Unit 6 - Week 5

Assignment 5

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-03-04, 23:59 IST.

1) Which of the following statements hold true for a perfectly correlated pair of random variables? (r = +1) *1 point*

- [ ] Scatter Plot will look like a line.
- [ ] Slope of the Scatter Plot (overall slanting) can be arbitrary but is positive.
- [ ] Slope of the Scatter Plot will be 1
- [ ] Nothing can be said. It will be an arbitrary plot.

No, the answer is incorrect.
Score: 0
Accepted Answers:
Scatter Plot will look like a line.
Slope of the Scatter Plot (overall slanting) can be arbitrary but is positive.

2) Which of the following statements are true? *1 point*

- [ ] If two random variables are independent, then their covariance is zero.
- [ ] If the correlation between two random variables is zero then both the variables don't hold any kind of linear relationship but can still be dependent.
- [ ] If the covariance between two random variables is zero, then both the variables are independent
- [ ] There is no relationship between independence of random variables and their covariance

No, the answer is incorrect.
Score: 0
Accepted Answers:
If two random variables are independent, then their covariance is zero.
If the correlation between two random variables is zero then both the variables don't hold any kind of linear relationship but can still be dependent.

3) Tom wants to kill Jerry and seeks help from another powerful cat. There is a box containing three coupons: "Save Jerry", "Kill Jerry" and "I am useless". Tom needs "Kill Jerry" coupon for seeking help. Tom can draw any coupon randomly and have infinite draws with replacement. Each draw takes 5 seconds approximately. How much time does Tom need in expectation before reaching out for help? *1 point*

- ( ) 20 seconds
- ( ) 15 seconds
- ( ) 10 seconds
- ( ) 5 seconds

No, the answer is incorrect.
Score: 0
Accepted Answers:
15 seconds

4) X and Y are two random variables having information of their expectation and variance. Which of the following statements hold in the light of above information? *1 point*

- [ ] $E(X + Y)$ can be calculated
- [ ] $Var(X + Y)$ can be calculated
- [ ] $E[(X + Y)^2]$ can be calculated
- [ ] $E(X^2 + Y^2)$ can be calculated

No, the answer is incorrect.
Score: 0
Accepted Answers:
$E(X + Y)$ can be calculated
$E(X^2 + Y^2)$ can be calculated

5) X and Y are distributed as N(0, 4) and N(5, 36) respectively. X and Y are correlated by a measure of 0.63. Find the value of $E[(X + Y)^2]$. *1 point*

- ( ) 65
- ( ) 55.12
- ( ) 80.12
- ( ) 66.26

No, the answer is incorrect.
Score: 0
Accepted Answers:
80.12

6) Given the below discrete random variable, find the value of $E[(2X + 1)^2]$. *1 point*

X	-1	0	1
P(X)	0.25	0.45	0.3

- ( ) 4.2
- ( ) 3.4
- ( ) 4.8
- ( ) 3.6

No, the answer is incorrect.
Score: 0
Accepted Answers:
3.4

7) Let us denote the $Cov(X, Y)$ as 0.5. What would be the value for $Cov(2X + 3Y, 2X - 3Y)$? Assume the variance of each of the two random variables to be 1. *1 point*

- ( ) 5
- ( ) -5
- ( ) 3
- ( ) -3

No, the answer is incorrect.
Score: 0
Accepted Answers:
-5

8) Let X be an $Exp(\lambda)$ random variable. Find value of $E(X^2)$. *1 point*

- ( ) $1/\lambda$
- ( ) $1/2\lambda$
- ( ) $1/\lambda^2$
- ( ) $2/\lambda^2$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$2/\lambda^2$

9) A unit rod is cut randomly into two parts (cut follows uniform distribution throughout the rod). Find the expected length of the shorter part of the rod. *1 point*

- ( ) 0.5
- ( ) 0.25
- ( ) 0.33
- ( ) 0.2

No, the answer is incorrect.
Score: 0
Accepted Answers:
0.25

10) If X is a B(n, p) distribution, then calculate the expectation and variance of random variable Y = n - X. *1 point*

- ( ) np, np(1-p)
- ( ) (1-p), p(1-p)
- ( ) p, p(1-p)
- ( ) n(1-p), np(1-p)

No, the answer is incorrect.
Score: 0
Accepted Answers:
n(1-p), np(1-p)