Assignment 6

The due date for submitting this assignment has passed.

Due on 2021-03-03, 23:59:00 IST.

Note: For numerical answers with decimal digits please read instructions on rounding-off. For true/false questions please answer True or False.

7. Suppose \( X \sim \text{Normal}(1, 2) \). Then \( f_Z(x) = \frac{1}{\sqrt{2\pi} \sigma} \exp \left( -rac{(x-\mu)^2}{2\sigma^2} \right) \) holds for \( x \), __________.

No. the answer is incorrect.
Acceptable Answers:
(Open Answers)

8. Let \( X \) and \( Y \) be two independent random variables and let \( Z = \max(X, Y) \). Let \( X \) be a random variable with \( X \sim \text{HyperGeo}(N, a, b, x) \). Then which of the following is true:

\[ E[Z] = \frac{N}{N-x} \left( E[X] + E[Y] \right) \]
\[ E[Z] = \frac{N}{N-x} E[X] \]
\[ E[Z] = \frac{N}{N-x} E[Y] \]
\[ E[Z] = \frac{N}{N-x} \left( E[X] + E[Y] \right) \]

No. the answer is incorrect.
Acceptable Answers:
(Open Answers)

Let \( X \) and \( Y \) be two discrete random variables with ranges \( X \in \{1, 2, 3\} \) and \( Y \in \{1, 2, 3\} \) with joint distribution given by the chart below:

<table>
<thead>
<tr>
<th>( X = 0 )</th>
<th>( X = 1 )</th>
<th>( X = 2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( Y = 1 )</td>
<td>0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>( Y = 2 )</td>
<td>0.3</td>
<td>0.2</td>
</tr>
</tbody>
</table>

9. \( E[XY] = \) __________ (Give your answer rounded up to one decimal digit)

No. the answer is incorrect.
Acceptable Answers:
(Open Answers)

10. \( Cov(X, Y) = \) __________ (Give your answer rounded up to two decimal digits)

No. the answer is incorrect.
Acceptable Answers:
(Open Answers)

11. Let \( X, Y \) be two discrete random variables. Suppose \( X \leq Y \) then it is possible that:

\[ E[Y | X] \leq E[Y] \]
\[ E[Y | X] > E[Y] \]

No. the answer is incorrect.
Acceptable Answers:
(Open Answers)

12. A random variable \( X \) has a probability mass function given by

\[ P(X = 0) = 0.1, P(X = 1) = 0.5, P(X = 2) = 0.3, \text{ and } P(X = 3) = 0.1 \]

\[ E[X] = \] __________ (Give your answer rounded up to one decimal digit)

No. the answer is incorrect.
Acceptable Answers:
(Open Answers)

13. \( \text{Var}(X) = \) __________ (Give your answer rounded up to four decimal digits)

No. the answer is incorrect.
Acceptable Answers:
(Open Answers)

14. The probability \( P \) will produce a result more than one standard deviation from the expected value is _________. (Give your answer rounded up to one decimal digit)

No. the answer is incorrect.
Acceptable Answers:
(Open Answers)

15. \( X \sim \text{Binomial}(n, p) \), probability that \( X \) will be within one standard deviation of expected value is _________. (Give your answer rounded up to two decimal digits)

No. the answer is incorrect.
Acceptable Answers:
(Open Answers)

16. Let \( X, Y \) be two discrete random variables taking values \( \{-1, 1\} \). Suppose their joint distribution is given by the table:

<table>
<thead>
<tr>
<th>( X = -1 )</th>
<th>( X = 1 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( Y = 1 )</td>
<td>0.3</td>
</tr>
<tr>
<td>( Y = 1 )</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Then \( Cov(X, Y) = \) __________