

MCQ'S ON Allied Business Statistics I



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ALIED BUSINESS STATISTICS I MULTIPLE CHOICE QUESTIONS WITH ANSWERS

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UNIT I

1.1.COLLECTION AND TABULATION OF STATISTICAL DATA

1. What is the primary purpose of collecting statistical data?

- A) To create graphs
- B) To summarize information
- C) To make informed decisions
- D) To manipulate numbers

Answer: C

Hint: It's about using information to guide decisions.

2. Which method of data collection involves studying a population as a whole?

- A) Sampling
- B) Census
- C) Surveys
- D) Experiments

Answer: B

Hint: It covers the entire population.

3. Which of the following is a characteristic of qualitative data?

A) Numeric values

- B) Descriptive information
- C) Continuous measurements
- D) Statistical formulas

Answer: B

Hint: Qualitative data describes qualities or characteristics.

4. What does random sampling ensure?

A) Every member of the population has an equal chance of being selected

B) Only a portion of the population is considered

C) The sample is selected based on convenience

D) Population characteristics are ignored

Answer: A

Hint: It's about fairness in selection from the population.

5. What is the primary advantage of using a structured interview for data collection?

A) Provides flexibility in responses

B) Allows for spontaneous questions

C) Consistency in questioning and responses

D) Avoids human bias

Answer: C

Hint: Structured interviews follow a predefined format.

6. Which type of data collection method involves directly observing subjects?

A) Census

B) Survey

C) Experimentation

D) Observation

Answer: D

Hint: It's about watching and recording.

7. What does the term "sampling frame" refer to in data collection?

A) A list of all possible participants in a study

B) A questionnaire used for surveys

C) Randomly selected data points

D) An experimental setup

Answer: A

Hint: It's the list from which a sample is drawn

8. Which of the following represents quantitative data?

A) Hair color

B) Temperature in Celsius

C) Satisfaction level (low, medium, high)

D) Marital status

Answer: B

Hint: Quantitative data involves numerical measurements.

9. What is the primary goal of using a pilot study in data collection?

A) To gather final data

B) To test research methods and tools

C) To involve a small portion of the population

D) To conduct multiple experiments

Answer: B

Hint: It's a test run before the actual study.

10. What is a disadvantage of using secondary data in research?

A) Higher cost

B) Inaccuracy

C) Time-consuming

D) Limited availability

Answer: B

Hint: Sometimes the quality of secondary data might not be reliable.

11. Which of the following best defines statistical tabulation?

A) Organizing data in a systematic manner

B) Sorting data alphabetically

C) Summarizing data in paragraphs

D) Creating random data sequences

Answer: A

Hint: It involves systematic organization for easier analysis.

12. What does a frequency distribution table show?

A) Relationships between variables

- B) Summary of qualitative data
- C) How data is dispersed
- D) Number of occurrences of different values

Answer: D

- Hint: It's a way to count occurrences of values.
- 13. What is the purpose of a cumulative frequency distribution?
 - A) To show total frequencies
 - B) To display frequencies over time
 - C) To summarize qualitative data
 - D) To demonstrate relationships between variables

Answer: A

Hint: It accumulates frequencies as you move through the data.

14. Which of these represents grouped data in statistics?

- A) Raw scores
- B) Ungrouped frequencies
- C) Classes or intervals
- D) Median values

Answer: C

Hint: It involves categorizing data into ranges or intervals.

15. In a frequency distribution table, what does the term "class frequency" refer to?

- A) Total number of data points
- B) Frequency of each class interval
- C) Sum of all frequencies
- D) Mean frequency value

Answer: B

Hint: It pertains to the occurrences within each interval.

16. How is the relative frequency of a value calculated?

A) By dividing the frequency by the total number of observations

B) By subtracting the frequency from the total

C) By multiplying the frequency by the mean

D) By adding the frequency to the total observations

Answer: A

Hint: It's a ratio of how often a value occurs to the total number of observations.

17. What does the term "range" indicate in statistical tabulation?

A) The difference between the highest and lowest values

B) The sum of all data values

C) The midpoint of the dataset

D) The average frequency of data

Answer: A

Hint: It's about the spread between extreme values.

18. Which of the following is an example of qualitative data in tabulation?

A) Age of respondents

B) Number of books read per month

C) Types of fruits in a basket

D) Weight of a sample group

Answer: C

Hint: Qualitative data deals with characteristics or categories.

19. How is a percentage frequency calculated from a frequency distribution?

A) Divide the frequency by the total and multiply by 100

B) Multiply the frequency by the total and divide by 100

C) Subtract the frequency from the total and multiply by 100

D) Add the frequency to the total and divide by 100

Answer: A

Hint: It involves the relation between frequency and the total.

20. Which graphical representation displays categorical data as rectangular bars?

- A) Line graph
- B) Histogram
- C) Pie chart
- D) Bar chart

Answer: D

Hint: It's all about rectangular representations of categories

1.2 MEASURES OF CENTRAL TENDANCY

21. What does the mode represent in a dataset?

A) The most frequently occurring value

B) The average value

C) The middle value

D) The smallest value

Answer: A

Hint: It's the value that appears most frequently.

22. Which measure of central tendency is significantly impacted by outliers?

A) Mean

B) Median

- C) Mode
- D) Range

Answer: A

Hint: Outliers can strongly influence this measure.

23. In a positively skewed distribution, how do the measures of central tendency (mean, median, mode) relate?

A) Mean > Median > Mode

- B) Mode > Median > Mean
- C) Median > Mean > Mode
- D) Mode > Mean > Median

Answer: A

Hint: Think about the positioning of these measures in a positively skewed distribution.

24. What does the median represent in a dataset?

A) The most frequent value

B) The middle value when data is arranged in order

C) The arithmetic average

D) The value occurring most after calculations

Answer: B

Hint: It's the value in the middle when data is arranged.

25. Which measure of central tendency is affected the least by extreme values?

A) Mean

B) Median

C) Mode

D) Standard deviation

Answer: B

Hint: It's the measure that isn't swayed by extreme values as much.

26. If a dataset has an even number of observations, how is the median calculated?

A) It's the value in the center

B) It's the mean of the two middle values

C) It's the mode of the dataset

D) It cannot be calculated for an even dataset

Answer: B

Hint: Consider how to find the middle when there's an even number of observations.

27. What does a bimodal distribution indicate?

A) It has two distinct peaks

B) It has no central tendency

C) It's symmetrically distributed

D) It has a single peak

Answer: A

Hint: Look for multiple high-frequency values.

28. Which measure of central tendency can be used for nominal data?

- A) Mean
- B) Median
- C) Mode
- D) Standard deviation

Answer: C

Hint: Nominal data doesn't have numerical significance but can have modes.

29. What does the arithmetic mean represent?

A) The most frequent value

B) The middle value

C) The sum of all values divided by the number of values

D) The highest value in the dataset

Answer: C

Hint: It's a mathematical average.

30. In a symmetric distribution, how do the measures of central tendency (mean, median, mode) relate?

A) Mean = Median = Mode

B) Mode = Median > Mean

C) Mean > Median = Mode

D) Median = Mode > Mean

Answer: A

Hint: Think about symmetry and the positions of these measures.

31. Which formula is used to calculate the arithmetic mean for a set of n numbers?

A) $\frac{\text{Sum of numbers}}{n}$ B) $\frac{n}{\text{Sum of numbers}}$ C) Sum of numbers -nD) $\frac{n}{\text{Sum of reciprocals}}$

Answer: A

Hint: Think about how to find the average of a set of numbers.

32. The arithmetic mean of a data set can also be represented as:

A) The middle value

B) The sum of deviations

C) The balance point

D) The range of data

Answer: C

Hint: It's a balancing point in a dataset.

33. When finding the arithmetic mean, what does the term "n" represent?

A) The total number of data points

B) The highest value in the dataset

C) The lowest value in the dataset

D) The range of the dataset

Answer: A

Hint: It's related to the count of items being averaged.

34. Which of the following is NOT a method of finding the arithmetic mean?

A) Direct Method

B) Weighted Method

C) Median Method

D) Short-Cut Method

Answer: C

Hint: The median is a different measure of central tendency.

35. What does the weighted arithmetic mean consider that the simple arithmetic mean does not?

A) Total number of values

B) Frequency or importance of values

C) Only the largest values

D) Only the smallest values

Answer: B

Hint: It assigns importance or weight to different values.

36. The harmonic mean is a method primarily used for:

A) Finding the average of percentages

B) Calculating central tendencies

C) Analyzing large datasets

D) Averaging rates and ratios

Answer: D

Hint: It's used when dealing with rates or ratios.

37. In the method of deviations, what does a deviation from the mean signify?

A) How far each value is from the highest value

B) How far each value is from the median

C) How far each value is from the arithmetic mean

D) How far each value is from the lowest value

Answer: C

Hint: Deviations are measures of how values differ from the mean

38. When the arithmetic mean is calculated using the direct method, what is directly calculated?

A) The sum of all values

B) The reciprocal of all values

C) The difference between the largest and smallest values

D) The average of all values

Answer: A

Hint: It involves adding up all the values.

39. Which method is employed when there's a group frequency distribution to find the arithmetic mean?

A) Shortcut Method

B) Median Method

C) Direct Method

D) Weighted Method

Answer: D

Hint: This method considers the frequency of each value.

40. What does the "midpoint" represent in the method of finding arithmetic mean using the shortcut method?

A) The average of all values

B) The middle value in the dataset

C) The central tendency of the dataset

D) The midpoint of each class interval

Answer: D

Hint: It's related to intervals or ranges in grouped data.

1.3ARITHMETIC MEAN

41. Mean $(\overline{X}) =$

- A) Number of values/Sum of all values
- B) Sum of all values/Number of values

C) Sum of all values

D) Number of values

Answer: \overline{X} = Sum of all values/ Total number of values 42. If a dataset has values: 5, 7, 9, 12, and 15, what is the mean?

A) 8

B) 9

- C) 10
- D) 11.6

Answer: B

Hint: Add the values and divide by the number of values.

42. What is the mean of the following set of data: 8, 10, 12, 14, 16?

- A) 10
- B) 12
- C) 13
- D) 12.4

Answer: B

Hint: Add the values and divide by the number of values.

43. What is the mean of the dataset: 6, 6, 6, 6, 12?

- A) 6
- **B**) 7
- C) 8
- D) 9

Answer: B

Hint: Add the values and divide by the number of values.

44. Which of the following best defines an individual series in statistics?

A) Data grouped into classes or intervals

B) Raw data values listed individually

C) Data presented in a frequency distribution table

D) Continuous range of data values

Answer: B

Hint: It's the simplest form of data representation.

45. What is characteristic of an individual series?

A) Grouping of data values

B) Visualization in histograms

- C) Each value listed separately
- D) Calculation of class intervals

Answer: C

Hint: This type of series lists values individually.

- 46. Which representation is used for an individual series?
 - A) Histogram
 - B) Pie chart
 - C) Dot plot
 - D) Frequency polygon

Answer: C

Hint: It involves plotting individual data points.

- 47. What defines a continuous series in statistics?
 - A) Data listed individually
 - B) Data grouped into intervals
 - C) Frequency of occurrences
 - D) Summarized data values

Answer: B

Hint: It involves grouping data into ranges.

48. Which of these is an advantage of using a continuous series over an individual series?

A) Provides more detailed information

B) Suitable for small datasets

C) Less time-consuming to construct

D) Easier interpretation

Answer: A

Hint: It offers a broader overview with fewer individual values.

49. What is crucial when creating a continuous series?

A) Utilizing raw data values

B) Choosing arbitrary class intervals

C) Ensuring mutually exclusive intervals

D) Excluding outliers

Answer: C

Hint: It involves non-overlapping intervals.

50. What characterizes a discrete series?

A) Continuous intervals

B) Unordered data values

C) Number values with frequency

D) Continuous distribution

Answer: C

Hint: It involves distinct separate values with frequency(number of times occurs).

51. What is the formula for Mean Discrete series?

A)
$$\overline{X} = \frac{\sum fx}{N}$$

B) $\overline{X} = \frac{\Sigma f}{N}$

C) $\overline{X} = \frac{\sum x}{N}$

D) None of the above

Hint: Formula for Arithmetic mean Discrete series is $\frac{\sum fx}{N}$ where N= $\sum f$

52. What is the median?

A) Difference between higher half and lower half of the data set

B) Mean of the highest and lowest number in a data sample

C) Value separating higher half from the lower half of a data sample

D) Difference between the highest and lowest number.

Answer: c

Hint: In statistics, the Median is also called the 'Middle Value' as it is the value that separates the Highest half from the lower half of a data sample.

53. What is the formula for Mean Continuous series?

A)
$$\bar{X} = \frac{\sum fM}{N}$$

B)
$$\overline{X} = \frac{\sum f}{N}$$

C) $\overline{X} = \frac{\sum x}{N}$
D) $\overline{X} = \frac{\sum M}{N}$

Hint: Formula for Arithmetic mean Discrete series is $\overline{X} = \frac{\sum fM}{N}$ where N= $\sum f$.

54. What is the formula for calculating the harmonic mean for a set of (n) values?

A)
$$\frac{Product of values}{N}$$

B) $\frac{n}{Sum of values}$
C) $\frac{n}{Product of values}$
D) $\frac{Sum of Reciprocals}{N}$

Answer: D

Hint: Consider the reciprocal of values and its relation to the mean.

55. Which of the following statements about the harmonic mean is correct?

A) It's influenced by extreme values.

B) It's the most commonly used measure of central tendency.

C) It's computed by summing all values and dividing by the count.

D) It's suitable for averaging rates or ratios.

Answer: D

Hint: Think about situations where rates or ratios need to be averaged.

56. In a dataset with values 2, 4, and 8, what is the harmonic mean?

A) 4

B) 5

C) 6

D) 4.5

Answer: A

Hint: Calculate the reciprocal of each value, find their average, then take the reciprocal of that average.

57. How does an outlier affect the harmonic mean?

A) It has a significant impact.

B) It has no effect.

C) It slightly influences the mean.

D) It makes the mean equal to the median.

Answer: A

Hint: Outliers can heavily skew this mean.

57.What characterizes the harmonic mean calculation?

A) It gives equal weight to all values.

B) It involves taking the arithmetic mean of values.

C) It uses squared values.

D) It's heavily influenced by extreme values.

Answer: A

Hint: Consider how each value's reciprocal plays a role.

58. If a dataset contains values 3, 6, 9, and 18, what is the harmonic mean?

A) 6

B) 7.2

C) 8

D) 9

Answer: A

Hint: Use the reciprocal of values and find their mean.

59. What is the formula for calculating the geometric mean for n values?

A) $\frac{\text{Sum of values}}{n}$ B) $\sqrt[n]{\text{Product of values}}$ C) $\frac{n}{\text{Sum of reciprocals}}$ D) $\frac{\text{Sum of squares}}{n}$ Answer: B

Hint: Consider how to find the *n*th root of the product of values.

60. When is the geometric mean commonly used?

A) When dealing with a diverse dataset

B) When extreme values are present

C) When averaging large values

D) When working with rates or growth rates

Answer: D

Hint: It's especially useful for rates or ratios.

61. In a dataset with values 2, 4, and 8, what is the geometric mean?

A) 3.2

B) 4

C) 4.5

D) 5.3

Answer: B

Hint: Find the product of values and take the square root.

62. How does an outlier affect the geometric mean?

A) It has a significant impact.

B) It has no effect.

C) It slightly influences the mean.

D) It makes the mean equal to the median.

Answer: A

Hint: Outliers can heavily skew this mean.

63. What characterizes the geometric mean calculation?

A) It's heavily influenced by extreme values.

B) It involves taking the square root of the sum of squares.

C) It gives equal weight to all values.

D) It's the product of values raised to a power.

Answer: D

Hint: Consider the operations involved: products and roots.

64. If a dataset contains values 3, 6, 12, and 24, what is the geometric mean?

A) 8

B) 10.39

C) 12

D) 14.6

Answer: C

Hint: Find the product of values and take the fourth root.

1.4MEDIAN

65. What is the formula for Median ?

A) $(N/2)^{th}$ value

B) $(N + 1/2)^{th}$ value

C) $(N/2)^{th} + 1$ value

D) *N*th value

Answer: B

Hint: Formula for Median $(N + 1/2)^{th}$ value

66. In a discrete series, if the values are 5, 8, 12, 15, and 18, what is the median?

A) 8

B) 12

C) 13

D) 15

Answer: B

Hint: Arrange the values in ascending order and find the middle value.

67. What defines a discrete series when finding the median?

A) Data values grouped into intervals

B) Values listed individually without intervals

C) Data arranged into continuous ranges

D) Frequency distribution of data values

Answer: B

Hint: Discrete series lists individual values separately.

68. If a discrete series contains 10 values and the median is the 6th value when arranged, what position holds the median?

A) 3rd

B) 5th

C) 6th

D) 7th

Answer: C

Hint: Identify the position of the median within the ordered dataset.

69. What is the formula for Median Continuous series?

A) L +
$$\left[\frac{i(N-cf)}{f}\right]$$

B) L + $\left[\frac{i(N/2-f)}{cf}\right]$
C) L + $\left[\frac{i(N/2-cf)}{f}\right]$
D) L + $\left[\frac{i(N-f)}{cf}\right]$

Hint: Formula for Median Continuous series is $L + [\frac{i(N/2 - cf)}{f}]$

70. In a continuous series, the class intervals are 10-20, 20-30, 30-40, and 40-50. What is the median?

A) 25

B) 30

C) 35

D) 40

Answer: C

Hint: Use cumulative frequencies and find the interval containing the median.

71. What characterizes a continuous series when finding the median?

A) Discrete individual values

B) Data arranged in a frequency distribution

C) Values listed separately without intervals

D) Continuous ranges or intervals

Answer: D

Hint: Continuous series involve intervals rather than individual values.

72. If the median of a continuous series falls in the interval 30-40, what can be concluded about its position?

A) It's greater than 40.

B) It's exactly 35.

C) It's within the range of 30-40.

D) It's not within any interval.

Answer: C

Hint: The median lies within the specific interval range..

1.5 **MODE**

73. In a dataset: 4, 7, 6, 9, 4, 6, 8, what is the mode?

A) 4

B) 6

C) 7 D) 8

.

Answer: A

Hint: Identify the value that appears most frequently.

74. What characterizes the mode in a dataset?

A) It's the arithmetic average.

B) It's the middle value when data is arranged.

C) It's the most frequently occurring value.

D) It's the product of all values.

Answer: C

Hint: Think about the value that appears the most.

75. In a set: 10, 15, 20, 25, 30, what is the mode?

A) 10

B) 15

C) 20

D) There is no mode.

Answer: D

Hint: When there's no value repeating, there is no mode.

75. How does an outlier affect the mode?

A) It has no effect.

B) It significantly influences the mode.

C) It slightly influences the mode.

D) It makes the mode equal to the median.

Answer: A

Hint: Outliers don't impact the mode.

76. What defines a dataset with multiple modes?

A) It has no mode.

B) It has exactly two modes.

C) It has more than one mode.

D) It has no central tendency.

Answer: C

Hint: There are multiple values occurring most frequently.

77. In a set of numbers: 3, 5, 5, 8, 9, 9, 9, what is the mode?

A) 3

B) 5

C) 8

D) 9

Answer: D

Hint: Identify the most frequent value.

78. Find the mode of given samples.

47, 25, 15, 89, 47, 89, 89, 1, 47, 73, 29, 64, 95, 90, 47, 25.

A) 85

B) 47

C) 25

D) No Mode

Answer: B

Hint: 89 and 25 occurs twice, 64 occurs once, 47 occurs four times.

Since 47 has occurred four times in the above data set and other numbers less than that. The mode of the above data set is 47.

79. What is the mode of 19, 18, 9, 24, 1, 12, 23, 75?

A) 75

B) 1

C) 19

D) No mode

Answer: d

Hint: According to the definition of mode, a mode is a number that occurs most frequently. There is no such number which is repeated more than once . So, we can say there is No Mode.

80) Mode = _____

A) 3 Mean – 2 Median

B) 3 Median -2 Mean

C) Median - Mean

D) Mean – Median

Answer: B

Hint: Empirical Relation between Mean, Median and Mode is 3 Median -2 Mean.

81) Formula for Mode continuous series:

A)
$$Z = L + [\frac{if_0}{f_{1-f_2}}]$$

B) $Z = L + [\frac{i(f_{1-f_0})}{2f_{1-f_0}-f_2}]$

c) Z = L +
$$\left[\frac{if_1}{f_{1-f_2}}\right]$$

D)
$$Z = L + \left[\frac{if_2}{f_{1-f_2}}\right]$$

Answer: B

Hint: Formula for Mode Continuous series is $Z = L + \left[\frac{i(f_{1-f_0})}{2f_{1-f_0-f_2}}\right]$

82) The two methods of finding mode in a discrete series are

A) Grouping method and ascending method

B) Table method and midpoint method

C) Grouping method and inspecting method

D) None of the above

Answer: c

Hint: These are the two methods for finding Mode discrete series

83) What is the formula for the combined mean of two sets of data with means

A) $(n_1 x_1 + n_2 x_2) / (n_1 + n_2)$ B) $(n_1 + n_2) / (x_1 + x_2)$ C) $(n_1 x_1 - n_2 x_2) / (n_1 - n_2)$ D) $(x_1 + x_2) / (n_1 + n_2)$ Answer: A

Hint: Weighted average based on means and frequencies.

84. When combining means of different datasets, the resultant combined mean is influenced by:

A) The total number of values in the datasets

B) The sum of all values in the datasets

C) The number of datasets combined

D) The frequencies or weights of each dataset

Answer: D

Hint: Consider the impact of different dataset weights.

85.If one dataset has a mean of 25 and another dataset has a mean of 35, what is the combined mean if the first dataset has 20 values and the second dataset has 30 values?

A) 30
B) 28
C) 31
D) 32
Answer: B

Hint: Use the formula for combined means with given means and frequencies.

86. The combined mean of several datasets is calculated by:

A) Adding all the means together

B) Dividing the sum of all values by the total count

C) Finding the weighted average of means based on frequencies

D) Taking the average of the highest and lowest means

Answer: C

Hint: It involves weighing means by their frequencies.

87. What is the impact of a dataset with a higher frequency on the combined mean?

A) It has no effect.

B) It slightly influences the mean.

C) It significantly influences the mean.

D) It makes the mean equal to the mode.

Answer: C

Hint: Higher frequency means higher weight in the combined mean.

88.If three datasets with means 10, 20, and 30 respectively have frequencies 5, 10, and 15, what is the combined mean?

A) 25
B) 22.5
C) 21.5
D) 20
Answer: B

Hint: Use the weighted average formula for combined means.

UNIT II

2.1MEASURES OF DISPERSION

1. Which of the following measures provides information about the spread or variability of data around the mean?

A) Mean

B) Median

C) Mode

D) Variance

Answer: D

Hint: It quantifies the average squared deviation from the mean.

2. The range as a measure of dispersion is calculated by:

A) Subtracting the highest value from the lowest value

B) Dividing the sum of values by the count

C) Finding the difference between the mean and the mode

D) Subtracting the median from the mean

Answer: A

Hint: It is the simplest measure, derived from the spread between the extreme values.

3. The interquartile range (IQR) represents:

A) The range between the maximum and minimum values

B) The range between the first and third quartiles

C) The range between the median and mode

D) The difference between the mean and median

Answer: B

Hint: It involves the middle 50% of the data.

4. Variance and standard deviation are both measures of dispersion.How are they related?

A) Variance is the square of standard deviation.

B) Standard deviation is the square of variance.

C) Variance is the absolute deviation from the mean.

D) Standard deviation is the mean deviation from the median.

Answer: A

Hint: One is the square root of the other.

- 5. What characterizes a higher standard deviation in a dataset?
 - A) Data points are closer to the mean.
 - B) Data points are farther from the mean.

C) Data points are evenly distributed.

D) The dataset has no dispersion.

Answer: B

Hint: It implies greater variability or spread from the mean.

6. Coefficient of Variation (CV) is:

A) The ratio of standard deviation to mean expressed as a percentage.

B) The difference between the highest and lowest values.

C) The ratio of variance to standard deviation.

D) The reciprocal of the mean.

Answer: A

Hint: It's a relative measure of variability.

7. Mean absolute deviation (MAD) is calculated by:

A) Taking the average of all absolute deviations from the mean.

B) Squaring the differences between each value and the mean.

C) Finding the absolute difference between the highest and lowest values.

D) Dividing the sum of values by the count.

Answer: A

Hint: It involves the absolute differences from the mean.

- 8. Which measure of dispersion is robust against outliers?
 - A) Range
 - B) Variance
 - C) Standard Deviation
 - D) Interquartile Range (IQR)

Answer: D

Hint: It's based on quartiles, not influenced by extreme values.

- 9. The formula for variance involves:
 - A) Taking the square root of the sum of squared deviations.
 - B) Finding the absolute differences between values and the mean.
 - C) Squaring the deviations from the mean and averaging them.

D) Dividing the sum of squared deviations by the count.

Answer: C

Hint: It involves squaring deviations and finding their average.

10. The range provides:

- A) Relative measure of variability
- B) Absolute measure of variability
- C) Measure of variability around the median
- D) Measure of central tendency

Answer: B

Hint: It's the difference between two extreme values.

2.2 RANGE

- 11. What does the range in statistics measure?
 - A) The average deviation from the mean

B) The spread or dispersion of data

C) The central tendency of data

D) The sum of all values in a dataset

Answer: B

Hint: It's a measure of how spread out the values in a dataset are.

12. How is the range calculated?

A) Subtracting the median from the mean

B) Subtracting the highest value from the lowest value

C) Dividing the sum of values by the count

D) Taking the square root of the sum of squares

Answer: B

Hint: It's the simplest measure of dispersion, derived from the extreme values.

13. The range is sensitive to:

A) Extreme values

B) The median

C) The interquartile range

D) The mean

Answer: A

Hint: Outliers or extreme values affect the range significantly.

14. What is the major limitation of using the range as a measure of dispersion?

A) It doesn't consider all values in a dataset.

B) It's computationally complex.

C) It doesn't account for extreme values.

D) It can only be applied to small datasets.

Answer: A

Hint: It only considers the spread between the highest and lowest values.

15. Which of the following scenarios results in a larger range?

A) Data points are closer to each other.

B) Data points are farther from each other.

C) Data points are evenly distributed.

D) The dataset has no dispersion.

Answer: B

Hint: A larger spread or variability results in a larger range.

16. If a dataset has values: 10, 15, 20, 25, what is the range?

- A) 10
- B) 15
- C) 20
- D) 25

Answer: D

Hint: Subtract the lowest value from the highest value.

17. Which measure of dispersion is calculated by subtracting the25th percentile from the 75th percentile?

A) Interquartile Range (IQR)

B) Standard Deviation

C) Variance

D) Coefficient of Variation (CV)

Answer: A

Hint: It involves quartiles.

18. What does a larger range indicate in a dataset?

A) Less variability

B) More variability

C) A perfectly uniform distribution

D) Extreme skewness

Answer: B

Hint: It implies a wider spread of values.

19. The range measures the:

A) Spread between quartiles

B) Difference between the mean and median

C) Extent of variation between extreme values

D) Average deviation from the mean

Answer: C

Hint: It focuses on the difference between extreme values.

20. What type of data is the range best suited for?

A) Continuous data

B) Categorical data

C) Normally distributed data

D) Data with outliers

Answer: A

21.Find the range of the following data: 25, 18, 20, 22, 16, 6, 17, 15, 12, 30, 32, 10, 19, 8, 11, 20.

a. 10

b. 15

c. 18

d. 26

Answer: d

Explanation: Range = Maximum value – Minimum value

Range = 32-6 = 26.

22) What is the class mark of the class interval 90-120?

A) 90

B) 105

C) 115

D) 120

Answer: B

Hint: Class mark = (upper limit + lower limit)/2

Class mark = (120+90)/2

Class mark = 105

23.Range =

A) S-L

B) L-S

C) L+S

D) None

Answer: B

Hint: Formula for Range: L-S where L is Largest value, S is smallest value

24. Co-efficient of Range =____

- A) $\frac{L+S}{L-S}$
- B) $\frac{L-S}{L+S}$

C) (L-S)(L+S)

D) None

25. For the data set {8, 12, 16, 20, 24}, what is the range?

- A) 12
- B) 16
- C) 20
- D) 24
- Answer: D

Hint: Range = Highest value - Lowest value

26. In a data set {3, 7, 9, 11, 15, 21, 25}, what is the range?

- A) 22
- B) 20
- C) 23
- D) 18

Answer: A

Hint: Range = Highest value - Lowest value

27. If the data set $\{5, 10, 15, 20, 25, 30, 35, 40, 45\}$ is extended by adding the number 50, what happens to the range?

- A) It increases by 5
- B) It decreases by 5
- C) It remains the same
- D) It doubles

Answer: A

Hint: Range = Highest value - Lowest value

28. In a data set {13, 22, 27, 34, 40, 55, 60}, if 10 is added to each value, what happens to the range?

A) It increases by 10
B) It decreases by 10

C) It remains the same

D) It doubles

Answer: C

Hint: Adding the same value to each term does not affect the range

29. If the range of a data set $\{4, 7, 11, 14, x, 22\}$ is 18, what is the value of x?

A) 15

B) 18

C) 19

D) 20

Answer: D

Hint: Range = Highest value - Lowest value, solve for x given the range and other values in the set

2.3QUARTILE DEVIATION

30. What does quartile deviation measure in a dataset?

A) Average deviation from the mean

B) Middle spread of the data

C) Spread between quartiles

D) Spread between the highest and lowest values

Answer: C

Hint: Quartile deviation measures the spread between quartiles.

31. How many quartiles are there in a dataset?

A) One

B) Two

C) Three

D) Four

Answer: C

Hint: Quartiles divide a dataset into four parts.

32. If Q1 = 15 and Q3 = 25, what is the quartile deviation?

A) 40

B) 20

C) 10

D) 5

Answer: B

Hint: Quartile deviation = (Q3 - Q1) / 2

33. The quartile deviation is based on which quartiles?

- A) Q2 and Q3
- B) Q1 and Q2
- C) Q2 and Q4
- D) Q1 and Q3

Answer: D

Hint: Quartile deviation measures the spread between Q1 and Q3.

34. If a dataset is divided into quartiles, which quartile represents the median?

A) Q1
B) Q2
C) Q3
D) Q4
Answer: B

Hint: The median is the second quartile (Q2).

35. If the quartile deviation of a dataset is zero, what does it indicate about the data?

- A) No dispersion
- B) Extreme outliers
- C) Large variability
- D) Perfect symmetry
- Answer: A

Hint: Zero quartile deviation means no spread between quartiles

36. What does a larger quartile deviation imply about a dataset?

- A) Less variability
- B) More variability
- C) Perfect symmetry
- D) More extreme outliers

Answer: B

Hint: Larger quartile deviation indicates more spread between quartiles.

37. If Q1 = 12 and Q3 = 28, what is the interquartile range?

- A) 16
- B) 10
- C) 20
- D) 40

Answer: C

Hint: Interquartile range = Q3 - Q1

38. The quartile deviation is a measure of:

- A) Central tendency
- B) Dispersion
- C) Skewness
- D) Kurtosis
- Answer: B

Hint: It measures the spread of the middle 50% of the data.

39.In a dataset, if Q1 = Q3, what is the quartile deviation?

A) Zero

- B) Equal to Q1
- C) Equal to Q3
- D) Undefined

Answer: A

Hint: When Q1 equals Q3, there is no spread between quartiles.

40. Formula for position of Q_1 is _____ A) $\frac{N+1}{4}$ B) $\frac{N+1}{2}$ C) $\frac{N}{2}$ D) $\frac{N}{4}$

Answer: A

Hint: Position of Q_1 is $\frac{N+1}{4}$

41. Formula for position of Q_3 is _____

A)
$$\frac{N+1}{4}$$

B) $3(\frac{N+1}{4})$
C) $\frac{3N}{2}$

D)
$$\frac{3N}{4}$$

Answer: A

Hint: Position of Q_3 is $\frac{N+1}{4}$

42. Formula for Quartile deviation is_____

A) Q.D =
$$\frac{Q_{3-Q_1}}{2}$$

B) Q.D = $\frac{Q_{3-Q_2}}{2}$

C)
$$Q.D = \frac{Q_{1-Q_2}}{2}$$

D) None

43. What does mean deviation about mean measure in a dataset?

- A) The spread of the values from the median
- B) The spread of the values from the mode
- C) The spread of the values from the mean
- D) The spread of the values from the range

Answer: C

Hint: Mean deviation about mean measures the average distance of values from the mean.

44. How is mean deviation about mean calculated?

A) Sum of absolute differences from the median

B) Sum of squared differences from the mode

C) Sum of absolute differences from the mean

D) Sum of squared differences from the range

Answer: C

Hint: It involves calculating the absolute deviations from the mean.

45. What does a larger mean deviation about mean indicate about a dataset?

A) Less variability

- B) More variability
- C) Perfect symmetry

D) Extreme outliers

Answer: B

Hint: Larger mean deviation about mean suggests more variability in the dataset.

46. If a dataset has a mean deviation about mean of zero, what does it imply about the data?

A) No dispersion from the mean

B) Large variability

C) Perfect symmetry

D) Extreme outliers

Answer: A

Hint: Zero mean deviation about mean indicates no deviation from the mean.

47. What does a smaller mean deviation about mean imply about a dataset?

A) Less variability

B) More variability

C) Perfect symmetry

D) Extreme outliers

Answer: A

Hint: Smaller mean deviation about mean suggests less variability in the dataset.

48. Which of the following measures considers the positive and negative deviations from the mean?

A) Mean absolute deviation

B) Mean deviation about median

C) Variance

D) Standard deviation

Answer: A

Hint: Mean absolute deviation considers both positive and negative deviations.

49. What is the value of mean deviation about mean when all values in a dataset are the same?

A) Zero

B) Equal to the mean

C) Undefined

D) Equal to the mode

Answer: A

Hint: When all values are the same, there is no deviation from the mean.

50. In a dataset $\{10, 15, 20, 25, 30\}$, what is the mean deviation about mean?

A) 5

B) 8

C) 10

D) 15

Answer: B

Hint: Calculate the absolute differences from the mean and find the average.

51. The mean deviation about mean is affected by:

A) Extreme outliers

B) The mode

C) The range

D) The interquartile range

Answer: A

Hint: Extreme values affect the mean deviation about mean.

52. Which measure of dispersion considers both the direction and magnitude of deviations from the mean?

A) Standard deviation

B) Variance

C) Range

D) Coefficient of Variation

Answer: A

Hint: Standard deviation considers the magnitude and direction of deviations from the mean.

53. Mean deviation about Mean=____

A)
$$\frac{\sum X}{N}$$

B) $\frac{\sum |X - \overline{X}|}{N}$
C) $\frac{\sum \overline{X}}{N}$
D) None
Answer : B
Hint: Mean deviation about Mean is $\frac{\sum |X - \overline{X}|}{N}$
54.Mean deviation about Median=___

A)
$$\frac{\sum M}{N}$$

B) $\frac{\sum |X - \overline{M}|}{N}$

C) $\frac{\Sigma \bar{X}}{N}$

D) None

Answer : B

Hint: Mean deviation about Median is $\frac{\sum |X-M|}{N}$. Where M is Median

55. . Mean deviation about Mode=____

A)
$$\frac{\sum X - Z}{N}$$

B) $\frac{\sum |X-Z|}{N}$ C) $\frac{\sum \overline{X}}{N}$

D) None

Answer : B

Hint: Mean deviation about Mode is $\frac{\sum |X-Z|}{N}$ where Z = Mode.

56. Co efficient of Mean deviation (about Mean)=____

D)
$$\frac{Sum}{Mean}$$

Answer: B

Hint: Formula for Co efficient of Mean deviation (about Mean) is *Mean deviation about Mean*

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57. Co efficient of Mean deviation (about Median) =____

B) Mean deviation about Median

C) $\frac{Quartile\ deviation}{N}$

 $D)\frac{Sum}{Meadin}$

Answer: B

Hint : Formula for Co efficient of Mean deviation (about Median) is

Mean deviation about Median Median

58. Co efficient of Mean deviation(about Mode)=

D) $\frac{Sum}{Mean}$

Answer: B

Hint: Formula for Co efficient of Mean deviation (about Mode) is

Mean deviation about Mode Mode

59. What does the standard deviation measure in a dataset?

A) The spread of values from the median

B) The spread of values from the mode

C) The spread of values from the mean

D) The spread of values from the range

Answer: C

Hint: Standard deviation measures the dispersion of values around the mean.

60. How is standard deviation calculated?

A) Sum of absolute differences from the median

B) Sum of squared differences from the mode

C) Sum of absolute differences from the mean

D) Sum of squared differences from the range

Answer: B

Hint: It involves squaring the differences from the mean.

61 A larger standard deviation indicates:

A) Less variability

B) More variability

C) Perfect symmetry

D) Extreme outliers

Answer: B

Hint: Larger standard deviation suggests greater variability in the dataset

62. If a dataset has a standard deviation of zero, what does it imply about the data?

A) No dispersion from the median

B) Large variability

C) Perfect symmetry

D) Extreme outliers

Answer: A

Hint: Zero standard deviation indicates no variability from the mean.

63. What is the value of standard deviation when all values in a dataset are the same?

A) Zero

B) Equal to the mean

C) Undefined

D) Equal to the mode

Answer: A

Hint: When all values are the same, there is no variability.

64. Which of the following measures considers both positive and negative deviations from the mean?

A) Mean deviation about mean

B) Standard deviation

C) Range

D) Variance

Answer: B

Hint: Standard deviation considers both positive and negative deviations.

65. What does a smaller standard deviation indicate about a dataset?

A) Less variability

B) More variability

C) Perfect symmetry

D) Extreme outliers

Answer: A

Hint: Smaller standard deviation suggests less variability in the dataset.

66. The standard deviation is affected by:

A) Extreme outliers

B) The mode

C) The median

D) The interquartile range

Answer: A

Hint: Extreme values have a significant impact on the standard deviation.

67. In a dataset $\{10, 15, 20, 25, 30\}$, what is the standard deviation?

A) Approximately 5

B) Approximately 8

C) Approximately 10

D) Approximately 15

Answer: B

Hint: Calculate the square root of the variance.

68. Which measure of dispersion is more sensitive to extreme values in a dataset?

A) Standard deviation

B) Variance

C) Mean deviation about mean

D) Range

Answer: A

Hint: Standard deviation is affected by outliers more than other measures.

69. Karl Pearson's coefficient of skewness measures:

A) Symmetry of the distribution

B) Variability of the data

C) Shape of the distribution

D) Central tendency of the data

Answer: C

Hint: It quantifies the asymmetry of a distribution.

70. For a perfectly symmetric distribution, what is the value of Karl Pearson's coefficient of skewness?

A) 0

B) 1

C) -1

D) Undefined

Answer: A

Hint: A symmetric distribution has a skewness of 0.

71. A positive value of Karl Pearson's coefficient of skewness indicates:

A) Left-skewed distribution

B) Right-skewed distribution

C) Symmetric distribution

D) Uniform distribution

Answer: B

Hint: Positive skewness suggests a longer tail on the right side.

72. A negative value of Karl Pearson's coefficient of skewness suggests:

A) Left-skewed distribution

B) Right-skewed distribution

C) Symmetric distribution

D) Uniform distribution

Answer: A

Hint: Negative skewness suggests a longer tail on the left side.

73. What does a larger magnitude of Karl Pearson's coefficient of skewness indicate?

A) Less skewness

B) More symmetry

C) Greater asymmetry

D) Uniform distribution

Answer: C

Hint: Larger magnitude indicates greater deviation from symmetry.

74. Karl Pearson's coefficient of skewness is based on which measures of central tendency and dispersion?

- A) Mean and median
- B) Mean and mode

C) Median and mode

D) Range and variance

Answer: A

Hint: It uses measures like mean and median.

75. In a symmetric distribution, what can be said about Karl Pearson's coefficient of skewness?

A) It is zero

B) It is positive

C) It is negative

D) It is undefined

Answer: A

Hint: Symmetric distributions have zero skewness.

76. Which shape of distribution does Karl Pearson's coefficient of skewness measure?

A) Linear

B) Symmetric

C) Normal

D) Asymmetric

Answer: D

Hint: It quantifies asymmetry in a distribution.

77. What does a skewness value of zero in Karl Pearson's coefficient suggest about the distribution?

A) No variability

B) Perfect symmetry

C) No central tendency

D) Infinite variability

Answer: B

Hint: It indicates perfect symmetry in the distribution.

78. What is the range of values for Karl Pearson's coefficient of skewness?

A) -1 to 1 B) -2 to 2

C) - ∞ to ∞

D) 0 to ∞

Answer: C

Hint: It has no specific range, theoretically infinite.

79. Bowley's coefficient of skewness is also known as:

A) Beta coefficient

B) Gamma coefficient

C) Sigma coefficient

D) Phi coefficient

Answer: A

Hint: Bowley's coefficient is often referred to as the beta coefficient.

80. Bowley's coefficient of skewness is calculated using which quartiles?

A) Q1 and Q2

B) Q2 and Q3

C) Q1 and Q3

D) Q3 and Q4

Answer: C

Hint: It involves the first and third quartiles.

81. A positive value of Bowley's coefficient of skewness indicates:

A) Left-skewed distribution

B) Right-skewed distribution

C) Symmetric distribution

D) No skewness

Answer: A

Hint: Positive Bowley's coefficient implies left skewness.

82. Bowley's coefficient of skewness can be used to measure the skewness of which type of distribution?

A) Symmetric distributions only

B) Skewed distributions only

C) Both symmetric and skewed distributions

D) Only normal distributions

Answer: C

Hint: It can be used for both symmetric and skewed distributions.

83. For a perfectly symmetric distribution, what is the value of Bowley's coefficient of skewness?

A) 0

B) 1

C) -1

D) Undefined

Answer: A

Hint: Perfectly symmetric distributions have a Bowley's coefficient of 0.

84. A negative value of Bowley's coefficient of skewness indicates:

A) Left-skewed distribution

B) Right-skewed distribution

C) Symmetric distribution

D) No skewness

Answer: B

Hint: Negative Bowley's coefficient implies right skewness.

85. What does Bowley's coefficient of skewness measure in a distribution?

A) Kurtosis

B) Central tendency

C) Dispersion

D) Asymmetry

Answer: D

Hint: It quantifies asymmetry in a distribution.

86. Bowley's coefficient of skewness is based on which quartiles?

A) Q1 and Q2

B) Q2 and Q3

C) Q1 and Q3

D) Q3 and Q4

Answer: C

Hint: It involves the first and third quartiles.

87. What is the range of values for Bowley's coefficient of skewness?

A) -1 to 1
B) -2 to 2
C) -∞ to ∞
D) 0 to ∞
Answer: A

Hint: It lies within the range of -1 to 1.

88. Bowley's coefficient of skewness is less affected by outliers compared to:

- A) Kurtosis
- B) Variance
- C) Pearson's coefficient of skewness
- D) Coefficient of quartile deviation

Answer: C

Hint: It's relatively robust against outliers compared to other skewness measures.

89. Standard deviation formula is

- A)
- B)
- C)
- D)

UNIT III

3.1CORRELATION

1. Which type of correlation indicates no relationship between variables?

- A) Positive correlation
- B) Negative correlation
- C) Zero correlation
- D) Perfect correlation

Answer: C

Hint: Zero correlation denotes no linear relationship.

2. When one variable increases as the other variable decreases, it represents:

A) Positive correlation

B) Negative correlation

C) Zero correlation

D) Perfect correlation

Answer: B

Hint: Negative correlation shows an inverse relationship.

3. Which correlation coefficient indicates a perfect positive linear relationship?

A) 0

B) 1

C) -1

D) Any value between -1 and 1

Answer: B

Hint: A perfect positive correlation is denoted by +1.

4. If a scatter plot forms a straight line sloping downward from left to right, it represents:

A) Positive correlation

B) Negative correlation

C) Zero correlation

D) Perfect correlation

Answer: B

Hint: A downward-sloping line indicates negative correlation.

5. What does a correlation coefficient of -0.75 indicate about the relationship between variables?

A) Weak positive correlation

B) Weak negative correlation

C) Strong positive correlation

D) Strong negative correlation

Answer: D

Hint: A high absolute value indicates a strong relationship.

6. Which type of correlation is indicated by a correlation coefficient close to -1?

A) Positive correlation

B) Negative correlation

C) Zero correlation

D) Perfect correlation

Answer: B

Hint: A coefficient close to -1 signifies a strong negative correlation.

7. What does a correlation coefficient of +0.20 indicate about the relationship between variables?

A) Weak positive correlation

B) Weak negative correlation

C) Strong positive correlation

D) Strong negative correlation

Answer: A

Hint: Low absolute values indicate weak relationships.

8. If two variables have a correlation coefficient of -0.90, what type of correlation is present?

A) Weak positive correlation

B) Weak negative correlation

C) Strong positive correlation

D) Strong negative correlation

Answer: D

Hint: High absolute value indicates strong negative correlation.

9. Which type of correlation suggests that one variable increases as the other variable also increases?

A) Positive correlation

B) Negative correlation

C) Zero correlation

D) Perfect correlation

Answer: A

Hint: Positive correlation implies a direct relationship.

10. Which type of correlation is indicated by a correlation coefficient close to +1?

A) Positive correlation

B) Negative correlation

C) Zero correlation

D) Perfect correlation

Answer: D

Hint: A coefficient close to +1 signifies a strong positive correlation.

Absolutely, here are 10 more multiple-choice questions about types of correlation:

11. What type of correlation does a correlation coefficient of 0.15 suggest?

A) Weak positive correlation

B) Weak negative correlation

C) Strong positive correlation

D) Strong negative correlation

Answer: A

Hint: A low absolute value indicates a weak relationship.

12. In a scatter plot, if data points form a cluster around a straight line sloping upward, it indicates:

A) Positive correlation

B) Negative correlation

C) Zero correlation

D) Perfect correlation

Answer: A

Hint: A positive slope suggests positive correlation.

13. A correlation coefficient of -0.60 indicates:

A) Moderate positive correlation

- B) Moderate negative correlation
- C) Weak positive correlation
- D) Weak negative correlation

Answer: B

Hint: Moderate absolute value indicates moderate strength.

14. Which type of correlation implies no linear relationship between variables?

A) Positive correlation

B) Negative correlation

C) Zero correlation

D) Perfect correlation

Answer: C

Hint: Zero correlation implies no linear relationship.

15.If a scatter plot shows no specific pattern, it indicates:

A) Positive correlation

B) Negative correlation

C) Zero correlation

D) Perfect correlation

Answer: C

Hint: A lack of pattern suggests zero correlation.

16. What does a correlation coefficient of 0 indicate about the relationship between variables?

- A) Weak positive correlation
- B) Weak negative correlation

C) Strong positive correlation

D) No linear relationship

Answer: D

Hint: Zero correlation implies no linear relationship.

17. When one variable increases and the other variable remains unchanged, what type of correlation exists?

A) Positive correlation

B) Negative correlation

C) Zero correlation

D) Perfect correlation

Answer: C

Hint: If one variable's change doesn't impact the other, it's zero correlation.

18. A correlation coefficient of -1 suggests:

A) Moderate negative correlation

B) Weak negative correlation

C) Strong negative correlation

D) Perfect negative correlation

Answer: D

Hint: -1 signifies a perfect negative relationship.

19. In a scatter plot, if points are scattered without any trend, what type of correlation exists?

A) Positive correlation

B) Negative correlation

C) Zero correlation

D) Perfect correlation

Answer: C

Hint: Scattered points without a trend imply zero correlation.

20. What does a correlation coefficient of 0.80 indicate about the relationship between variables?

A) Weak positive correlation

B) Weak negative correlation

C) Strong positive correlation

D) Strong negative correlation

Answer: C

Hint: High absolute value indicates a strong relationship.

21. Karl Pearson's coefficient of correlation measures:

A) Strength of the relationship between two variables

B) Causation between two variables

C) Direction of the relationship between two variables

D) Magnitude of variability in a dataset

Answer: A

Hint: It quantifies the strength of the linear relationship.

22. The range of values for Karl Pearson's coefficient of correlation is between:

A) -1 and 1

B) - ∞ and ∞

C) 0 and 1

D) -1 and 0

Answer: A

Hint: The coefficient ranges between -1 and +1.

23. A coefficient of +0.70 in Karl Pearson's correlation coefficient implies:

A) Weak positive correlation

B) Strong positive correlation

C) Weak negative correlation

D) Strong negative correlation

Answer: B

Hint: High absolute value indicates strong relationship.

24. What does a correlation coefficient of -1 indicate about the relationship between variables?

A) Perfect positive correlation

B) Strong positive correlation

C) Perfect negative correlation

D) Weak negative correlation

Answer: C

Hint: -1 implies a perfect negative relationship.

25. A correlation coefficient of 0 suggests:

A) Perfect positive correlation

B) No correlation

C) Perfect negative correlation

D) Weak correlation

Answer: B

Hint: Zero correlation denotes no linear relationship.

26. If Karl Pearson's correlation coefficient is +0.20, what type of correlation is present?

A) Weak positive correlation

B) Weak negative correlation

C) Strong positive correlation

D) Strong negative correlation

Answer: A

Hint: Low absolute values indicate weak relationships.

27. What does a correlation coefficient of -0.90 suggest about the relationship between variables?

A) Strong positive correlation

B) Strong negative correlation

C) Weak positive correlation

D) Weak negative correlation

Answer: B

Hint: High absolute value indicates a strong relationship.

28) If two variables have a correlation coefficient of +0.50, what type of correlation is present?

A) Weak positive correlation

B) Strong positive correlation

C) Weak negative correlation

D) Strong negative correlation

Answer: A

Hint: Moderate absolute values indicate moderate relationships.

29)Which value of Karl Pearson's correlation coefficient denotes no linear relationship?

A) 0

B) 1

C) -1

D) Any value between -1 and 1

Answer: A

Hint: Zero denotes no linear relationship.

30.What does a correlation coefficient of +1 indicate about the relationship between variables?

A) Perfect positive correlation

B) Strong positive correlation

C) Perfect negative correlation

D) Weak positive correlation

Answer: A

Hint: +1 indicates a perfect positive linear relationship.

3.2 Rank Correlation

31. Spearman's rank correlation measures:

A) Strength of the relationship between two variables

B) Causation between two variables

C) Direction of the relationship between two variables

D) Magnitude of variability in a dataset

Answer: A

Hint: It quantifies the strength of the monotonic relationship.

32. Spearman's rank correlation is appropriate for:

A) Linear relationships only

B) Non-linear relationships only

C) Both linear and non-linear relationships

D) Causal relationships only

Answer: C

Hint: It assesses monotonic relationships, both linear and non-linear.

33. The range of Spearman's rank correlation coefficient is between:

A) -1 and 1

B) - ∞ and ∞

C) 0 and 1

D) -1 and 0

Answer: A

Hint: The coefficient ranges between -1 and +1.

34. In Spearman's rank correlation, a coefficient of -0.70 suggests:

A) Weak negative monotonic relationship

B) Strong negative monotonic relationship

C) Weak positive monotonic relationship

D) Strong positive monotonic relationship

Answer: B

Hint: High absolute value indicates a strong monotonic relationship.

35. What does a rank correlation coefficient of 0 indicate about the relationship between variables?

A) Perfect monotonic relationship

B) No monotonic relationship

C) Perfect linear relationship

D) Weak monotonic relationship

Answer: B

Hint: Zero rank correlation implies no monotonic relationship.

36. If Spearman's rank correlation is +0.20, what type of relationship is present?

A) Weak positive monotonic relationship

B) Weak negative monotonic relationship

C) Strong positive monotonic relationship

D) Strong negative monotonic relationship

Answer: A

Hint: Low absolute values indicate weak relationships.

37. What does a rank correlation coefficient of -0.90 suggest about the relationship between variables?

A) Strong positive monotonic relationship

B) Strong negative monotonic relationship

C) Weak positive monotonic relationship

D) Weak negative monotonic relationship

Answer: B

Hint: High absolute value indicates a strong relationship.

38. If two variables have a rank correlation coefficient of +0.50, what type of relationship is present?

A) Weak positive monotonic relationship

B) Strong positive monotonic relationship

C) Weak negative monotonic relationship

D) Strong negative monotonic relationship

Answer: A

Hint: Moderate absolute values indicate moderate relationships.

39. A rank correlation coefficient of 1 denotes:

A) Perfect positive monotonic relationship

B) Strong positive monotonic relationship

C) Perfect negative monotonic relationship

D) Weak positive monotonic relationship

Answer: A

Hint: +1 indicates a perfect positive monotonic relationship.

40. What does a rank correlation coefficient of 0.25 indicate about the relationship between variables?

A) Weak positive monotonic relationship

B) Weak negative monotonic relationship

C) Strong positive monotonic relationship

D) Strong negative monotonic relationship

Answer: A

Hint: Low absolute values indicate weak relationships.

41. Regression analysis is used to:

A) Predict future values based on past data

B) Determine causation between variables

C) Establish relationships between variables

D) Test hypothesis in statistics

Answer: A

Hint: Regression predicts based on relationships between variables.

42. What is the main difference between simple and multiple regression?

A) Number of variables involved

B) Type of relationship analyzed

C) Predictive accuracy

D) Causation analysis

Answer: A

Hint: Simple uses one predictor, multiple uses multiple predictors.

43. In a scatter plot, the line that best fits the data points in regression analysis is called:

A) Trend line

B) Best-fit line

C) Regression line

D) Correlation line

Answer: C

Hint: The line represents the relationship between variables.

- 44. The equation of a regression line is represented as:
 - A) y = mx + c
 - B) y = cx + m
 - C) x = my + c
 - D) x = cy + m

Answer: A

Hint: It represents the equation of a straight line.

45. In regression analysis, the variable being predicted is called the:

A) Dependent variable

B) Independent variable

- C) Predictor variable
- D) Residual variable

Answer: A

Hint: It's the variable being predicted or explained.

46. What does the term "residual" represent in regression analysis?

A) The difference between observed and predicted values

- B) The dependent variable
- C) The independent variable
- D) The error in prediction

Answer: A

Hint: It measures the deviation of observed values from predicted values.

47. Which statistical measure assesses the goodness-of-fit in regression analysis?

A) R-squared

B) P-value

C) Coefficient of determination

D) Standard error

Answer: A

Hint: It quantifies the proportion of variance explained by the model.

48.An R-squared value of 0.80 in regression analysis indicates:

A) High predictive accuracy

B) Low predictive accuracy

C) No relationship between variables

D) No variation in the data

Answer: A

Hint: High R-squared indicates good model fit.

49. What does a slope of 0 in regression analysis signify?

A) No relationship between variables

B) Perfect positive relationship

C) Perfect negative relationship

D) Constant value of the dependent variable

Answer: A

Hint: The slope signifies the change in the dependent variable for a unit change in the independent variable.

50. Which of the following is a potential limitation of regression analysis?

A) Assumes a causal relationship between variables

B) Requires a large sample size

C) Suitable for analyzing non-linear relationships

D) Provides precise predictions for any situation

Answer: A

Hint: Correlation doesn't imply causation.

51. The correlation coefficient and the slope of the regression line have a relationship in that:

A) They always have the same value

B) They are both measures of strength

C) They are mathematically unrelated

D) The correlation coefficient is the square of the slope

Answer: A

Hint: In simple linear regression, they are equal if the data meets certain conditions.

52.If the correlation coefficient between two variables is 0.90, what does this suggest about their relationship in terms of regression?

A) Strong linear relationship

B) Weak linear relationship

C) Non-linear relationship

D) Perfect negative relationship

Answer: A

Hint: High correlation implies a strong linear relationship.

53. What does a correlation coefficient of zero imply about the relationship between two variables in terms of regression analysis?

A) Perfect positive relationship

B) No linear relationship

C) Perfect negative relationship

D) Strong linear relationship

Answer: B

Hint: Zero correlation implies no linear relationship.

54. In regression analysis, what does a correlation coefficient of - 0.70 suggest about the relationship between variables?

A) Weak negative relationship

B) Weak positive relationship

C) Strong negative relationship

D) Strong positive relationship

Answer: C

Hint: High absolute value indicates a strong relationship.

55. If the correlation coefficient between two variables is 0.20, what does this suggest about their relationship in terms of regression?

A) Strong linear relationship

B) Weak linear relationship

C) Non-linear relationship

D) No relationship

Answer: B

Hint: Low correlation implies a weak linear relationship.

57. What does a correlation coefficient of -1 indicate about the relationship between variables in regression analysis?

A) No linear relationship

B) Perfect positive relationship

C) Perfect negative relationship

D) Weak positive relationship

Answer: C

Hint: -1 implies a perfect negative linear relationship.

58. The correlation coefficient measures the:

A) Strength of linear relationship

B) Slope of the regression line

C) Predictive power of the model

D) Variance explained by the model

Answer: A

Hint: It quantifies the strength of the linear relationship between variables.

59. In regression analysis, what does a correlation coefficient of +0.80 indicate about the relationship between variables?

A) Weak positive relationship

B) Strong positive relationship

C) Weak negative relationship

D) No linear relationship

Answer: B

Hint: High absolute value indicates a strong relationship.

60. What happens to the correlation coefficient if there's a curvilinear relationship between variables?

A) Increases

B) Decreases

C) Stays the same

D) Becomes negative

Answer: B

Hint: A curvilinear relationship reduces the correlation coefficient.

61.In simple linear regression, the sign of the correlation coefficient r between two variables X and Y is the same as the sign of:

A) The slope coefficient in the regression equation

B) The intercept coefficient in the regression equation

C) The product of the means of X and Y

D) The standard deviation of X and Y

Answer: A

Hint: The sign of the correlation coefficient and the slope coefficient in linear regression are the same.

62: In a perfect positive linear relationship, the correlation coefficient ((r)) and the slope of the regression line ((b)) are:

A) Equal to zero

B) Both positive

C) Both negative

D) Equal to one

Answer: D

Hint: In a perfect positive linear relationship, (r) and (b) are both equal to one.

63: A correlation coefficient ((r)) of -0.70 suggests that in a regression analysis:

A) There is a weak positive relationship between variables

B) There is a strong negative relationship between variables

C) The slope coefficient will be positive

D) The intercept coefficient will be zero

Answer: B

Hint: A negative (r) indicates a strong negative relationship between variables in a regression.

64: If the correlation coefficient $(\langle r \rangle)$ between two variables is zero, then in a linear regression model:

A) The slope of the regression line is also zero

B) There is no relationship between the variables

C) The intercept of the regression line is zero

D) The residuals are perfectly distributed

Answer: A

Hint: A zero correlation implies the slope of the regression line is zero.

65. In a multiple regression scenario with three predictor variables, a high correlation between two of the predictors would likely lead to:

A) A weaker relationship between the other predictor and the dependent variable

B) A multicollinearity issue affecting the regression coefficients

C) A stronger relationship between the predictors and the dependent variable

D) A reduced standard error of the regression coefficients

Answer: B

Hint: High correlation among predictors causes multicollinearity issues.

66: A regression coefficient can be interpreted as the change in the dependent variable for a one-unit increase in the independent variable, whereas the correlation coefficient ($\langle (r \rangle) \rangle$) represents:

A) The strength and direction of the linear relationship

B) The prediction error of the regression model

C) The variability of the residuals

D) The magnitude of the dependent variable

Answer: A

Hint: Regression coefficients measure the change in the dependent variable per unit change in the independent variable, while (r) signifies the strength and direction of the relationship.

67: In a regression model where the correlation coefficient is close to +1, the relationship between the variables is:

A) Weak and negative

B) Strong and negative

C) Weak and positive

D) Strong and positive

Answer: D

Hint: A correlation coefficient close to +1 indicates a strong positive relationship.

68: The coefficient of determination R^2 is the square of the:

A) Correlation coefficient γ

B) Slope coefficient in regression ρ

C) Standard deviation of the residuals ρ

D) Intercept coefficient in regression

Answer: A

Hint: R^2 is the square of the correlation coefficient γ .

69: If the regression coefficient is positive and the correlation coefficient is negative, it suggests:

A) A perfect linear relationship between the variables

B) An error in the calculation of the regression coefficient

C) A quadratic relationship between the variables

D) A problem with the assumption of linearity

Answer: C

Hint: A positive regression coefficient and a negative correlation coefficient can indicate a quadratic relationship.

70. When the regression line is steeper, indicating a larger slope coefficient, the correlation coefficient tends to be:

A) Closer to zero

B) Closer to +1 or -1

C) Closer to +0.5

D) Unrelated to the slope

Answer: B

Hint: A steeper regression line often corresponds to a correlation coefficient closer to

+1 or -1

UNIT IV

4.1 Index Numbers

- 1. What do index numbers help measure?
 - A) Absolute values
 - B) Percentage changes
 - C) Ratios
 - D) Proportions

Answer: B

Hint: Index numbers represent changes in percentage terms.

2. Which formula represents the Laspeyres Price Index?

A)
$$\sum \frac{P_1 Q_0}{P_0 Q_0}$$

B) $\sum \frac{P_1 Q_1}{P_0 Q_1}$
C) $\sum \frac{P_0 Q_1}{P_1 Q_0}$

D)
$$\sum \frac{P_{0} q_{0}}{P_{1} Q_{1}}$$

Answer: A

Hint: The Laspeyres index uses base-period quantities.

3. Which index number uses both current and base-period quantities and prices?

- A) Laspeyres Index
- B) Paasche Index
- C) Fisher's Ideal Index
- D) Marshall-Edgeworth Index
Answer: C

Hint: Fisher's Ideal Index uses both base and current period quantities and prices.

4. Which index number accounts for a geometric mean of price relatives?

A) Laspeyres Index

B) Paasche Index

C) Fisher's Ideal Index

D) Marshall-Edgeworth Index

Answer: D

Hint: The Marshall-Edgeworth Index employs a geometric mean.

5. In the formula for the Laspeyres Price Index, what do P_1 and Q_0 represent?

A) Current price and current quantity

B) Current price and base-period quantity

C) Base-period price and current quantity

D) Base-period price and base-period quantity

Answer: A

Hint: P_1 is the current price and Q_0 is the base-period quantity.

6. The Paasche Price Index formula involves which quantities and prices?

A) Base-period quantities and base-period prices

B) Base-period quantities and current prices

C) Current quantities and base-period prices

D) Current quantities and current prices

Answer: D

Hint: Paasche uses current quantities and prices.

7. What does a base index number value of 100 indicate?

A) Prices have increased since the base period

B) Prices have decreased since the base period

C) No change in prices since the base period

D) Base period quantities are zero

Answer: C

Hint: A base index of 100 signifies no change from the base period.

8. Fisher's Ideal Index is considered:

A) Biased

B) Unbiased

C) Overestimated

D) Underestimated

Answer: B

Hint: Fisher's index is considered unbiased.

9. The chain-base index uses which period as the base?

A) The earliest period in the dataset

B) The latest period in the dataset

C) The period with the highest values

D) The previous period in the dataset

Answer: D

Hint: The chain-base index uses the previous period as the base for the next index.

10. Index numbers are used primarily to:

A) Represent absolute values

B) Measure inflation or deflation

C) Analyze proportions

D) Compute exact prices

Answer: B

Hint: Index numbers are widely used to measure changes in prices over time.

11. What do index numbers help measure?

A) Absolute values

B) Percentage changes

C) Ratios

D) Proportions

Answer: B

Hint: Index numbers represent changes in percentage terms.

12. Paasche's index number is typically used when:

A) There is a need to overestimate the cost of living.

B) Base quantities are more relevant than current quantities.

C) Current quantities are more relevant than base quantities.

D) None of the above.

Answer: C) Current quantities are more relevant than base quantities.

Hint: Paasche's index numbers are preferred when current quantities are more relevant.

13. Which index number uses both current and base-period quantities and prices?

A) Laspeyres Index

B) Paasche Index

C) Fisher's Ideal Index

D) Marshall-Edgeworth Index

Answer: C

Hint: Fisher's Ideal Index uses both base and current period quantities and prices.

14. Which index number accounts for a geometric mean of price relatives?

A) Laspeyres Index

B) Paasche Index

C) Fisher's Ideal Index

D) Marshall-Edgeworth Index

Answer: D

Hint: The Marshall-Edgeworth Index employs a geometric mean.

15. In the formula for the Laspeyres Price Index, what do P_1 and Q_0 represent?

A) Current price and current quantity

B) Current price and base-period quantity

C) Base-period price and current quantity

D) Base-period price and base-period quantity

Answer: A

Hint: P_1 is the current price and Q_0 is the base-period quantity.

16. The Paasche Price Index formula involves which quantities and prices?

A) Base-period quantities and base-period prices

B) Base-period quantities and current prices

C) Current quantities and base-period prices

D) Current quantities and current prices

Answer: D

Hint: Paasche uses current quantities and prices.

17. What does a base index number value of 100 indicate?

A) Prices have increased since the base period

B) Prices have decreased since the base period

C) No change in prices since the base period

D) Base period quantities are zero

Answer: C

Hint: A base index of 100 signifies no change from the base period.

18. Fisher's Ideal Index is considered:

A) Biased

B) Unbiased

C) Overestimated

D) Underestimated

Answer: B

Hint: Fisher's index is considered unbiased.

19. The chain-base index uses which period as the base?

A) The earliest period in the dataset

B) The latest period in the dataset

C) The period with the highest values

D) The previous period in the dataset

Answer: D

Hint: The chain-base index uses the previous period as the base for the next index.

20. Index numbers are used primarily to:

A) Represent absolute values

B) Measure inflation or deflation

C) Analyze proportions

D) Compute exact prices

Answer: B

Hint: Index numbers are widely used to measure changes in prices over time.

21.In a fixed base index, what does the base period usually represent?

A) The period with the highest prices

B) The period with the lowest prices

C) The earliest period in the dataset

D) The most recent period in the dataset

Answer: C

Hint: The base period is often the earliest period for a fixed base index.

22. Which formula represents the Paasches Price Index?

A) A)
$$\sum \frac{P_1 Q_1}{P_0 Q_0}$$

B) $\sum \frac{P_1 Q_1}{P_0 Q_0}$
C) $\sum \frac{P_0 Q_1}{P_1 Q_0}$
D) $\sum \frac{P_0 Q_0}{P_1 Q_1}$

Answer: B

Hint: The Paasches index uses base-period quantities.

23. The Laspeyres index typically uses which quantities and prices?

A) Base-period quantities and base-period prices

B) Base-period quantities and current prices

C) Current quantities and base-period prices

D) Current quantities and current prices

Answer: A

Hint: Laspeyres uses base-period quantities and prices.

24. In a fixed base index, what does the index value represent for the base period?

A) 0

B) 50

C) 100

D) 1

Answer: C

Hint: The base period is assigned a value of 100 in a fixed base index.

25. The Paasche Price Index formula involves which quantities and prices?

A) Base-period quantities and base-period prices

B) Base-period quantities and current prices

C) Current quantities and base-period prices

D) Current quantities and current prices

Answer: D

Hint: Paasche uses current quantities and prices.

26. What does a fixed base index of 120 indicate?

A) 20% increase from the base period

B) 120% increase from the base period

C) 20% decrease from the base period

D) 120% decrease from the base period

Answer: A

Hint: The index value above 100 indicates an increase.

27. Which index number assigns equal weight to all items in the computation?

A) Laspeyres Index

B) Paasche Index

C) Marshall-Edgeworth Index

D) Simple Aggregate Index

Answer: D

Hint: The Simple Aggregate Index assigns equal weight to all items.

28. The Fisher's Ideal Index combines which two indices?

A) Laspeyres and Paasche

B) Laspeyres and Marshall-Edgeworth

C) Paasche and Marshall-Edgeworth

D) Laspeyres and Simple Aggregate

Answer: A

Hint: Fisher's Ideal Index combines Laspeyres and Paasche.

29. In a fixed base index, what happens if a commodity's price data is missing for a specific period?

A) The index remains unchanged

B) The index for that period becomes zero

C) The index for that period becomes equal to the average of surrounding periods

D) The index becomes negative for that period

Answer: A

Hint: Missing data does not affect the base index.

30. What does a fixed base index of 85 indicate?

A) 85% decrease from the base period

B) 15% decrease from the base period

C) 85% increase from the base period

D) 15% increase from the base period

Answer: B

Hint: An index value below 100 indicates a decrease from the base period.

31. In a chain base index, the base year changes from:

A) Year to year

B) Period to period

C) Decade to decade

D) Region to region

Answer: B

Hint: The base year changes from one period to the next.

32. Which of the following statements is true regarding the

Laspeyres index number?

A) It uses current quantities and base prices.

B) It uses current prices and current quantities.

C) It uses base quantities and current prices.

D) It uses base prices and base quantities.

Answer: C) It uses base quantities and current prices.

Hint: Laspeyres index numbers use quantities from one period and prices from another period

Hint: The chain base index uses both current and previous period quantities and prices.

33. The chain base index typically uses which quantities and prices?

A) Base-period quantities and base-period prices

B) Base-period quantities and current prices

C) Current quantities and base-period prices

D) Current quantities and current prices

Answer: D

Hint: Chain base index uses both current quantities and prices.

34. In a chain base index, what is the starting point for index calculations?

A) Base period

B) Current period

C) Earliest period

D) Ending period

Answer: A

Hint: The base period is the starting point for calculations.

35. The formula for the chain base index allows for:

A) Revisions in base year

B) Fixed base calculations

C) One-time calculations

D) Static data processing

Answer: A

Hint: Chain base index allows the base year to change.

36. What does a chain base index of 105 indicate?

A) 5% increase from the previous period

B) 105% increase from the previous period

C) 5% decrease from the previous period

D) 105% decrease from the previous period

Answer: A

Hint: An index value above 100 indicates an increase.

37. Which index number assigns varying weights to different items in the computation?

A) Fixed Base Index

B) Paasche Index

C) Chain Base Index

D) Simple Aggregate Index

Answer: C

Hint: Chain base index uses varying weights.

38. The chain base index method is commonly used in calculating:

A) Historical price trends

B) Current inflation rates

C) Long-term forecasts

D) Average price levels

Answer: B

Hint: It's used for measuring current changes.

39. In a chain base index, what happens if data for a specific period is missing?

A) The index remains unchanged

B) The index for that period becomes zero

C) The index for that period becomes equal to the average of surrounding periods

D) The index becomes negative for that period

Answer: C

Hint: It's often interpolated using surrounding periods.

40. What does a chain base index of 97 indicate?

A) 3% decrease from the previous period

B) 3% increase from the previous period

C) 97% decrease from the previous period

D) 97% increase from the previous period

Answer: A

Hint: An index value below 100 indicates a decrease from the previous period.

UNIT V

5.1TIME SERIES

1. What does time series analysis primarily focus on?

A) Cross-sectional data

B) Relationships between variables

C) Variations over time

D) Longitudinal data

Answer: C

Hint: Time series analysis observes variations over time.

2. The moving average method is used for:

A) Forecasting future values

B) Calculating the mean of a dataset

C) Determining outliers

D) Estimating the median value

Answer: A

Hint: Moving average predicts future values based on past data.

3. What does autocorrelation refer to in time series analysis?

A) Correlation between two different variables

B) Correlation between lagged values of the same variable

C) Correlation between dependent and independent variables

D) Correlation between two different time periods

Answer: B

Hint: Autocorrelation measures the relationship between a variable and its lagged values.

4. Seasonal decomposition is used to:

A) Remove trends from time series data

B) Identify cyclical patterns in the data

C) Separate a time series into its seasonal, trend, and irregular components

D) Identify outliers in the data

Answer: C

Hint: It disassembles the time series into its components.

5. Which method involves decomposing a time series into trend, seasonal, and irregular components?

A) Smoothing methods

B) Box-Jenkins method

C) Seasonal decomposition

D) Moving average method

Answer: C

Hint: Seasonal decomposition disassembles time series data.

6. Which technique is used to identify the turning points or peaks in a time series?

A) Smoothing methods

B) Seasonal decomposition

C) Trend analysis

D) Peak detection

Answer: D

Hint: Peak detection identifies turning points.

7. Which statistical measure is used to identify the presence of trends in time series data?

A) Mean

B) Variance

C) Autocorrelation

D) Linear regression

Answer: D

Hint: Linear regression helps identify trends.

8. Which analysis focuses on identifying cyclical patterns in a time series?

A) Seasonal decomposition

B) Moving average smoothing

C) Trend analysis

D) Cycle analysis

Answer: D

Hint: Cycle analysis identifies cyclical patterns.

9 .In a time series, which component represents the long-term movement of data?

A) Seasonal component

B) Cyclical component

C) Trend component

D) Irregular component

Answer: C

Hint: Trends represent long-term movements.

10. The irregular component in a time series represents:

A) Short-term fluctuations not attributable to other components

B) Periodic variations with a fixed frequency

C) Systematic movements with a known pattern

D) Regular and predictable changes

Answer: A

Hint: Irregular components account for random fluctuations.

11. The component of a time series that repeats at regular intervals is the:

A) Trend

B) Seasonal

C) Cyclical

D) Irregular

Answer: B

Hint: Seasonal components repeat regularly.

12. The cyclical component in a time series represents:

A) Short-term fluctuations not attributable to other components

B) Systematic movements with a known pattern

C) Periodic variations with a fixed frequency

D) Irregular and unpredictable changes

Answer: C

Hint: Cycles have fixed and repetitive frequencies.

13. Which component in a time series is difficult to model or forecast?

A) Trend

B) Seasonal

C) Cyclical

D) Irregular

Answer: D

Hint: Irregular components are unpredictable.

14. The trend component of a time series can be identified by:

A) Seasonal decomposition

B) Identifying cyclical patterns

C) Observing long-term movements

D) Removing irregular fluctuations

Answer: C

Hint: Trends show long-term movements.

15. What does the seasonal component of a time series represent?

A) Long-term movements

B) Short-term fluctuations

C) Random variations

D) Periodic variations within a year

Answer: D

Hint: Seasonal components repeat within a year.

16 Which component in a time series typically occurs due to economic fluctuations?

A) Trend

B) Seasonal

C) Cyclical

D) Irregular

Answer: C

Hint: Cyclical components relate to economic cycles.

17. The irregular component in a time series is also known as:

A) Noise

B) Cycle

C) Seasonality

D) Trend

Answer: A

Hint: Irregular components are often considered noise.

18. What is the primary characteristic of the trend component in a time series?

A) Long-term movements

B) Short-term fluctuations

C) Fixed and repetitive patterns

D) Unpredictable changes

Answer: A

Hint: Trends represent long-term movements.

19. Which component of a time series often results from unpredictable events or irregular occurrences?

A) Trend

B) Seasonal

C) Cyclical

D) Irregular

Answer: D

Hint: Irregular components stem from irregular events.

20. Which component in a time series is typically associated with periodic variations in data?

A) Trend

B) Seasonal

C) Cyclical

D) Irregular

Answer: B

Hint: Seasonal components exhibit regular patterns.

30. The component of a time series that may span several years and does not have a fixed frequency is the:

A) Trend

B) Seasonal

C) Cyclical

D) Irregular

Answer: C

Hint: Cycles do not have fixed periods like seasons.

31. What is the main focus of removing or detrending the data in time series analysis?

A) Enhancing the cyclical patterns

B) Eliminating seasonal variations

C) Highlighting irregular fluctuations

D) Isolating the trend component

Answer: D

Hint: Detrending isolates the trend.

32. The component in a time series that occurs due to external factors influencing the data is the:

A) Trend

B) Seasonal

C) Cyclical

D) Irregular

Answer: C

Hint: Cycles often result from external factors.

33. Which component in a time series often exhibits short-term fluctuations within a year?

A) Trend

B) Seasonal

C) Cyclical

D) Irregular

Answer: B

Hint: Seasonal components repeat within a year.

34. What type of pattern is usually associated with the seasonal component in a time series?

A) Long-term movements

B) Short-term fluctuations

C) Random variations

D) Predictable variations within a year

Answer: D

Hint: Seasonal patterns repeat predictably within a year.

35. The cyclical component in a time series typically extends over a period of:

A) Several days

B) Several months

C) Several years

D) Several minutes

Answer: C

Hint: Cycles span longer periods.

36. The irregular component in a time series is often the result of:

A) Business cycles

B) External influences

C) Random or unpredictable events

D) Seasonal variations

Answer: C

Hint: Irregular components arise from random events.

37. Which component in a time series is often associated with the business or economic cycle?

A) Trend

B) Seasonal

C) Cyclical

D) Irregular

Answer: C

Hint: Cyclical components are linked to economic cycles.

38. What does the term "secular trend" refer to in time series analysis?

A) Long-term changes in a time series

B) Short-term fluctuations in a time series

C) Seasonal patterns in a time series

D) Random fluctuations in a time series

Answer: A

Hint: Secular trend refers to long-term changes.

39. Which statistical method separates a time series into trend, seasonal, and irregular components?

A) Moving averages

B) Seasonal indices

C) Seasonal decomposition

D) Linear regression

Answer: C

Hint: Seasonal decomposition disassembles the series.

40. Which seasonal adjustment method involves computing an average for each season in a time series?

A) Ratio-to-moving average method

B) Link relative method

C) Seasonal indices method

D) Exponential smoothing method

Answer: C

Hint: Seasonal indices compute averages for each season.

41. Which method assigns seasonal indices based on the average value for each season?

A) Ratio-to-trend method

B) Ratio-to-moving average method

C) Seasonal indices method

D) Seasonal decomposition method

Answer: C

Hint: Seasonal indices compute averages for each season.

42. Which method uses ratios to adjust for seasonal variations in a time series?

A) Link relative method

B) Ratio-to-trend method

- C) Moving average method
- D) Seasonal decomposition method

Answer: A

Hint: Link relative method adjusts using ratios.

43. The purpose of seasonal indices in time series analysis is to:

- A) Represent the overall trend
- B) Isolate cyclical patterns

C) Eliminate irregular fluctuations

D) Quantify seasonal patterns

Answer: D

Hint: Seasonal indices quantify seasonal patterns.

44. The component in a time series that represents fluctuations that occur due to unpredictable and irregular events is termed as:

- A) Trend
- B) Seasonal
- C) Cyclical
- D) Irregular
- Answer: D

Hint: Irregular components stem from unpredictable events.

45. The part of a time series that typically occurs due to changes in economic conditions is known as:

- A) Trend
- B) Seasonal
- C) Cyclical
- D) Irregular

Answer: C

Hint: Cyclical components relate to economic fluctuations.

46. The process of extracting the trend component from a time series data is called:

A) Detrending

B) Seasonal decomposition

C) Cyclical adjustment

D) Irregular filtering

Answer: A

Hint: Detrending involves removing the trend.

47. The irregular component in a time series is also termed as:

A) Noise

B) Cycle

- C) Seasonality
- D) Trend

Answer: A

Hint: Irregular components are often referred to as noise.

48. The cyclical component in a time series typically extends over a period of:

A) Several days

B) Several months

C) Several years

D) Several minutes

Answer: C

Hint: Cyclical components cover longer durations.

49. What does the term "secular trend" refer to in time series analysis?

A) Long-term changes in a time series

B) Short-term fluctuations in a time series

C) Seasonal patterns in a time series

D) Random fluctuations in a time series

Answer: A

Hint: Secular trend refers to long-term changes.

50. The cyclical component in a time series often occurs due to:

A) Seasonal variations

B) Long-term changes

C) Business cycles

D) Irregular events

Answer: C

Hint: Cyclical components are linked to business cycles.

5.2 Seasonal Variations

51: Seasonal fluctuations in a time series:

A) Are long-term changes

B) Occur due to cyclical variations

C) Repeat within a specific period

D) Stem from irregular events

Answer: C

Hint: Seasonal fluctuations repeat within a period.

52: Which component of a time series exhibits regular patterns within a year?

A) Trend

B) Seasonal

C) Cyclical

D) Irregular

Answer: B

Hint: Seasonal components repeat within a year.

53: The primary characteristic of seasonal fluctuations is their:

A) Unpredictability

B) Random occurrence

C) Regularity within a period

D) Long-term nature

Answer: C

Hint: Seasonal fluctuations occur regularly.

54: The removal of seasonal variations in time series data is achieved through:

A) Detrending

B) Seasonal decomposition

C) Cyclical adjustment

D) Irregular filtering

Answer: B

Hint: Seasonal decomposition removes seasonal effects.

55: What does the term "seasonality" signify in time series analysis?

A) Long-term changes

B) Short-term fluctuations

C) Irregular patterns

D) Regular patterns within a year

Answer: D

Hint: Seasonality represents regular patterns within a year.

56.Seasonal fluctuations are often caused by:

A) Long-term economic changes

B) Irregular and random events

C) Predictable patterns in specific periods

D) Random variations without any pattern

Answer: C

Hint: Seasonal fluctuations occur in predictable periods.

57. What does the seasonal component in a time series exhibit?

A) Long-term movements

B) Short-term random variations

C) Regular patterns within a year

D) Random fluctuations

Answer: C

Hint: Seasonal components show regular patterns.

58 Which method quantifies and adjusts for seasonal variations in a time series?

A) Moving average

B) Seasonal indices

C) Linear regression

D) Cyclical adjustment

Answer: B

Hint: Seasonal indices quantify and adjust for seasonality.

59. The primary purpose of analyzing seasonal fluctuations in time series is to:

A) Predict long-term trends

B) Isolate irregular patterns

C) Adjust for cyclical changes

D) Understand regular patterns within periods

Answer: D

Hint: Analyzing seasonality helps understand regular patterns.

60. The ratio-to-moving average method is specifically used for:

A) Trend estimation

B) Cyclical adjustment

C) Seasonal adjustment

D) Irregular filtering

Answer: C

Hint: Ratio-to-moving average helps in seasonal adjustment

61. Cyclical fluctuations in a time series refer to:

A) Irregular and unpredictable changes

B) Regular patterns within a year

C) Periodic movements not linked to seasons

D) Long-term economic changes

Answer: C

Hint: Cyclical fluctuations occur independently of seasonal patterns.

62. Which component of a time series typically represents movements beyond one year in duration?

A) Trend

B) Seasonal

C) Cyclical

D) Irregular

Answer: C

Hint: Cyclical components cover longer durations than seasonal components.

63. Cyclical fluctuations in time series often stem from:

A) Regular patterns within a year

B) Short-term random variations

C) Predictable changes over several years

D) Unpredictable and irregular events

Answer: C

Hint: Cyclical fluctuations involve predictable changes over multiple years.

64. The removal of cyclical variations from a time series data is achieved through:

A) Detrending

B) Cyclical adjustment

C) Seasonal decomposition

D) Irregular filtering

Answer: A

Hint: Detrending helps in removing cyclical effects.

65. Which economic phenomenon is primarily associated with cyclical fluctuations in time series?

A) Short-term variations

B) Long-term trends

C) Seasonal patterns

D) Business cycles

Answer: D

Hint: Business cycles relate to cyclical fluctuations.

66. Cyclical components in a time series exhibit:

A) Predictable changes within a year

B) Long-term patterns beyond a year

C) Random and irregular movements

D) Regular fluctuations within a year

Answer: B

Hint: Cyclical components extend beyond one year.

67. What characterizes cyclical fluctuations in time series analysis?

A) Regular patterns within a year

B) Predictable changes over several years

C) Unpredictable and irregular events

D) Irregular fluctuations

Answer: B

Hint: Cyclical fluctuations occur predictably over several years.

68. Which method is primarily used to estimate and analyze cyclical fluctuations in time series?

A) Moving averages

B) Seasonal indices

C) Linear regression

D) Business cycle analysis

Answer: D

Hint: Business cycle analysis focuses on cyclical fluctuations.

69. The primary purpose of studying cyclical fluctuations in time series is to:

A) Isolate irregular patterns

B) Understand long-term economic changes

C) Adjust for seasonal variations

D) Analyze predictable changes beyond a year

Answer: D

Hint: Studying cyclical fluctuations helps understand predictable changes over years.

70. The cyclical component in a time series is often associated with:

A) Seasonal variations

B) Random and irregular patterns

- C) Long-term economic cycles
- D) Short-term variations

Answer: C

Hint: Cyclical components relate to long-term economic cycles.

71. Irregular variations in a time series refer to changes that are:

- A) Regularly occurring
- B) Predictable and cyclical
- C) Unpredictable and random
- D) Seasonal in nature
- Answer: C

Hint: Irregular variations are unpredictable and random.

72. Which component of a time series represents unpredictable and erratic movements?

- A) Trend
- B) Seasonal
- C) Cyclical

D) Irregular

Answer: D

Hint: Irregular components are unpredictable and erratic.

73. The removal of irregular fluctuations from a time series data is:

- A) Detrending
- B) Seasonal decomposition
- C) Cyclical adjustment

D) Filtering

Answer: D

Hint: Filtering helps remove irregular effects.

74. Irregular variations in a time series often arise due to:

A) Long-term economic cycles

B) Predictable patterns

C) Unpredictable and random events

D) Seasonal fluctuations

Answer: C

Hint: Irregular variations stem from unpredictable events.

75. What characterizes irregular fluctuations in a time series analysis?

A) Predictable patterns

B) Long-term changes

C) Unpredictable and random movements

D) Regular and cyclical variations

Answer: C

Hint: Irregular fluctuations are unpredictable and random.

76. The irregular component in a time series is often termed as:

A) Noise

B) Cycle

C) Seasonality

D) Trend

Answer: A

Hint: Irregular components are often referred to as noise.

77. Which method is primarily used to filter out random fluctuations in a time series?

A) Moving averages

B) Seasonal indices

C) Linear regression

D) Cyclical adjustment

Answer: A

Hint: Moving averages help filter out random fluctuations.

78. Irregular variations are difficult to forecast because they are:

A) Random and unpredictable

B) Linked to seasonal patterns

- C) Cyclical in nature
- D) Long-term changes

Answer: A

Hint: Irregular variations are random and unpredictable.

79. The irregular component in a time series is often caused by:

- A) Economic cycles
- B) Seasonal variations
- C) Random or erratic events
- D) Predictable patterns

Answer: C

Hint: Irregular components stem from random events.

80. The primary purpose of identifying irregular fluctuations in a time series is to:

A) Predict cyclical changes

B) Adjust for seasonal variations

C) Isolate unpredictable movements

D) Analyze long-term trends

Answer: C

Hint: Identifying irregular fluctuations helps isolate unpredictable movements.

Additive Model:

81. In an additive model, the relationship between components and the series of observations is depicted as:

A) Multiplication of components

B) Addition of components

C) Subtraction of components

D) Division of components

Answer: B

Hint: Additive models involve adding the components.

82. Which of the following describes an additive model?

A) Series = Trend \times Seasonality \times Cyclical \times Irregular

B) Series = Trend + Seasonality + Cyclical + Irregular

C) Series = Trend / Seasonality / Cyclical / Irregular

D) Series = Trend - Seasonality - Cyclical - Irregular

Answer: B

Hint: Additive models represent the series as a sum of components.

83. In an additive time series model, if the seasonal component remains constant, what happens to the observed data?

A) It increases linearly

B) It remains constant

C) It fluctuates around a constant

D) It decreases linearly

Answer: C

Hint: In an additive model, the seasonal component does not change the variability of the data.

Multiplicative Model:

84: In a multiplicative model, how are the components related to the series of observations?

A) They are subtracted from the series

B) They are divided into the series

C) They are added to the series

D) They are multiplied with the series

Answer: D

Hint: Multiplicative models involve multiplying the components.

85. Which equation represents a multiplicative model?

A) Series = Trend + Seasonality + Cyclical + Irregular

B) Series = Trend \times Seasonality \times Cyclical \times Irregular

C) Series = Trend - Seasonality - Cyclical - Irregular

D) Series = Trend / Seasonality / Cyclical / Irregular

Answer: B

Hint: Multiplicative models represent the series as a product of components.

86. In a multiplicative time series model, if the seasonal component changes, what happens to the observed data?

A) It remains constant

B) It increases linearly

C) It fluctuates around a constant

D) It changes multiplicatively

Answer: D

Hint: In a multiplicative model, changes in the seasonal component impact the variability of the data.

Comparative Questions:

87: Which model assumes that the magnitude of seasonal fluctuations increases as the series values increase?

A) Additive model

B) Multiplicative model

C) Both models assume the same

D) Neither model accounts for seasonal fluctuations

Answer: B

Hint: Multiplicative models assume proportional changes.

88. Which model is more appropriate when the magnitude of seasonal fluctuations remains constant?

A) Additive model

B) Multiplicative model

C) Both models are equally appropriate

D) Neither model accounts for constant seasonal fluctuations

Answer: A

Hint: Additive models are more suitable when seasonal fluctuations remain constant.

89. In which model is the interaction between components linear?

A) Additive model

B) Multiplicative model

C) Both models have linear interactions

D) Neither model exhibits linear interactions

Answer: A

Hint: Additive models exhibit linear interactions between components.

90. Which model is more suitable for a time series where the variance is proportional to the level of the series?

A) Additive model

B) Multiplicative model

C) Both models assume the same variance

D) Neither model considers variance in time series

Answer: B

Hint: Multiplicative models are apt when the variance is proportional to the level of the series.

91: Secular trend in a time series represents:

A) Short-term fluctuations

B) Long-term movements

C) Seasonal patterns

D) Random variations

Answer: B

Hint: Secular trend denotes long-term movements or changes.

92. Which statement best describes secular trend in time series analysis?

A) Cyclical changes within a year

B) Irregular fluctuations over several years

C) Long-term upward or downward movements

D) Seasonal patterns within a specific period

Answer: C

Hint: Secular trend signifies long-term directional movements.

93: Secular trend is primarily associated with:

A) Short-term variations

B) Cyclical movements

C) Irregular events

D) Long-term changes

Answer: D

Hint: Secular trend represents long-term changes over a period.

94. The secular trend component in a time series is typically:

A) Predictable and cyclical

B) Unpredictable and random

C) Irregular and erratic

D) Stable and long-term

Answer: D

Hint: Secular trend reflects stable, long-term changes.

95. Which statistical method is used to estimate and analyze the secular trend in a time series?

A) Moving averages

B) Seasonal decomposition

C) Linear regression

D) Autoregressive integrated moving average (ARIMA)

Answer: C

Hint: Linear regression helps estimate the secular trend.

96. Secular trend is best defined as:

A) Irregular and unpredictable movements

B) Changes occurring over a year

C) Long-term directional movements

D) Predictable cyclic patterns

Answer: C

Hint: Secular trend relates to long-term directional movements.

97. The primary objective of analyzing secular trends in a time series is to:

A) Understand short-term variations

B) Predict cyclical movements

C) Identify long-term changes

D) Extract seasonal patterns

Answer: C

Hint: Secular trend analysis aims to identify long-term changes.

98. Secular trends in economic data often represent:

A) Short-term business cycles

B) Long-term economic growth or decline

C) Seasonal employment variations

D) Unpredictable economic events

Answer: B

Hint: Secular trends reflect long-term economic growth or decline.

99. The term "secular" in secular trend refers to:

A) Short-term

B) Long-term

C) Predictable

D) Unpredictable

Answer: B

Hint: Secular trend pertains to long-term changes.

100. Secular trend analysis is essential for:

A) Short-term forecasting

B) Understanding cyclical patterns

C) Predicting seasonal variations

D) Long-term planning

Answer: D

Hint: Secular trend analysis aids in long-term planning.

101. The method of semi-average is primarily used for:

A) Estimating long-term trends

B) Analyzing cyclical variations

C) Identifying irregular fluctuations

D) Adjusting for seasonal patterns

Answer: A

Hint: The method of semi-average helps estimate long-term trends.

102. In the method of semi-average, the data is divided into segments of:

A) Equal length

B) Unequal length

C) Seasonal periods

D) Cyclical fluctuations

Answer: A

Hint: The data is divided into equal-length segments in the semiaverage method.

103. Which step is involved in the method of semi-average?

A) Summing all data points in each segment

B) Averaging every two adjacent data points

C) Calculating the median of each segment

D) Excluding outliers in each segment


Answer: B

Hint: Semi-average involves averaging every two adjacent data points.

104. The method of semi-average aims to:

- A) Smooth out irregular fluctuations
- B) Increase the variability in the data
- C) Amplify seasonal patterns
- D) Minimize long-term trends

Answer: A

Hint: Semi-average helps in smoothing out irregular fluctuations.

105. In the semi-average method, after computing the semi-averages, what is the next step?

- A) Compute the mean of all semi-averages
- B) Calculate the median of the semi-averages
- C) Plot the semi-averages against time
- D) Combine the semi-averages with the original data

Answer: C

Hint: The semi-averages are usually plotted against time in the next step.

106. Which statement describes the semi-average method correctly?

- A) It divides the data into uneven segments
- B) It calculates the mean of every data point
- C) It involves averaging consecutive pairs of data
- D) It removes outliers from the dataset

Answer: C

Hint: Semi-average method involves averaging consecutive pairs of data.

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107. In the context of the semi-average method, what is the purpose of averaging pairs of data points?

A) To increase the dataset's variability

B) To emphasize cyclical fluctuations

C) To minimize irregular fluctuations

D) To smooth out trends

Answer: D

Hint: Averaging pairs of data points helps in smoothing out trends.

108. What does the semi-average method focus on in a time series?

- A) Short-term variations
- B) Irregular fluctuations
- C) Long-term trends
- D) Seasonal patterns
- Answer: C

Hint: Semi-average method primarily focuses on estimating long-term trends.

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