

Continuous Random Variables - Practice MCQs

1. Which of the following is a valid property of a continuous random variable?

- A. The probability at a single point is always greater than zero
- B. The PDF must be a decreasing function
- C. The total area under the PDF curve must equal 1
- D. The cumulative distribution function (CDF) must be negative

Answer: C

2. Let $X \sim U(1, 5)$. What is the mean of X ?

- A. 2
- B. 3
- C. 4
- D. 2.5

Answer: B

3. Let a continuous random variable X have the PDF $f(x) = 2x$ for $0 \leq x \leq 1$. What is the expected value $E[X]$?

- A. 0.5
- B. 0.67
- C. 0.75
- D. 1

Answer: B

4. Which of the following distributions is commonly used to model waiting times?

- A. Normal Distribution
- B. Exponential Distribution
- C. Uniform Distribution
- D. Bernoulli Distribution

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Answer: B

5. Let $X \sim N(0, 1)$. Which of the following statements is TRUE?

- A. $P(X = 0) = 1$
- B. $P(X = 0) = 0$
- C. $P(X \leq 0) = 1$
- D. $P(X = 0.5) = 0.5$

Answer: B

6. The variance of an exponential distribution with rate λ is:

- A. λ
- B. $1/\lambda$
- C. $1/(\lambda^2)$
- D. λ^2

Answer: C

7. A continuous random variable has a PDF $f(x) = kx^2$ for $0 \leq x \leq 1$. Find the value of k .

- A. 1
- B. 2
- C. 3
- D. 4

Answer: C

8. Which statement is FALSE about continuous random variables?

- A. The CDF is non-decreasing
- B. The area under the PDF is always 1
- C. The PDF can be negative
- D. The probability between two points is the area under the PDF curve

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Answer: C

9. The mean of a normal distribution $N(\mu, \sigma^2)$ is:

- A. σ
- B. 0
- C. μ
- D. $\mu + \sigma$

Answer: C

10. A feature in a dataset that is best modeled using a continuous random variable is:

- A. Gender
- B. Number of students
- C. Temperature in Celsius
- D. Country of origin

Answer: C