Question Number : 140 Question Id : 640653903693 Question Type : MCQ Calculator : Yes Correct Marks : 1

Question Label : Multiple Choice Question

'Time is money' is an example of a metaphor.
This statement is ____.

Options :

6406533043171. ✔ TRUE

6406533043172. ✖ FALSE

Question Number : 141 Question Id : 640653903694 Question Type : MCQ Calculator : Yes Correct Marks : 1

Question Label : Multiple Choice Question

Choose the correct passive form of the following sentence.
'The company offered him a better position.'

Options :

6406533043173. ✔ He was offered a better position by the company

6406533043174. ✖ He was being offered a better position by the company

6406533043175. ✖ A better position was being offered to him by the company

6406533043176. ✖ None of these

Question Number : 142 Question Id : 640653903695 Question Type : MCQ Calculator : Yes Correct Marks : 1

Question Label : Multiple Choice Question

If they were corrupt, they would be facing its consequences.
This is a __ sentence.

Options :

6406533043177. ✖ Zero conditional

6406533043178. ✖ First conditional

6406533043179. ✔ Second conditional

6406533043180. ✖ Mixed conditional

Sem1 Statistics1

Section Id :	64065364117
Section Number :	4
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	17
Number of Questions to be attempted :	17
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
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653133996
Question Shuffling Allowed :	No

Question Number : 143 Question Id : 640653903696 Question Type : MCQ Calculator : Yes
Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "FOUNDATION LEVEL : SEMESTER I: STATISTICS FOR DATA SCIENCE I (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 :

6406533043181. ✔ YES

6406533043182. ✖ NO

Question Number : 144 Question Id : 640653903697 Question Type : MCQ Calculator : Yes
Correct Marks : 0

Question Label : Multiple Choice Question

1. Sample mean $\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n}$, where n is the sample size.

2. Population mean $\mu = \frac{\sum_{i=1}^{N} x_i}{N}$, where N is the population size.

3. Sample variance $(s_x^2) = \frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n-1}$

4. Population variance $(\sigma^2) = \frac{\sum_{i=1}^{N}(x_i - \mu)^2}{N}$

5. Sample Covariance : $Cov(x, y) = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{n-1}$

6. Population Covariance : $Cov(x, y) = \frac{\sum_{i=1}^{N}(x_i - \mu)(y_i - \mu)}{N}$

7. Correlation coefficient : $r = \frac{Cov(x, y)}{s_x s_y}$

8. If an action A can occur in n_1 different ways, another action B can occur in n_2 different ways, then the total number of occurrence of the actions A **or** B is $n_1 + n_2$.

9. If an action A can occur in n_1 different ways, another action B can occur in n_2 different ways, then the total number of occurrence of the actions A **and** B is $n_1 \times n_2$.

10. $n! = n \times (n-1) \times (n-2) \times \ldots \times 3 \times 2 \times 1$

11. ${}^{n}P_r = \frac{n!}{(n-r)!}$

12. The number of permutations of n objects where p_1 is of one kind, p_2 is of second kind, and so on p_k of k^{th} kind is given by:

$$\frac{n!}{p_1! p_2! \ldots p_k!}$$

13. The number of ways n distinct objects can be arranged in a circle (clockwise and anticlockwise are different) is equal to $(n-1)!$

14. The number of ways n distinct objects can be arranged in a circle (clockwise and anticlockwise are same) is equal to $\frac{(n-1)!}{2}$

15. ${}^{n}C_{r} = \dfrac{n!}{r!(n-r)!}$

16. Events $E_1, E_2, \ldots, E_n$ are said to be exhaustive of a sample space when $\bigcup_{i=1}^{n} E_i = S$.

17. **Addition Rule of Probability**:
For any two events E_1 and E_2 , $P(E_1 \cup E_2) = P(E_1) + P(E_2) - P(E_1 \cap E_2)$.

18. $P(E|F) = \dfrac{P(E \cap F)}{P(F)}$; $P(F) > 0$

19. **Multiplication rule of probability:** For any two events E and F,

$$P(E \cap F) = P(F) \times P(E|F);\ P(F) > 0$$
$$P(E \cap F) = P(E) \times P(F|E);\ P(E) > 0$$

20. **Pairwise Independent Events:** The events $E_1, E_2, \ldots, E_n$ are said to be pairwise independent if the following condition holds:

$$P(E_i \cap E_j) = P(E_i) \times P(E_j)\ , i \neq j = 1, 2, \ldots, n$$

21. **Law of total probability:**
Suppose that events $F_1, F_2, \ldots, F_k$, are mutually exclusive and exhaustive; that is, exactly one of the events must occur. Then for any event E,

$$P(E) = \sum_{i=1}^{k} P(E|F_i)P(F_i)$$

22. **Bayes' Rule:**

$$P(F_i|E) = \frac{P(E|F_i)P(F_i)}{\sum_{i=1}^{k} P(E|F_i)P(F_i)}$$

Discrete random variables:

Distribution	PMF $(P(X=x))$	$E[X]$	$\mathrm{Var}(X)$
Uniform(A) $A=\{a,a+1,\ldots,b\}$	$\frac{1}{n}, \quad \forall x$ $n=b-a+1$ $k=a,a+1,\ldots,b$	$\frac{a+b}{2}$	$\frac{n^2-1}{12}$
Bernoulli(p)	$\begin{cases} p & x=1 \\ 1-p & x=0 \end{cases}$	p	$p(1-p)$
Binomial(n,p)	${}^nC_x p^x (1-p)^{n-x}$, $x=0,1,\ldots,n$	np	$np(1-p)$
HyperGeometric(n,m,N)	$\frac{{}^mC_x \, {}^{N-m}C_{n-x}}{{}^NC_n}$, $x \le n, x \le m, n-x \le N-m$	$\frac{nm}{N}$	$n\frac{m}{N}\frac{N-m}{N}\frac{N-n}{N-1}$
Poisson(λ)	$\frac{e^{-\lambda}\lambda^x}{x!}$, $x=0,1,\ldots,\infty$	λ	λ

Continuous random variables:

Distribution	PDF $(f_X(x))$	CDF $(F_X(x))$	$E[X]$	$\mathrm{Var}(X)$
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

Options :

6406533043183. ✔ Useful Data has been mentioned above.

6406533043184. ✖ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number : 2

Sub-Section Id : 640653133997

Question Shuffling Allowed : Yes

Question Number : 145 Question Id : 640653903710 Question Type : MCQ Calculator : Yes
Correct Marks : 2

Question Label : Multiple Choice Question

If $X \sim \text{Normal}(\mu, \sigma^2)$, where $\mu = 12$ and $\sigma = 4$. Find the value of $P(12 \leq X \leq 20)$ in terms of Z, where Z is standard normal variable.

Options :

6406533043205. ✖ $P(Z \leq 0) - P(Z \leq 2)$

6406533043206. ✖ $1 - P(Z \leq 2)$

6406533043207. ✔ $P(Z \leq 2) - P(Z \leq 0)$

6406533043208. ✖ $1 - P(Z \leq 0)$

Question Number : 146 Question Id : 640653903720 Question Type : MCQ Calculator : Yes Correct Marks : 2

Question Label : Multiple Choice Question

An analyst wants to know the feedback of people for a recently released movie. He selected randomly 10 people and tabulated the data of their opinions in Table 2.

Person	Rating of the Film
Person-1	Excellent
Person-2	Average
Person-3	Excellent
Person-4	Bad
Person-5	Bad
Person-6	Average
Person-7	Excellent
Person-8	Excellent
Person-9	Bad
Person-10	Average

Table 2

Choose the correct option from the following:

Options :

6406533043230. ✖ Mode of the data is “Bad”.

6406533043231. ✖ Median of the data is “Excellent”.

6406533043232. ✔ Mode of the data is “Excellent”.

6406533043233. ✖ The given data is bimodal.

Sub-Section Number : 3

Sub-Section Id : 640653133998

Question Shuffling Allowed : Yes

Question Number : 147 Question Id : 640653903718 Question Type : MCQ Calculator : Yes Correct Marks : 3

Question Label : Multiple Choice Question

There are 10 chocolates in a box out of which 6 are milk chocolates and 4 are dark chocolates. A sample of 4 chocolates is randomly selected (without replacement) from the box. Let random variable *X* represents the number of milk chocolates in the selected sample. What is the value of *P*(*X* = 1)?

Options :

6406533043222. ✖ $\frac{6}{210}$

6406533043223. ✖ $\frac{10}{210}$

6406533043224. ✖ $\frac{6}{10}$

6406533043225. ✔ $\frac{24}{210}$

Question Number : 148 Question Id : 640653903719 Question Type : MCQ Calculator : Yes Correct Marks : 3

Question Label : Multiple Choice Question

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

x	0	1	2
$P(X = x)$	1/2	3/8	1/8

Table 1

Find the value of $E(X^2)$.

Options :

6406533043226. ✖ $\frac{5}{8}$

6406533043227. ✔ $\frac{7}{8}$

6406533043228. ✖ $\frac{3}{8}$

6406533043229. ✖ $\frac{1}{8}$

Sub-Section Number : 4
Sub-Section Id : 640653133999
Question Shuffling Allowed : Yes

Question Number : 149 Question Id : 640653903716 Question Type : MSQ Calculator : Yes
Correct Marks : 1 Max. Selectable Options : 0
Question Label : Multiple Select Question
A manager at a multinational corporation wants to assess the satisfaction level of its employees regarding the company's remote work policy. He randomly selects 50 employees from the company's global workforce for a survey. Identify the sample and population.
Options :
6406533043217. ✖ The sample is all employees working at the multinational corporation.
6406533043218. ✔ The population is all employees working at the multinational corporation.
6406533043219. ✔ The sample is randomly selected group of 50 employees from the company's global workforce.
6406533043220. ✖ The population is randomly selected group of 50 employees from the company's global workforce.

Sub-Section Number : 5
Sub-Section Id : 640653134000
Question Shuffling Allowed : Yes

Question Number : 150 Question Id : 640653903711 Question Type : MSQ Calculator : Yes
Correct Marks : 2 Max. Selectable Options : 0
Question Label : Multiple Select Question
Choose the correct option(s) from the following:
Options :
6406533043209. ✖ $\text{Var}(X-Y) = \text{Var}(X) - \text{Var}(Y)$, if X and Y are independent random variables.

6406533043210. ✔ $E(X+a) = E(X) + a$, where a is a constant.

6406533043211. ✖ $\text{Var}(aX+b) = a\text{Var}(X) + b$, where a and b are constants.

6406533043212. ✔ $\mathrm{SD}(aX+b) = a\mathrm{SD}(X)$, where a and b are constants.

Sub-Section Number : 6
Sub-Section Id : 640653134001
Question Shuffling Allowed : Yes

Question Number : 151 Question Id : 640653903712 Question Type : SA Calculator : None Correct Marks : 3

Question Label : Short Answer Question

If two dice are thrown, what is the probability that the sum is either 7 or 11? 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 :

0.19 to 0.25

Question Number : 152 Question Id : 640653903713 Question Type : SA Calculator : None Correct Marks : 3

Question Label : Short Answer Question

Suppose person *X* speaks truth with a probability of 3/5 and person *Y* speaks truth with a probability of 5/8. If you ask both of them their opinions on a story, what is the probability that their opinions will be contradictory? 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 :

0.45 to 0.51

Question Number : 153 Question Id : 640653903715 Question Type : SA Calculator : None Correct Marks : 3

Question Label : Short Answer Question

If sample correlation coefficient between *X* and *Y* is 3/4, sample covariance is 45 and sample variance of *X* is 36, then what is the value of sample standard deviation of *Y* ?

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

10

Sub-Section Number : 7

Sub-Section Id : 640653134002

Question Shuffling Allowed : Yes

Question Number : 154 Question Id : 640653903714 Question Type : SA Calculator : None Correct Marks : 4

Question Label : Short Answer Question

In a cooking competition, contestants are required to prepare a 3-course meal consisting of an appetizer, a main course, and a dessert. Each course can be rated as “Excellent”, “Good”, “Average”, “Fair”, or “Poor”. According to the rules, a contestant must receive at least a “Fair” rating in each course to promote to the next round. What is the total number of ways in which a contestant can be promoted to the next round?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

64

Question Number : 155 Question Id : 640653903717 Question Type : SA Calculator : None Correct Marks : 4

Question Label : Short Answer Question

The numbers 2, 6, 8, 10 have frequencies $x+6, x-1, x$ and $x-1$ respectively. If their mean is 5, then find the value of x.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

4

Sub-Section Number : 8

Sub-Section Id : 640653134003

Question Shuffling Allowed : No

Question Id : 640653903698 Question Type : COMPREHENSION Sub Question Shuffling

Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (156 to 157)

Question Label : Comprehension

The cumulative distribution function (CDF) of a discrete random variable X is given as

$$F_X(x) = \begin{cases} 0, & x < 0, \\ \frac{1}{2}, & 0 \le x < 1, \\ \frac{3}{5}, & 1 \le x < 2, \\ \frac{4}{5}, & 2 \le x < 3, \\ \frac{9}{10}, & 3 \le x < 4, \\ 1, & x \ge 4. \end{cases}$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 156 Question Id : 640653903699 Question Type : MCQ Calculator : Yes Correct Marks : 3

Question Label : Multiple Choice Question

Find the probability mass function of *X*.

Options :

6406533043185. ✖

x	0	1	2	3	4
$P(X=x)$	0	1/2	1/5	1/5	1/10

6406533043186. ✔

x	0	1	2	3	4
$P(X=x)$	1/2	1/10	1/5	1/10	1/10

6406533043187. ✖

x	0	1	2	3	4
$P(X=x)$	1/2	1/5	1/10	1/5	1/10

6406533043188.

x	0	1	2	3	4
$P(X = x)$	1/5	1/5	1/5	1/5	1/5

Question Number : 157 Question Id : 640653903700 Question Type : SA Calculator : None Correct Marks : 2

Question Label : Short Answer Question

What is the value of *E*(*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 :

1.2

Question Id : 640653903701 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (158 to 159)

Question Label : Comprehension

A grocery store sells apples with weights between 150 grams and 450 grams. Assume the weight of the apples follows a uniform distribution.

Based on the given information, answer the given subquestions.

Sub questions

Question Number : 158 Question Id : 640653903702 Question Type : SA Calculator : None Correct Marks : 2

Question Label : Short Answer Question

What is the probability that a randomly selected apple will have a weight of at least 270 grams? 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 :

0.6

Question Number : 159 Question Id : 640653903703 Question Type : MCQ Calculator : Yes Correct Marks : 3

Question Label : Multiple Choice Question

What is the conditional probability that a randomly selected apple will have a weight of more than 300 grams given that it already weighs at least 270 grams?

Options :

6406533043191. ✖ $\frac{1}{2}$

6406533043192. ✖ $\frac{3}{5}$

6406533043193. ✔ $\frac{5}{6}$

6406533043194. ✖ $\frac{4}{5}$

Question Id : 640653903704 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (160 to 161)

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 : 160 Question Id : 640653903705 Question Type : MCQ Calculator : Yes Correct Marks : 3

Question Label : Multiple Choice Question

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

Options :

6406533043195. ✖ $\frac{1}{5}(\ln 20)$

6406533043196. ✔ $5(\ln 20)$

6406533043197. ✖

$\frac{1}{5}(\ln 2)$

6406533043198. ✖ $5(\ln 2)$

Question Number : 161 Question Id : 640653903706 Question Type : MCQ Calculator : Yes Correct Marks : 2

Question Label : Multiple Choice Question

Find the value of $P(10 \leq X \leq 15)$.

Options :

6406533043199. ✖ $e^{-3} - e^{-2}$

6406533043200. ✖ $1 - e^{-2}$

6406533043201. ✖ $1 - e^{-3}$

6406533043202. ✔ $e^{-2} - e^{-3}$

Question Id : 640653903707 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (162 to 163)

Question Label : Comprehension

Suppose $X \sim \text{Binomial}(n, p)$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 162 Question Id : 640653903708 Question Type : SA Calculator : None Correct Marks : 3

Question Label : Short Answer Question

If the mean and variance of X are 4 and $\frac{4}{3}$ respectively, then find the value of n.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
6

Question Number : 163 Question Id : 640653903709 Question Type : SA Calculator : None Correct Marks : 2
Question Label : Short Answer Question

Calculate the value of $\frac{P(X=0)}{P(X=1)}$.

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 :
0.05 to 0.11

Sem2 Maths2

Section Id :	64065364118
Section Number :	5
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	17
Number of Questions to be attempted :	17
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
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653134004
Question Shuffling Allowed :	No