

UNIT-II

1. The probability distribution function (PDF) of a continuous random variable must always be:
a) Negative b) Non-negative ☒ c) Greater than 1 d) Equal to variance
2. The area under a probability density function curve is always:
a) 0 b) 1 ☒ c) Infinite d) Depends on distribution
3. The binomial distribution is used when:
a) Trials are dependent b) Trials are independent with two outcomes ☒ c) Outcomes are continuous d) Variance is zero
4. The Poisson distribution is often used to model:
a) Continuous outcomes b) Rare events in a fixed interval ☒ c) Gaussian variables d) Uniform outcomes
5. The uniform distribution has:
a) Equal probability for all outcomes ☒ b) Increasing probability c) Decreasing probability d) No probability
6. The exponential distribution is commonly used to model:
a) Waiting times ☒ b) Heights c) Coin tosses d) Gaussian noise
7. The Gaussian distribution is also called:
a) Normal distribution ☒ b) Poisson distribution c) Uniform distribution d) Binomial distribution
8. The Rayleigh distribution is often used in: a) Wireless communication ☒ b) Coin tosses c) Dice rolls d) Binomial trials
9. The expected value of a random variable is also called its:
a) Mean ☒ b) Variance c) Skewness d) Mode
10. Variance measures:
a) Central tendency b) Spread of data ☒ c) Skewness d) Probability
11. Skewness measures
: a) Symmetry of distribution ☒ b) Spread c) Mean d) Variance
12. The moment generating function (MGF) is used to:
a) Generate moments ☒ b) Calculate variance only c) Find skewness only d) Define independence
13. The characteristic function is the Fourier transform of
a) Probability density function ☒ b) Variance c) Skewness d) Mean
14. A monotonic transformation of a continuous random variable preserves:
a) Order ☒ b) Variance c) Skewness d) Independence
15. The central limit theorem states that the sum of many independent random variables tends to:

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

16. A joint distribution function describes:

- a) One random variable b) Two or more random variables ☒ c) Variance only d) Skewness only

17. Marginal distribution is obtained by:

- a) Integrating out other variables ☒ b) Multiplying distributions c) Adding variances d) Skewing data

18. Two random variables are statistically independent if:

- a) Joint PDF = product of marginal PDFs ☒ b) Variance = 0 c) Skewness = 0 d) Mean = 0

19. Jointly Gaussian random variables are defined by:

- a) Mean and covariance ☒ b) Variance only c) Skewness only d) Uniformity

20. The distribution of the sum of several independent random variables tends to:

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

1. The total area under a probability density function is -----(1).
2. The binomial distribution models -----(**independent trials with two outcomes.**)
3. The Poisson distribution models----- (**rare events in a fixed interval.**)
4. The uniform distribution assigns -----(**equal probability**) to all outcomes.
5. The exponential distribution is used to model -----(**waiting times**).
6. The Gaussian distribution is also called the -----(**Normal distribution**).
7. The Rayleigh distribution is used in -----**wireless communication**.
8. The expected value of a random variable is its -----**mean**.
9. Variance measures the -----**spread of data**.
10. Skewness measures the -----**symmetry of distribution**.
11. The moment generating function is used to -----**generate moments**.
12. The characteristic function is the -----**Fourier transform of the PDF**.
13. A monotonic transformation preserves the -----**order** of values.
14. The central limit theorem states that sums of random variables tend to a -----**normal distribution**.
15. A joint distribution function describes -----**two or more random variables**.
 1. Marginal distribution is obtained by **integrating out other variables**.
 2. Two random variables are independent if their **joint PDF equals product of marginals**.
 3. Jointly Gaussian random variables are defined by their **mean and covariance**.

4. The distribution of the sum of several independent random variables tends to a **normal distribution**.
5. The variance of a random variable is the **expected value of squared deviation from mean**.