

## RAYALASEEMA UNIVERSITY: KURNOOL

B.A/B.Sc., STATISTICS (WM) CBCS REVISED SYLLABUS 2020-21  
Semester - I (CBCS With Maths Combination Common to BA/BSc)

### Course - I: Descriptive Statistics

#### UNIT-I

**Introduction to Statistics:** Importance of Statistics. Scope of Statistics in different fields. Concepts of primary and secondary data. Diagrammatic and graphical representation of data: Histogram, frequency polygon, Ogives, Pie. Measures of Central Tendency: Mean, Median, Mode, Geometric Mean and Harmonic Mean. Median and Mode through graph.

#### UNIT-II

**Measures of Dispersion:** Range, Quartile Deviation, Mean Deviation and Standard Deviation, Variance. Central and Non-Central moments and their interrelationship. Sheppard's correction for moments. Skewness and kurtosis.

#### UNIT-III

**Curve fitting:** Bi- variate data, Principle of least squares, fitting of degree polynomial. Fitting of straight line, Fitting of Second degree polynomial or parabola, Fitting of power curve and exponential curves.

**Correlation:** Meaning, Types of Correlation, Measures of Correlation: Scatter diagram, Karl Pearson's Coefficient of Correlation, Rank Correlation Coefficient (with and without ties), Bi-variate frequency distribution, correlation coefficient for bi-variate data and simple problems. Concept of multiple and partial correlation coefficients (three variables only ) and properties

#### UNIT-IV

**Regression :** Concept of Regression, Linear Regression: Regression lines, Regression coefficients and it's properties, Regressions lines for bi-variate data and simple problems. Correlation vs regression.

#### UNIT-V

**Attributes :** Notations, Class, Order of class frequencies, Ultimate class frequencies, Consistency of data, Conditions for consistency of data for 2 and 3 attributes only , Independence of attributes , Association of attributes and its measures, Relationship between association and colligation of attributes, Contingency table: Square contingency, Mean square contingency, Coefficient of mean square contingency, Tschuprow's coefficient of contingency.

**Text Books:**

1. V.K.Kapoor and S.C.Gupta: Fundamentals of Mathematical Statistics, SultanChand & Sons, New Delhi.
- 2 BA/BSc I year statistics - descriptive statistics, probability distribution - Telugu Academy  
- Dr M.Jaganmohan Rao,Dr N.Srinivasa Rao, Dr P.Tirupathi Rao, Smt.D.Vijayalakshmi.
3. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC. PHI

**Reference books:**

1. Willam Feller: Introduction to Probability theory and its applications. Volume -I, Wiley
2. Goon AM, Gupta MK, Das Gupta B : Fundamentals of Statistics , Vol-I, the World Press Pvt.Ltd., Kolakota.
3. Hoel P.G: Introduction to mathematical statistics, Asia Publishing house.
4. M. JaganMohan Rao and Papa Rao: A Text book of Statistics Course-I.
5. Sanjay Arora and Bansi Lal: New Mathematical Statistics: Satya Prakashan , NewDelhi

**Credits 2**

**Practicals - Course - I Note:****Minimum 10 practicals should be done**

1. Graphical presentation of data (Histogram, frequency polygon, Ogives).
2. Diagrammatic presentation of data (Bar and Pie).
3. Computation of measures of central tendency(Mean, Median and Mode)
4. Computation of measures of dispersion(Q.D, M.D and S.D)
5. Computation of non-central, central moments,  $\beta_1$  and  $\beta_2$  for ungrouped data.
6. Computation of non-central, central moments,  $\beta_1$  and  $\beta_2$  and Sheppard's corrections for grouped data.
7. Computation of Karl Pearson's coefficients of Skewness and Bowley's coefficients of Skewness.
8. Fitting of straight line by the method of leastsquares
9. Fitting of parabola by the method of least squares
10. Fitting of power curve of the type by the method of least squares.
11. Fitting of exponential curve of the type and by the method of leastsquares.
12. Computation of correlation coefficient and regression lines for ungrouped data
13. Computation of correlation coefficient, forming regression lines for grouped data
14. Computation of Yule's coefficient of association
15. Computation of Pearson's, Tcherprows coefficient of contingency

**Note: Training shall be on establishing formulae in Excel cells and derive the results. The excel output shall be exported to MS word for writing inference.**

## **Course Learning Outcomes**

Students will acquire

- 1) knowledge of Statistics and its scope and importance in various areas such as Medical, Engineering, Agricultural and Social Sciences etc.
- 2) knowledge of various types of data, their organization and evaluation of summary measures such as measures of central tendency and dispersion etc.
- 3) knowledge of other types of data reflecting quality characteristics including concepts of independence and association between two attributes,
- 4) insights into preliminary exploration of different types of data.
- 5) Knowledge of correlation, regression analysis, regression diagnostics, partial and multiple correlations.

## **Course Wise Objectives COURSE-I:**

### **Descriptive Statistics**

- The objective of this Course is to throw light on the role of statistics in different fields with special reference to business and economics.
- It gives the students to review good practice in presentation and the format most applicable to their own data.
- The measures of central tendency or averages reduce the data to a single value which is highly useful for making comparative studies.
- The measures of dispersion throw light on reliability of average and control of variability
- The concept of Correlation and Linear Regression deals with studying the linear relationship between two or more variables, which is needed to analyze the real life problems.
- The attributes gives an idea that how to deal with qualitative data.

**RAYALASEEMA UNIVERSITY**  
**THREE YEAR B.A./B.Sc DEGREE EXAMINATION STATISTICS(WM)**  
**(W.E.F 2022-23 ADMITTED BATCH)**  
**SEMESTER - I**  
**COURSE 1: DESCRIPTIVE STATISTICS**

**Time: 3 Hours**

**Max. Marks : 75**

**SECTION - A**

**I. Answer the following Multiple Choice questions (10 x 1= 10 marks)**

1. *Pie chart is always .....*  
A)Cylinder      B)Cone      C)Circular      D)Histogram
2. *Ideal Measure of Central Tendency is .....*  
A) Median      B)Mean      C)Mode      D)Geometric Mean
3. *Peakedness of a Frequency curve measured by....*  
A)Skewness      B) Kurtosis C) Momens      D) Variance
4. *The second order central moment is equal to.....*  
A)Mean      B)Variance C)SD      D)QD
5. *Principle of least squares is due to.....*  
A)Karl Pearson      B)Spearman      C)Legender      D)Fisher
6. *The Correlation Coefficient between two independent variables...*  
A)1      B)0      C)-1      D)2
7. *The..... of Regression coefficients is equal to Correlation coefficient*  
A)AM      B)GM      C)HM      D)Product
8. *Regression introduced by .....*  
A)Fisher      B)C.R.Rao      C)pearson      D)Galton
9. *The number of ultimate classes for a data with 3 Attributes...*  
A)27      B)9      C)8      D)3
10. *Measures of Association between attributes are due to.....*  
A)Pearson      B)Spearman      C)Kendal      D)Yule

**II. Answer the following fill in the blanks (5 x 1 = 5 marks)**

11. *The most frequent value in a data is called as.....*
12. *The ideal measure of Dispersion is.....*
13. *The method used for Curve fitting is called as.....*
14. *If two regression lines coincide, then the correlation is.....*
15. *If  $N=100$ ,  $(A)=23$  then  $(\alpha)=$ .....*

**III. Answer the following Questions :-**

**5 X 2 = 10M**

16. Define Primary data
17. Mention the sheppard corrections for moments
18. Define Correlation Coefficient
19. Define two types of Regression Lines.
20. Define Independence of Attributes

**SECTION - B**

**Answer one question from each unit. Each question carries 10 marks**

**5 X 10 = 50M**

**UNIT I**

21. Explain various measures of Central tendency.

OR

22. Find Mean, Median for the following data

C.I	0-20	20-40	40-60	60-80	80-100
f	15	23	50	25	10

**UNIT II**

23. Explain various measures of dispersion. State their merits and demerits.

OR

24. Define central, non-central moments. Derive central moments in terms of raw moments.

**UNIT III**

25. Explain Fitting of a Second degree Parabola by Least Squares Method: Fit Parabola for the following data.

X	1960	1970	1980	1990	2000
Y	20	35	55	80	115

OR

26. Define Karl Pearson Correlation Coefficient. State and prove the Properties of Correlation Coefficient

**UNIT IV**

27. Derive regression line of Y on X .

OR

28. The equations of the two regression lines are  $8x-10y+66=0$ ,  $40x-18y+214=0$  and  $v(x)=9$ , then find (a) Correlation Coefficient (b)S.D of y

**UNIT V**

29. Explain Yules Coefficient of Association and Colligation and Show that  $Q=2Y/(1+Y^2)$

OR

30. Explain various coefficients of contingency