There are more than one, but finitely many points on the graph of f that maximize the function ϕ.

6406533522942. ✖ There are infinitely many points on the graph of f that maximize the function ϕ.

6406533522943. ✔ There is no point on the graph of f that maximizes the function ϕ.

Sem2 Statistics2

Section Id :	64065375503
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
Section Maximum Duration :	0
Section Minimum Duration :	0
Section Time In :	Minutes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653160696
Question Shuffling Allowed :	No

Question Number : 196 Question Id : 6406531043258 Question Type : MCQ

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 :

6406533522953. ✔ YES

6406533522954. ✖ NO

Question Number : 197 Question Id : 6406531043259 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) $A = \{a, a+1, \ldots, b\}$	$\frac{1}{n}$, $x = k$ $n = b - a + 1$ $k = a, a+1, \ldots, b$	$\begin{cases} 0 & x < 0 \\ \frac{k-a+1}{n} & k \leq x < k+1 \\ & k = a, a+1, \ldots, b-1, b \\ 1 & x \geq n \end{cases}$	$\frac{a+b}{2}$	$\frac{n^2-1}{12}$
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$[a, b]$	$\frac{1}{b-a}$, $a \le x \le b$	$\begin{cases} 0 & x \le a \\ \frac{x-a}{b-a} & a < x < b \\ 1 & x \ge b \end{cases}$	$\frac{a+b}{2}$	$\frac{(b-a)^2}{12}$
Exp(λ)	$\lambda e^{-\lambda x}$, $x > 0$	$\begin{cases} 0 & x \le 0 \\ 1 - e^{-\lambda x} & x > 0 \end{cases}$	$\frac{1}{\lambda}$	$\frac{1}{\lambda^2}$
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,
$$P(X \ge c) \le \frac{\mu}{c}$$

2. **Chebyshev's inequality:** Let X be a discrete random variable with a finite mean μ and a finite variance σ^2. Then,
$$P(\mid X - \mu \mid \ge k\sigma) \le \frac{1}{k^2}$$

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

4. **Using CLT to approximate probability:** Let $X_1, X_2, \ldots, X_n \sim$ iid X with $E[X] = \mu, \mathrm{Var}(X) = \sigma^2$.
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: $\hat{\mu} = \overline{X}\left(\frac{n\sigma_0^2}{n\sigma_0^2 + \sigma^2}\right) + \mu_0\left(\frac{\sigma^2}{n\sigma_0^2 + \sigma^2}\right)$

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

Use the following information if required:

1. F_Z values.
   $F_Z(1.645) = 0.95, F_Z(1) = 0.84134, F_Z(-1) = 0.15866, F_Z(-1.75) = 0.04, F_Z(-0.175) = 0.43, F_Z(-1.645) = 0.05, F_Z(-2.32) = 0.01, F_{t_{99}}(-1.645) = 0.05, F_{t_{99}}(-2.33) = 0.01$

2. $\displaystyle\int e^{ax}\,dx = \frac{e^{ax}}{a}.$

Options :

6406533522955. ✔ Useful Data has been mentioned above.

6406533522956. ✖ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number : 2
Sub-Section Id : 640653160697
Question Shuffling Allowed : Yes

Question Number : 198 Question Id : 6406531043260 Question Type : SA
Correct Marks : 3
Question Label : Short Answer Question

A four sided die is such that the probability of getting any number from one to three is θ, and the probability of getting four is $1 - 3\theta$. The die is rolled seven times and outcomes are

$$1, 4, 3, 4, 3, 2, 4.$$

Find the maximum likelihood estimate of θ. 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 :

0.16 to 0.22

Sub-Section Number : 3
Sub-Section Id : 640653160698
Question Shuffling Allowed : Yes

Question Number : 199 Question Id : 6406531043261 Question Type : MCQ
Correct Marks : 3
Question Label : Multiple Choice Question

Let $X \sim \text{Binomial}(100, p)$. Let the null and alternative hypothesis be $H_0 : p = 0.5$ and $H_A : p \neq 0.5$. Consider a test that rejects H_0 if $|X - 300| > 50$. What is the power of the test against the alternative $\text{Binomial}(100, p)$ as a function of p?

Options :

6406533522958. ✔ $$1 + F_Z\left(\frac{25 - 10p}{\sqrt{p(1-p)}}\right) - F_Z\left(\frac{35 - 10p}{\sqrt{p(1-p)}}\right)$$

6406533522959. ✖ $$1 - F_Z\left(\frac{35 - 10p}{\sqrt{p(1-p)}}\right) - F_Z\left(\frac{25 - 10p}{\sqrt{p(1-p)}}\right)$$

6406533522960. ✖

$$F_Z\left(\frac{35-10p}{\sqrt{p(1-p)}}\right)-F_Z\left(\frac{25-10p}{\sqrt{p(1-p)}}\right)$$

6406533522961. ✖ $F_Z\left(\frac{25-10p}{\sqrt{p(1-p)}}\right)-F_Z\left(\frac{35-10p}{\sqrt{p(1-p)}}\right)$

Question Number : 200 Question Id : 6406531043264 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following situation and match it with a suitable test statistic and hypothesis test:
Suppose that we observe samples from a normal distribution, where the variance is known. We want to check whether the population mean is equal to a specific value.

Options :

6406533522970. ✔ Test Statistic: T = Sample mean, Hypothesis test: Z-test.

6406533522971. ✖ Test Statistic: T = Sample variance, Hypothesis test: χ^2-test.

6406533522972. ✖ Test Statistic: T = Sample mean, Hypothesis test: t-test.

6406533522973. ✖ Test Statistic: T = Sample variance, Hypothesis test: Z-test.

Sub-Section Number :	4
Sub-Section Id :	640653160699
Question Shuffling Allowed :	Yes

Question Number : 201 Question Id : 6406531043262 Question Type : MSQ

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

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

Options :

6406533522962. ✔ The power of a test is the probability of rejecting the null hypothesis when it is false.

6406533522963. ✖ The probability of accepting the alternative hypothesis when it is true is called as level of significance.

6406533522964. ✔ Type I error is the probability of rejecting the null hypothesis when alternative hypothesis is false.

6406533522965. ✔ If the probability of making a Type II error is 0.05, the power of the test is 0.95.

Question Number : 202 Question Id : 6406531043263 Question Type : MSQ

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider two estimators T_1 and T_2 with the following properties;

- $\text{Bias}(T_1) = \frac{1}{n}$, $\text{Var}(T_1) = \frac{1}{n^2}$
- $\text{Bias}(T_2) = \frac{-\mu}{n+1}$, $\text{Var}(T_2) = \frac{n\sigma^2}{(n+1)^2}$

Which of the following option(s) is(are) true?

Options :

6406533522966. ✔ $\text{Risk}(T_1) = \frac{2}{n^2}$

6406533522967. ✖ $\text{Risk}(T_1) = \frac{1}{n} + \frac{1}{n^2}$

6406533522968. ✖ $\text{Risk}(T_2) = \frac{-\mu}{n+1} + \frac{n\sigma^2}{(n+1)^2}$

6406533522969. ✔ $\text{Risk}(T_2) = \frac{n\sigma^2 + \mu^2}{(n+1)^2}$

Sub-Section Number :	5
Sub-Section Id :	640653160700
Question Shuffling Allowed :	No

Question Id : 6406531043265 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Question Numbers : (203 to 204)

Question Label : Comprehension

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

x	1	2	3
$P(X=x)$	$\frac{\theta}{2}$	$\frac{\theta}{3}$	$\frac{6-5\theta}{6}$

Consider 50 i.i.d. samples of X in which 1, 2, and 3 occur 10, 20, and 20 times, respectively.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 203 Question Id : 6406531043266 Question Type : SA

Correct Marks : 3

Question Label : Short Answer Question

Find the method of moments estimate of θ. 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 :

0.57 to 0.63

Question Number : 204 Question Id : 6406531043267 Question Type : SA

Correct Marks : 2

Question Label : Short Answer Question

Find the maximum likelihood estimate of θ. 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 :

0.69 to 0.75

Question Id : 6406531043268 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Question Numbers : (205 to 206)

Question Label : Comprehension

Let p be the true proportion of customers who favor a newly introduced feature in our mobile app. The product team randomly selected 50 customers and asked them if they appreciate the new feature. From the survey, 20 out of the 50 customers responded with a 'yes'.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 205 Question Id : 6406531043269 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Find the posterior distribution of p for a Uniform [0, 1] prior.

Options :

6406533522976. ✖ Beta(20, 30)

6406533522977. ✖ Beta(30, 20)

6406533522978. ✔ Beta(21, 31)

6406533522979. ✖ Beta(31, 21)

Question Number : 206 Question Id : 6406531043270 Question Type : SA

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 :

0.37 to 0.43

Question Id : 6406531043271 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Question Numbers : (207 to 208)

Question Label : Comprehension

A packaging company uses a machine to fill packets with 98.5 gram of powdered material. A quality control manager suspects that the machine is underfilling the packets. To investigate, he collects a random sample of 100 packets and measures the weights. The sample reveals an average weight of 98.29 gram, with a standard deviation of 1.2 gram.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 207 Question Id : 6406531043272 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

State the null and alternative hypotheses.

Options :

6406533522981. ✖ $H_0 : \mu = 98.5, H_A : \mu \neq 98.5$

6406533522982. ✖ $H_0 : \mu = 98.5, H_A : \mu > 98.5$

6406533522983. ✔ $H_0 : \mu = 98.5, H_A : \mu < 98.5$

6406533522984. ✖ $H_0 : \mu \neq 98.5, H_A : \mu = 98.5$

Question Number : 208 Question Id : 6406531043273 Question Type : MSQ

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Choose the set of correct options.

Options :

6406533522985. ✔ Reject H_0 at significance level $\alpha = 0.05$.

6406533522986. ✔ Accept H_0 at significance level $\alpha = 0.01$.

6406533522987. ✖ Accept H_0 at significance level $\alpha = 0.05$.

6406533522988. ✖ Reject H_0 at significance level $\alpha = 0.01$.

Question Id : 6406531043274 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Question Numbers : (209 to 210)

Question Label : Comprehension

The joint density function of two continuous random variables X and Y is given as

$$f_{XY}(x,y) = \begin{cases} c(x+y), & 0 \le x \le 1, 0 \le y \le 1, \\ 0, & \text{otherwise.} \end{cases}$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 209 Question Id : 6406531043275 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

Find the Marginal distribution of X.

Options :

6406533522989. ✖ $$f_X(x) = \begin{cases} 1, & 0 \le x \le 1 \\ 0, & \text{otherwise.} \end{cases}$$

6406533522990. ✔ $$f_X(x) = \begin{cases} x + \frac{1}{2}, & 0 \le x \le 1 \\ 0, & \text{otherwise.} \end{cases}$$

6406533522991. ✖ $$f_X(x) = \begin{cases} x - \frac{1}{2}, & 0 \le x \le 1 \\ 0, & \text{otherwise.} \end{cases}$$

6406533522992. ✖ $$f_X(x) = \begin{cases} \frac{x+1}{2}, & 0 \le x \le 1 \\ 0, & \text{otherwise.} \end{cases}$$

Question Number : 210 Question Id : 6406531043276 Question Type : SA

Correct Marks : 3

Question Label : Short Answer Question

Find $P(X + Y \le 1)$. 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 : 6406531043277 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix
Question Numbers : (211 to 212)
Question Label : Comprehension

Let X and Y be i.i.d. Uniform $\{-1, 0, 1\}$. Define a new random variable $Z = X^2 + Y^2$.

Based on the above data, answer the given subquestions.
Sub questions

Question Number : 211 Question Id : 6406531043278 Question Type : MCQ
Correct Marks : 3
Question Label : Multiple Choice Question

Find the PMF of Z.

Options :

6406533522994. ✖

z	0	1	2
$f(z)$	1/3	1/3	1/3

6406533522995. ✖

z	0	1	2
$f(z)$	1/3	4/9	2/9

6406533522996. ✔

z	0	1	2
$f(z)$	1/9	4/9	4/9

6406533522997. ✖

z	0	1	2
$f(z)$	1/3	4/3	4/3

Question Number : 212 Question Id : 6406531043279 Question Type : SA
Correct Marks : 2
Question Label : Short Answer Question
Find $E[Z]$. 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 :
1.30 to 1.36

DBMS

Section Id :	64065375504
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 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 :	640653160701
Question Shuffling Allowed :	No

Question Number : 213 Question Id : 6406531043280 Question Type : MCQ
Correct Marks : 0
Question Label : Multiple Choice Question