STA 4321

Spring 2019

Quiz 6

Full Name: _____

On my honor, I have neither given nor received unauthorized aid on this quiz

Signature: _____

This is a 10 minute quiz. There are 5 multiple choice problems, each having EXACTLY ONE correct answer. You may *not* use any books, other references, or text-capable electronic devices.

1. If X and Y are discrete random variables, then

   (a) $P(X = x) = \sum_{y \in Range(Y)} P(X = x, Y = y)$.

   (b) $P(X = x) = \sum_{y \in Range(X)} P(X = x, Y = y)$.

   (c) $P(X = x) = \sum_{y \in Range(Y)} P(Y = y)$.

   (d) $P(X = x) = \sum_{y \in Range(X)} P(X = x)$.

   See lecture notes

2. If X and Y are jointly continuous random variables, then

   (a) $f_{X|Y=y}(x) = f_X(x)$.

   (b) $f_{X|Y=y}(x) = \frac{f_{X,Y}(x,y)}{f_Y(y)}$.

   (c) $f_{X|Y=y}(x) = f_Y(y)$.

   (d) $f_{X|Y=y}(x) = f_{X,Y}(x,y)$.

   See lecture notes

3. If X and Y are jointly continuous and independent random variables, then

   (a) $f_{X,Y}(x,y) = f_X(x)$.

   (b) $f_{X,Y}(x,y) = f_Y(y)$.

   (c) $f_{X,Y}(x,y) = f_X(x)f_Y(y)$.

   (d) $f_X(x) = f_Y(y)$.

   See lecture notes

4. Let X and Y be jointly continuous random variables with joint density

$$f_{X,Y}(x,y) = \begin{cases} 1 & \text{if } 0 \leq x, y \leq 1 \\ 0 & \text{otherwise.} \end{cases}$$

   Then $P(1 < X < 2, 1 < Y < 2)$ is given by

   (a) 1.

   (b) 0.5.

   (c) 0.6.

   (d) 0.

$$P(1 < X < 2, 1 < Y < 2) = \int_1^2 \int_1^2 f_{X,Y}(x,y)\, dx\, dy$$
$$= \int_1^2 \int_1^2 0 \, dx\, dy$$
$$= 0.$$

5. If X and Y are jointly continuous random variables with joint density $f_{X,Y}$, then

$$P((X,Y) \in A) = \int\int_A f_{X,Y}(x,y)dxdy.$$

This statement is

(a) True.

(b) False.

See lecture notes