



NARSIMHAREDDY ENGINEERING COLLEGE
(UGC AUTONOMOUS)

II B.Tech I Semester (NR25)

MATHEMATICAL AND STATISTICAL FOUNDATIONS (25MA301)

UNIT - II

Random Variables and Probability Distributions

Multiple Choice Questions

1. A random variable is a function that assigns [b]
A) Letters to events
B) **Numerical values to outcomes of a random experiment**
C) Symbols to events
D) Graphs to experiments
2. Which of the following is a discrete random variable [c]
A) Height of students
B) Weight of a person
C) **Number of cars in a parking lot**
D) Time taken to complete a race
3. A continuous random variable can take [c]
A) Only integer values
B) Only positive values
C) **Any value within a given interval**
D) Only finite values
4. The sum of probabilities in any probability distribution is [d]
A) 0
B) 2
C) 100
D) **1**
5. The mean of a random variable is also called its [c]
A) Median
B) Mode
C) **Expected value**
D) Standard deviation
6. Variance measures the [c]
A) Maximum value
B) Minimum value

C) **Spread of the distribution**

D) Total probability

7. Which distribution is used for a fixed number of independent trials [d]

A) Poisson Distribution

B) Normal Distribution

C) Uniform Distribution

D) **Binomial Distribution**

8. A binomial experiment has [c]

A) Three outcomes

B) Infinite outcomes

C) **Two possible outcomes in each trial**

D) Four outcomes

9. The parameters of a binomial distribution are [b]

A) λ and μ

B) **n and p**

C) μ and σ

D) x and y

10. The mean of a binomial distribution is [b]

A) npq

B) **np**

C) nq

D) p^2

11. The variance of a binomial distribution is [c]

A) np

B) $p(1 - p)$

C) **npq**

D) n^2p

12. The Poisson distribution is mainly used to model [b]

A) Continuous data

B) **Rare events occurring in a fixed interval**

C) Heights of people

D) Uniformly distributed values

13. The parameter of a Poisson distribution is [d]

A) p

B) n

C) q

D) **λ (lambda)**

14. The mean of a Poisson distribution is [c]

A) n

- B) p
- C) λ
- D) λ^2

15. In a Poisson distribution, the variance is equal to [c]

- A) np
- B) npq
- C) λ
- D) λ^2

Fill in the Blanks

1. A _____ variable assigns numerical values to the 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 can take any value in an interval is called a _____ random variable.

Answer: continuous

4. The total probability of all possible values of a random variable is _____.

Answer: 1

5. The mean of a random variable is also known as the _____ value.

Answer: expected

6. Variance measures the _____ of a probability distribution.

Answer: spread

7. A binomial distribution has _____ possible outcomes in each trial.

Answer: two

8. The two parameters of the binomial distribution are _____ and _____.

Answer: n, p

9. The mean of a binomial distribution is _____.

Answer: np

10. The variance of a binomial distribution is _____.

Answer: npq

11. The Poisson distribution is commonly used to model _____ events.

Answer: rare

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

Answer: λ (lambda)

13. The mean of a Poisson distribution is equal to _____.

Answer: λ

14. In a Poisson distribution, the mean and variance are _____.

Answer: equal

15. The probability values in a discrete probability distribution must be _____ or equal to zero.

Answer: positive