

**SHRI GURU NANAK DEGREE COLLEGE,**  
**Preet Vihar, RUDRAPUR**  
**MCOM102 - Statistical Analysis**

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**Section A: Long Answer Type Questions**

**Unit I: Analysis of the Time Series**

1. What do you mean by time series analysis? Explain the components of a time series with examples.
2. Describe the methods of measuring secular trend.
3. Discuss the graphical method of analyzing time series.
4. Elaborate on the seasonal variations and their measurement techniques.
5. Explain cyclical and random variations in a time series.
6. Describe the moving average method for trend measurement.
7. How can time series be used in economic forecasting?
8. Compare and contrast secular trend and seasonal variation.
9. Write a note on the utility of time series in business decision-making.
10. Explain the different methods to isolate seasonal variation from a time series.

**Unit II: Regression Analysis**

1. Define regression. How is it different from correlation?
2. Derive the equations for simple linear regression.
3. Discuss the assumptions and limitations of linear regression.
4. Explain regression coefficients and their interpretations.
5. Derive regression lines using least squares method.
6. Show the relation between correlation and regression coefficients.
7. How can regression be used for prediction? Give examples.
8. Distinguish between regression line of X on Y and Y on X.
9. Discuss the importance of regression analysis in research.
10. Explain the concept and calculation of standard error of estimate.

**Unit III: Association of Attributes**

1. Define attribute and classify attributes with examples.
2. Explain the method of determining consistency of data.
3. Discuss the method of determining association of attributes.
4. How is Chi-Square test used to test association of attributes?
5. What are class frequencies? How are they calculated?
6. Illustrate with examples the methods for studying association.
7. Define and explain independence and perfect association of attributes.
8. Describe various types of association with suitable examples.
9. What are ultimate class frequencies? How are they determined?
10. Discuss the limitations of association of attributes.

## **Unit IV: Interpolation and Extrapolation**

1. Define interpolation and extrapolation. Explain their significance.
2. Explain graphical and algebraic methods of interpolation.
3. Describe Newton's method of advancing differences.
4. Explain the Lagrange interpolation method with an example.
5. Discuss the parabolic curve method of interpolation.
6. Differentiate between interpolation and extrapolation.
7. Explain the direct binomial expansion method.
8. What are the assumptions behind interpolation techniques?
9. Explain the importance of interpolation in business and economics.
10. Compare different methods of interpolation.

## **Unit V: Indian Statistics**

1. Discuss the role of Indian statistics in national planning.
2. Explain the structure and functions of the Central Statistical Organization.
3. Describe the statistical methods used in calculating National Income.
4. Discuss the importance and types of population statistics in India.
5. Explain the sources of Indian statistics.
6. What are agricultural statistics? Discuss their utility. Point out the main sources of agricultural statistics in India and comment on their adequacy and reliability.
7. Describe the role and functions of the National Sample Survey.
8. Evaluate the contribution of Indian statistics in economic development.
9. Discuss the limitations of Indian statistical systems.
10. Explain how Indian statistical data is used in policy making.

## **Section B: Short Answer Type Questions**

### **Unit I: Analysis of the Time Series**

1. What is time series analysis?
2. Define secular trend.
3. Mention any two methods of measuring seasonal variation.
4. What do you mean by random fluctuation?
5. State the importance of time series in business.
6. Define cyclical variation.
7. Write two uses of time series.
8. Bring out the significance of moving average in analyzing a time series and point out their limitations.
9. What is the significance of seasonal variation?
10. Differentiate between cyclical and irregular variations.

### **Unit II: Regression Analysis**

1. Define regression line.
2. What is regression coefficient?
3. Write one assumption of linear regression.

4. Mention the formula of regression line of Y on X.
5. What is the role of regression in prediction?
6. State any two differences between correlation and regression.
7. What is the meaning of regression analysis?
8. Write one real-life application of regression.
9. State any one limitation of regression analysis.
10. What is the error term in regression?

### **Unit III: Association of Attributes**

1. Define consistency of data.
2. What is a class frequency?
3. State any one method of measuring association of attributes.
4. What is Chi-Square test?
5. Differentiate between positive and negative association.
6. Define an attribute in statistics.
7. Give an example of a class frequency.
8. Mention any one limitation of association of attributes.
9. What is meant by independence of attributes?
10. Write the use of consistency of data in classification.

### **Unit IV: Interpolation and Extrapolation**

1. Define interpolation.
2. Define extrapolation.
3. Name one graphical method of interpolation.
4. What is Newton's method of advancing differences?
5. Write the difference between direct and inverse interpolation.
6. State one assumption of interpolation method.
7. Mention one use of extrapolation.
8. What is parabolic curve method?
9. What is meant by Lagrange's interpolation?
10. Name any two methods of interpolation.

### **Unit V: Indian Statistics**

1. What are crop estimates in India? How are they prepared?
2. Define Indian statistics. Name one source of Indian statistics.
3. What is the use of population statistics?
4. What is National Sample Survey?
5. Explain any one method of calculating national income
6. What is agricultural statistics?
7. Name any one component of National Income.
8. What is the use of statistical data in policy formulation?
9. Define Central Statistical Organization.
10. What are official statistics? Mention any one role of CSO

## Section C: Objective Type Questions

### Unit I: Analysis of the Time Series

1. Which of the following is a component of time series?
  - a) Mean
  - b) Standard deviation
  - c) Seasonal variation
  - d) None
2. Time series is used to study:
  - a) Present only
  - b) Past only
  - c) Future only
  - d) Past, Present and Future
3. Which method is not used for trend measurement?
  - a) Moving average
  - b) Least squares
  - c) Histograms
  - d) Semi-averages
4. Random fluctuation is also called:
  - a) Trend
  - b) Irregular variation
  - c) Seasonal effect
  - d) Cycle
5. Least squares method is used to:
  - a) Measure mode
  - b) Draw trend line
  - c) Measure standard deviation
  - d) Calculate mean
6. Cyclical variations occur in:
  - a) 1-2 years
  - b) 3-4 months
  - c) 5-10 years
  - d) Daily data
7. Time series data is collected:
  - a) At one point in time
  - b) Over a period of time
  - c) Both
  - d) None
8. Trend is measured by:

- a) Correlation
- b) Regression
- c) Graphical method
- d) Standard deviation

9. Seasonal variations are generally:
  - a) Long-term
  - b) Short-term
  - c) Permanent
  - d) Irregular

10. Which is not a method of seasonal variation?
  - a) Ratio-to-trend
  - b) Ratio-to-moving average
  - c) Chain index
  - d) Link relative

### Unit II:

11. Regression line is used to:

- a) Find mean
- b) Predict value
- c) Calculate range
- d) Measure deviation

12. Regression coefficient lies between:

- a) 0 and 1
- b) -1 and 0
- c)  $-\infty$  and  $+\infty$
- d) None

13. Which is the correct regression line formula?

- a)  $Y = a + bX$
- b)  $Y = ab + X$
- c)  $X = a + Yb$
- d)  $a = Y + bX$

14. Regression line passes through:

- a) Origin
- b) Mean of X and Y
- c) Zero point
- d) Mode

15. Regression is used in:

- a) Histograms
- b) Forecasting



- c) Classification
- d) Index number

16. If  $r = 0$ , then regression coefficient is:

- a) 1
- b) 0
- c) Infinite
- d) None

17. In regression, Y is called:

- a) Independent variable
- b) Dependent variable
- c) Constant
- d) Frequency

18. Which method is used in regression?

- a) Least square method
- b) Arithmetic mean
- c) Graph
- d) Chi-square

19. Regression coefficient is:

- a) Always negative
- b) Always more than 1
- c) May be negative
- d) None

20. Regression analysis shows:

- a) Mean
- b) Trend
- c) Relationship
- d) Variation

### Unit III:

21. Which is a method to determine association of attributes?

- a) Histogram
- b) Chi-Square Test
- c) Regression
- d) Time Series

22. If two attributes occur together frequently, they are:

- a) Inconsistent
- b) Independent
- c) Associated
- d) Unrelated

23. Chi-square test is used to:

- a) Estimate mean
- b) Study correlation

- c) Test association
- d) Measure variation

24. The symbol for Chi-square is:

- a)  $\mu$
- b)  $\Sigma$
- c)  $\chi^2$
- d)  $\sigma^2$

25. Which of the following is an ultimate class frequency?

- a) A
- b) AB
- c) (AB)
- d)  $A - B$

26. Consistency of data means:

- a) Randomness
- b) Variability
- c) Logical agreement
- d) Frequency count

27. Attributes are:

- a) Quantitative data
- b) Qualitative data
- c) Continuous data
- d) Interval data

28. Which is a positive association?

- a)  $(AB) > (A)(B)$
- b)  $(AB) = (A)(B)$
- c)  $(AB) < (A)(B)$
- d) None

29. Which test is used for independence?

- a) Regression test
- b) t-test
- c) Chi-square test
- d) Z-test

30. Class frequencies refer to:

- a) Number of times classes occur
- b) Number of attributes
- c) Standard deviation
- d) Mode

### Unit IV:

31. Interpolation is used for:

- a) Estimating within data
- b) Estimating beyond data
- c) Calculating average

d) None

32. Extrapolation helps in:

- a) Present analysis
- b) Past analysis
- c) Future estimation
- d) None

33. Newton's method is a:

- a) Graphical method
- b) Algebraic method
- c) Survey method
- d) None

34. Lagrange's method is based on:

- a) Subtraction
- b) Differences
- c) Polynomial interpolation
- d) Regression

35. Parabolic curve method is a type of:

- a) Graph
- b) Trend line
- c) Curve fitting
- d) Histogram

36. Binomial method is used in:

- a) Mean calculation
- b) Interpolation
- c) Time series
- d) Regression

37. Interpolation requires data to be:

- a) Discontinuous
- b) Random
- c) Continuous
- d) Missing

38. Extrapolation is mainly used in:

- a) Present condition
- b) Future prediction
- c) Data classification
- d) Sampling

39. Algebraic methods are:

- a) Less accurate
- b) Less complex
- c) More accurate
- d) Outdated

40. Which of these is not a method of interpolation?

- a) Lagrange
- b) Binomial

c) Histogram

d) Newton

### Unit V:

41. CSO stands for:

- a) Central Survey Organisation
- b) Central Statistical Organisation
- c) Central Software Office
- d) Central Service Organisation

42. NSS stands for:

- a) National Sample Statistics
- b) National Survey Scheme
- c) National Sample Survey
- d) None

43. Which of the following is a source of Indian statistics?

- a) RBI
- b) CSO
- c) NSS
- d) All of these

44. Population statistics includes:

- a) GDP
- b) Literacy rate
- c) Exports
- d) Inflation

45. Agricultural statistics relate to:

- a) Industry output
- b) Foodgrain production
- c) Service sector
- d) None

46. Which of these collects statistical data?

- a) CSO
- b) TRAI
- c) SEBI
- d) UPSC

47. National income is calculated by:

- a) NSSO
- b) CSO
- c) RBI
- d) SBI

48. The Indian Census is conducted:

- a) Annually
- b) Every 5 years
- c) Every 10 years
- d) Irregularly

49. Indian statistics help in:

- a) News publishing
- b) Economic planning
- c) Criminal records
- d) Entertainment

50. NSSO is under the:

- a) Ministry of Finance
- b) Ministry of Statistics and Programme Implementation
- c) RBI
- d) TRAI

