5

Sub-Section Number : 12

Sub-Section Id : 64065380215

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 21 Question Id : 640653563104 Question Type : SA Calculator : None

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

Correct Marks : 5

Question Label : Short Answer Question

Consider a quadratic equation $f(x) := ax^2 + bx + c$. The maximum value of f is -3, its axis of symmetry is $x = 2$ and the value of the quadratic function at $x = 0$ is -9. What is the value of a?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

-1.5

Sem2 Statistics2

Section Id : 64065338303

Section Number : 2

Section type : Online

Mandatory or Optional : Mandatory

Number of Questions : 12

Number of Questions to be attempted : 12

Section Marks : 40

Display Number Panel :	Yes
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	64065380216
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 22 Question Id : 640653563112 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 :

6406531882695. ✔ YES

6406531882696. ✖ NO

Question Number : 23 Question Id : 640653563113 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 ($F_X(x)$)	$E[X]$	Var(X)
Uniform(A) $A = \{a, a+1, \ldots, b\}$	$\frac{1}{n}$, $x = k$ $n = b - a + 1$ $k = a, a+1, \ldots, b$	$\begin{cases} 0 & x < 0 \\ \frac{k-a+1}{n} & k \leq x < k+1 \\ & k = a, a+1, \ldots, b-1, b \\ 1 & x \geq n \end{cases}$	$\frac{a+b}{2}$	$\frac{n^2-1}{12}$
Bernoulli(p)	$\begin{cases} p & x = 1 \\ 1-p & x = 0 \end{cases}$	$\begin{cases} 0 & x < 0 \\ 1-p & 0 \leq x < 1 \\ 1 & x \geq 1 \end{cases}$	p	$p(1-p)$
Binomial(n, p)	${}^nC_k p^k (1-p)^{n-k}$, $k = 0, 1, \ldots, n$	$\begin{cases} 0 & x < 0 \\ \sum_{i=0}^{k} {}^nC_i p^i (1-p)^{n-i} & k \leq x < k+1 \\ & k = 0, 1, \ldots, n \\ 1 & x \geq n \end{cases}$	np	$np(1-p)$
Geometric(p)	$(1-p)^{k-1} p$, $k = 1, \ldots, \infty$	$\begin{cases} 0 & x < 0 \\ 1-(1-p)^k & k \leq x < k+1 \\ & k = 1, \ldots, \infty \end{cases}$	$\frac{1}{p}$	$\frac{1-p}{p^2}$
Poisson(λ)	$\frac{e^{-\lambda}\lambda^k}{k!}$, $k = 0, 1, \ldots, \infty$	$\begin{cases} 0 & x < 0 \\ e^{-\lambda} \sum_{i=0}^{k} \frac{\lambda^i}{i!} & k \leq x < k+1 \\ & k = 0, 1, \ldots, \infty \end{cases}$	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 $E[X] = \mu, \text{Var}(X) = \sigma^2$.
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	$\mu = \mu_0$	$\mu > \mu_0$	$T = \overline{X}$ $Z = \dfrac{\overline{X} - \mu_0}{\sigma/\sqrt{n}}$	$\overline{X} > c$
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 $\dfrac{\alpha}{2} = P(S^2 > c^2)$ or $S^2 < c^2$ where $\dfrac{\alpha}{2} = P(S^2 < c^2)$

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

Use the following values if required:

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

Options :

6406531882697. ✔ Useful Data has been mentioned above

6406531882698. ✖ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number : 2

Sub-Section Id : 64065380217

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 24 Question Id : 640653563114 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

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

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.17 to 0.23

Question Number : 25 Question Id : 640653563115 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

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

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

7

Sub-Section Number :	3
Sub-Section Id :	64065380218
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 26 Question Id : 640653563116 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3 Selectable Option : 0

Question Label : Multiple Select Question

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

Options :

6406531882701. ✔ If $\hat{\theta}_1$ is an unbiased estimator of θ, then $\hat{\theta}_2 = \hat{\theta}_1 + Y$ is an unbiased estimator of θ.

6406531882702. ✖ If $\hat{\theta}_1$ is an estimator of θ such that $E[\hat{\theta}_1] = 0$, then $\hat{\theta}_2 = \hat{\theta}_1 + Y$ is an unbiased estimator of θ.

6406531882703. ✖ If $\hat{\theta}_1$ is an unbiased estimator of θ, then $E[X - \hat{\theta}_1] = 0$.

6406531882704. ✔ If $\hat{\theta}_1$ is an estimator of θ such that $E[\hat{\theta}_1] = 2\theta$, then $\hat{\theta}_2 = \dfrac{\hat{\theta}_1}{2}$ is an unbiased estimator of θ.

Sub-Section Number :	4
Sub-Section Id :	64065380219
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 27 Question Id : 640653563117 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

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

Options :

6406531882705. ✖ $1 - F_Z\left(\dfrac{5c+5}{2}\right)$

6406531882706. ✔ $F_Z\left(\frac{5c+5}{2}\right)$

6406531882707. ✖ $1-F_Z\left(\frac{5c-5}{2}\right)$

6406531882708. ✖ $F_Z\left(\frac{5c-5}{2}\right)$

Question Number : 28 Question Id : 640653563118 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Consider 16 samples $X_1, X_2, \ldots, X_{16} \sim$ iid Normal(μ, σ^2). Suppose the mean and the standard deviation of the given samples are 36.9 and 3.8 respectively. Let the null and alternative hypothesis be $H_0 : \mu = 35$ and $H_A : \mu > 35$. Find the P-value.

Options :

6406531882709. ✖ $F_{t_{15}}(2)$

6406531882710. ✔ $1-F_{t_{15}}(2)$

6406531882711. ✖ $F_Z(2)$

6406531882712. ✖ $1-F_Z(2)$

Sub-Section Number : 5

Sub-Section Id : 64065380220

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653563119 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 : (29 to 30)

Question Label : Comprehension

Let X be a random variable with PMF as follows:

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

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

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 29 Question Id : 640653563120 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Short Answer Question

What is the standard deviation of Y ?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 30 Question Id : 640653563121 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Find $Cov(X, Y)$.

Options :

6406531882714. ✖ $\frac{1}{4}$

6406531882715. ✖ 0

6406531882716. ✔ $\frac{1}{2}$

6406531882717. ✖ $\frac{1}{3}$

Question Id : 640653563122 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 : (31 to 32)

Question Label : Comprehension

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

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

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 31 Question Id : 640653563123 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Find the value of *c*.

Options :

6406531882718. ✖ $\frac{1}{4}$

6406531882719. ✔ $\frac{1}{8}$

6406531882720. ✖ $\frac{1}{40}$

6406531882721. ✖ $\frac{1}{10}$

Question Number : 32 Question Id : 640653563124 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Short Answer Question

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

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.372 to 0.378

Question Id : 640653563125 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 : (33 to 34)

Question Label : Comprehension

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

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

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

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 33 Question Id : 640653563126 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

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

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.23 to 0.27

Question Number : 34 Question Id : 640653563127 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

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

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.23 to 0.27

Question Id : 640653563128 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (35 to 36)

Question Label : Comprehension

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

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 35 Question Id : 640653563129 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Find the posterior distribution of p.

Options :

6406531882725. ✖ Gamma(39,11)

6406531882726. ✖ Beta(40, 16)

6406531882727. ✖ Gamma(40,16)

6406531882728. ✔ Gamma(40,11)

Question Number : 36 Question Id : 640653563130 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

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

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

3.60 to 3.68

Question Id : 640653563131 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (37 to 38)

Question Label : Comprehension

A manufacturer produces cotter pins and claims that the probability of a randomly selected cotter pin being defective is 0.3. However, an analyst suspects that the claimed probability value is too high and decides to verify it by conducting a test. The analyst randomly selects 8 cotter pins from the manufacturer's production line and inspects them for defects. If less than 2 cotter pins are defective (out of those 8 cotter pins), then the analyst rejects the claim, or else he accepts it.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 37 Question Id : 640653563132 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 :

6406531882730. ✖ $H_0 : p = 0.3, H_A : p \neq 0.3$

6406531882731. ✖ $H_0 : p = 0.3, H_A : p > 0.3$

6406531882732. ✔ $H_0 : p = 0.3, H_A : p < 0.3$

6406531882733. ✖ $H_0 : p \neq 0.3, H_A : p = 0.3$

Question Number : 38 Question Id : 640653563133 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Short Answer Question

Find the significance level of the test. Enter the answer correct to two decimal places.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.23 to 0.29

Sem2 Maths2

Section Id :	64065338304
Section Number :	3
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	15
Number of Questions to be attempted :	15
Section Marks :	50
Display Number Panel :	Yes
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	64065380221
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 39 Question Id : 640653563134 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