$$\frac{1}{2}\begin{bmatrix}1 & 0 & -1\\ 1 & 2 & 1\\ 1 & -2 & -1\end{bmatrix}$$

6406533043290. ✖ $\begin{bmatrix}1 & -1 & 1\\ 1 & 0 & 1\\ 0 & 1 & -2\end{bmatrix}$

6406533043291. ✖ $\begin{bmatrix}-1 & -1 & 1\\ -1 & 0 & 1\\ 2 & 1 & -1\end{bmatrix}$

Sem2 Statistics2

Section Id :	64065364119
Section Number :	6
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
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653134011
Question Shuffling Allowed :	No

Question Number : 188 Question Id : 640653903749 Question Type : MCQ Calculator : Yes
Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "FOUNDATION LEVEL : SEMESTER II: 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 :

6406533043292. ✔ YES

6406533043293. ✖ NO

Question Number : 189 Question Id : 640653903750 Question Type : MCQ Calculator : Yes

Correct Marks : 0

Question Label : Multiple Choice Question

Discrete random variables:

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

Continuous random variables:

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

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,

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

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

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

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

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

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

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

   Procedure: For one parameter θ

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

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

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

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

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

9. **Bayesian estimation:** Let $X_1, \ldots, X_n \sim$ i.i.d.X, parameter Θ.
Prior distribution of $\Theta : \Theta \sim f_\Theta(\theta)$.
Samples, $S : (X_1 = x_1, \ldots, X_n = x_n)$
Posterior: $\Theta \mid (X_1 = x_1, \ldots, X_n = x_n)$
Bayes' rule: Posterior $\propto$ Prior $\times$ Likelihood
Posterior density $\propto f_\Theta(\theta) \times P(X_1 = x_1, \ldots, X_n = x_n \mid \Theta = \theta)$

10. **Normal samples with unknown mean and known variance**:
$X_1, \ldots, X_n \sim$ i.i.d. Normal(M, σ^2).
Prior $M \sim$ Normal(μ_0, σ_0^2).
Posterior mean: $\hat{\mu} = \overline{X}\left(\dfrac{n\sigma_0^2}{n\sigma_0^2 + \sigma^2}\right) + \mu_0\left(\dfrac{\sigma^2}{n\sigma_0^2 + \sigma^2}\right)$

11. **Hypothesis Testing**

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

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

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

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

- **χ^2-test for variance:**

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

- **Two samples z-test for means:**

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

- **Two samples F-test for variances**

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

Use the following values if required:

$F_Z^{-1}(0.95) = 1.64$
$F_Z^{-1}(0.05) = -1.64$
$F_{t_{99}}^{-1}(0.95) = 1.66$
$F_Z^{-1}(0.025) = -1.96$
$F_Z^{-1}(0.975) = 1.96$

Table : Useful values

Options :

6406533043294. ✔ Useful Data has been mentioned above.

6406533043295. ✖ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number : 2

Sub-Section Id : 640653134012

Question Shuffling Allowed : Yes

Question Number : 190 Question Id : 640653903751 Question Type : SA Calculator : None
Correct Marks : 3
Question Label : Short Answer Question
Let X and Y be two independent Bernoulli(1/3) random variables. Define another random variable $Z = | Y - X |$. Find the expectation of Z. 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 :
0.41 to 0.47

Question Number : 191 Question Id : 640653903757 Question Type : SA Calculator : None
Correct Marks : 3
Question Label : Short Answer Question
Consider a group of individuals participating in a fitness program, where the weights they can lift follow a normal distribution with an unknown mean μ and standard deviation σ. A sample of 9 participants was randomly selected, and their lifting capacities (in kgs) are as follows:

$$60, 66, 40, 54, 40, 60, 48, 60, 52.$$

Find the maximum likelihood estimate of μ.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
53.30 to 53.36

Sub-Section Number :	3
Sub-Section Id :	640653134013
Question Shuffling Allowed :	Yes

Question Number : 192 Question Id : 640653903755 Question Type : MCQ Calculator : Yes
Correct Marks : 3
Question Label : Multiple Choice Question
Let $X_1, X_2, \ldots, X_n \sim$ iid Exp(λ), and let $\overline{X}$ and S^2 be the sample mean and sample variance, respectively. Select the correct options from the following:

Options :

6406533043303. ✔ Both $\overline{X}$ and S^2 are biased estimators of λ.

6406533043304. ✖ Both $\overline{X}$ and S^2 are unbiased estimators of λ.

6406533043305. ✖ $\overline{X}$ is an unbiased estimator of λ while S^2 is a biased estimator of λ.

6406533043306. ✖ S^2 is an unbiased estimator of λ while $\overline{X}$ is a biased estimator of λ.

Question Number : 193 Question Id : 640653903756 Question Type : MCQ Calculator : Yes
Correct Marks : 3

Question Label : Multiple Choice Question

Consider 36 samples $X_1, X_2, \ldots, X_{36} \sim$ iid Normal$(\mu, 36)$. Let the null and alternate hypothesis be $H_0 : \mu = 150$ and $H_A : \mu \neq 150$. Suppose $T = \dfrac{X_1 + X_2 + \ldots + X_{36}}{36}$.

Consider a test that rejects H_0 if $\mid T - 150 \mid > c$ for some constant c. What should be the critical value for the test at a significance level of 0.05?

Options :

6406533043307. ✖ $F_Z^{-1}(0.025)$

6406533043308. ✔ $-F_Z^{-1}(0.025)$

6406533043309. ✖ $150 + F_Z^{-1}(0.025)$

6406533043310. ✖ $150 - F_Z^{-1}(0.025)$

Sub-Section Number :	4
Sub-Section Id :	640653134014
Question Shuffling Allowed :	No

Question Id : 640653903752 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (194 to 195)

Question Label : Comprehension

Let $X_1, X_2, \ldots, X_{50}$ be i.i.d. samples from Uniform$(\theta, 2\theta)$ distribution, where $\theta > 0$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 194 Question Id : 640653903753 Question Type : MCQ Calculator : Yes
Correct Marks : 2

Question Label : Multiple Choice Question

Find the method of moments estimator of θ.

Options :

6406533043297. ✖ $\hat{\theta}_{MME} = \frac{3}{2}\left(\frac{X_1 + \ldots + X_{50}}{50}\right)$

6406533043298. ✖ $\hat{\theta}_{MME} = \frac{X_1 + \ldots + X_{50}}{50}$

6406533043299. ✔ $\hat{\theta}_{MME} = \frac{2}{3}\left(\frac{X_1 + \ldots + X_{50}}{50}\right)$

6406533043300. ✖ $\hat{\theta}_{MME} = 2\left(\frac{X_1 + \ldots + X_{50}}{50}\right)$

Question Number : 195 Question Id : 640653903754 Question Type : MCQ Calculator : Yes
Correct Marks : 1

Question Label : Multiple Choice Question

Is the previous question estimator obtained unbiased?

Options :

6406533043301. ✔ Yes

6406533043302. ✖ No

Sub-Section Number :	5
Sub-Section Id :	640653134015
Question Shuffling Allowed :	No

Question Id : 640653903758 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (196 to 197)

Question Label : Comprehension

The joint density function of the random variables X and Y is given by:

$$f(x,y) = \begin{cases} 6(x-y), & 0 \le y \le x \le 1 \\ 0, & \text{elsewhere} \end{cases}$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 196 Question Id : 640653903759 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Are X and Y independent?

Options :

6406533043312. ✖ Yes

6406533043313. ✔ No

Question Number : 197 Question Id : 640653903760 Question Type : SA Calculator : None

Correct Marks : 2

Question Label : Short Answer Question

Find $P(X > 0.6|Y = 0.5)$. Enter the answer correct to two decimal places.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.93 to 0.99

Question Id : 640653903761 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (198 to 199)

Question Label : Comprehension

Consider a game where two coins, Coin 1 and Coin 2, are flipped simultaneously until one lands on head and the other on tail. The probability of Coin 1 landing heads is 1/4, while for Coin 2, it is 1/3. Let X denote the number of tosses until the game concludes. Assume that all the tosses are independent.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 198 Question Id : 640653903762 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

Find $P(X = 5)$. Enter the answer correct to three decimal places.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.045 to 0.051

Question Number : 199 Question Id : 640653903763 Question Type : SA Calculator : None

Correct Marks : 2

Question Label : Short Answer Question

Find the expected value of X. 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 :

2.4

Question Id : 640653903764 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (200 to 201)

Question Label : Comprehension

Let X be a discrete random variable with the following PMF

X	0	1	2	3
$P(X = x)$	$\frac{1}{4}(2+\theta)$	$\frac{1}{4}(1-\theta)$	$\frac{1}{4}(1-\theta)$	$\frac{1}{4}\theta$

where $\Theta = \theta$ is a parameter. Let $1, 2, 1, 3, 3, 1, 2, 2, 1, 3$ be 10 iid samples from X. Assume the prior distribution of Θ to be Uniform$[0, 1]$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 200 Question Id : 640653903765 Question Type : MCQ Calculator : Yes
Correct Marks : 3

Question Label : Multiple Choice Question

Find the posterior distribution of Θ.

Options :

6406533043317. ✖ Beta(3, 7)

6406533043318. ✔ Beta(4, 8)

6406533043319. ✖ Gamma(3, 7)

6406533043320. ✖ Gamma(4, 8)

Question Number : 201 Question Id : 640653903766 Question Type : SA Calculator : None
Correct Marks : 2

Question Label : Short Answer Question

Find the posterior mean. Enter the answer correct to two decimal places.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.30 to 0.36

Question Id : 640653903767 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (202 to 204)

Question Label : Comprehension

An old charging method takes an average of 60 minutes to fully charge a battery with a standard deviation of 10 minutes. A new charging method is introduced and is expected to reduce this time to around 55 minutes. We want to test if the new charging method significantly reduces the average charging time. To evaluate this, the new charging method is tested on 36 batteries and the average charging time is found to be 57 minutes.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 202 Question Id : 640653903768 Question Type : MCQ Calculator : Yes
Correct Marks : 1

Question Label : Multiple Choice Question

What should be the null hypothesis and alternative hypothesis?

Options :

6406533043322. ✖ $H_0 : \mu = 60, H_A : \mu > 60$

6406533043323. ✔ $H_0 : \mu = 60, H_A : \mu < 60$

6406533043324. ✖ $H_0 : \mu = 55, H_A : \mu < 55$

6406533043325. ✖ $H_0 : \mu = 55, H_A : \mu > 55$

Question Number : 203 Question Id : 640653903769 Question Type : SA Calculator : None
Correct Marks : 3

Question Label : Short Answer Question

Find the critical value *c* at a significance level of 0.05. 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 :

57.23 to 57.29

Question Number : 204 Question Id : 640653903770 Question Type : MCQ Calculator : Yes
Correct Marks : 1

Question Label : Multiple Choice Question

What conclusion should be made from the test hypotheses?

Options :

6406533043327. ✔ The new charging method reduces the charging time.

6406533043328. ✖ The new charging method does not reduce the charging time.

Question Id : 640653903771 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (205 to 206)

Question Label : Comprehension

A researcher is comparing the effectiveness of two different teaching methods X and Y. The standard deviations of test scores of students who were taught using Method X and Method Y are 10 and 12, respectively. The researcher collects data from 50 students for Method X, with an average score of 57. For Method Y, the average score is 51 from a sample of *n* students. The researcher wants to check if the average marks of students taught using Method X and Y are same or not.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 205 Question Id : 640653903772 Question Type : MCQ Calculator : Yes
Correct Marks : 2

Question Label : Multiple Choice Question

Which hypothesis test should the researcher use to compare the effectiveness of the two teaching methods?

Options :

6406533043329. ✖ One-sample *t*-test

6406533043330. ✖ Two-sample *t*-test

6406533043331. ✔ Two-sample *z*-test

6406533043332. ✖ One-sample *z*-test

6406533043333. ✖ Chi-squared test

6406533043334. ✖ F test

Question Number : 206 Question Id : 640653903773 Question Type : SA Calculator : None
Correct Marks : 3

Question Label : Short Answer Question

If the *P*-value of the test is 0.05, find the value of *n*. Round off your answer to the next greatest integer.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

20

DBMS

Section Id :	64065364120
Section Number :	7
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	21
Number of Questions to be attempted :	21
Section Marks :	50
Display Number Panel :	Yes
Section Negative Marks :	0
Group All Questions :	No
Enable Mark as Answered Mark for Review and	No