

UNIT-I: Random Variables and Probability Distributions

1. A random variable is a function that assigns:

- a) Letters to outcomes
- b) Numbers to outcomes
- c) Symbols to events
- d) Colors to experiments

Answer: b) Numbers to outcomes

2. Which of the following is a discrete random variable?

- a) Height of students
- b) Weight of a person
- c) Number of cars in a parking lot
- d) Time taken to complete a task

Answer: c) Number of cars in a parking lot

3. The sum of probabilities in a probability distribution is:

- a) 0
- b) 1
- c) 2
- d) Depends on the experiment

Answer: b) 1

4. A continuous random variable can take:

- a) Only integer values
- b) Only positive values
- c) Any value within an interval
- d) Only finite values

Answer: c) Any value within an interval

5. The expected value of a random variable is also called:

- a) Median
- b) Mode
- c) Mean
- d) Range

Answer: c) Mean

6. Variance measures:

- a) Central tendency
- b) Spread of data
- c) Highest value
- d) Probability of an event

Answer: b) Spread of data

8. The Binomial distribution is used when:

- a) Outcomes are continuous
- b) There are two possible outcomes in each trial
- c) Events occur randomly over time
- d) Sample size is zero

Answer: b) There are two possible outcomes in each trial

9. The number of trials in a Binomial distribution is:

- a) Infinite
- b) Fixed
- c) Random
- d) Zero

Answer: b) Fixed

10. The probability of success in each Binomial trial is:

- a) Variable
- b) Zero
- c) Constant
- d) Greater than 1

Answer: c) Constant

11. The Binomial distribution has parameters:

- a) λ
- b) n and p
- c) μ and σ
- d) x and y

Answer: b) n and p

12. Poisson distribution is mainly used to model:

- a) Heights of students
- b) Number of events occurring in a fixed interval
- c) Continuous measurements
- d) Sample means

Answer: b) Number of events occurring in a fixed interval

13. The parameter of the Poisson distribution is:

- a) n
- b) p
- c) λ
- d) σ

Answer: c) λ

14. Which distribution is a limiting case of the Binomial distribution?

- a) Normal
- b) Uniform
- c) Poisson
- d) Exponential

Answer: c) **Poisson**

15. In a probability distribution, each probability must be:

- a) Negative
- b) Greater than 1
- c) Between 0 and 1
- d) Equal to 2

Answer: c) Between 0 and 1

Fill in the Blanks

1. A _____ variable assigns numerical values to outcomes of a random experiment.
Answer: Random
2. A random variable that takes countable values is called a _____ random variable.
Answer: Discrete
3. A random variable that takes values over an interval is called a _____ random variable.
Answer: Continuous
4. The sum of all probabilities in a probability distribution is _____.
Answer: 1
5. The expected value of a random variable is called its _____.
Answer: Mean
6. Variance measures the _____ of a random variable.
Answer: Dispersion (or Spread)
7. The square root of variance is called the _____ deviation.
Answer: Standard
8. A Binomial experiment consists of a fixed number of _____ trials.
Answer: Independent
9. Each trial in a Binomial distribution has _____ possible outcomes.
Answer: Two

10. The two outcomes of a Binomial trial are called _____ and failure.

Answer: Success

11. The probability of success in each Binomial trial remains _____.

Answer: Constant

12. The Binomial distribution is represented by the parameters _____ and _____.

Answer: n , p

13. The Poisson distribution is used to model the number of _____ occurring in a fixed interval.

Answer: Events

14. The parameter of the Poisson distribution is denoted by _____.

Answer: λ (lambda)

15. The Poisson distribution is a limiting form of the _____ distribution.

Answer: Binomial