

UG Semester-End Final Exams-2024

B.A 3rd Semester (SEC)

METHODS OF DATA ANALYSIS

Full Marks: 37.5

Pass Mark: 15

Time: 2 Hours

(Figures in the right hand margin indicates marks)

Part-A (I) Answer all questions.

(0.5 × 15 = 7.5)

1. In a univariate frequency distribution, which of the following statements is correct?
 - (A) Only one variable is analyzed.
 - (B) Two or more variables are analyzed.
 - (C) It is used only for categorical data.
 - (D) It only applies to time-series data.
2. If we are examining the relationship between hours studied and test scores, we are working with:
 - (A) Univariate frequency distribution
 - (B) Bivariate frequency distribution
 - (C) Multivariate frequency distribution
 - (D) None of the above
3. Which measure is often used to determine the strength of association in bivariate data?
 - (A) Mean
 - (B) Median
 - (C) Mode
 - (D) Correlation coefficient
4. An ogive is typically used to represent:
 - (A) Relative frequency distribution.
 - (B) Cumulative frequency distribution.
 - (C) Frequency distribution of qualitative data.
 - (D) Relationship between two variables.

(PTO)

5. In a histogram, the bars are placed:
- With spaces between them.
 - With no spaces between them.
 - Diagonally across the chart.
 - In descending order of height.
6. When the data points form a curve rather than a straight line, the correlation is called:
- Linear correlation
 - Non-linear correlation
 - Positive correlation
 - Negative correlation
7. Which of the following is an example of a positive correlation?
- Hours of study and exam scores
 - Temperature and ice cream sales
 - Price of a product and demand for the product
 - Both A and B
8. What is a scatter diagram used for?
- To show cumulative frequencies.
 - To compare means of different groups.
 - To display the relationship between two variables.
 - To measure the central tendency of data.
9. The value of Karl Pearson's coefficient of correlation ranges between:
- 0 and 1
 - 1 and 1
 - 2 and 2
 - 0 and infinity
10. If two variables have identical ranks, the Spearman's rank correlation coefficient will be:
- 0
 - +1
 - 1
 - Undefined
11. Regression analysis can help businesses in:
- Determining mean customer satisfaction.
 - Calculating inventory levels without considering trends.
 - Predicting future sales based on past trends.
 - Measuring the cumulative frequency of product returns.

12. Which of the following is TRUE about regression but NOT about correlation?
- It establishes the association between two variables.
 - It allows one variable to be predicted from the other.
 - It only measures the strength of a relationship.
 - It does not assume any causation.
13. Both correlation and regression can be represented visually using a:
- Histogram
 - Scatter plot
 - Bar chart
 - Frequency distribution table
14. If one regression coefficient is greater than 1, what can be said about the other?
- It will also be greater than 1.
 - It will be equal to 1.
 - It will be less than 1.
 - It will be negative.
15. The regression equation of Y on X is used to:
- Predict the value of Y based on the value of X
 - Predict the value of X based on the value of Y
 - Find the correlation between two variables
 - Estimate the mean of X

Part-A (II) Answer any five questions

(1 × 5 = 5)

- What is the primary difference between univariate and bivariate frequency distributions?
- How can you visually represent a univariate frequency distribution?
- How does a pictogram differ from a traditional bar chart?
- What does each point on a scatter diagram represent?
- What are the main methods used to study correlation?
- What does a Pearson correlation coefficient of 0.85 indicate?
- How does Spearman's correlation differ from Pearson's correlation?
- What is regression in statistics?
- In what scenario would you use correlation rather than regression?
- What is the primary purpose of regression analysis?

(PTO)

Part-B (Answer any-five selecting at least one question from each Unit.)
(5 × 5 = 25)

Unit - 1

1. Explain briefly the general rules for constructing diagrams.
2. Draw a pie diagram for the following data of Sixth Five-Year Plan Public Sector outlays:

Sector	Outlay (%)
Agriculture and Rural Developments	12.9
Irrigation etc.	12.5
Energy	27.2
Industry and Minerals	15.4
Transport, Communication Etc.	15.9
Social services and others	16.1

3. Draw less than and more than ogives from the data given below:

Profits (₹Lakh)	No. of Companies	Profit (₹Lakh)	No. of Companies
10-20	6	60-70	16
20-30	8	70-80	8
30-40	12	80-90	5
40-50	18	90-100	2
50-60	25		

Unit - 2

4. Calculate Karl Person's coefficient of correlation from the advertisement cost and sales as per the data given below:

Adv. Cost (₹Lakh)	Sales (₹Lakh)	Adv. Cost (₹Lakh)	Sales (₹Lakh)
39	47	75	68
65	53	25	60
62	58	98	91
90	86	36	51
82	62	78	84

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5. Calculate Spearman's Rank coefficient of Correlation from the sales and expenses of 10 firms as given below:

Sales (₹lakh)	Expenses (₹Lakh)	Sales (₹Lakh)	Expenses (₹Lakh)
50	11	65	15
50	13	65	15
55	14	60	14
60	16	60	13
65	16	50	13

Unit - 3

6. The heights of father and sons are given in the following table:

Height of Fathers	65	56	67	67	68	69	71	73
Height of Sons	67	68	64	68	72	70	69	70

Form the two lines of regression and calculate the expected average height of the son if father is 67.5 inches.

7. Comparison of Correlation and Regression studies.