Unit 9 - Week 7

Assignment 7

The due date for submitting this assignment has passed. **Due on 2019-03-20, 23:59 IST**
As per our records you have not submitted this assignment.

1) ***1 point***

Let (X_1, X_2) have a uniform distribution on a triangular region with the joint density

$$f(x_1, x_2) = \begin{cases} 2, & 0 \le x_1 \le x_2 \le 1 \\ 0, & otherwise \end{cases}.$$

Let $U = \frac{X_1}{X_2}$. Find $P\left(\frac{1}{2} \le U \le \frac{3}{2}\right)$.

a. $\frac{1}{2}$

b. $\frac{1}{3}$

c. $\frac{1}{4}$

d. $\frac{1}{5}$

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.

2) ***1 point***

Week 12
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Assignment Solution

Let (X,Y) be jointly distributed continuous random variables with the joint density

$$f(x,y)=\begin{cases}x+y, & 0<x<1,\ 0<y<1\\ 0, & otherwise\end{cases}.$$

Let U=XY. Find Var (U).

a. $\frac{1}{9}$

b. $\frac{1}{18}$

c. $\frac{1}{36}$

d. $\frac{1}{54}$

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
b.

3) **1 point**

Let X and Y be independent random variables each with an exponential distribution parameter λ. Let $U=\frac{Y}{X+Y}$. Find $E(U^2)$.

a. $\frac{1}{2}$

b. $\frac{1}{3}$

c. $\frac{1}{4}$

d. $\frac{1}{5}$

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
b.

4) **1 point**

Let (X,Y) be jointly distributed continuous random variables with the joint density

$$f(x,y)=\begin{cases}2e^{-x-2y}, & x>0,\ y>0\\ 0, & otherwise\end{cases}.$$

Let $U=X+Y$. Find $E(U)$.

a. $\frac{1}{2}$

b. $\frac{1}{3}$

c. $\frac{3}{2}$

d. $\frac{3}{5}$

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
c.

5) **1 point**

Let $X_1,\ldots,X_5$ be an independent identical distributed random sample from an expon distribution with mean 9. Consider $X_{(1)}=\min(X_1,\ldots,X_5)$ then find $P(X_{(1)}>7\,|\,X_{(1)}>4)$.

a. $e^{-\frac{1}{9}}$

b. $e^{-\frac{1}{15}}$

c. $e^{-\frac{3}{5}}$

d. $e^{-\frac{5}{3}}$

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
d.

6) **1 point**

Let X and Y be an independent continuous random variables with respective densities

$f(x)=\frac{1}{\pi\sqrt{1-x^2}},\ -1<x<1$ and $f(y)=2y\,e^{-y^2},\ 0<y<\infty.$

Find $E(XY)$.

a. 0
b. 1
c. 2
d. 3

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.

7) **1 point**

Let X_1, X_2, X_3 be independent and identically distributed random variables with the proba mass function

$$P(X=k)=\frac{1}{3}\left(\frac{2}{3}\right)^{k-1},\quad k=1,2,\ldots$$

Find $P(X_{(3)}=2)$.

a. $\frac{68}{729}$
b. $\frac{29}{729}$
c. $\frac{98}{729}$
d. $\frac{71}{729}$

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
c.

8) **1 point**

Let X_1, X_2, X_3, X_4 and X_5 be independent and identically distributed random variables wit common density

$$f(x) = \begin{cases} 1, & 0 < x < 1 \\ 0, & otherwise \end{cases}.$$

Let $Y = X_{(3)}$ be a third order statistic with density of the form

$$g(y) = Ay^B(1-y)^C, \quad 0 < y < 1.$$

Then Find the value of A, B and C.

a. 15, 2 and 3
b. 15, 2 and 2
c. 30, 2 and 3
d. 30, 2 and 2

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
d.

9) **1 point**

Let X_1, X_2, X_3 and X_4 be independent and identically distributed random variables witl density

$$f(x) = \begin{cases} 1, & 0 < x < 1 \\ 0, & otherwise \end{cases}.$$

Let $Y_i = -\log(X_i), \quad i = 1, 2, 3, 4$. Find $E(\bar{Y})$.

a. 1
b. 2
c. 3
d. 4

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.

10) **1 point**

Let $X_1,...,X_{10}$ be independent and identically standard normal random variables Let $Z = \sum_{i=1}^{10} X$

Then $Var(Z)$ is

a. 10
b. 15
c. 20
d. 25

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
c.

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