6406532041737. ✔ The equation of the tangent line of the function $h(t)$ at $t = 3$ is $y = 125 - 30t$.

6406532041738. ✖ The linear approximation $(L_h(t))$ of the function $h(t)$ at $t = 2$ is $L_h(t) = 125 - 30t$.

Sem2 Statistics2

Section Id :	64065341320
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	12
Number of Questions to be attempted :	12
Section Marks :	40
Display Number Panel :	Yes
Section Negative Marks :	0
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	64065388141
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 27 Question Id : 640653611383 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0

Question Label : Multiple Choice Question

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

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

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

Options :

6406532041739. ✔ YES

6406532041740. ✖ NO

Question Number : 28 Question Id : 640653611384 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0

Question Label : Multiple Choice Question

Discrete random variables:

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

3. **Weak Law of Large numbers:** Let $X_1, X_2, \ldots, X_n \sim$ iid X with $E[X] = \mu$, Var$(X) = \sigma^2$.
Define sample mean $\overline{X} = \frac{X_1 + X_2 + \ldots + X_n}{n}$. 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 $E[X] = \mu$, 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, $M_k(X_1, X_2, \ldots, X_n) = \frac{1}{n} \sum_{i=1}^{n} X_i^k$

   <u>Procedure:</u> 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: $\hat{\mu} = \overline{X} \left(\frac{n\sigma_0^2}{n\sigma_0^2 + \sigma^2} \right) + \mu_0 \left(\frac{\sigma^2}{n\sigma_0^2 + \sigma^2} \right)$

11. Hypothesis Testing

- Test for mean

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

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

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

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

- χ^2-test for variance:

Test	H_0	H_A	Test statistic	Rejection region
right-tailed	$\sigma = \sigma_0$	$\sigma > \sigma_0$	$T = \dfrac{(n-1)S^2}{\sigma_0^2} \sim \chi^2_{n-1}$	$S^2 > c^2$
left-tailed	$\sigma = \sigma_0$	$\sigma < \sigma_0$	$T = \dfrac{(n-1)S^2}{\sigma_0^2} \sim \chi^2_{n-1}$	$S^2 < c^2$
two-tailed	$\sigma = \sigma_0$	$\sigma \neq \sigma_0$	$T = \dfrac{(n-1)S^2}{\sigma_0^2} \sim \chi^2_{n-1}$	$S^2 > c^2$ 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	$\mu_1 = \mu_2$	$\mu_1 > \mu_2$	$T = \overline{X} - \overline{Y}$ $\overline{X} - \overline{Y} \sim \text{Normal}\left(0, \dfrac{\sigma_1^2}{n_1} + \dfrac{\sigma_2^2}{n_2}\right)$ if H_0 is true	$\overline{X} - \overline{Y} > c$
left-tailed	$\mu_1 = \mu_2$	$\mu_1 < \mu_2$	$T = \overline{Y} - \overline{X}$ $\overline{Y} - \overline{X} \sim \text{Normal}\left(0, \dfrac{\sigma_2^2}{n_2} + \dfrac{\sigma_1^2}{n_1}\right)$ if H_0 is true	$\overline{Y} - \overline{X} > c$
two-tailed	$\mu_1 = \mu_2$	$\mu_1 \neq \mu_2$	$T = \overline{X} - \overline{Y}$ $\overline{X} - \overline{Y} \sim \text{Normal}\left(0, \dfrac{\sigma_1^2}{n_1} + \dfrac{\sigma_2^2}{n_2}\right)$ 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	$\sigma_1 = \sigma_2$	$\sigma_1 > \sigma_2$	$T = \dfrac{S_1^2}{S_2^2} \sim F_{(n_1-1, n_2-1)}$	$\dfrac{S_1^2}{S_2^2} > 1 + c$
one-tailed	$\sigma_1 = \sigma_2$	$\sigma_1 < \sigma_2$	$T = \dfrac{S_1^2}{S_2^2} \sim F_{(n_1-1, n_2-1)}$	$\dfrac{S_1^2}{S_2^2} < 1 - c$
two-tailed	$\sigma_1 = \sigma_2$	$\sigma_1 \neq \sigma_2$	$T = \dfrac{S_1^2}{S_2^2} \sim F_{(n_1-1, n_2-1)}$	$\dfrac{S_1^2}{S_2^2} > 1 + c_R$ where $\frac{\alpha}{2} = P(T > 1 + c_R)$ or $\dfrac{S_1^2}{S_2^2} < 1 - c_L$ where $\frac{\alpha}{2} = P(T < 1 - c_L)$

Use the following values if required:

$F_Z(0.33) = 0.62930$, $F_Z(-1) = 0.15866$, $F_Z(-1.75) = 0.04$, $F_Z(-0.175) = 0.43$,

$F_Z(-1.645) = 0.05$, $F_Z(-2.32) = 0.01$

Options :

6406532041741. ✔ Useful Data has been mentioned above.

6406532041742. ✖ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number : 2

Sub-Section Id : 64065388142

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 29 Question Id : 640653611385 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

Suppose $X \sim$ Uniform $\{-2, -1, 0, 1, 2\}$ and $Y = X^2$. Find $P(Y = 1|Y > 0)$. 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 :

0.5

Question Number : 30 Question Id : 640653611387 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

The weights (in kg) of people in a certain area are normally distributed with mean μ and standard deviation 10. The weights from a random sample of 10 people are as follows:

$$60, 54, 70, 62, 74, 50, 50, 60, 55, 65$$

Suppose $\hat{\mu}$ is the method of moments estimate for μ. Letting $X \sim$ Normal(64, 16), find the value of $P(X > \hat{\mu})$. 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 :

0.80 to 0.88

Sub-Section Number :	3
Sub-Section Id :	64065388143
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 31 Question Id : 640653611386 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Let $X_1, X_2, \ldots, X_{50} \sim \text{Uniform}(0, \theta)$. Let $\hat{\theta}$ be the estimator for θ.

If $\text{Risk}(\hat{\theta}, \theta) = \text{Var}(\hat{\theta})$, then which of the following can be $\hat{\theta}$?

Options :

6406532041744. ✖ $\dfrac{X_2 + X_4 + X_6 + \cdots + X_{50}}{50}$

6406532041745. ✖ $\dfrac{X_1 + X_{50}}{2}$

6406532041746. ✖ $\dfrac{X_1 + X_2 + X_3 + \cdots + X_{50}}{50}$

6406532041747. ✔ $X_1 + X_2 + X_{49} - X_{50}$

Question Number : 32 Question Id : 640653611389 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following situation and match them with suitable test statistics and hypothesis test:

Suppose we observe samples from a normal distribution, where the variance is unknown. We want to check whether the variance is greater than σ^2. What test statistic and test can be applied to this situation?

Options :

6406532041753. ✖ Test Statistic: T = Sample mean, Hypothesis test: t-test.

6406532041754. ✖ Test Statistic: T = Sample mean, Hypothesis test: χ^2-test.

6406532041755. ✔ Test Statistic: T = Sample variance, Hypothesis test: χ^2-test.

6406532041756. ✖ Test Statistic: T = Sample variance, Hypothesis test: Z-test.

Sub-Section Number :	4
Sub-Section Id :	64065388144
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 33 Question Id : 640653611388 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following statement(s) is (are) correct?

Options :

6406532041749. ✔ Type II error is the probability of accepting the Null hypothesis when it is not true.

6406532041750. ✖ The probability of accepting the null hypothesis when it is false is equal to the power of the test.

6406532041751. ✔ The probability of rejecting the Null hypothesis when it is true is called the level of significance.

6406532041752. ✖ If the P-value of a test is 0.04, then the corresponding test will reject the null hypothesis at the significance level of 0.03.

Sub-Section Number :	5
Sub-Section Id :	64065388145
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653611390 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (34 to 35)

Question Label : Comprehension

The number of industrial injuries on a working day in Delhi can be modelled by a Poisson(0.4) random variable. Suppose that the number of industrial injuries on different days are independent. Let Y represent the total number of industrial injuries in a year of 365 days.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 34 Question Id : 640653611391 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following are true?

Options :

6406532041757. ✖ $E[Y] = 0.4$

6406532041758. ✔ $E[Y] = 146$

6406532041759. ✔ $\text{Var}(Y) = 146$

6406532041760. ✖ $\text{Var}(Y) = 0.4$

Question Number : 35 Question Id : 640653611392 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Short Answer Question

Using the Central Limit Theorem, find the approximate probability that there will be more than 150 industrial injuries in a year in Delhi. 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 :

0.34 to 0.40

Question Id : 640653611393 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (36 to 38)

Question Label : Comprehension

The density function of a continuous random variable X is given by

$$f_X(x) = \begin{cases} kx^2, & |x| \leq 1, \\ 0, & \text{otherwise.} \end{cases}$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 36 Question Id : 640653611394 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Multiple Choice Question

Find the value of *k*.

Options :

6406532041762. ✔ $\frac{3}{2}$

6406532041763. ✖ $\frac{1}{2}$

6406532041764. ✖ 3

6406532041765. ✖ $\frac{2}{3}$

Question Number : 37 Question Id : 640653611395 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

Calculate the value of $F_X(0.5)$. 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 :

0.53 to 0.59

Question Number : 38 Question Id : 640653611396 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

Find the expected value of X.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Question Id : 640653611397 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (39 to 40)

Question Label : Comprehension

The probability mass function of a discrete random variable X is given by

x	0	2	4
$f_X(x)$	$1 - \frac{2p}{3}$	$\frac{p}{3}$	$\frac{p}{3}$

Table 1

Let 2, 4, 0, 2, 4, 0, 2, 0, 4, 0 be 10 i.i.d. samples of X.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 39 Question Id : 640653611398 Question Type : SA Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

Find the method of moments estimate of *p*. 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 :

0.9

Question Number : 40 Question Id : 640653611399 Question Type : SA Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Short Answer Question

Find the maximum likelihood estimate of *p*. 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 :

0.9

Question Id : 640653611400 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (41 to 42)

Question Label : Comprehension

Let X be a discrete random variable taking values $\{0, 1, 2\}$ with respective probabilities $\left\{\frac{p}{2}, \frac{p}{2}, (1-p)\right\}$, where $0 \leq p \leq 1$ is a parameter.

Consider the samples $\{0, 0, 2, 1, 2, 1, 1, 0, 0, 2\}$ from X. Assume prior distribution of θ to be Beta$(4, 5)$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 41 Question Id : 640653611401 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Find the posterior distribution of θ.

Options :

6406532041770. ✖ Gamma(11, 8)

6406532041771. ✖ Beta(10, 7)

6406532041772. ✔ Beta(11, 8)

6406532041773. ✖ Beta(8, 11)

Question Number : 42 Question Id : 640653611402 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

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

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.55 to 0.61

Question Id : 640653611403 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (43 to 44)

Question Label : Comprehension

Suppose a principal states that the students studying in her school have an average IQ score equal to 98.5. A reporter suspects that the average may be higher and took a sample of 100 random students from that school and found out that the average IQ score of those children is 98.78. Assume the IQ scores of the students are normally distributed with a standard deviation of 1.6.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 43 Question Id : 640653611404 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Define null hypothesis and alternative hypothesis

Options :

6406532041775. ✖ $H_0 : \mu = 98.5, H_A : \mu \neq 98.5$

6406532041776. ✔ $H_0 : \mu = 98.5, H_A : \mu > 98.5$

6406532041777. ✖ $H_0 : \mu = 98.5, H_A : \mu < 98.5$

6406532041778. ✖ $H_0 : \mu \neq 98.5, H_A : \mu = 98.5$

Question Number : 44 Question Id : 640653611405 Question Type : SA Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Short Answer Question

Find the P−value. 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 :

0.01 to 0.07

Sem2 Maths2

Section Id : 64065341321