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1. Which of the following best describes a discrete random variable?
   a) A variable that can take on any value within a specified range.
   b) A variable that can take on only a countable number of distinct values.
   c) A variable that can take on any value in a continuous interval.
   d) A variable that can take on only integer values.

2. Which of the following is an example of a discrete random variable?
   a) Height of individuals in a population.
   b) Weight of oranges in a basket.
   c) Number of cars passing through an intersection in a given hour.
   d) Time taken for a computer program to execute.

3. What is the probability mass function (PMF) used to describe?
   a) Continuous random variables.
   b) Discrete random variables.
   c) The cumulative distribution function.
   d) The probability density function.

4. Which of the following best describes a continuous random variable?
   a) A variable that can take on only a countable number of distinct values.
   b) A variable that can take on any value within a specified range.
   c) A variable that can take on only integer values.
   d) A variable that can take on values from a finite set.

5. Which of the following is an example of a continuous random variable?
   a) Number of students in a classroom.
   b) Number of heads obtained when flipping a coin.
   c) Temperature recorded in a city at noon.
   d) Number of defective items produced in a factory.

6. The probability density function (PDF) is used to describe:
   a) Discrete random variables.
   b) Continuous random variables.
   c) The cumulative distribution function.
   d) The probability mass function.

7. Which of the following statements is true about the cumulative distribution function (CDF)?
   a) It can only be defined for discrete random variables.
   b) It represents the probability density function.
   c) It provides the probability of a random variable taking a value less than or equal to a given value.
   d) It is used to calculate the expected value of a random variable.

8. Which of the following is a characteristic of the expected value of a random variable?
   a) It can be negative.
   b) It represents the most frequently occurring value.
   c) It is always greater than the variance.
   d) It represents the long-term average value of the random variable.

9. Variance of a random variable measures:
   a) The spread of the distribution.
   b) The likelihood of a particular outcome.
   c) The distance of each value from the mean.
   d) The probability of each outcome occurring.

10. The standard deviation of a random variable is:
   a) Always negative.
   b) A measure of how spread out the values of the random variable are.
   c) Equal to the mean of the random variable.
   d) The same as the variance.