

Unit 3 - week 1

Course outline

How to access the portal?

Assignment 0

week 1

- Introduction and motivation for studying stochastic processes
- Probability space and conditional probability
- Random Variable and cumulative distribution function
- Discrete Uniform Distribution, Binomial Distribution, Geometric Distribution, Continuous Uniform Distribution, Exponential Distribution, Normal Distribution and Poisson Distribution
- Joint Distribution of Random Variables
- Independent Random Variables, Covariance and Correlation Coefficient and Conditional Distribution
- Conditional Expectation and Covariance Matrix
- Generating Function, Law of Large Numbers and Central Limit Theorem

Quiz : Assignment 1

- Assignment 1 solution
- Feedback Form

week 2

week 3

week 4

week 5

week 6

week 7

week 8

week 9

week 10

week 11

week 12

Assignment 1

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

Due on 2019-08-14, 23:59 IST.

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) Let E and F be two events such that $P(E) = 0.7$, $P(F) = 0.4$ and $P(E \cap F^c) = 0.4$. Then, $P(F|E \cup F^c)$ is equal to **2 points**

- $\frac{1}{2}$
 $\frac{1}{3}$
 $\frac{1}{4}$
 $\frac{1}{5}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $\frac{1}{3}$

- 2) Let joint density function of (X, Y) be $f(x, y) = c(x^2 + y)$ if $-x < y < x$, $0 < x < 1$ and 0 otherwise. Then value of c is equal to **2 points**

- 2/3
 2
 1
 3

No, the answer is incorrect.
Score: 0

Accepted Answers:
2

- 3) In a room, there are four 18 year old males, six 18 year old females, six 19 year old males and x 19 years old females. What is the value of x if we want age and gender to be independent when a student is chosen at random. **2 points**

- x = 6
 x = 10
 x = 9
 x = 12

No, the answer is incorrect.
Score: 0

Accepted Answers:
x = 9

- 4) A circle of random radius R (in cm) is constructed. Let $R \sim U(0, 2)$. The probability that area of the circle is less than 2 cm^2 is **0 points**

- $\frac{1}{2\sqrt{\pi}}$
 $\frac{1}{\sqrt{3}\pi}$
 $\frac{1}{\sqrt{2}\pi}$
 $\frac{1}{\sqrt{\pi}}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $\frac{1}{\sqrt{2}\pi}$

- 5) A system consisting of n components function if and only if atleast one of n components function. Suppose that all n components function independently, each with probability 4/5. If reliability of the system is 624/625, then the value of n is **2 points**

- 2
 4
 3
 5

No, the answer is incorrect.
Score: 0

Accepted Answers:
4

- 6) There are two urns U_1 and U_2 . U_1 contains three white and three black balls, and U_2 contains two white and three black balls. Four balls are drawn at random from U_1 and transferred to U_2 . Then a ball is drawn at random from U_2 . The probability that ball drawn from U_2 is white is **2 points**

- 4/9
 9/16
 3/4
 5/8

No, the answer is incorrect.
Score: 0

Accepted Answers:
4/9

- 7) Let ω be a complex cube root of unity with $\omega \neq 1$. A fair die is thrown three times. If x, y and z are the numbers obtained on the die, then the probability that $\omega^x + \omega^y + \omega^z = 0$ is equal to **2 points**

- $\frac{1}{9}$
 $\frac{1}{2}$
 $\frac{2}{9}$
 $\frac{2}{3}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $\frac{2}{9}$

- 8) The coefficients a, b and c of the quadratic equation $ax^2 + bx + c = 0$ are determined by rolling a fair die three times in a row. The probability that both the roots of the equation are real is **2 points**

- $\frac{43}{216}$
 $\frac{173}{216}$
 $\frac{73}{216}$
 $\frac{143}{216}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $\frac{43}{216}$

- 9) Let X be uniformly distributed random variable over the interval [0,10]. Define $Y = \min\{8, \max\{4, X\}\}$, then which of the following statements are true? **2 points**

- $P(5 \leq Y \leq 8) = 1$
 $P(Y = 4) = 0.3$
 $P(3 \leq Y \leq 8) = 1$
 $P(Y = 8) = 0.4$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $P(3 \leq Y \leq 8) = 1$