

INTRODUCTION TO STATISTICS

‘Statistical thinking will one day be as necessary for efficient citizenship as the ability to read and write’- Prof. H.G. Wells

‘Statistics are like clay of which you can make a God or a Devil, as you please’
-Prof. W. King

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Why STATISTICS for ENGINEERS and VAULERS?

- For a layman : Figures, data
- For a business person : Market survey to sale of final goods
- For a firm/company : Systematically arranged and compiled data in reports
- For a nation/society : National income, GNP, GDP NDP NNP, Savings, Consumption
- For an engineer/valuer : Graphs, Diagrams, Pricing, Measurement, Costing, Marketing concerning Real Estate or Machinery, Plant.

Statistics is a Guiding Instrument in Engineering and Valuing

- Singular Sense of STATISTICS: Statistical -Methods-Collection, Classification, Tabulation, Analysis, Interpretation of DATA
- Plural Sense of STATISTICS: Numerical data-Ratio, Percentage, Coefficient, Average
- Applications in Economics, Industry, Agriculture, Banking, Sports, Medicine, State, Law, Management, Services, Engineering.....BUT Limitations.....

STATISTICAL METHODS for ENGINEERS and VALUERS

- Classification of Data : As per Time, Place, Quality, Quantity-Individual, Discreet, Continuous (Frequency Distribution), WHY?
- Tabulation of Data : One way, Two way, Three way, Mani-fold, WHY?
- Presentation of Data : Tables, Diagrams (Simple, Multiple, Sub-divided, Percentage, Square, Circle, Pie, Cube, Maps, Cartograms), Graphs (Band, Range, Line, Histogram, Ogive, Frequency Polygon) WHY?
- 'A figure is worth a thousand words'

ANALYSIS of DATA

- MCT: Mean, Median, Mode, Geometric Mean, Harmonic Mean
- Dispersion and Skewness: Range, Q.D., M.D., S.D., Coefficient of Variance
- Correlation : Simple, Partial, Multiple, Karl Pearson, Spearman, Graphic
- Regression : Simple, Partial, Multiple, Least Square
- Index Number : Price, Quantity, Value, Special (Barometer)
- Time Series : Trend, Seasonal, Cyclical, Random

Hypothesis Testing and Estimation

- Probability Theory : Better decision making in the face of uncertainties- Terminology, Concepts, Theorems
- Probability Distribution : Binomial, Poisson, Normal, Gamma, Beta
- Sampling Distribution : Mean, S. D.
- Hypothesis testing : Z, t, Chi, F, Non-parametric, Standard Error
- Estimation : Qualities, Point and Interval.

STATISTICS (Sample Questions)

Q. No. 1. Statistics can be defined in..... sense

- (a) Singular (b) Plural (c) Both (a) and (b) (d) None

Q. No. 2. Which one is true:

- (a) $\text{Mean} = 3M - 2Z$ (b) $\text{Mode} = 3M - 2\text{Mean}$
(c) $\text{Mean} = 2M - 3Z$ (d) $\text{Mode} = 3M + 2Z$

Q. No. 3. Given S.D.=5, find M.D.

- (a) 4 (b) 5 (c) 3 (d) 6

Q. No. 4. Time Reversal Test results into

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

Q. No. 5. Index number of base year is taken as

- (a) 0 (b) 50 (c) 100 (d) 1000

STATISTICS (Sample Questions)

Q.No. 6. Correlation coefficient varies between

- (a) 0 to 1 (b) -1 to 0 (c) -1 to +1 (d) None

Q. No. 7. Index number measures..... Changes

- (a) absolute (b) relative (c) complementary (d) None

Q. No. 8. Regression coefficient is given by

- (a) b_{xy} , b_{yx} (b) $b_{xy} + b_{yx}$ (c) $b_{xy} - b_{yx}$ (d) b_{xy}/b_{yx}

Q. No. 9. Which one is false

- (a) Probability is always positive (b) Probability can be negative
(c) Probability distribution can be discrete (d) None

Q. No. 10. Which test is non-parametric in nature:

- (a) t test (b) Z test (c) F test (d) Chi square test

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● THANKS