

THEORETICAL DISTRIBUTIONS

41. Binomial distribution cannot be symmetrical.
Ans. Binomial distribution is symmetrical whenever $p = \frac{1}{2}$.
42. The area under a standard normal curve for $Z \geq 0$ is 1.
Ans. The area under a standard normal curve for $Z \geq 0$ is 0.5.
43. If mean of a Poisson distribution is 7 then it has one modal value.
Ans. If mean of a Poisson distribution is 7 then it has two modal values, 6 and 7.
44. Mean of a binomial distribution is 4.5 and the number of trials is 18 then it has 2 modes.
Ans. Mean of a binomial distribution is 4.5 and the number of trials is 18 then it has only 1 mode i.e 4.
45. Mean of a Poisson distribution is always larger than the variance.
Ans. Mean of a Poisson distribution is always equal to the variance.

46. The standard deviation of a standard normal variate is 0.
Ans. The standard deviation of a standard normal variate is 1.
47. If $p < \frac{1}{2}$, the Binomial distribution becomes negatively skewed.
Ans. If $p < \frac{1}{2}$, the Binomial distribution becomes positively skewed.
48. Normal distribution has one parameter.
Ans. Normal distribution has two parameters namely μ and σ .
49. A binomial distribution becomes symmetrical whenever, $pq = \frac{1}{2}$
Ans. A binomial distribution becomes symmetrical whenever, $pq = \frac{1}{2}$.
50. If the variance of a Poisson distribution is an integer then it has only one mode.
Ans. If the variance of a Poisson distribution is an integer then it has two mode.

CHAPTER WISE

FILL IN THE BLANKS WITH ANSWERS

CORRELATION & REGRESSION

1. Two variables are related by only one equation $50x + 39y = 2765$. Coefficient of correlation between them is _____.
Ans. Two variables are related by only one equation $50x + 39y = 2765$. Coefficient of correlation between them is -1 .
2. Correlation between habit of smoking and chances of lungs cancer can be best studied through _____ method.
Ans. Correlation between habit of smoking and chances of lungs cancer can be best studied through Rank correlation method.
3. The points of a scatter diagram lie on a straight line making an obtuse angle with the positive x-axis. The variables are _____ correlated.

- Ans.** The points of a scatter diagram lie on a straight line making an obtuse angle with the positive x-axis. The variables are negatively correlated.
4. As per the method of least squares, the sum of deviations parallel to the dependent axis should be _____.
Ans. As per the method of least squares, the sum of deviations parallel to the dependent axis should be 0.
5. If a line of regression is parallel to the y-axis then the other line of regression will be _____.
Ans. If a line of regression is parallel to the y-axis then the other line of regression will be parallel to the x-axis.
6. Determination of correlation between Yearly number of live births and yearly production of electricity is called _____ correlation.
Ans. Determination of correlation between Yearly number of live births and yearly production of electricity is called spurious correlation.

7. If one of the regression coefficients is larger than 1, the other one must be _____
Ans. If one of the regression coefficients is larger than 1, the other one must be smaller than 1.
8. If x and y are independent, the correlation coefficient between them is _____
Ans. If x and y are independent, the correlation coefficient between them is 0.
9. If x and y have perfect correlation, $r_{xy} =$ _____
Ans. If x and y have perfect correlation, $r_{xy} = \pm 1$
10. The product moment method of correlation was suggested by _____
Ans. The product moment method of correlation was suggested by Karl Pearson.

18. Increase in the sale of uniforms during the admission season is an example of seasonal variation due to _____
Ans. Increase in the sale of uniforms during the admission season is an example of seasonal variation due to social activities.
19. The stage when a business experiences the minimum profit level is called _____
Ans. The stage when a business experiences the minimum profit level is called Depression.
20. _____ number of normal equations are to be solved while fitting a second degree trend.
Ans. Three number of normal equations are to be solved while fitting a second degree trend.

TIME SERIES ANALYSIS

11. Semi-average method cannot provide _____ trend.
Ans. Semi-average method cannot provide non-linear trend.
12. The component of a time series that repeats at an interval of one year is called _____
Ans. The component of a time series that repeats at an interval of one year is called Seasonal variation
13. The multiplicative model for a time series is given by _____
Ans. The multiplicative model for a time series is given by $y = T \times S \times C \times I$
14. The general behaviour of a time series to increase or decrease studied over a long period of time is _____
Ans. The general behaviour of a time series to increase or decrease studied over a long period of time is trend.
15. War is an example of _____
Ans. War is an example of irregular.
16. If periods of various cycles are not equal, the period of the cycle is taken as _____
Ans. If periods of various cycles are not equal, the period of the cycle is taken as the average of the periods of all the cycles.
17. A time series can have _____ components.
Ans. A time series can have 4 components

INDEX NUMBER

21. Fisher's Ideal method does not satisfy _____ test.
Ans. Fisher's Ideal method does not satisfy Circular test
22. Unweighted GM of relatives method does not satisfy _____ test.
Ans. Unweighted GM of relatives method does not satisfy FRT test.
23. Paasche's method uses _____ year's quantity consumed as the weight.
Ans. Paasche's method uses Current year's quantity consumed as the weight.
24. Formula of Index Number by the weighted GM of relatives method is _____
Ans. Formula of Index Number by the weighted GM of relatives method is
- $$P_{01} = \text{Antilog} \left[\frac{1}{\sum w} \sum w \left\{ \log \left(\frac{P_1}{P_0} \right) \right\} \right] \times 100$$
25. _____ is used as weight in Laspeyre's method.
Ans. Base year's quantity is used as weight in Laspeyre's method.
26. The index number that shows the relative change in the quantity level at a point of time with respect to another point of time is a _____ index.
Ans. The index number that shows the relative change in the quantity level at a point of time with respect to another point of time is a Quantity index

27. _____ method is likely to over estimate the relative change.

Ans. Laspeyre's method is likely to over estimate the relative change

28. The price of a certain quality of rice in 2014 was Rs 20/- per KG which increased to Rs 28/- per KG in 2016. The price relative for the commodity is _____

Ans. The price of a certain quality of rice in 2014 was Rs 20/- per KG which increased to Rs 28/- per KG in 2016. The price relative for the commodity is 140.

29. Price quotations should be in the form of _____ per unit _____.

Ans. Price quotations should be in the form of Price per unit quantity.

30. Index numbers are called Economic _____.

Ans. Index numbers are called Economic barometers.

SAMPLING TECHNIQUES

31. A population consists of 5 units with values 2, 4, 6, 8 and 10. If all possible samples of 3 units will be drawn from it without replacement, the mean of the sampling distribution of mean will be _____

Ans. A population consists of 5 units with values 2, 4, 6, 8 and 10. If all possible samples of 3 units will be drawn from it without replacement, the mean of the sampling distribution of mean will be 6.

32. The formula for variance of sample mean under simple random sampling is _____

Ans. The formula for variance of sample mean under simple random sampling is $\frac{N-n}{nN} S^2$

33. Under simple random sampling, _____ is the unbiased estimator of the population total.

Ans. Under simple random sampling, $N\bar{y}$ is the unbiased estimator of the population total.

34. As compared to census, sampling requires _____ manpower.

Ans. As compared to census, sampling requires more manpower.

35. _____ method is more convenient to select a sample of 3 units from a population with 10 units.

Ans. Lottery method is more convenient to select a sample of 3 units from a population with 10 units.

36. Census method does not contain _____ error.

Ans. Census method does not contain sampling error.

37. For simple random sampling, the probability of selection of any population unit out of N into the sample of size n is _____

Ans. For simple random sampling, the probability of selection of any population unit out of N into the sample of size n is $\frac{n}{N}$

38. Precision of an estimate is _____ of the standard deviation.

Ans. Precision of an estimate is reciprocal of the standard deviation

39. The number of simple random samples of 6 units without replacement that can be drawn from a population with 30 units is _____

Ans. The number of simple random samples of 6 units without replacement that can be drawn from a population with 30 units is $\binom{30}{6}$

40. For a sample of size n units from a population of N sampling units, the sampling fraction is _____

Ans. For a sample of size n units from a population of N sampling units, the sampling fraction is $\frac{n}{N}$

THEORETICAL DISTRIBUTIONS

41. For a Normal distribution with mean μ and standard deviation σ , if $(-a \leq Z \leq a) = 95\%$ then $a =$ _____

Ans. For a Normal distribution with mean μ and standard deviation σ , if $(-a \leq Z \leq a) = 95\%$ then $a =$ 1.96

42. If a Binomial distribution is symmetrical then $p =$ _____

Ans. If a Binomial distribution is symmetrical then $p =$ $\frac{1}{2}$

43. The conditions under which a Binomial distribution tends to Poisson are _____

Ans. The conditions under which a Binomial distribution tends to Poisson are (i) $n \rightarrow \infty$ (ii) $p \rightarrow 0$ (iii) $np = \lambda$ is a constant.

44. In rolling a biased die, the probability of getting 6 is twice that of not getting it. If such a die will be rolled 4 times then the probability of getting 6 at least once is _____.

Ans. In rolling a biased die, the probability of getting 6 is twice that of not getting it. If such a die will be rolled 4 times then the probability of getting 6 at least once is $1 - \left(\frac{2}{3}\right)^4 = 1 - \frac{16}{81} = \frac{65}{81}$

45. The probability of failure at each trial is $\frac{2}{3}$ and the number of trials is 15 then the binomial distribution is _____ modal.

Ans. The probability of failure at each trial is $\frac{2}{3}$ and the number of trials is 15 then the binomial distribution is uni-modal.

46. The relationship between mean, median and mode of a standard normal distribution is _____

Ans. The relationship between mean, median and mode of a standard normal distribution is they are equal.

47. In terms of kurtosis, Poisson distribution is always _____

Ans. In terms of kurtosis, Poisson distribution is always Leptokurtic

48. If the mean of a Poisson distribution is 5 then it is _____ skewed.

Ans. If the mean of a Poisson distribution is 5 then it is positively skewed

49. If $p = 0.3$ then binomial distribution is _____ skewed.

Ans. If $p = 0.3$ then binomial distribution is positively skewed.

50. If the standard deviation of a Poisson distribution is 2.5 then the distribution has _____ number of modes.

Ans. If the standard deviation of a Poisson distribution is 2.5 then the distribution has only one number of modes.

25 MARKS **CHAPTER WISE** **SHORT-TYPE QUESTIONS WITH ANSWERS**

CORRELATION & REGRESSION

1. Define correlation coefficient and mention any two of its properties.

Ans. Correlation coefficient may be defined as the degree of linear relationship between two variables.

It is computed by the formula: $r_{xy} = \frac{Cov(x,y)}{\sigma_x \sigma_y}$

Properties:

- (i) Correlation coefficient is independent of change of origin and scale.
- (ii) The limits of the correlation coefficient are ± 1 i.e. $-1 \leq r \leq 1$ or $|r| \leq 1$.

2. Explain the method of interpretation of the value of correlation coefficient.

Ans. The interpretation of the value of correlation coefficient can be done by using the probable error.

Probable error of $r = PE(r) = 0.6745 \times$ Standard error of r

Standard error of $r = SE(r) = \frac{1-r^2}{\sqrt{n}}$

Interpretation:

- (i) If $|r| > 6 \times PE(r)$ then r is highly significant i.e. there is a strong association between the variables.
- (ii) If $|r| < PE(r)$ then r is insignificant i.e. there is a weak association between the variables.
- (iii) If $PE(r) \leq |r| \leq 6 \times PE(r)$ then the variables are moderately correlated.

3. Express the regression coefficients by using correlation coefficient.

Ans. The normal equations for fitting the line of regression of Y on X of the form $y = a + bx$ are:

$\sum_{i=1}^n y_i = na + b \sum_{i=1}^n x_i \dots (i)$