

- In a Binomial Distribution, if 'n' is the number of trials and 'p' is the probability of success, then the mean value is given by \_\_\_\_\_
  - np**
  - n
  - p
  - $np(1-p)$
- In a Binomial Distribution, if p, q and n are probability of success, failure and number of trials respectively then variance is given by \_\_\_\_\_
  - np
  - npq**
  - $np^2q$
  - $npq^2$
- If 'X' is a random variable, taking values 'x', probability of success and failure being 'p' and 'q' respectively and 'n' trials being conducted, then what is the probability that 'X' takes values 'x'? Use Binomial Distribution
  - $P(X = x) = {}^nC_x p^x q^{n-x}$
  - $P(X = x) = {}^nC_x p^x q^{(n-x)}$**
  - $P(X = x) = {}^xC_n q^x p^{(n-x)}$
  - $P(x = x) = {}^xC_n p^n q^x$
- If 'p', 'q' and 'n' are probability pf success, failure and number of trials respectively in a Binomial Distribution, what is its Standard Deviation?
  - $np - \sqrt{pq}$
  - $pq - \sqrt{pq}$
  - $(np)^2$
  - $npq - \sqrt{pq}$**
- It is suitable to use Binomial Distribution only for \_\_\_\_\_
  - Large values of 'n'
  - Fractional values of 'n'
  - Small values of 'n'**
  - Any value of 'n'
- Binomial Distribution is a \_\_\_\_\_
  - Continuous distribution
  - Discrete distribution**
  - Irregular distribution
  - Not a Probability distribution
- In a Poisson Distribution, if 'n' is the number of trials and 'p' is the probability of success, then the mean value is given by?
  - $m = np$**
  - $m = (np)^2$

- c)  $m = np(1-p)$   
d)  $m = p$
8. If 'm' is the mean of a Poisson Distribution, then variance is given by \_\_\_\_\_  
a)  $m^2$   
b)  $m^{1/2}$   
c)  $m$   
d)  $m^{1/2}$
9. If 'm' is the mean of Poisson Distribution, the  $P(0)$  is given by \_\_\_\_\_  
a)  $e^{-m}$   
b)  $e^m$   
c)  $e$   
d)  $m^{-e}$
10. For a Poisson Distribution, if mean( $m$ ) = 1, then  $P(1)$  is?  
a)  $1/e$   
b)  $e$   
c)  $e/2$   
d) Indeterminate
11. Normal Distribution is applied for \_\_\_\_\_  
a) **Continuous Random Distribution**  
b) Discrete Random Variable  
c) Irregular Random Variable  
d) Uncertain Random Variable
12. The shape of the Normal Curve is \_\_\_\_\_  
a) **Bell Shaped**  
b) Flat  
c) Circular  
d) Spiked
13. Normal Distribution is symmetric is about \_\_\_\_\_  
a) Variance  
b) **Mean**  
c) Standard deviation  
d) Covariance
14. The area under a standard normal curve is?  
a) 0  
b) **1**  
c)  $\infty$   
d) not defined
15. The value of constant 'e' appearing in normal distribution is \_\_\_\_\_  
a) 2.5185  
b) 2.7836

c) 2.1783

**d) 2.7183**

16. In Standard normal distribution, the value of mode is \_\_\_\_\_

a) 2

b) 1

c) 0

d) Not fixed

17. The mean of exponential distribution is given as \_\_\_\_\_

a)  $1/\lambda$

b)  $\lambda$

c)  $\lambda^2$

d)  $1/\lambda^2$

18. A mobile conversation follows a exponential distribution  $f(x) = (1/3)e^{-x/3}$ . What is the probability that the conversation takes more than 5 minutes?

a)  $e^{-5/3}$

b)  $e^{-15}$

c)  $5e^{-15}$

d)  $e^{-5}/3$

19. A random variable X has an exponential distribution with probability distribution function is given by

$f(x) = 3e^{-3x}$  for  $x > 0$  = 0 otherwise

Find probability that X is not less than 2.

a)  $e^{-3}$

b)  $e^{-6} - 3$

c)  $e^{-6}$

d)  $e^{-6} - 1$

20. Consider a random variable with exponential distribution with  $\lambda=1$ . Compute the probability for  $P(X > 3)$ .

a)  $e^{-3}$

b)  $e^{-1}$

c)  $e^{-2}$

d)  $e^{-4}$

21. Which of the following mentioned standard Probability density functions is applicable to discrete Random Variables?

a) Gaussian Distribution

**b) Poisson Distribution**

c) Rayleigh Distribution

d) Exponential Distribution

22. For larger values of 'n', Binomial Distribution \_\_\_\_\_

a) loses its discreteness

**b) tends to Poisson Distribution**

c) stays as it is

- d) gives oscillatory values
23. It is suitable to use Binomial Distribution only for \_\_\_\_\_
- Large values of 'n'
  - Fractional values of 'n'
  - Small values of 'n'**
  - Any value of 'n'
24. In a Binomial Distribution, the mean and variance are equal.
- True
  - False
25. In a Binomial Distribution, if  $p = q$ , then  $P(X = x)$  is given by?
- ${}^n C_x (0.5)^n$
  - ${}^n C_n (0.5)^n$
  - ${}^n C_x p^{(n-x)}$
  - ${}^n C_n p^{(n-x)}$
26. The p.d.f of Poisson Distribution is given by \_\_\_\_\_
- $e^{-m} m^x / x!$
  - $e^{-mx} / mx$
  - $x! m^x e^{-m}$
  - $e^m m^x / x!$
27. If 'm' is the mean of a Poisson Distribution, the standard deviation is given by \_\_\_\_\_
- $m - \sqrt{m}$
  - $m^2$
  - $m$
  - $\sqrt{m}$
28. Poisson distribution is applied for \_\_\_\_\_
- Continuous Random Variable
  - Discrete Random Variable**
  - Irregular Random Variable
  - Uncertain Random Variable
29. The recurrence relation between  $P(x)$  and  $P(x+1)$  in a Poisson distribution is given by \_\_\_\_\_
- $P(x+1) - m P(x) = 0$
  - $m P(x+1) - P(x) = 0$
  - $(x+1) P(x+1) - m P(x) = 0$**
  - $(x+1) P(x) - x P(x+1) = 0$
30. For a standard normal variate, the value of mean is?
- $\infty$
  - 1
  - 0**
  - not defined

31. The standard normal curve is symmetric about the value \_\_\_\_\_

- a) 0.5
- b) 1
- c)  $\infty$
- d) 0

32. For a standard normal variate, the value of Standard Deviation is \_\_\_\_\_

- a) 0
- b) 1**
- c)  $\infty$
- d) not defined

33. In Normal distribution, the highest value of ordinate occurs at \_\_\_\_\_

- a) Mean**
- b) Variance
- c) Extremes
- d) Same value occurs at all points

34. The shape of the normal curve depends on its \_\_\_\_\_

- a) Mean deviation
- b) Standard deviation**
- c) Quartile deviation
- d) Correlation

35. In Standard normal distribution, the value of median is \_\_\_\_\_

- a) 1
- b) 0**
- c) 2
- d) Not fixed

36. The mean of exponential distribution is given as \_\_\_\_\_

- a)  $1/\lambda$**
- b)  $\lambda$
- c)  $\lambda^2$
- d)  $1/\lambda^2$

1. Marks obtained by all the students of class 12 are presented in a frequency distribution with the classes of equal width. Let the median is 14 with median class interval 12-18 and median class frequency is 12. If the number of students whose marks are less than 12 is 18, the total number of students is:

- A. 48
- B. 40
- C. 44
- D. 52

2. Calculate the mode of the following data-

- A. Mode = 65.  
 B. Mode = 65.5  
 C. Mode = 62.4  
 D. None of these.
3. The range & Coefficient of Range are:
- |      |   |   |    |    |    |    |   |
|------|---|---|----|----|----|----|---|
| $x:$ | 1 | 2 | 3  | 4  | 5  | 6  | 7 |
| $f:$ | 5 | 9 | 12 | 17 | 14 | 10 | 6 |
- A. 6.5, 0.75  
 B. 6, 1.5  
 C. 6.5, 0.5  
 D. 6, 0.75
4. Calculate quartile deviation and coefficient of quartile deviation for the given data:  
 4,8,10,7,15,11,18,14,12,16.
- A. 3.75, 0.3261  
 B. 4.5, 0.7525  
 C. 3.5, 0.7575  
 D. 4.75, 0.3275
5. Calculate the Mean Deviation from the following data:
- |                 |      |       |       |       |       |       |
|-----------------|------|-------|-------|-------|-------|-------|
| Marks           | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 |
| No. of students | 10   | 20    | 30    | 50    | 40    | 30    |
- A. 33.11  
 B. 11.33  
 C. 11.11  
 D. 33.33
6. The mean of the 100 observation is 50 and their standard deviation is 5. Then the sum of squares of all observation is:
- A. 250000  
 B. 252500  
 C. 255000  
 D. 50000
7. If  $Q_3 = 20$  and  $Q_1 = 10$ , then coefficient of quartile deviation is:
- A. 2/3  
 B. 1/3  
 C. 2  
 D. 3

8. The first three moments about mean of a distribution 1, 3, 7, 9, 10 are:
- $\mu_1 = 0, \mu_2 = 10, \mu_3 = -12$
  - $\mu_1 = 0, \mu_2 = -12, \mu_3 = -12$
  - $\mu_1 = 0, \mu_2 = -12, \mu_3 = 10$
  - $\mu_1 = 0, \mu_2 = 12, \mu_3 = -12$
9. Compute first three moments of the data 3, 5, 7, 9 about the point 4.
- $\mu'_1 = 2, \mu'_2 = 9, \mu'_3 = 38$
  - $\mu'_1 = 0, \mu'_2 = 9, \mu'_3 = 35$
  - $\mu'_1 = 2, \mu'_2 = -9, \mu'_3 = 35$
  - $\mu'_1 = 0, \mu'_2 = -9, \mu'_3 = 38$
10. If  $\beta_1 = 0.066$  and  $\beta_2 = 2.9584$ , then the nature of the curve is:
- Negatively skewed and platykurtic.
  - Positively skewed and platykurtic.
  - Symmetrically skewed and leptokurtic.
  - None of these
- 
1. If the normal equations of straight line  $y = a + bx$  are  $26 = 4a + 6b$  and  $34 = 6a + 4b$ , then fit the above straight line.
- $y = 5x - 1$
  - $y = 5x + 1$
  - $y = x + 5$
  - $y = x - 5$
2. In the least square method we use \_\_\_\_\_ to find the values of unknowns.
- Auxiliary equations
  - General equations
  - Normal equations
  - None of these.
3. The normal equation of fitting of parabola  $y = a + bx + cx^2$  is:
- $\sum xy = a \sum x + b \sum x^2 + c \sum x^3$
  - $\sum y = a \sum x + b \sum x^2 + c \sum x^3$
  - $\sum y = a \sum x + b \sum x^3 + c \sum x^4$
  - $\sum xy = a \sum x + b \sum x^2 + c \sum x^3$
4. If the values of two variables move in the same direction, the correlation is said to be \_\_\_\_\_.
- Non-linear
  - Linear
  - Negative
  - Positive
5. The coefficient of correlation between two variables X and Y is 0.48. The covariance is 36. The variance of X is 16. The standard deviation of Y is:
- 18.75
  - 13.32

- C. 16.5  
D. 10.15
6. The coefficient of correlation ranges from:  
A. 0 to 1  
B. 0 to infinity  
C. -1 to 1  
D. -1 to 0
7. If the correlation coefficient is close to +1, it indicates:  
A. Strong positive correlation  
B. Weak positive correlation  
C. Strong negative correlation  
D. No correlation
8. Let  $x - 3y + 4 = 0$  and  $2x - 7y + 8 = 0$  be two lines of regression. If  $b_{yx}$  and  $b_{xy}$  are regression coefficients of lines of regression of  $y$  on  $x$  and  $x$  on  $y$  respectively, then what is the value of  $b_{xy} + 7b_{yx}$ ?  
A. 1  
B. 5  
C. 2  
D. 0
9. If the two regression lines cut each other at the right angle then the value of coefficient of correlation will be:  
A. 0  
B. 1  
C. -1  
D. More than 1.
10. If  $r = 1$ , the angle between regression lines is \_\_\_\_\_.  
A.  $90^\circ$   
B.  $180^\circ$   
C.  $0^\circ$   
D.  $360^\circ$

1. Choose of the following are not the probability distribution of a random variable.
- A.  $x: \begin{matrix} 0 & 1 & 2 \end{matrix}$   
 $P(x): \begin{matrix} 0.4 & 0.4 & 0.2 \end{matrix}$
- B.  $x: \begin{matrix} 0 & 1 & 2 & 3 & 4 \end{matrix}$   
 $P(x): \begin{matrix} 0.1 & 0.5 & 0.2 & -0.1 & 0.3 \end{matrix}$
- C.  $x: \begin{matrix} -1 & 0 & 1 \end{matrix}$   
 $P(x): \begin{matrix} 0.6 & 0.1 & 0.2 \end{matrix}$
- D.  $x: \begin{matrix} 3 & 2 & 1 & 0 \end{matrix}$   
 $P(x): \begin{matrix} 0.3 & 0.4 & 0.1 & 0.2 \end{matrix}$
2. Four persons are chosen at random from a group containing 3 men, 3 women and 4 children then the probability that exactly two of them will be children is:  
A.  $3/7$

- B.  $\frac{7}{3}$   
C.  $\frac{4}{7}$   
D. None of these.
3. A discrete random variable has a range of  $\{0, 1, 2, 3\}$ . If the probability of each value is the same, the probability of  $X = 2$  is \_\_\_\_\_.  
A.  $\frac{1}{2}$   
B.  $\frac{1}{4}$   
C.  $\frac{1}{3}$   
D. 1
4. If  $X$  is a continuous random variable, the probability that  $X$  is exactly equal to a specific value 'a' is:  
A.  $P(X = a) = 1$   
B.  $P(X = a) > 0$   
C.  $P(X = a) = 0$   
D. None of these.
5. The mean value of the probability density function  $f(x) = \begin{cases} 1, & 0 < x < 1 \\ 0, & \text{Otherwise} \end{cases}$  is:  
A. 0.35  
B. 0.25  
C. 0.29  
D. 0.39
6. The joint probability of two random variables of  $X$  and  $Y$  is given by:  $P(X=0, Y=0)=0.2$ ,  $P(X=0, Y=1)=0.2$  and  $P(X=1, Y=1)=0.6$ . Then marginal probability of  $X=1$  is \_\_\_\_\_.  
A. 1  
B. 0.2  
C. 0.4  
D. 0.6
7. The joint probability of two random variables of  $X$  and  $Y$  is given by:  $P(X=0, Y=0)=0.3$ , and  $P(X=1, Y=1)=0.7$ . Then conditional probability of  $Y=1$  given  $X=1$  is \_\_\_\_\_.  
A. 0  
B. 1  
C. 0.3  
D. 0.7
8. The marginal density function of  $X$  is \_\_\_\_, for the joint probability density is given as:  

$$f(x, y) = \begin{cases} xe^{-x(y+1)}, & 0 \leq x \leq \infty \\ 0; & \text{Otherwise} \end{cases}$$
  
A.  $e^{-x^2}$   
B.  $e^{-x}$   
C.  $e^{-(x+1)}$   
D. None of these.
9. If  $f_{XY}(x, y)$  is the joint probability density function of continuous random variables  $X$  and  $Y$ , then the joint CDF  $F_{XY}(x, y)$  related to \_\_\_\_\_.  
A.  $F_{XY}(x, y) = \int_{-\infty}^x \int_{-\infty}^y f_{XY}(x, y) dx dy$

- B.  $F_{XY}(x, y) = \int_0^x \int_x^y f_{XY}(x, y) dx dy$
- C.  $F_{XY}(x, y) = \int_x^\infty \int_y^\infty f_{XY}(x, y) dx dy$
- D. None of these.
10. The cumulative distribution function of a random variable X is the probability that X takes the value \_\_\_\_\_.
- A. Equal to  $x$ .
- B. Less than or equal to  $x$ .
- C. Greater than  $x$ .
- D. Zero.

Which distribution is commonly used to model the time between independent events occurring at a constant rate?

- A. Gaussian
- B. Exponential
- C. Binomial
- D. Poisson

2. What is the expected value of a random variable?

- A. The most likely value of the random variable
- B. The value that occurs most frequently
- C. The average value of the random variable over many repetitions of the experiment
- D. The maximum value of the random variable

3. Which distribution is used to model the number of events occurring in a fixed interval of time or space given a constant rate of occurrence?

- A. Binomial
- B. Exponential
- C. Poisson
- D. Uniform

4. If X and Y are two random variables  $Y \leq x$ , then

- A.  $E(y) \geq E(x)$
- B.  $E(y) \leq E(x)$
- C.  $E(x) + E(y) = 0$
- D.  $E(x) - E(y) = 0$

5. A random variable X may have no moments although its M.G.F is

- A. Not exist
- B. Exist

C. 1

D. 0

6. The moment generating function of binomial distribution is

A.  $M_x(t) = E(e^{tx})$

B.  $M_x(t) = E(e^x)$

C.  $M_x(t) = e^x$

D.  $M_x(t) = (e^{tx})$

7. \_\_\_\_\_ does not have additive or reproductive property

A. Binomial distribution

B. Poisson distribution

C. Binomial variate

D. Poisson variate

8. All binomial distribution

A. Variance  $\leq$  mean

B. Variance  $\geq$  mean

C. Variance  $>$  mean

D. Variance  $<$  mean

9. Poisson distribution is proceeding to limit as

A.  $\lambda \rightarrow 0$

B.  $\lambda \rightarrow -\infty$

C.  $\lambda \rightarrow \infty$

D. None of these

10.  $x \sim p(\lambda)$  to denote that  $x$  is a \_\_\_\_\_ variate with parameter \_\_\_\_\_

A. Binomial, np

B. Poisson,  $\lambda$

C. Normal,  $\mu$

D. Exponential,  $\lambda p$