # exit Emacs
```

6406533362621. *

Sub-Section Number :

3

Sub-Section Id :

640653146999

Question Shuffling Allowed :

Yes

Correct Marks : 8

Question Label : Multiple Choice Question

Which of the following command sequences will ensure that both stdout and stderr are written to output.log and also displayed in the terminal?

Options :

6406533362589. ✓ command 2>&1 | tee output.log

6406533362590. ✗ command | tee output.log 2>&1

6406533362591. ✗ command &> output.log | tee output.log

6406533362592. ✗ command > output.log 2>&1 | tee output.log

Question Number : 138 Question Id : 640653996138 Question Type : MCQ

Correct Marks : 8

Question Label : Multiple Choice Question

You receive a "Host key verification failed" error when trying to SSH into a remote VM. Which ssh-keygen command would you use to remove the old host key?

Hint

Excerpts from MAN page of ssh-keygen command

```
DESCRIPTION
ssh-keygen generates, manages and converts authentication keys for
ssh(1). ssh-keygen can create keys for use by SSH protocol version
2.

The type of key to be generated is specified with the -t option. If
invoked without any arguments, ssh-keygen will generate an RSA
key.

ssh-keygen is also used to generate groups for use in Diffie-Hellman
group exchange (DH-GEX). See the MODULI GENERATION section for
details.

Finally, ssh-keygen can be used to generate and update Key Revocation
Lists, and to test whether given keys have been revoked by one.
See the KEY REVOCATION LISTS section for details.

Normally each user wishing to use SSH with public key authentication
runs this once to create the authentication key in ~/.ssh/id_dsa,
~/.ssh/id_ecdsa, ~/.ssh/id_ecdsa_sk, ~/.ssh/id_ed25519,
~/.ssh/id_ed25519_sk or ~/.ssh/id_rsa. Additionally, the system
administrator
may use this to generate host keys.

Normally this program generates the key and asks for a file in which to
store the private key. The public key is stored in a file with
the same name but ".pub" appended. The program also asks for a
passphrase. The passphrase may be empty to indicate no passphrase
(host keys must have an empty passphrase), or it may be a string of
arbitrary length. A passphrase is similar to a password, except it
can be a phrase with a series of words, punctuation, numbers,
whitespace, or any string of characters you want. Good passphrases are
10-30 characters long, are not simple sentences or otherwise easily
guessable (English prose has only 1-2 bits of entropy per character,
and provides very bad passphrases), and contain a mix of upper and
lowercase letters, numbers, and non-alphanumeric characters.
The passphrase can be changed later by using the -p option.

There is no way to recover a lost passphrase. If the passphrase is
lost or forgotten, a new key must be generated and the corresponding
public key copied to other machines.

ssh-keygen will by default write keys in an OpenSSH-specific format.
This format is preferred as it offers better protection for keys
at rest as well as allowing storage of key comments within the private
key file itself. The key comment may be useful to help identify
the key. The comment is initialized to "user@host" when the key is
created, but can be changed using the -c option.

It is still possible for ssh-keygen to write the previously-used PEM
format private keys using the -m flag. This may be used when generating
new keys, and existing new-format keys may be converted using
this option in conjunction with the -p (change passphrase) flag.

After a key is generated, ssh-keygen will ask where the keys should be
placed to be activated.

...
-t dsa | ecdsa | ecdsa-sk | ed25519 | ed25519-sk | rsa
    Specifies the type of key to create. The possible values are
    "dsa", "ecdsa", "ecdsa-sk", "ed25519", "ed25519-sk", or "rsa".
    -b bits
        Specifies the number of bits in the key to create. For RSA
        keys, the minimum size is 1024 bits and the default is 3072 bits.
        Generally, 3072 bits is considered sufficient. DSA keys must
        be exactly 1024 bits as specified by FIPS 186-2. For ECDSA keys,
        the -b flag determines the key length by selecting from one of
        three elliptic curve sizes: 256, 384 or 521 bits. Attempting to
        use bit lengths other than these three values for ECDSA keys
        will fail. ECDSA-SK, Ed25519 and Ed25519-SK keys have a fixed
        length and the -b flag will be ignored.
...
-f filename
    Specifies the filename of the key file.

-R hostname | [hostname]:port
    Removes all keys belonging to the specified hostname (with
    optional port number) from a known_hosts file. This option is useful
    to delete hashed hosts (see the -H option above).
...
```

Options :

6406533362610. ✓ ssh-keygen -R remote-vm

6406533362611. ✗ ssh-keygen -t rsa -b 4096

6406533362612. ✗ ssh-keygen -f ~/.ssh/id_rsa -y

6406533362613. ✗ ssh-keygen -L remote-vm

Sub-Section Number : 4
Sub-Section Id : 640653147000
Question Shuffling Allowed : Yes

Question Number : 139 Question Id : 640653996131 Question Type : MSQ

Correct Marks : 7 Max. Selectable Options : 0

Question Label : Multiple Select Question

Select the Regular Expression to match the complete string of "address" (e.g. "address": "326-2072 Sagittis Road") from the below JSON file named addresses.json .

```
[  
 {  
   "name": "Chadwick Cummings",  
   "email": "nulla.dignissim.maecenas@hotmail.org",  
   "address": "326-2072 Sagittis Road",  
   "numberrange": 9,  
   "alphanumeric": "ESM17JCJ7NR"  
 },  
 {  
   "name": "Isaac Whitaker",  
   "email": "vitae.semper.egestas@icloud.ca",  
   "address": "589-9277 Vivamus St.",  
   "numberrange": 3,  
   "alphanumeric": "CTI05YDP7BX"  
 },  
 {  
   "name": "Bethany Potter",  
   "email": "enim.gravida@protonmail.com",  
   "address": "P.O. Box 807, 2790 Ut, Ave",  
   "numberrange": 7,  
   "alphanumeric": "VOE77ZLE00J"  
 },  
 ]
```

Options :

6406533362585. ✓ "address": "([^"]+)"

6406533362586. ✗ "address": \["(.+)\"\]

6406533362587. ✓ "address": "[[:space:]]*:[[:space:]]*([^\"]*)"

6406533362588. ✘ "address"[:space:]+[:space:]+(["]*)"

Sub-Section Number : 5

Sub-Section Id : 640653147001

Question Shuffling Allowed : Yes

Question Number : 140 Question Id : 640653996133 Question Type : MSQ

Correct Marks : 8 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following command sequences will run two commands in the background and print their PIDs?

Options :

6406533362593. ✓ command1 & PID1=\$!; command2 & PID2=\$!; echo \$PID1 \$PID2

6406533362594. ✘ command1 & command2 & echo \$!

6406533362595. ✓ command1 & PID1=\$! && command2 & PID2=\$! && echo \$PID1 \$PID2

6406533362596. ✘ command1 &; PID1=\$!; command2 &; PID2=\$!; echo \$PID1 \$PID2

Question Number : 141 Question Id : 640653996134 Question Type : MSQ

Correct Marks : 8 Max. Selectable Options : 0

Question Label : Multiple Select Question

You have a large log file, `server.log`, and you want to count the number of occurrences of the word "ERROR" in the file. Which of the following command sequences will accomplish this?

Hint

- For command `grep`

`-c, --count`

Suppress normal output; instead print a count of matching lines for each input file. With the `-v, --invert-match` option (see below), count non-matching lines.

- In command `wc`

`-l, --lines`

print the newline counts

Options :

```
6406533362597. ✓ grep "ERROR" server.log | wc -l  
  
6406533362598. ✗ echo server.log | grep "ERROR" | wc -l  
  
6406533362599. ✗ wc -l server.log | grep "ERROR"  
  
6406533362600. ✓ grep -c "ERROR" server.log
```

Question Number : 142 Question Id : 640653996136 Question Type : MSQ

Correct Marks : 8 Max. Selectable Options : 0

Question Label : Multiple Select Question

You try to SSH into a remote VM using the command `ssh user@remote-vm` and receive the following error:

```
Host key verification failed.
```

What are the possible reasons for this error?

Options :

- 6406533362602. ✓ The remote VM's IP address has changed.
- 6406533362603. ✓ The remote VM's SSH host key has changed.
- 6406533362604. ✗ The local SSH configuration file is corrupted.
- 6406533362605. ✗ The SSH client is not installed.

Question Number : 143 Question Id : 640653996137 Question Type : MSQ

Correct Marks : 8 Max. Selectable Options : 0

Question Label : Multiple Select Question

You try to SSH into a remote VM using the command `ssh user@remote-vm` and receive the following error:

```
@@@@@@@@@@@  
@     WARNING: REMOTE HOST IDENTIFICATION HAS CHANGED!     @  
@@@@@@@@@@@  
IT IS POSSIBLE THAT SOMEONE IS DOING SOMETHING NASTY!
```

Which of the following option(s) are likely the cause ?

Options :

- 6406533362606. ✓ The remote VM's SSH host key has changed.

The remote VM's IP address has changed and is now associated with a different host
6406533362607. ✓ key.

6406533362608. ✗ The local `~/.ssh/known_hosts` file is corrupted.

6406533362609. ✗ The remote VM's SSH server is down.

Sub-Section Number :

6

Sub-Section Id :

640653147002

Question Shuffling Allowed :

Yes

Question Number : 144 Question Id : 640653996141 Question Type : MSQ

Correct Marks : 6 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which command will display the inode number of the file `myfile` ?

Options :

6406533362622. ✓ `ls -i myfile`

6406533362623. ✗ `ls -l myfile`

6406533362624. ✓ `stat myfile`

6406533362625. ✗ `file myfile`

Question Number : 145 Question Id : 640653996142 Question Type : MSQ

Correct Marks : 6 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which command will create a directory `data` with a subdirectory `backup` and set the permissions so that the owner has full control, the group can read and execute, and others have no permissions, then verify the permissions?

Hint

```
MKDIR(1)
Commands

NAME      mkdir - make directories
User
MKDIR(1)

SYNOPSIS  mkdir [OPTION]... DIRECTORY...
DESCRIPTION Create the DIRECTORY(ies), if they do not already exist.

...
-p, --parents
        no error if existing, make parent directories as needed
...

LN(1)
Commands

NAME      ln - make links between files
User
LN(1)

SYNOPSIS  ln [OPTION]... [-T] TARGET LINK_NAME
ln [OPTION]... TARGET
ln [OPTION]... TARGET... DIRECTORY
ln [OPTION]... -t DIRECTORY TARGET...
DESCRIPTION In the 1st form, create a link to TARGET with the name LINK_NAME. In the 2nd form, create a link to TARGET in the current directory. In the 3rd and 4th forms, create links to each TARGET in DIRECTORY. Create hard links by default; symbolic links with --symbolic. By default, each destination (name of new link) should not already exist. When creating hard links, each TARGET must exist. Symbolic links can hold arbitrary text; if later resolved, a relative link is interpreted in relation to its parent directory.

...
-s, --symbolic
        make symbolic links instead of hard links

...

LS(1)
Commands

NAME      ls - list directory contents
User
LS(1)

SYNOPSIS  ls [OPTION]... [FILE]...
DESCRIPTION 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.
...
-l      use a long listing format
...
-d, --directory
        list directories themselves, not their contents
...

CHMOD(1)
Commands

NAME      chmod - change file mode bits
User
CHMOD(1)

SYNOPSIS  chmod [OPTION]... MODE[,MODE]... FILE...
chmod [OPTION]... OCTAL-MODE FILE...
chmod [OPTION]... --reference=RFILE FILE...

DESCRIPTION This manual page documents the GNU version of chmod. chmod changes the mode bits of each given file according to mode, which can be either a symbolic representation of changes to make, or an octal number representing the bit pattern for the new mode bits.

The format of a symbolic mode is [ugo...][[+=][perms...]...], where perms is either zero or more letters from the set rwxxt, or a single letter from the set ugo. Multiple symbolic modes can be given, separated by commas.

A combination of the letters ugoa controls which users' access to the file will be changed: the user who owns it (u), other users in the file's group (g), other users not in the file's group (o), or all users (a). If none of these are given, the effect is as if (a) were given, but bits that are set in the umask are not affected.

The operator + causes the selected file mode bits to be added to the existing file mode bits of each file; - causes them to be removed; and = causes them to be added and causes unmentioned bits to be removed except that a directory's unmentioned set user and group ID bits are not affected.

The letters rwxxt select file mode bits for the affected users: read (r), write (w), execute (or search for directories) (x), execute/search only if the file is a directory or already has execute permission for the user (X), set user or group ID on execution (s), restricted deletion flag or sticky bit (t). Instead of one or more of these letters, you can specify exactly one of the letters ugo: the permissions granted to the user who owns the file (u), the permissions granted to other users who are members of the file's group (g), and the permissions granted to users that are in neither of the two preceding categories (o).

A numeric mode is from one to four octal digits (0-7), derived by adding up the bits with values 4, 2, and 1. Omitted digits are assumed to be leading zeros. The first digit selects the set user ID (4) and set group ID (2) and restricted deletion or sticky bit (1) attributes. The second digit selects permissions for the user who owns the file: read (0), write (2), and execute (1); the third selects permissions for other users in the file's group, with the same values; and the fourth for other users not in the file's group, with the same values.

chmod never changes the permissions of symbolic links; the chmod system call cannot change their permissions. This is not a problem since the permissions of symbolic links are never used. However, for each symbolic link that is traversed, chmod changes the permissions of the pointed-to file. In contrast, chmod ignores symbolic links encountered during recursive directory traversals.

-R, --recursive
        change files and directories recursively
```

Options :

```
mkdir -p data/backup
chmod 750 data data/backup
ls -ld data data/backup
```

6406533362626. ✓

6406533362627. ✓

```
mkdir -p data/backup  
chmod -R 750 data  
ls -ld data data/backup
```

```
mkdir data data/backup  
chmod -R 750 data  
ls -ld data data/backup
```

6406533362628. *

```
mkdir -p data/backup  
chmod 750 data/backup  
ls -ld data data/backup
```

6406533362629. *

Question Number : 146 Question Id : 640653996143 Question Type : MSQ

Correct Marks : 6 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following command sequences will create a SHA256 checksum for the file data.bin and later verify its integrity?

SHA256SUM(1) User
Commands SHA256SUM(1)

NAME

sha256sum - compute and check SHA256 message digest

SYNOPSIS

sha256sum [OPTION]... [FILE]...

DESCRIPTION

Print or check SHA256 (256-bit) checksums.

With no FILE, or when FILE is -, read standard input.

-b, --binary

read in binary mode

-c, --check

read SHA256 sums from the FILES and check them

--tag create a BSD-style checksum

-t, --text

read in text mode (default)

-z, --zero

end each output line with NUL, not newline, and disable file name escaping

...

Options :

sha256sum data.bin > data.sha256
sha256sum -c data.sha256

6406533362630. ✓

sha256sum data.bin -o data.sha256
sha256sum -v data.sha256

6406533362631. ✗

6406533362632. ✓

```
sha256sum data.bin | tee data.sha256
sha256sum -c data.sha256
```

```
sha256sum -v data.bin > data.sha256
sha256sum -c data.sha256
```

6406533362633. ✘

Question Number : 147 Question Id : 640653996144 Question Type : MSQ

Correct Marks : 6 Max. Selectable Options : 0

Question Label : Multiple Select Question

A MAC (Media Access Control) address is a unique identifier assigned to network interfaces for communications on the physical network segment. A MAC address is typically represented in the format 00:1A:2B:3C:4D:5E , where each pair of characters is a hexadecimal digit (0-9, A-F).

Which of the following regular expressions (Extended Regular Expression) will match a MAC address in the format 00:1A:2B:3C:4D:5E ?

Options :

6406533362634. ✓ \([0-9A-Fa-f]\{2\}:\)\{5\}[0-9A-Fa-f]\{2\}

[0-9A-Fa-f]\{2\}:[0-9A-Fa-f]\{2\}:[0-9A-Fa-f]\{2\}:[0-9A-Fa-f]\{2\}:[0-9A-Fa-

6406533362635. ✓ f]\{2\}:[0-9A-Fa-f]\{2\}

[0-9A-F]\{2\}:[0-9A-F]\{2\}:[0-9A-F]\{2\}:[0-9A-F]\{2\}:[0-9A-F]\{2\}:[0-9A-F]\{2\}

6406533362636. ✘ {2\}

[0-9A-Fa-f]\{2\}-[0-9A-Fa-f]\{2\}-[0-9A-Fa-f]\{2\}-[0-9A-Fa-f]\{2\}-[0-9A-Fa-

6406533362637. ✘ f]\{2\}-[0-9A-Fa-f]\{2\}

6406533362638. ✘ \([0-9A-Fa-f]\{2\}:\)\{6\}

Sub-Section Number :

7

Sub-Section Id :

640653147003

Question Shuffling Allowed :

Yes

Question Number : 148 Question Id : 640653996135 Question Type : SA

Correct Marks : 8

Question Label : Short Answer Question

Given the following contents of a file `websites.txt`, what will be the output of the command

```
cat websites.txt | cut -d: -f1 | sort | uniq| tail -1?
```

```
https://www.example.com/page1 http://www.test.org/page2  
https://sub.domain.net/page3 http://anotherexample.com/page4  
https://www.site.co.uk/page5 http://example.org/page6
```

NOTE: Enter the exact answer without any extra space in the beginning or at the end.

Response Type : Alphanumeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Answers Case Sensitive : Yes

Text Areas : PlainText

Possible Answers :

https

AppDev2

Section Id :	64065369439
Section Number :	10
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	17
Number of Questions to be attempted :	17
Section Marks :	50
Display Number Panel :	Yes
Section Negative Marks :	0
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	No
Section Maximum Duration :	0
Section Minimum Duration :	0
Section Time In :	Minutes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653147004
Question Shuffling Allowed :	No

Question Number : 149 Question Id : 640653996145 Question Type : MCQ

Correct Marks : 0

Question Label : Multiple Choice Question

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

6406533362639. ✓ YES

6406533362640. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 640653147005

Question Shuffling Allowed : Yes

Question Number : 150 Question Id : 640653996149 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

Consider the following HTML, with the correct Vue 2 CDN links included.

```
<body>
  <div id="app" :class="['box', { active: isActive }]>
    Vue Component
  </div>
  <script>
    new Vue({
      el: '#app',
      data() {
        return {
          isActive: false,
        };
      },
    });
  </script>
</body>
```

What will be the final rendered class attribute of the <div> ?

Options :

6406533362653. ✓ box

6406533362654. ✗ active

6406533362655. ✗ box active

6406533362656. ✗ box inactive

Question Number : 151 Question Id : 640653996161 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

Which of the following is an example of ephemeral state in a web application?

Options :

6406533362703. ❌ A user's authentication token stored in local storage

6406533362704. ✓ A form input value that changes as the user types

6406533362705. ❌ The list of favorite items saved in a user's profile

6406533362706. ❌ A shopping cart saved between sessions

Sub-Section Number :

3

Sub-Section Id :

640653147006

Question Shuffling Allowed :

Yes

Question Number : 152 Question Id : 640653996146 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following JavaScript code

```
const juices = [
  { id: 1, name: "grape", rating: 8.1 },
  { id: 2, name: "apple", rating: 5.0 },
  { id: 3, name: "orange", rating: 6.9 },
  { id: 4, name: "banana", rating: 10 },
]

mapping = { "4": 1, "3": 2, "2": 3, "1": 4 }

juices.map((juice) => { return { ...juice, rank: mapping[juice.id] } })
  .sort((a, b) => a.rank - b.rank)
  .map((juice) => { console.log(juice.name) })
```

What will be the output of the code?

Options :

apple

orange

grape

6406533362641. ❌ banana

banana

grape

orange

6406533362642. ❌ apple

6406533362643. ✓

banana
orange
apple
grape

6406533362644. ✘ undefined

Question Number : 153 Question Id : 640653996147 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following JavaScript code snippet

```
var name = 'Taylor'

const person = {
    name: 'Jeremy',
    talk() {
        return () => `${this.name} says Hello!`
    }
}

talkReturn = person.talk()
console.log(talkReturn())
```

What will be the output of the code?

Options :

6406533362645. ✘ undefined says Hello!

6406533362646. ✓ Jeremy says Hello!

6406533362647. ✘ Taylor says Hello!

6406533362648. ✘ ReferenceError

Question Number : 154 Question Id : 640653996151 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following code snippet

```
function createCounter() {
  let count = 0;

  return function() {
    count++;
    setTimeout(() => {
      console.log(count);
    }, 1000);
  };
}

const counter = createCounter();
counter();
counter();
counter();
```

What will be the output **after 1 second?**

Options :

6406533362661. ✘ 1

1
1

6406533362662. ✘ 1

1
2

6406533362663. ✘ 3

3
3

6406533362664. ✓ 3

Question Number : 155 Question Id : 640653996154 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the below javascript program.

```
const obj = {
    a: 10,
    b() {
        return this.a;
    }
};

const c = obj.b;
const d = obj.b.bind(obj);

console.log(c(), d());
```

What will be the output of the above program?

Options :

6406533362674. ✘ 10 10

6406533362675. ✓ undefined 10

6406533362676. ✘ 10 undefined

6406533362677. ✘ undefined undefined

6406533362678. ✘ Error

Question Number : 156 Question Id : 640653996159 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the below Vue component.

```
<template>
  <div>
    <p>{{ computedMessage }}</p>
    <button @click="update">Update</button>
  </div>
</template>

<script>
export default {
  data() {
    return {
      message: 'Initial'
    };
  },
  computed: {
    computedMessage() {
      return this.message + ' - Computed';
    }
  },
  methods: {
    update() {
      this.message = 'Updated';
    }
  }
};
</script>
```

What will be displayed in the <p> element, after the button with text “Update” is clicked?

Options :

- 6406533362695. ❌ "Initial - Computed"
- 6406533362696. ✓ "Updated - Computed"
- 6406533362697. ❌ "Initial - Computed Updated"
- 6406533362698. ❌ "Updated"

Sub-Section Number :

4

Sub-Section Id :

640653147007

Question Shuffling Allowed :

Yes

Question Number : 157 Question Id : 640653996148 Question Type : MCQ

Correct Marks : 4.5

Question Label : Multiple Choice Question

Consider the following HTML, with the correct Vue 2 CDN links included.

```
<body>
  <div id="app">
    <p>pineapple 🍍</p>
    <button @click="addPineapple">Buy</button>
    <p>Amount : {{amount}}</p>
  </div>
  <script>
    new Vue({
      el: '#app',
      data() {
        return {
          amount: '',
          price: 40,
        }
      },
      methods: {
        addPineapple() {
          this.amount += this.price;
        }
      }
    })
  </script>
</body>
```

What will be shown in the **amount** placeholder when the **Buy button** is clicked **two** times?

Options :

6406533362649. ✘ 40

6406533362650. ✘ 80

6406533362651. ✓ 4040

6406533362652. ✘ undefined

Question Number : 158 Question Id : 640653996150 Question Type : MCQ

Correct Marks : 4.5

Question Label : Multiple Choice Question

Consider the following HTML, with the correct Vue 2 CDN links included.

```
<div id="app">
    <p>Original Order: {{ customerOrder }}</p>
    <p>Updated Order: {{ updatedOrder }}</p>
    <server-component :order="customerOrder"
@order-updated="updateOrder"></server-component>
</div>

<script>
Vue.component('server-component', {
    props: ['order'],
    template: `
        <div>
            <button @click="modifyOrder">Send Updated Order</button>
        </div>
    `,
    methods: {
        modifyOrder() {
            this.$emit('order-updated', this.order + ' - Extra mayo');
        }
    }
});
new Vue({
    el: '#app',
    data() {
        return {
            customerOrder: 'Burger',
            updatedOrder: ''
        };
    },
    methods: {
        updateOrder(newOrder) {
            this.updatedOrder = newOrder;
        }
    }
});
</script>
```

What will be displayed in the `<p>` tags after the `button` on the `server-component` is clicked?

Options :

Original Order: Burger

6406533362657. ❌ Updated Order:

Original Order:

6406533362658. ❌ Updated Order:

6406533362659. ❌

Original Order: Burger

Updated Order: - Extra mayo

Original Order: Burger

Updated Order: Burger - Extra mayo

6406533362660. ✓

Question Number : 159 Question Id : 640653996152 Question Type : MCQ

Correct Marks : 4.5

Question Label : Multiple Choice Question

Consider the below javascript program.

```
const numbers = [10, 20, 30];
const modifiedNumbers = numbers.reduce((acc, num) => {
    if (num % 2 === 0) {
        acc.push(num * 2);
    } else {
        acc.push(num / 2);
    }
    return acc;
}, []);

const finalOutput = modifiedNumbers.filter(num => num > 20);
console.log(finalOutput);
```

What will be the output of the above program?

Options :

6406533362665. ✘ []

6406533362666. ✘ [10, 20, 30]

6406533362667. ✘ [20, 40, 60]

6406533362668. ✓ [40, 60]

6406533362669. ✘ [40]

Question Number : 160 Question Id : 640653996160 Question Type : MCQ

Correct Marks : 4.5

Question Label : Multiple Choice Question

Consider the below Vue component.

```
<template>
  <div>
    <ul>
      <li v-for="item in filteredItems" :key="item.id">{{ item.name }}</li>
    </ul>
  </div>
</template>

<script>
export default {
  data() {
    return {
      items: [
        { id: 1, name: "Item 1" },
        { id: 2, name: "Item 2" },
        { id: 3, name: "Item 3" },
      ],
      filterActive: true,
    };
  },
  computed: {
    filteredItems() {
      return this.filterActive
        ? this.items.filter((item) => item.id !== 2)
        : this.items;
    },
  },
};
</script>
```

What will be displayed in the when filterActive is true?

Options :

6406533362699. ✓ Item 1, Item 3

6406533362700. ✗ Item 2

6406533362701. ✗ Item 1, Item 2, Item 3

6406533362702. ✗ The list will be empty.

Sub-Section Number :

5

Sub-Section Id :

640653147008

Question Shuffling Allowed :

Yes

Question Number : 161 Question Id : 640653996153 Question Type : MSQ

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following statements is/are true about JavaScript's "this" keyword behavior in different contexts?

Options :

6406533362670. ✓ In a regular function call, "this" refers to the global object in non-strict mode and "undefined" in strict mode.

6406533362671. ✓ In an arrow function, "this" is lexically inherited from the enclosing execution context.

6406533362672. ✗ Inside a method of an object, "this" always refers to the object itself, regardless of how the method is called.

6406533362673. ✓ The value of "this" can be explicitly set using "call()", apply(), or "bind()" methods, inside a method of an object.

Question Number : 162 Question Id : 640653996155 Question Type : MSQ

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Considering the differences between "var", "let", and "const" in terms of scope, hoisting, and reassignment, which of the following statements is/are true?

Options :

6406533362679. ✓ "var" is function-scoped, hoisted, and allows reassignments.

6406533362680. ✓ "let" is block-scoped, hoisted, and allows reassignments.

6406533362681. ✓ "const" is block-scoped, hoisted, does not allow reassignments, and its value must be assigned at the time of declaration.

6406533362682. ✗ "let" and "const" behave identically except that const variables cannot be redeclared, while let variables can be redeclared in the same block.

Question Number : 163 Question Id : 640653996156 Question Type : MSQ

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following statements is/are true?

Options :

6406533362683. ✓ call() and apply() immediately invoke the function, while bind() returns a new function that can be called later.

6406533362684. ✓ call() accepts arguments as a comma-separated list, whereas apply() accepts a single array of arguments.

6406533362685. ✓ bind() permanently sets the "this" context for a function, but the resulting function must still be explicitly called to execute.

6406533362686. ✗ All three methods are used to permanently change the "this" context of functions.

Sub-Section Number :

6

Sub-Section Id :

640653147009

Question Shuffling Allowed :

Yes

Question Number : 164 Question Id : 640653996157 Question Type : MSQ

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following scenario(s) represent ephemeral state(s) in a web application?

Options :

6406533362687. ✓ The user's current scroll position on a webpage.

6406533362688. ✗ The user's authentication token, saved in localStorage.

6406533362689. ✓ The temporary state of a dropdown menu.

6406533362690. ✗ All of these

Question Number : 165 Question Id : 640653996158 Question Type : MSQ

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

What are the differences between Vue's computed properties and methods?

Options :

6406533362691. ✓ Computed properties are cached based on their reactive dependencies, whereas methods are recalculated every time they are called.

6406533362692. ✓ Methods can be used to perform operations that do not need to be cached.

6406533362693. ✗ Computed properties can be used as methods if they require parameters.

6406533362694. ✗ Methods are always reactive and update automatically when their dependencies change.

CT

Section Id :	64065369440
Section Number :	11
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	14
Number of Questions to be attempted :	14
Section Marks :	50
Display Number Panel :	Yes
Section Negative Marks :	0
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	No
Section Maximum Duration :	0
Section Minimum Duration :	0
Section Time In :	Minutes
Maximum Instruction Time :	0

Sub-Section Number : 1
Sub-Section Id : 640653147010
Question Shuffling Allowed : No

Question Number : 166 Question Id : 640653996162 Question Type : MCQ

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "FOUNDATION LEVEL : COMPUTATIONAL THINKING (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 :

6406533362707. ✓ YES

6406533362708. ✗ NO

Question Number : 167 Question Id : 640653996163 Question Type : MCQ

Correct Marks : 0

Question Label : Multiple Choice Question

Scores

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

Words

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

Library

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

Olympics

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

Three sample cards out of 30 for Shopping Bills dataset

Item List {

SV Stores		Srivatsan 1	
Item	Category	Qty	Price
Carrots	Vegetables/Food	1.5	50
Soup	Toiletries	4	32
Tomatoes	Vegetables/Food	2	40
Bananas	Vegetables/Food	8	64
Socks	Footwear/Apparel	3	56
Curd	Dairy/Food	0.5	32
Milk	Dairy/Food	1.5	24
		567	

Sun General		Vignesh 14	
Item	Category	Qty	Price
Phone Charger	Utilities	1	230
Razor Blades	Grooming	1	12
Razor	Grooming	1	45
Shaving Lotion	Grooming	0.8	180
Earphones	Electronics	1	210
Pencils	Stationery	3	15
		856	

Big Bazaar		Sudeep 3	
Item	Category	Qty	Cost
Baked Beans	Canned/Food	1	125
Chicken Wings	Meat/Food	0.5	600
Cocoa powder	Canned/Food	1	160
Capiscum	Vegetables/Food	0.8	144
Tie	Apparel	2	390
Clips	Household	0.5	16
		1525	

Options :

6406533362709. ✓ Useful Data has been mentioned above.

6406533362710. ✗ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number :

2

Sub-Section Id :

640653147011

Question Shuffling Allowed :

Yes

Question Number : 168 Question Id : 640653996165 Question Type : MCQ

Correct Marks : 4

Question Label : Multiple Choice Question

The following pseudocode is executed using the "Shopping Bills" dataset. Assume that the variable **AvgT** holds the value of the average total bill amount. What will **Q** represent at the end of execution?

```
1 P = 0, Q = 0
2 while(Table 1 has more rows){
3     Read the first row X in Table 1
4     if(X.TotalBillAmount <= AvgT){
5         P = P + 1
6     }
7     else{
8         if(X.ShopName == "Big Bazaar" or X.ShopName == "SV Stores"){
9             Q = Q + 1
10        }
11    }
12 }
```

Options :

6406533362715. ✓ Number of bills from "Big Bazaar" or "SV Stores" with total bill amount greater than the average total bill amount.

6406533362716. ✗ Number of bills from either "Big Bazaar" or "SV Stores" with total bill amount lesser than the average total bill amount.

6406533362717. ✗ Number of bills from either "Big Bazaar" or "SV Stores".

6406533362718. ✗ Number of bills from either "Big Bazaar" or "SV Stores" with total bill amount lesser than or equal to the average total bill amount.

Question Number : 169 Question Id : 640653996168 Question Type : MCQ

Correct Marks : 4

Question Label : Multiple Choice Question

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

```
1 A = 0, Flag = True
2 while(Table 1 has more cards){
3     Read the first row X from Table 1
4     if(X.LetterCount > A){
5         A = X.LetterCount
6     }
7     Move X to Table 2
8 }
9 B = 0, Count = 0
10 while(Table 2 has more cards){
11     Read the first row X from Table 2
12     if(X.LetterCount == A){
13         B = B + 1
14     }
15     if(X.word ends with a full stop and B >= 2){
16         Count = Count + 1
17         B = 0
18     }
19     Move X to Table 3
20 }
```

Options :

6406533362727. ❌ Number of sentences with at most two longest words

6406533362728. ✓ Number of sentences with at least two longest words

6406533362729. ❌ Number of sentences with at most two shortest words

6406533362730. ❌ Number of sentences with at least two shortest words

Question Number : 170 Question Id : 640653996170 Question Type : MCQ

Correct Marks : 4

Question Label : Multiple Choice Question

The following pseudocode is executed using the "Words" dataset. At the end of the execution, **A** captures the maximum letter count of a word which is not noun. Choose the correct code fragment to complete the pseudocode.

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

Options :

```
1 if(X.PartofSpeech == "Noun" and X.LetterCount > A){  
2     A = X.LetterCount  
3 }
```

6406533362732. ✘

```
1 if(X.PartofSpeech != "Noun" and X.LetterCount < A){  
2     A = X.LetterCount  
3 }
```

6406533362733. ✘

```
1 if(X.PartofSpeech == "Noun" and X.LetterCount < A){  
2     A = X.LetterCount  
3 }
```

6406533362734. ✘

```
1 if(X.PartofSpeech != "Noun" and X.LetterCount > A){  
2     A = X.LetterCount  
3 }
```

6406533362735. ✓

Question Number : 171 Question Id : 640653996173 Question Type : MCQ

Correct Marks : 4

Question Label : Multiple Choice Question

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

```
1 count = 0, A = 0  
2 while(Table 1 has more rows){  
3     Read the first row X in Table 1  
4     if(X.Gender == 'F' or X.Mathematics > X.Physics){  
5         A = A + 1  
6     }  
7     else{  
8         count = count + 1  
9     }  
10    Move X to Table 2  
11 }
```

Options :

6406533362745. ✘ Number of male students whose Physics marks are greater than Mathematics marks

6406533362746. ✓ Number of male students whose Physics marks are greater than or equal to Mathematics marks

6406533362747. ✘ Number of female students whose Physics marks are greater than or equal to Mathematics marks

6406533362748. ✘ Number of female students whose Physics marks are less than or equal to Mathematics marks

Question Number : 172 Question Id : 640653996175 Question Type : MCQ

Correct Marks : 4

Question Label : Multiple Choice Question

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

```
1 count = 0
2 while(Pile 1 has more cards){
3     Read the top card x from Pile 1
4     C = 0
5     if(x.Mathematics < 75){
6         C = C + 1
7     }
8     if(x.Physics < 75){
9         C = C + 1
10    }
11    if(x.Chemistry < 75){
12        C = C + 1
13    }
14    if(c == 1){
15        count = count + 1
16    }
17    Move X to Pile 2
18 }
```

Options :

- 6406533362753. ✘ Number of students who scored less than 75 marks in all three subjects.
- 6406533362754. ✘ Number of students who scored less than 75 marks in atmost one subject.
- 6406533362755. ✘ Number of students who scored less than 75 marks in atleast one subject.
- 6406533362756. ✓ Number of students who scored less than 75 marks in exactly one subject.

Sub-Section Number :

3

Sub-Section Id :

640653147012

Question Shuffling Allowed :

Yes

Question Number : 173 Question Id : 640653996167 Question Type : MCQ

Correct Marks : 5

Question Label : Multiple Choice Question

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

```
1 Count = 0, Flag = True
2 while(Table 1 has more cards){
3     Read the first row X from Table 1
4     if(CountVowels(X) != X.LetterCount - CountVowels(X)){
5         Flag = False
6     }
7     if(X.word ends with a full stop){
8         if(Flag){
9             Count = Count + 1
10        }
11        Flag = True
12    }
13    Move X to Table 2
14 }
15 Procedure CountVowels(Y)
16     i = 1
17     B = 0
18     while(i ≤ Y.LetterCount){
19         if(ith letter of Y.Word is a vowel){
20             B = B + 1
21         }
22         i = i + 1
23     }
24     return(B)
25 End CountVowels
```

Options :

6406533362723. ✘ Number of sentences with equal number of vowels and consonants

6406533362724. ✓ Number of sentences with each word having equal number of vowels and consonants

6406533362725. ✘ Number of sentences with different number of vowels and consonants

6406533362726. ✘ Number of sentences with each word having different number of vowels and consonants

Sub-Section Number :

4

Sub-Section Id :

640653147013

Question Shuffling Allowed :

Yes

Question Number : 174 Question Id : 640653996164 Question Type : MSQ

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Let **X** and **Y** be two rows in the "Scores" table. We call **X** and **Y** partially matching if student **X** and **Y** are either from the same city or have the same total marks or both. Let **partialMatch(X, Y)** be a procedure to find whether **X** and **Y** are matching. Choose the correct implementation of the

procedure partialMatch.

Options :

```
1 Procedure partialMatch(X, Y)
2     A = False, B = False
3     if(X.CityTown == Y.CityTown){
4         A = True
5     }
6     if(X.Total == Y.Total){
7         B = True
8     }
9     if(A and B){
10        return (True)
11    }
12    return(False)
13 End partialMatch
```

6406533362711. ✖

```
1 Procedure partialMatch(X, Y)
2     A = False, B = False
3     if(X.CityTown == Y.CityTown){
4         A = True
5     }
6     if(X.Total == Y.Total){
7         B = True
8     }
9     if(A or B){
10        return(True)
11    }
12    return(False)
13 End partialMatch
```

6406533362712. ✓

```
1 Procedure partialMatch(X, Y)
2     A = 0, B = 0
3     if(X.CityTown == Y.CityTown){
4         A = 1
5     }
6     if(X.Total == Y.Total){
7         B = 1
8     }
9     if(A + B == 1){
10        return(True)
11    }
12    return(False)
13 End partialMatch
```

6406533362713. ✖

6406533362714. ✓

```

1 Procedure partialMatch(X, Y)
2     A = 0, B = 0
3     if(X.cityTown == Y.cityTown){
4         A = 1
5     }
6     if(X.Total == Y.Total){
7         B = 1
8     }
9     if((A + B) >= 1){
10        return(True)
11    }
12    return(False)
13 End partialMatch

```

Question Number : 175 Question Id : 640653996166 Question Type : MSQ

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

The following pseudocode is executed using the "Library" dataset. At the end of the execution, A captures the number of fiction books which were published between 2000 and 2010 (including 2000 and 2010) and are written in a language other than English. Choose the correct code for procedure doSomething to complete the pseudocode.

```

1 A = 0
2 while (Table 1 has more rows) {
3     Read the first row X in Table 1
4     A = A + doSomething(X)
5     Move X to Table 2
6 }

```

Options :

```

1 Procedure dosomething(X)
2     B = 0
3     if(X.Year >= 2000 and X.Year <= 2010){
4         if(X.Genre == "Fiction"){
5             if(X.Language != "English"){
6                 B = 1
7             }
8         }
9     }
10    return B
11 End dosomething

```

6406533362719. ✓

6406533362720. ✘

```
1 Procedure dosomething(x)
2     B = 0
3     if(x.Year >= 2000 or x.Year <= 2010){
4         if(x.Genre == "Fiction"){
5             if(x.Language != "English"){
6                 B = 1
7             }
8         }
9     }
10    return B
11 End dosomething
```

```
1 Procedure dosomething(x)
2     B = 0
3     if(x.Year >= 2000 or x.Year <= 2010 and x.Genre == "Fiction" and
x.Language != "English"){
4         B = 1
5     }
6     return B
7 End dosomething
```

6406533362721. ✖

```
1 Procedure dosomething(x)
2     B = 0
3     if(x.Year >= 2000 and x.Year <= 2010 and x.Genre == "Fiction" and
x.Language != "English"){
4         B = 1
5     }
6     return B
7 End dosomething
```

6406533362722. ✓

Question Number : 176 Question Id : 640653996172 Question Type : MSQ

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

The given information represents a "Shopping Bill" and it may have some mistakes with respect to the sanity of data. Identify all rows with such mistakes. It is a Multiple Select Question (MSQ).

Row no.	Item	Category	Qty	Price	Cost
Row 1	Cereal	Packed/Food	2	220	220
Row 2	Milk	Fruits/Food	1	24	24
Row 3	Cupcakes	Packed/Food	1	25	25
Row 4	Chocolates	Packed/Food	1	10	10
Row 5	Shirts	Women/Apparel	1.5	1350	2025

Options :

6406533362740. ✓ Row 1

6406533362741. ✓ Row 2

6406533362742. ✗ Row 3

6406533362743. ✗ Row 4

6406533362744. ✓ Row 5

Question Number : 177 Question Id : 640653996174 Question Type : MSQ

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

The following pseudocode is executed using the "Library" dataset. At the end of the execution, A captures the number of books which are published by "Penguin" or written by the author "Narayan". The pseudocode may have mistakes. Identify all such mistakes (if any). It is a Multiple Select Question (MSQ).

```
1 A = 0
2 while(Table 1 has more rows){
3     Read the first row X in Table 1
4     C = True
5     if(X.Publisher == "Penguin"){
6         C = True
7     }
8     if(X.Author == "Narayan"){
9         C = False
10    }
11    if(C){
12        A = A + 1
13    }
14    Move X to Table 2
15 }
```

Options :

6406533362749. ✓ Error in Line 4

6406533362750. ✓ Error in Line 9

6406533362751. ✗ Error in Line 12

6406533362752. ✗ No error

Sub-Section Number : 5

Sub-Section Id : 640653147014

Question Shuffling Allowed : Yes

Question Number : 178 Question Id : 640653996171 Question Type : MSQ

Correct Marks : 5 Max. Selectable Options : 0

Question Label : Multiple Select Question

The following pseudocode is executed using the "Scores" dataset. At the end of the execution, A captures the lowest Chemistry marks scored by a male student from Vellore. Choose the correct code fragment(s) to complete the pseudocode.

```
1 | A = 101
2 | while (Table 1 has more rows) {
3 |     Read the first row X in Table 1
4 |     ****
5 |     * Fill the code *
6 |     ****
7 |     Move X to Table 2
8 | }
```

Options :

```
1 | if(x.Gender != 'F' and x.cityTown == "Vellore"){
2 |     if(x.chemistry > A){
3 |         A = x.Chemistry
4 |     }
5 | }
```

6406533362736. ✗

```
1 | if(x.Gender == 'M' and x.cityTown == "Vellore"){
2 |     if(x.chemistry < A){
3 |         A = x.Chemistry
4 |     }
5 | }
```

6406533362737. ✓

```
1 | if(x.Gender == 'M' and x.cityTown == "Vellore"){
2 |     if(x.chemistry > A){
3 |         A = x.Chemistry
4 |     }
5 | }
```

6406533362738. ✗

6406533362739. ✓

```
1 if(x.Gender != 'F'){
2     if(x.cityTown == "Vellore"){
3         if(x.chemistry < A){
4             A = x.Chemistry
5         }
6     }
7 }
```

Sub-Section Number :

6

Sub-Section Id :

640653147015

Question Shuffling Allowed :

Yes

Question Number : 179 Question Id : 640653996169 Question Type : SA

Correct Marks : 4

Question Label : Short Answer Question

The following pseudocode is executed using a dataset similar to the "Words" dataset, based on the following paragraph.

"Surrounded by nature, Susan often takes a stroll, savoring the soothing sounds of chirping birds. Rustlings in the trees suggest squirrels beginning their day, searching for sustenance. Surely, the beauty of a sunrise holds unparalleled magic."

```
1 count = 0, flag = True
2 while(Table 1 has more rows){
3     Read the first row x in Table 1
4     Move X to Table 2
5     if(1st letter of x.word == 's' and flag){
6         if(2nd letter of x.word == 'o'){
7             count = count + 1
8         }
9     }
10
11    if(x.word ends with full stop){
12        flag = False
13    }
14 }
```

What would be the value of **count** at the end of the execution of the above pseudocode?

Assume that upper case and lower case are ignored during comparison of letters.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

Intro to Python

Section Id :	64065369441
Section Number :	12
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
Section Negative Marks :	0
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	No
Section Maximum Duration :	0
Section Minimum Duration :	0
Section Time In :	Minutes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653147016
Question Shuffling Allowed :	No

Question Number : 180 Question Id : 640653996176 Question Type : MCQ

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "FOUNDATION LEVEL : 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 :

6406533362757. ✓ YES

6406533362758. ✗ NO

Question Number : 181 Question Id : 640653996177 Question Type : MCQ

Correct Marks : 0

Question Label : Multiple Choice Question

Useful Data

Presentation

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

Code

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

Input or Output

```
0
2
4
6
8
```

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

Line Numbers ← → Code/Input/Output

1	0
2	2
3	4
4	6
5	8

Useful information

range

Sample behaviour of the range function:

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

// operator

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

NAT → integer

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

Options :

6406533362759. ✓ Useful Data has been mentioned above.

6406533362760. ❌ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number :

2

Sub-Section Id :

640653147017

Question Shuffling Allowed :

Yes

Question Number : 182 Question Id : 640653996178 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the input for the first line of the following code snippet to be "abcd", and select the correct option from the choices below.

```
word = input()
new_word = word[0::2] + "-"
new_word += word[1::2]
print(new_word)
```

Options :

6406533362761. ❌ ab-cd

6406533362762. ❌ ac - bd

6406533362763. ✓ ac-bd

6406533362764. ✘ All snippets are wrong.

Question Number : 183 Question Id : 640653996179 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

When will be the following code snippet output True?

```
word_1 = input()
word_2 = input()
flag = True
if(len(word_1) < len(word_2)):
    for ch in word_1:
        if ch not in word_2:
            flag = False
else:
    for ch in word_2:
        if ch not in word_1:
            flag = False
print(flag)
```

Options :

6406533362765. ✘ Only when `word_1` and `word_2` are same.

6406533362766. ✘ When the number of characters in `word_1` is less than number of characters in `word_2`.

6406533362767. ✘ It will always print `True`.

Only when either set of characters in `word_1` is subset of set of characters in `word_2` or set of characters in `word_2` is subset of set of characters in `word_1`.
6406533362768. ✓

6406533362769. ✘ It will always print `False`.

Question Number : 184 Question Id : 640653996180 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Consider a program that wants to find the number of vowels in each word of a sentence and create a list. Choose the correct implementation from the following set of code snippets.

Snippet-1

```
sentence = input()
vowels = 'aeiouAEIOU'
words = sentence.split()
vowel_counts = []

for word in words:
    count = 0
    for char in word:
        if char in vowels:
            count += 1
    vowel_counts.append(count)

print(vowel_counts)
```

Snippet-2

```
sentence = input()
vowels = set('aeiouAEIOU')
words = sentence.split()
vowel_counts = []

for word in words:
    count = len(set(word).intersection(vowels))
    vowel_counts.append(count)

print(vowel_counts)
```

Snippet-3

```
sentence = input()
vowels = 'aeiou'
words = sentence.split()
vowel_counts = []

for word in words:
    word = word.lower()
    count = 0
    for char in word:
        count += 1 if char in vowels else 0
    vowel_counts.append(count)

print(vowel_counts)
```

Snippet-4

```
sentence = input().split()
vowel_counts = []

for word in sentence:
    word = word.upper()
    count = 0
    for char in word:
        if char in 'AEIOU':
            count += 1
    vowel_counts.append(count)

print(vowel_counts)
```

Options :

- 6406533362770. ❌ Only snippet-1 and snippet-2 is correct
- 6406533362771. ❌ Only snippet-2 and snippet-4 is correct
- 6406533362772. ❌ All snippets are wrong
- 6406533362773. ✓ Only snippet-1, snippet-3 and snippet-4 is correct

Sub-Section Number :

3

Sub-Section Id :

640653147018

Question Shuffling Allowed :

Yes

Question Number : 185 Question Id : 640653996181 Question Type : MSQ

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following code snippet where `num` gets an integer number from user input.

```
num = int(input())
if num > 0:
    num = num + 100
else:
    num = abs(num - 100)
print(num)
```

Choose the correct options regarding the above code.

Options :

6406533362774. ✘ It prints different values based on the magnitude of the input number.

6406533362775. ✘ It always adds 100 and prints the final value.

6406533362776. ✓ If the input is either `+num` or `-num`, the output is same.

An equivalent code segment is.

```
num = float(input())
num = abs(num) + 100
print(num)
```

6406533362777. ✓

Question Number : 186 Question Id : 640653996182 Question Type : MSQ

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the below code snippets produces the following output?

`[], [0], [0, 1], [0, 1, 2], [0, 1, 2, 3]`

Options :

```
values = []
for i in range(5):
    temp = []
    for item in range(i):
        temp.append(item)
    values.append(temp)
print(values)
```

6406533362778. ✓

6406533362779. ✘

```
values = []
for i in range(4):
    for item in range(i):
        values.append(item)
print(values)
```

6406533362780. ✓

```
values = [[item for item in range(i)] for i in range(5)]
print(values)
```

6406533362781. ✗

```
values = []
for i in range(4):
    temp = []
    for item in range(i):
        temp.append(item)
    values.append(temp)
print(values)
```

6406533362782. ✗

```
values = [[item for item in range(i)] for i in range(4)]
print(values)
```

Sub-Section Number :

4

Sub-Section Id :

640653147019

Question Shuffling Allowed :

Yes

Question Number : 187 Question Id : 640653996183 Question Type : SA

Correct Marks : 3

Question Label : Short Answer Question

Consider the given program.

```
words = input().split()
value = 0
for word in words:
    value += max(min(len(word), 12), 9)
print(value)
```

What is the output of the above code for the input "The extraordinary performance"? Enter an integer as your answer.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

32

Question Number : 188 Question Id : 640653996184 Question Type : SA

Correct Marks : 3

Question Label : Short Answer Question

Two integers are entered as strings for the following code snippet. For instance, input "15" for number_1 and "7" for number_2. What will be the output for the specified input?

```
number_1 = int(input())
number_2 = int(input())
if number_1 == number_2:
    if number_1 % 2 == 0:
        print(number_1)
    else:
        print(number_2)
elif number_2 < number_1:
    print(number_1 // number_2)
else:
    print(number_2 // number_1)
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 189 Question Id : 640653996185 Question Type : SA

Correct Marks : 3

Question Label : Short Answer Question

What will be the output of the following code snippet? Enter an integer as your answer.

```
words = ['Learning', 'Python', 'is', 'fun']

final_str = ' ' # single space
final_str = final_str.join(words)
final_str.strip("oslo")

print(len(final_str))
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

22

Question Number : 190 **Question Id :** 640653996186 **Question Type :** SA

Correct Marks : 3

Question Label : Short Answer Question

What will be the output of the following code snippet? Enter an integer as your answer.

```
result = 0
for i in range(1, 15):
    if i % 2 == 0:
        continue
    elif i % 5 == 0:
        break
    result += i
print(result)
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

4

Sub-Section Number : 5

Sub-Section Id : 640653147020

Question Shuffling Allowed : No

Question Id : 640653996187 **Question Type :** COMPREHENSION **Sub Question Shuffling Allowed :** No **Group Comprehension Questions :** No **Question Pattern Type :** NonMatrix

Question Numbers : (191 to 192)

Question Label : Comprehension

Consider the following snippet of code and answer the given sub-questions

```
n = int(input()) # value of n is more than 2
P = [0, 1]

for i in range(n-2):
    P.append(P[-1] + P[-2])

n = len(P)
for j in range(n):
    P.append(P[-(2*j+1)]**2)

print(P)

#####
#####
#####

mnum, mval = 0, P[0]
for i in range(len(P)):
    if P[i] > mval:
        mval = P[i]
        mnum = i

print(mnum + mval)
```

Sub questions

Question Number : 191 Question Id : 640653996188 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

What is the first line of output for `n = 5`?

Options :

6406533362787. ✓ [0, 1, 1, 2, 3, 9, 4, 1, 1, 0]

6406533362788. ✗ [0, 1, 1, 2, 3, 0, 1, 1, 4, 9]

6406533362789. ✗ [0, 1, 1, 2, 3, 0, 0, 0, 0, 0]

6406533362790. ✗ None of these

Question Number : 192 Question Id : 640653996189 Question Type : SA

Correct Marks : 3

Question Label : Short Answer Question

What is the second line of the output for

`n = 5`? Enter an integer as your answer.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

14

Question Id : 640653996190 Question Type : COMPREHENSION Sub Question Shuffling

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

Question Numbers : (193 to 194)

Question Label : Comprehension

Consider the following code snippets and answer the given subquestions.

```
M = [5, 8, 2, 4, 6, 9]
new_array = [M[i] + M[-(i%3)] for i in range(len(M))]

print(new_array)

column_sum = 0

for i in range(len(new_array)):
    column_sum += new_array[i]
print(column_sum)
```

Sub questions

Question Number : 193 Question Id : 640653996191 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

What is the first line of output?

Options :

6406533362792. ✘ [10, 16, 4, 9, 14, 11]

6406533362793. ✓ [10, 17, 8, 9, 15, 15]

6406533362794. ✘ [10, 17, 8, 8, 8, 17]

6406533362795. ✘ [10, 16, 4, 8, 12, 18]

Question Number : 194 Question Id : 640653996192 Question Type : SA

Correct Marks : 3

Question Label : Short Answer Question

What is the second line of the output? Enter an integer as your answer.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

74

Question Id : 640653996193 Question Type : COMPREHENSION Sub Question Shuffling

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

Question Numbers : (195 to 196)

Question Label : Comprehension

What will be the output of the following code snippet for the input in the first line as "Hello everyone, \n welcome to the world of Python. \nlets explore Python.".

```
str1 = input()
n = len(str1)
line = ""
i = 0
while (str1[i] != r'\\\' and str1[i+1] != '\n') and i < n - 1:
    line += str1[i]
    i+=1
print(line)
print(len(line))
```

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 195 Question Id : 640653996194 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

What is the first line of output ?

Options :

6406533362797. ✘ Hello everyone,

6406533362798. ✓ Hello every

6406533362799. ✘ Hello everyone, \n welcome to the world of Python. \nlets explore Python.

6406533362800. ✘ Empty string.

Question Number : 196 Question Id : 640653996195 Question Type : SA

Correct Marks : 3

Question Label : Short Answer Question

What is the second line of the output? Enter an integer as your answer .

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

11

Sub-Section Number : 6

Sub-Section Id : 640653147021

Question Shuffling Allowed : No

Question Id : 640653996196 Question Type : COMPREHENSION Sub Question Shuffling

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

Question Numbers : (197 to 198)

Question Label : Comprehension

Consider the following code snippet and answer the given subquestions.

```
animals = ["tiger", "elephant", "cat", "giraffe", "wolf", "dolphin"]
list_animals = []
max_length = 0
for animal in animals:
    if len(animal) >= max_length:
        max_length = len(animal)
        list_animals = [animal]
    else:
        list_animals.append(animal)
print(list_animals)
print(len(list_animals))
```

Sub questions

Question Number : 197 Question Id : 640653996197 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

What is the first line of output ?

Options :

6406533362802. ✘ ['dolphin']

6406533362803. ✘ ['elephant']

6406533362804. ✓ ['elephant', 'cat', 'giraffe', 'wolf', 'dolphin']

6406533362805. ✘ ['tiger', 'elephant', 'cat', 'giraffe', 'wolf', 'dolphin']

Question Number : 198 Question Id : 640653996198 Question Type : SA

Correct Marks : 2

Question Label : Short Answer Question

What is the second line of the output ? Enter an integer as your answer.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

5

Maths2

Section Id :	64065369442
Section Number :	13
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	9
Number of Questions to be attempted :	9
Section Marks :	25
Display Number Panel :	Yes
Section Negative Marks :	0
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	No
Section Maximum Duration :	0
Section Minimum Duration :	0
Section Time In :	Minutes
Maximum Instruction Time :	0
Sub-Section Number :	1

Sub-Section Id :

640653147022

Question Shuffling Allowed :

No

Question Number : 199 Question Id : 640653996199 Question Type : MCQ

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "FOUNDATION LEVEL : MATHEMATICS FOR DATA SCIENCE II (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 :

6406533362807. ✓ YES

6406533362808. ✗ NO

Sub-Section Number :

2

Sub-Section Id :

640653147023

Question Shuffling Allowed :

Yes

Question Number : 200 Question Id : 640653996200 Question Type : MSQ

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Choose the correct option(s) from the following:

Options :

Let $A, B \in M_{n \times n}(\mathbb{R})$ such that $AB = 0$. Then at least one of the matrices A or B

6406533362809. ✓ must have determinant 0.

If $A - \alpha I = 0$ where $A \in M_{n \times n}(\mathbb{R})$, I is the identity matrix of order n , $\alpha \in \mathbb{R}$ and

6406533362810. ✓ n is even, then determinant of A is always positive.

6406533362811. ✗ A matrix with all diagonal entries as zero will always have determinant zero.

For a square matrix A , if the system of linear equations $Ax = 0$ has a unique

6406533362812. ✓ solution, then determinant of A is non-zero.

Question Number : 201 Question Id : 640653996211 Question Type : MSQ

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the system of linear equations $Ax = b$. Choose all the options from the following which guarantee a unique solution.

Options :

6406533362820. ✓ A is a square and invertible matrix.

6406533362821. ✗ b belongs to span of the column vectors of A .

6406533362822. ✗ The columns of A are linearly independent.

6406533362823. ✗ The system has no independent variables.

Question Number : 202 Question Id : 640653996212 Question Type : MSQ

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Choose all the correct options from the following.

Options :

For a vector space V with dimension n , there is always a subspace

6406533362824. ✓ of dimension k where $1 \leq k < n$.

Let S be a set of k vectors in \mathbb{R}^n . Then $\text{span}(S)$ has dimension less

6406533362825. ✓ than or equal to k .

Let S be a subset of a vector space V of dimension n . Then S can

6406533362826. ✓ have a maximum of n linearly independent vectors.

A finite non-empty set of vectors from a vector space can never be

6406533362827. ✗ a subspace.

Sub-Section Number :

3

Sub-Section Id :

640653147024

Question Shuffling Allowed :

No

Question Id : 640653996201 Question Type : COMPREHENSION Sub Question Shuffling

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

Question Numbers : (203 to 204)

Question Label : Comprehension

Let $A = \begin{bmatrix} -2 & \alpha \\ \beta & 2 \end{bmatrix}$ such that $AA^T = \begin{bmatrix} 8 & 8 \\ 8 & 8 \end{bmatrix}$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 203 Question Id : 640653996202 Question Type : SA

Correct Marks : 1.5

Question Label : Short Answer Question

Find the value of α .

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 204 Question Id : 640653996203 Question Type : SA

Correct Marks : 1.5

Question Label : Short Answer Question

Find the value of β .

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

-2

Question Id : 640653996204 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Question Numbers : (205 to 207)

Question Label : Comprehension

Write correct answers for the given subquestions.

Sub questions

Question Number : 205 Question Id : 640653996205 Question Type : SA

Correct Marks : 1

Question Label : Short Answer Question

Let A be a 5×5 matrix such that

$A^T = -A$. Then $\det(A) =$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Question Number : 206 Question Id : 640653996206 Question Type : SA

Correct Marks : 1

Question Label : Short Answer Question

Let A be a 2×2 matrix such that

$\det(A) = 2$. If B is a matrix

obtained from A by swapping the first and second row, and then multiplying the second row by -2 , then $\det(B) =$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

4

Question Number : 207 Question Id : 640653996207 Question Type : SA

Correct Marks : 1

Question Label : Short Answer Question

Let $Ax = b$ be a system of linear

equations, where $A = \begin{bmatrix} 1 & 0 & 0 & -2 \\ 0 & 0 & 1 & 3 \\ 0 & 0 & 0 & 1 \end{bmatrix}$.

Find the number of independent variables.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Id : 640653996213 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Question Numbers : (208 to 210)

Question Label : Comprehension

Find the dimension of the subspaces given in the subquestions.

Sub questions

Question Number : 208 Question Id : 640653996214 Question Type : SA

Correct Marks : 1

Question Label : Short Answer Question

$$W_1 = \{x \in \mathbb{R}^n : Ax = 0 \text{ where } A \text{ is an invertible matrix}\}.$$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Question Number : 209 Question Id : 640653996215 Question Type : SA

Correct Marks : 1

Question Label : Short Answer Question

$$W_2 = \text{span}\{(1, -1, 1), (4, 1, 2), (2, 3, 0)\}.$$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 210 Question Id : 640653996216 Question Type : SA

Correct Marks : 1

Question Label : Short Answer Question

W_3 is the set of all 2×2 symmetric matrices.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Question Id : 640653996217 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Question Numbers : (211 to 213)

Question Label : Comprehension

Consider the following sets.

$$\mathcal{B}_1 = \left\{ \begin{bmatrix} 3 & -3 \\ 0 & 0 \end{bmatrix}, \begin{bmatrix} 0 & 0 \\ -5 & 5 \end{bmatrix} \right\},$$

$$\mathcal{B}_2 = \left\{ \begin{bmatrix} 0 & 2 \\ -2 & 0 \end{bmatrix} \right\},$$

$$\mathcal{B}_3 = \left\{ \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}, \begin{bmatrix} 0 & -2 \\ 0 & 0 \end{bmatrix}, \begin{bmatrix} 0 & 0 \\ 3 & 0 \end{bmatrix} \right\}.$$

Choose the correct basis for each of the given vector spaces in the subquestions.

Sub questions

Question Number : 211 Question Id : 640653996218 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

$$W_1 = \{A \in M_{2 \times 2}(\mathbb{R}) : A^T = -A\}.$$

Options :

6406533362831. ✘ \mathcal{B}_1

6406533362832. ✓ \mathcal{B}_2

6406533362833. ✘ \mathcal{B}_3

Question Number : 212 Question Id : 640653996219 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

W_2 is the set of all 2×2 matrices such that the sum of entries in each row is zero.

Options :

6406533362834. ✓ \mathcal{B}_1

6406533362835. ✘ \mathcal{B}_2

6406533362836. ✘ \mathcal{B}_3

Question Number : 213 Question Id : 640653996220 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

W_3 is the set of all 2×2 matrices such that the sum of the diagonal entries is

Options :

6406533362837. ✘ \mathcal{B}_1

6406533362838. ✘ \mathcal{B}_2

6406533362839. ✓ \mathcal{B}_3

Sub-Section Number :

4

Sub-Section Id :

640653147025

Question Shuffling Allowed :

No

Question Id : 640653996208 Question Type : COMPREHENSION Sub Question Shuffling

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

Question Numbers : (214 to 215)

Question Label : Comprehension

Answer the given subquestions.

Sub questions

Question Number : 214 Question Id : 640653996209 Question Type : SA

Correct Marks : 2

Question Label : Short Answer Question

Consider the matrix $A = \begin{bmatrix} 1 & 0 & 5 \\ -2 & 3 & -4 \\ 1 & 4 & a \end{bmatrix}$.

Find the value of a if the system
 $Ax = 0$ has infinitely many solutions.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

13

Question Number : 215 **Question Id :** 640653996210 **Question Type :** SA

Correct Marks : 2

Question Label : Short Answer Question

Consider the matrix $A = \begin{bmatrix} 1 & 2 & -3 \\ -2 & 1 & -4 \\ 1 & 0 & 1 \end{bmatrix}$.

Consider the system of linear

equations $Ax = \begin{bmatrix} 3 \\ b \\ 1 \end{bmatrix}$. Find the

value of b if the system has infinitely many solutions.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

-1

Statistics2

Section Id :	64065369443
Section Number :	14
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
Section Negative Marks :	0
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	No
Section Maximum Duration :	0
Section Minimum Duration :	0

Section Time In :	Minutes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653147026
Question Shuffling Allowed :	No

Question Number : 216 Question Id : 640653996221 Question Type : MCQ

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "FOUNDATION LEVEL : STATISTICS FOR DATA SCIENCE II (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 :

6406533362840. ✓ YES

6406533362841. ✗ NO

Question Number : 217 Question Id : 640653996222 Question Type : MCQ

Correct Marks : 0

Question Label : Multiple Choice Question

Discrete random variables:

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

Continuous random variables:

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

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,

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

Options :

6406533362842. ✓ Useful Data has been mentioned above.

6406533362843. ✗ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number :

2

Sub-Section Id :

640653147027

Question Shuffling Allowed :

No

Question Id : 640653996223 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Question Numbers : (218 to 219)

Question Label : Comprehension

The joint PMF of two discrete random variables X and Y is

$$f_{XY}(x, y) = \begin{cases} \frac{x + 3y}{36}, & x, y \in \{0, 1, 2\}, \\ 0, & \text{otherwise} \end{cases}$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 218 Question Id : 640653996224 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

What is the marginal distribution of X ?

Options :

6406533362844. ✘ $\frac{3x + 1}{12}; x = 0, 1, 2$

6406533362845. ✓ $\frac{x + 3}{12}; x = 0, 1, 2$

6406533362846. ✘ $\frac{6x + 3}{12}; x = 0, 1, 2$

6406533362847. ✘ $\frac{6x + 1}{12}; x = 0, 1, 2$

Question Number : 219 Question Id : 640653996225 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

What is the conditional distribution of $Y|X = x$?

Options :

6406533362848. ✓ $\frac{x + 3y}{3x + 9}$

6406533362849. ✘ $\frac{3x + 9y}{x + 3}$

6406533362850. ✘ $\frac{x + 3y}{9y + 3}$

$$\frac{x+3y}{x+1}$$

6406533362851. ✘

Question Id : 640653996226 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Question Numbers : (220 to 221)

Question Label : Comprehension

Let $X, Y \sim \text{i.i.d. Uniform } \{1, 2, 3\}$. Define a new random variable $Z = X^3Y$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 220 Question Id : 640653996227 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

Find the range of $Z|Y = 2$.

Options :

6406533362852. ✘ $\{1, 2, 3\}$

6406533362853. ✘ $\{1, 8, 27\}$

6406533362854. ✘ $\{2, 16, 27\}$

6406533362855. ✓ $\{2, 16, 54\}$

Question Number : 221 Question Id : 640653996228 Question Type : SA

Correct Marks : 2

Question Label : Short Answer Question

What is the value of $P(Z = 54, Y = 2)$?

Enter the answer correct to two decimal places.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.08 to 0.14

Question Id : 640653996229 Question Type : COMPREHENSION Sub Question Shuffling

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

Question Numbers : (222 to 223)

Question Label : Comprehension

Let X and Y be two independent random variables with $E[X] = 4$, $E[Y] = 1$,

$\text{Var}(X) = 9$ and $\text{Var}(Y) = 2$. Define a new random variable $T = 4X + 2Y$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 222 Question Id : 640653996230 Question Type : SA

Correct Marks : 1

Question Label : Short Answer Question

Find the value of $E[T]$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

18

Question Number : 223 Question Id : 640653996231 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

What is the value of $\text{Var}(3T + 4)$?

Options :

6406533362858. ✗ 1372

6406533362859. ✓ 1368

6406533362860. ✗ 456

6406533362861. ✗ 612

Sub-Section Number :

3

Sub-Section Id :

640653147028

Question Shuffling Allowed :

No

Question Id : 640653996234 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Question Numbers : (224 to 225)

Question Label : Comprehension

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

\backslash	X	2	4	6	$f_Y(y)$
Y					
1		$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{2}$
3		m	$\frac{1}{4}$	$\frac{1}{24}$	p
9		$\frac{1}{12}$	0	n	$\frac{1}{6}$
$f_X(x)$		q	$\frac{1}{2}$	$\frac{1}{4}$	1

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 224 Question Id : 640653996235 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Find the value of m and n .

Options :

6406533362867. ✘ $m = \frac{1}{2}, n = \frac{1}{24}$

6406533362868. ✘ $m = \frac{1}{8}, n = \frac{1}{12}$

6406533362869. ✓ $m = \frac{1}{24}, n = \frac{1}{12}$

6406533362870. ✘ $m = \frac{1}{4}, n = \frac{1}{12}$

Question Number : 225 Question Id : 640653996236 Question Type : SA

Correct Marks : 2

Question Label : Short Answer Question

Find the value of $P(X = 2 | Y = 9)$.

Enter the answer correct to one decimal place.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.47 to 0.53

Question Id : 640653996237 Question Type : COMPREHENSION Sub Question Shuffling

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

Question Numbers : (226 to 227)

Question Label : Comprehension

Suppose that a factory manufactures electronic gadgets every day. A quality control team tracks the number of defective gadgets found in daily production runs. Let X be the number of defective gadgets produced on any given day. The mean and variance of X are 50 and 81, respectively.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 226 Question Id : 640653996238 Question Type : SA

Correct Marks : 2

Question Label : Short Answer Question

Using Markov's inequality, find an upper bound on the probability that production will exceed 99 on a given day. Enter the answer correct to one decimal place.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.47 to 0.53

Question Number : 227 Question Id : 640653996239 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Using Chebyshev's inequality, find a lower bound on the probability that on a given day production will be between 30 and 70.

Options :

6406533362873. ✘ $\frac{9}{20}$

6406533362874. ✘ $\frac{81}{400}$

6406533362875. ✓ $\frac{319}{400}$

6406533362876. ✘ $\frac{1}{2}$

Question Id : 640653996240 Question Type : COMPREHENSION Sub Question Shuffling

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

Question Numbers : (228 to 229)

Question Label : Comprehension

A machine produces metal rods in a factory. Let a random variable X denote the length (in cm) of a randomly selected rod and let it be modeled by the following probability density function (PDF):

$$f_X(x) = \begin{cases} k(5 - x), & 0 \leq x \leq 5, \\ 0, & \text{otherwise.} \end{cases}$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 228 Question Id : 640653996241 Question Type : SA

Correct Marks : 2

Question Label : Short Answer Question

Find the value of k . 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 :

0.05 to 0.11

Question Number : 229 Question Id : 640653996242 Question Type : SA

Correct Marks : 3

Question Label : Short Answer Question

Calculate the probability that the length of a randomly selected rod is between 2 cm and 4 cm.
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 :

0.29 to 0.35

Question Id : 640653996243 Question Type : COMPREHENSION Sub Question Shuffling

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

Question Numbers : (230 to 231)

Question Label : Comprehension

Let X_1, X_2 and X_3 be i.i.d random variables with the geometric probability mass function:

$$f_X(k) = \begin{cases} \frac{2}{3} \left(\frac{1}{3}\right)^{k-1}, & k = 1, 2, 3, \dots \\ 0, & \text{otherwise.} \end{cases}$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 230 Question Id : 640653996244 Question Type : SA

Correct Marks : 3

Question Label : Short Answer Question

If $P(X_1 > 2) = \frac{t}{9}$, then find the value of t .

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

Question Number : 231 Question Id : 640653996245 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

Define a new random variable

$Z = \max(X_1, X_2, X_3)$. Find the value of $P(Z \leq 2)$.

Options :

6406533362880. ✘ $\left(\frac{7}{8}\right)^3$

6406533362881. ✘ $\left(\frac{1}{9}\right)^3$

6406533362882. ✓ $\left(\frac{8}{9}\right)^3$

6406533362883. ✘ $\left(\frac{6}{7}\right)^3$

Question Id : 640653996246 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Question Numbers : (232 to 233)

Question Label : Comprehension

Rajat and Meenal are playing a game. Rajat will roll a fair six-sided die, and Meenal will flip a fair coin as many times as the number shown on the die. Let X be the number displayed on the die, and Y be the number of heads obtained by Meenal.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 232 Question Id : 640653996247 Question Type : MSQ

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

If $X = 4$, then which of the following options are true?

Options :

6406533362884. ✘ Range of $(Y|X = 4) = \{1, 2, 3, 4\}$

6406533362885. ✓ Range of $(Y|X = 4) = \{0, 1, 2, 3, 4\}$

6406533362886. ✗ $(Y|X = 4) \sim \text{Binomial}\left(4, \frac{1}{6}\right)$

6406533362887. ✓ $(Y|X = 4) \sim \text{Binomial}\left(4, \frac{1}{2}\right)$

Question Number : 233 Question Id : 640653996248 Question Type : SA

Correct Marks : 2

Question Label : Short Answer Question

Find the value of $100P(Y = 6)$. 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

Sub-Section Number : 4

Sub-Section Id : 640653147029

Question Shuffling Allowed : Yes

Question Number : 234 Question Id : 640653996232 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

A tech company develops a new software system. The time until the system experiences its first major failure is modeled by an exponential distribution with an average failure time of 5 years. Find the value of k such that there is a 95% chance the system will fail within k years.

Options :

6406533362862. ✗ $\frac{1}{5}(\ln 20)$

6406533362863. ✓ $5(\ln 20)$

6406533362864. ✗

$$\frac{1}{5}(\ln 2)$$

$$6406533362865. \times 5(\ln 2)$$

Sub-Section Number :

5

Sub-Section Id :

640653147030

Question Shuffling Allowed :

Yes

Question Number : 235 Question Id : 640653996233 Question Type : SA

Correct Marks : 3

Question Label : Short Answer Question

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

$X \backslash Y$	0	1	2	$f_Y(y)$
0	$\frac{1}{10}$	$\frac{3}{20}$	$\frac{1}{20}$	$\frac{6}{20}$
1	$\frac{1}{5}$	$\frac{1}{20}$	$\frac{1}{10}$	$\frac{7}{20}$
2	$\frac{1}{10}$	$\frac{1}{5}$	$\frac{1}{20}$	$\frac{7}{20}$
$f_X(x)$	$\frac{4}{10}$	$\frac{8}{20}$	$\frac{4}{20}$	1

Find the value of $\text{Cov}(X, Y)$. Enter the answer correct to two decimal places.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0 to 0.05

Statistics1

Section Id :

64065369444

Section Number :

15

Section type :

Online

Mandatory or Optional :

Mandatory

Number of Questions :	10
Number of Questions to be attempted :	10
Section Marks :	40
Display Number Panel :	Yes
Section Negative Marks :	0
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	No
Section Maximum Duration :	0
Section Minimum Duration :	0
Section Time In :	Minutes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653147031
Question Shuffling Allowed :	No

Question Number : 236 Question Id : 640653996249 Question Type : MCQ

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "FOUNDATION LEVEL : STATISTICS FOR DATA SCIENCE I (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 :

6406533362889. ✓ YES

6406533362890. ✗ NO

Sub-Section Number :	2
Sub-Section Id :	640653147032
Question Shuffling Allowed :	No

Question Id : 640653996251 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Question Numbers : (237 to 238)

Question Label : Comprehension

An analyst wants to analyse the salary of employees in different organizations in a city. To analyse this, he has selected an organization and the data of salaries is tabulated as shown in Table 1.

Employee name	Post	Salary (in thousands rupees)
Sagar	Assistant manager	80
Sanjana	Analyst	60
Rohit	Junior developer	50
Jenny	Senior developer	60
Ross	Consultant	50

Table 1

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 237 Question Id : 640653996252 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

Based on the data collected from an organisation, an analyst made a statement that the average salary of an employee is 50,000 rupees in different organizations in the city. The given statement of the analyst is based on which kind of statistical analysis ?

Options :

640653362895. ❌ Descriptive statistics

640653362896. ✓ Inferential statistics

Question Number : 238 Question Id : 640653996253 Question Type : SA

Correct Marks : 3

Question Label : Short Answer Question

What is the sample standard deviation of salary (in thousand rupees)? (Enter the answer correct to 2 decimal accuracy)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

12.22 to 12.28

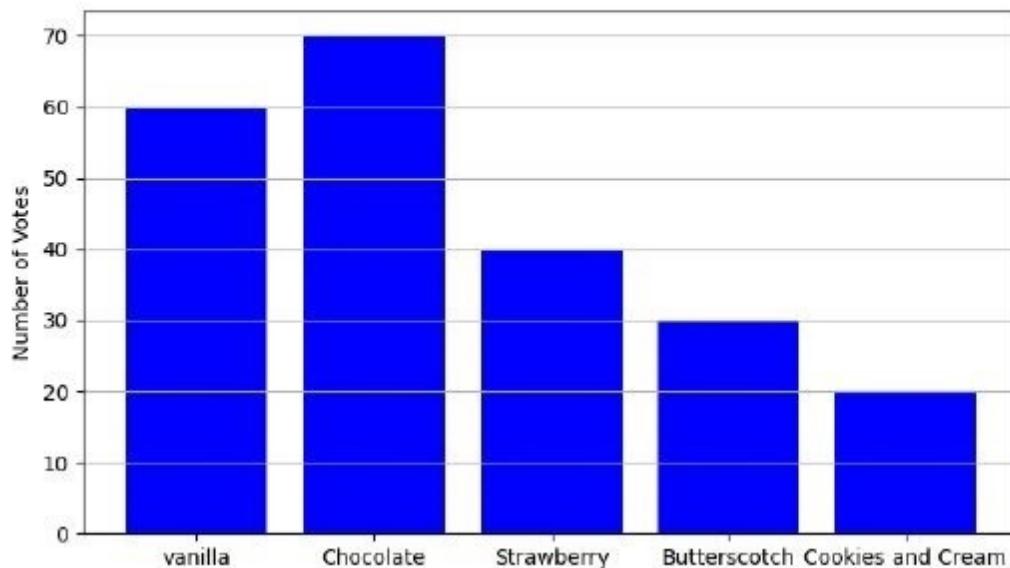
Question Id : 640653996254 Question Type : COMPREHENSION Sub Question Shuffling

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

Question Numbers : (239 to 240)

Question Label : Comprehension

Refer to the bar chart displaying the Number of Votes for people's preferred Ice Cream Flavors to answer the given subquestions



Sub questions

Question Number : 239 Question Id : 640653996255 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

What is the mode of the dataset?

Options :

6406533362898. ✘ Strawberry

6406533362899. ✘ 40

6406533362900. ✓ Chocolate

6406533362901. ✘ 70

Question Number : 240 Question Id : 640653996256 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

What percentage of the total votes is represented by Butterscotch and Strawberry ice creams combined?

Options :

6406533362902. ✓ 31.81%

6406533362903. ✘ 20%

6406533362904. ✘ 22.72%

6406533362905. ✘ 50%

Question Id : 640653996262 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Question Numbers : (241 to 242)

Question Label : Comprehension

Please answer the subquestions based on the given stem-and-leaf plot,

Stem	Leaf
1	2, 4, 5
2	0, 3, 4, 5
3	1, 5, 5, 7
4	0, 4, 6

Here 1 | 5 represents 15.

Sub questions

Question Number : 241 Question Id : 640653996263 Question Type : SA

Correct Marks : 3

Question Label : Short Answer Question

What is the median of the data set represented by the stem-and-leaf plot?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

28

Question Number : 242 Question Id : 640653996264 Question Type : SA

Correct Marks : 2

Question Label : Short Answer Question

Calculate the range of the data set.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

34

Sub-Section Number :

3

Sub-Section Id :

640653147033

Question Shuffling Allowed :

No

Question Id : 640653996259 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Question Numbers : (243 to 244)

Question Label : Comprehension

Please answer the subquestions based on the given frequency distribution table for different types of cuisines preferred by 150 people:

Cuisine	Frequency	Relative frequency
Italian	45	
Chinese	35	
Mexican		x
Indian	20	
Thai	y	0.1
Greek	10	

Sub questions

Question Number : 243 Question Id : 640653996260 Question Type : SA

Correct Marks : 3

Question Label : Short Answer Question

What is the value of y (frequency of Thai cuisine)?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

15

Question Number : 244 Question Id : 640653996261 Question Type : SA

Correct Marks : 3

Question Label : Short Answer Question

What is the value of x (relative frequency of Mexican cuisine)?(write correct upto 2 decimal places)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.15 to 0.17

Question Id : 640653996266 Question Type : COMPREHENSION Sub Question Shuffling

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

Question Numbers : (245 to 246)

Question Label : Comprehension

Please answer the subquestions based on the given dataset:

X	-5	-4	-3	3	4	5
Y	-13	-12	-5	13	12	5

Table 2

Sub questions

Question Number : 245 Question Id : 640653996267 Question Type : SA

Correct Marks : 3

Question Label : Short Answer Question

Find the sample covariance between X and Y for the dataset given in Table 2.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

48

Question Number : 246 Question Id : 640653996268 Question Type : SA

Correct Marks : 3

Question Label : Short Answer Question

Find the sample correlation coefficient(r) between X and Y for the dataset given in Table 2. (Write correct upto 3 digits after the decimal)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.921 to 0.925

Sub-Section Number : 4

Sub-Section Id : 640653147034

Question Shuffling Allowed : Yes

Question Number : 247 Question Id : 640653996250 Question Type : MSQ

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following statements is/are true ?

Options :

6406533362891. ✓ A sample is the subset of a population.

6406533362892. ✓ Numerical variables can have all the properties of ordinal and nominal scales of measurement.

6406533362893. ❌ Descriptive measures like Mean, Median, and Mode all of them can be used to summarize the categorical variable.

6406533362894. ✓ The correlation coefficient measures the strength of the linear association between two numerical variables.

Question Number : 248 Question Id : 640653996257 Question Type : MSQ

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

If a categorical variable is measured on an ordinal scale, which of the following statistical measures is(are) appropriate?

Options :

6406533362906. ❌ Mean

6406533362907. ✓ Median

6406533362908. ✓ Mode

6406533362909. ❌ Variance

Question Number : 249 Question Id : 640653996258 Question Type : MSQ

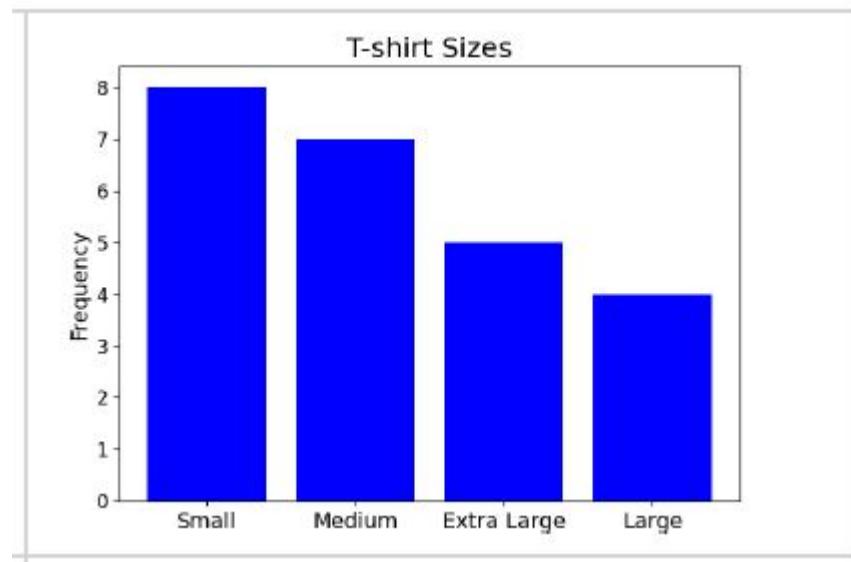
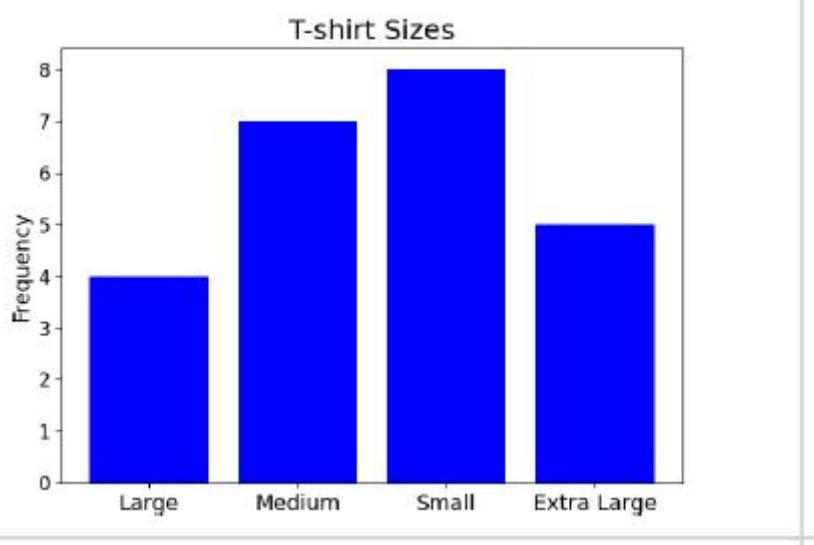
Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

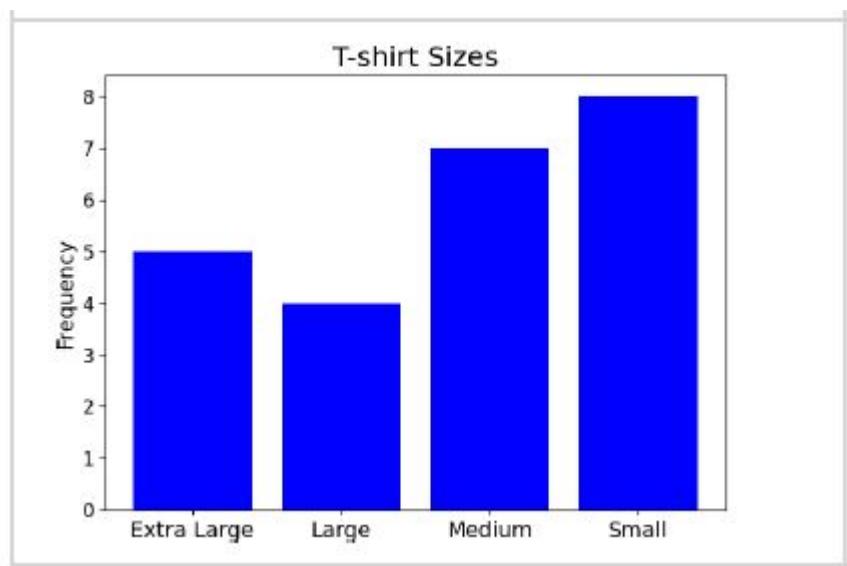
Given bar chart represent the T-Shirt sizes worn by the members of a sports club. Which of the following option(s) is(are) the best way to represent the data?

Options :

6406533362910. ❌

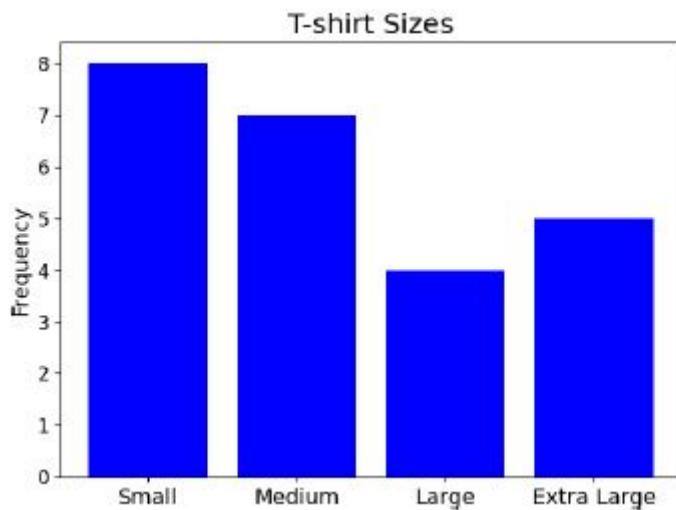


6406533362911. ✘



6406533362912. ✓

6406533362913. ✓



Sub-Section Number :

5

Sub-Section Id :

640653147035

Question Shuffling Allowed :

Yes

Question Number : 250 Question Id : 640653996265 Question Type : SA

Correct Marks : 4

Question Label : Short Answer Question

In an exam, students' scores have an interquartile range (IQR) of 20. The teacher decides to first add 5 marks to each student's score and then multiply each adjusted score by 2. What will be the interquartile range now?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

40