Possible Answers :

0.39 to 0.45

Sem2 Statistics2

Section Id :	64065356691
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 :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653118908
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 188 Question Id : 640653816052 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 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 :

6406532733604. ✔ YES

6406532733605. ✖ NO

Question Number : 189 Question Id : 640653816053 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

Use the following information if required:

1. F_Z values.
   $F_Z(-1.75) = 0.04, F_Z(-0.175) = 0.43, F_Z(-1.645) = 0.05, F_Z(-2.32) = 0.01$
2. $\int e^{ax}\,dx = \frac{e^{ax}}{a}$.

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)	$(1-p)^{k-1} p$, $k = 1, \ldots, \infty$	$\begin{cases} 0 & x < 0 \\ 1-(1-p)^k & k \le x < k+1 \\ & k = 1, \ldots, \infty \end{cases}$	$\frac{1}{p}$	$\frac{1-p}{p^2}$
Poisson(λ)	$\frac{e^{-\lambda}\lambda^k}{k!}$, $k = 0, 1, \ldots, \infty$	$\begin{cases} 0 & x < 0 \\ e^{-\lambda} \sum_{i=0}^{k} \frac{\lambda^i}{i!} & k \le x < k+1 \\ & k = 0, 1, \ldots, \infty \end{cases}$	λ	λ

Continuous random variables:

Distribution	PDF ($f_X(k)$)	CDF ($F_X(x)$)	$E[X]$	$\text{Var}(X)$
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 $E[X] = \mu, \text{Var}(X) = \sigma^2$.
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 $E[X] = \mu, \text{Var}(X) = \sigma^2$.
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 Θ : $\Theta \sim f_\Theta(\theta)$.
   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	$\sigma = \sigma_0$	$\sigma > \sigma_0$	$T = \frac{(n-1)S^2}{\sigma_0^2} \sim \chi^2_{n-1}$	$S^2 > c^2$
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 $\frac{\alpha}{2} = P(T < 1 - c_L)$

Options :

6406532733606. ✔ Useful Data has been mentioned above.

6406532733607. ✖ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number : 2

Sub-Section Id : 640653118909

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 190 Question Id : 640653816054 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 $X_1, X_2, X_3 \sim$ i.i.d.X and $X \sim$ Uniform$\{-0.2, 0.2\}$. Define a random variable $S = X_1 + X_2 + X_3$. Find the MGF (moment generating function) of S.

Options :

6406532733608. ✖ $\left(\frac{e^{-0.2\lambda} + e^{0.2\lambda}}{3}\right)^3$

6406532733609. ✖ $\left(\frac{e^{-0.5\lambda} + e^{0.5\lambda}}{2}\right)^3$

6406532733610. ✔ $\left(\frac{e^{-0.2\lambda} + e^{0.2\lambda}}{2}\right)^3$

6406532733611. ✖ $\left(\frac{e^{-0.5\lambda} + e^{0.5\lambda}}{3}\right)^2$

Question Number : 191 Question Id : 640653816056 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$(\mu, 36)$. Let the null and alternative hypothesis be $H_0 : \mu = 4$ and $H_A : \mu = -4$. 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 level of significance in terms of 'c'?

Options :

6406532733613. ✖ $1 - F_Z\left(\dfrac{5c + 20}{2}\right)$

6406532733614. ✖ $1 - F_Z\left(\dfrac{5c - 20}{3}\right)$

6406532733615. ✖ $F_Z\left(\dfrac{5c + 20}{3}\right)$

6406532733616. ✔ $F_Z\left(\dfrac{5c - 20}{3}\right)$

Question Number : 192 Question Id : 640653816058 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 it with suitable test statistic and hypothesis test:

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

Options :

6406532733618. ✖ Test Statistic: T = Sample mean, Hypothesis test: Z-test.

6406532733619. ✖ Test Statistic: T = Sample mean, Hypothesis test: χ^2-test.

6406532733620. ✖ Test Statistic: T = Sample variance, Hypothesis test: χ^2-test.

6406532733621. ✔ Test Statistic: T = Sample mean, Hypothesis test: t-test.

Sub-Section Number :	3
Sub-Section Id :	640653118910
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 193 Question Id : 640653816055 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 the time taken by a delivery service to deliver a package (in hours) follows an exponential distribution with parameter λ. The timings (in hours) from a random sample of 6 deliveries are as follows:

$$15, 20, 15, 16, 14, 20$$

Find the method of moment estimate of λ 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 :

0.03 to 0.09

Question Number : 194 Question Id : 640653816057 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 $X_1, X_2, \ldots, X_n$ are i.i.d. samples from a distribution X with an unknown mean μ and variance σ^2. If $\hat{\mu}_1$ is an estimator of μ such that $E(\hat{\mu}_1) = 2\mu + 3$ and another estimator $\hat{\mu}_2$ is defined as

$$\hat{\mu}_2 = \frac{\hat{\mu}_1 - k}{(k-1)}$$

Find the value of k for which $\hat{\mu}_2$ will be an unbiased estimator of μ.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Sub-Section Number :	4
Sub-Section Id :	640653118911
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653816059 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 : (195 to 196)

Question Label : Comprehension

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

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

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 195 Question Id : 640653816060 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

Consider a random sample $(0, 3, 2, 2, 3, 1, 2, 2, 3, 0)$. Find the method of moments estimate of p for the given sample. 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 :

0.7 to 0.9

Question Number : 196 Question Id : 640653816061 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

Consider a random sample $(0, 0, 1, 2, 2, 3, 3, 3, 3, 3)$. Find the maximum likelihood estimate of p 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 :

0.63 to 0.70

Question Id : 640653816062 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 : (197 to 198)

Question Label : Comprehension

Let X be a discrete random variable taking values $\{1, 3, 5\}$ with respective probabilities

$$\left\{\frac{\theta}{2}, (1-\theta), \frac{\theta}{2}\right\}, \text{ where } 0 \leq \theta \leq 1 \text{ is a parameter.}$$

Consider the samples $\{1, 1, 5, 3, 5, 3, 3, 1, 1, 5\}$ from X. Assume prior distribution of θ to be Beta$(5, 6)$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 197 Question Id : 640653816063 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 :

6406532733624. ✖ Gamma(11, 8)

6406532733625. ✖ Beta(11, 8)

6406532733626. ✔ Beta(12, 9)

6406532733627. ✖ Beta(9, 12)

Question Number : 198 Question Id : 640653816064 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 :

0.54 to 0.60

Question Id : 640653816065 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 : (199 to 200)

Question Label : Comprehension

A university claims that the average time for students to complete a particular exam is 60 minutes with a standard deviation of 5 minutes. An analyst believes that the average time is less than 60 minutes. He randomly selects 100 completed exams and finds that the average completion time is 59.3 minutes.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 199 Question Id : 640653816066 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

What null hypothesis and alternative hypothesis should the analyst consider?

Options :

6406532733629. ✖ $H_0 : \mu = 60, H_A : \mu > 60$

6406532733630. ✔ $H_0 : \mu = 60, H_A : \mu < 60$

6406532733631. ✖ $H_0 : \mu = 59.3, H_A : \mu < 59.3$

6406532733632. ✖ $H_0 : \mu = 59.3, H_A : \mu > 59.3$

Question Number : 200 Question Id : 640653816067 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 conclusions will the analyst reach at the specified significance levels ?

Options :

6406532733633. ✖ Reject H_0 at significance level $\alpha = 0.05$.

6406532733634. ✖ Reject H_0 at significance level $\alpha = 0.01$.

6406532733635. ✔ Accept H_0 at significance level $\alpha = 0.05$.

6406532733636. ✔ Accept H_0 at significance level $\alpha = 0.01$.

Question Id : 640653816068 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 : (201 to 202)

Question Label : Comprehension

Suppose a random variable *X* follows an exponential distribution with mean 5.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 201 Question Id : 640653816069 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

If $P(X \leq k) = 0.95$, then find the value of k.

Options :

6406532733637. ✖ $\frac{1}{5}(\ln 20)$

6406532733638. ✔ $5(\ln 20)$

6406532733639. ✖ $\frac{1}{5}(\ln 2)$

6406532733640. ✖ $5(\ln 2)$

Question Number : 202 Question Id : 640653816070 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 $P(10 \leq X \leq 15)$.

Options :

6406532733641. ✖ $e^{-3} - e^{-2}$

6406532733642. ✖ $1 - e^{-2}$

6406532733643. ✖ $1 - e^{-3}$

6406532733644. ✔ $e^{-2} - e^{-3}$

Question Id : 640653816071 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 : (203 to 204)

Question Label : Comprehension

The PMF of a discrete random variable X is given as

$$f_X(x) = \begin{cases} \frac{x}{15}, & x = 1, 2, 3, 4, 5 \\ 0, & \text{otherwise.} \end{cases}$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 203 Question Id : 640653816072 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 value of $P(X = 1 \text{ or } X = 2)$. 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 :

0.1 to 0.3

Question Number : 204 Question Id : 640653816073 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 value of $P\left(\frac{1}{2} < X < \frac{5}{2} \mid X > 1\right)$?

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 :

0.11 to 0.17

DBMS

Section Id :	64065356692
Section Number :	7
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	20
Number of Questions to be attempted :	20
Section Marks :	50