Unit 4 - week 2

Assignment 2

The due date for submitting this assignment has passed. **Due on 2019-08-21, 23:59 IST.**
As per our records you have not submitted this assignment.

Each of the following questions has four options out of which one or more options can be correct. Individual marks are mentioned corresponding to each questions. In case of multiple answers partial marks will be awarded for every correct option chosen provided no incorrect option have been chosen. 0 marks are awarded for questions not attempted.

1) If X has $N(\mu, \sigma^2)$. Then, distribution of $Y = a + bX$ is **2 points**

- $N(a - b\mu, a - b\sigma^2)$
- $N(a - b\mu, b^2\sigma^2)$
- $N(a + b\mu, b^2\sigma^2)$
- $N(a + b\mu, a^2 + b^2\sigma^2)$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$N(a + b\mu, b^2\sigma^2)$

2) Let X be the life length of an electron tube and suppose that X may be represented as a continuous random variable which is exponentially distributed with parameter λ. Let $p_j = P(j \leq X < j + 1)$ be of the form $(1 - \alpha)\alpha^j$. Then, value of α is **2 points**

- $\alpha = e^{\lambda}$
- $\alpha = e^{-\lambda}$
- $\alpha = \lambda$
- $\alpha = \frac{1}{2}$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$\alpha = e^{-\lambda}$

3) Let X be a continuous random variable with CDF $F_X(x)$. De fine $Y = F_X(X)$. Then, the distribution of Y is **2 points**

- $N(0, 1)$
- $exp(1)$
- $U(0, 1)$
- $C(0, 1)$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$U(0, 1)$

4) Consider a random variable X with $E(X) = 1$ and $E(X^2) = 1$. Then, $P(X = 3)$ equals **2 points**

- 1
- 0
- 0.5
- 0.25

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

5) Let X and Y be exponential distributed random variables with parameters 2 and 5 respectively. Assume that, the two random variables X and Y are independent. Then, P(X < Y). **2 points**

- 2/7
- 3/7
- 4/7
- 1/7

No, the answer is incorrect.
Score: 0
Accepted Answers:
2/7

6) The moment generating function of a discrete random variable X is given by $M_X(t) = \frac{1}{4} + \frac{1}{4}e^{-2t} + \frac{1}{6}e^{-t} + \frac{1}{3}e^{t}$. If μ is the mean and σ^2 is the variance of this random variable, then value of $P(\mu - \sigma < X < \mu + \sigma)$ equals **2 points**

- $\frac{1}{3}$
- $\frac{5}{12}$
- $\frac{1}{2}$
- $\frac{7}{12}$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$\frac{5}{12}$

7) Suppose that the two-dimensional random variable (X,Y) has joint pdf **2 points**

$$f_{XY}(x, y) = \begin{cases} kx(x - y), & 0 < x < 2, -x < y < x \\ 0, & \text{otherwise} \end{cases}$$

Which of the following statements are TRUE?

- $P(X \geq 1 \mid Y = \frac{1}{2}) = 0.94$
- $P(Y \leq 1 \mid X = 1) = 1$
- $k = 8$
- $P(Y \geq \frac{3}{2} \mid X = 1) = 0$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$P(Y \leq 1 \mid X = 1) = 1$
$P(Y \geq \frac{3}{2} \mid X = 1) = 0$

8) Let X be a continuous random variable with pdf **2 points**

$$f(x) = \begin{cases} \alpha + \beta x, & 0 \leq x \leq 1 \\ 0, & \text{otherwise} \end{cases}$$

If $E(X) = 1/6$, then the value of α and β is

- $\alpha = 3, \beta = 4$
- $\alpha = 3, \beta = -4$
- $\alpha = 4, \beta = 3$
- $\alpha = -4, \beta = 3$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$\alpha = 3, \beta = -4$

9) Let $\Omega = \mathcal{N} = \{0, 1, \ldots\}$. Let $\mathcal{F}$ be the largest σ − field on Ω . Define a probability measure on $(\Omega, \mathcal{F})$ by $P(\{n\}) = k3^{-n}$ where $n \in \Omega$ and k is a constant. Then, the probability of the event $\{n \in \Omega : n \text{ is even}\}$ is **2 points**

- 3/5
- 2/3
- 3/4
- 4/5

No, the answer is incorrect.
Score: 0
Accepted Answers:
3/4

10) If X is uniform distributed random variable in $(0, 1)$, then distribution of $Y = -2 \ln X$ is **2 points**

- Exponential
- Normal
- Binomial
- Cauchy

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