STATISTICS

1 Statistics - Scope and Development
History of Statistics. Definition of Statistics. Scope and importance of Statistics. Some applied areas of Statistics-Actuarial science, biostatistics and agricultural statistics. Official Statistics-CSO and NSSO,ISI.

2 Collection of Data
Data Collection-statistical investigation, population and sample and statistical survey. Types of variables - Qualitative and quantitative, discrete and continuous variables, Types of Data: - Primary, Secondary. Questionnaire and Schedule – drafting and requisites. Methods of Primary Data collection - Direct personal interview, sending questionnaire through post or email, telephone interview, indirect investigation, direct observation, focus group discussion. Sources of secondary data.

3. Classification and Tabulation
Types of classification - Qualitative, Quantitative, Chronological and Geographical. Tabulation of data, Objective of classification and tabulation, one Way and two Way classification, classification according to attributes. Construction of frequency tables- discrete and continuous (univariate only), Inclusive and Exclusive Classes, Percentage Frequency Tables,Cumulative frequency table, Relative frequency table.

4. Diagrams and Graphs
Significance of diagrams and graphs. Difference between diagrams and graphs. Bar Diagrams – Simple bar diagram, multiple bar diagram, sub-divided bar diagram, percentage bar diagram, pie diagram, histogram, frequency polygon and frequency curve, ogives

5. Central Tendency
Average, requisites of good average, various measures of central tendencies. Arithmetic Mean-raw, discrete and continuous,. Mathematical properties of arithmetic mean, weighted arithmetic mean, combined arithmetic mean. Median - raw, discrete and continuous. Mode - raw, discrete and continuous. Empirical relationship between mean, median and mode. Geometric Mean - raw data. Harmonic mean – raw data. Quartiles- raw data.

6. Dispersion
Meaning, characteristics and properties of Dispersion. Various measures of dispersion. Range – raw data. Quartile deviation- raw data. Mean Deviation- raw data . Standard deviation & variance - raw, discrete and continuous. Properties and characteristics of Standard Deviation. Relative measures of dispersion -Coefficient of variation

7. Skewness and Kurtosis
Meaning of skewness. Types of skewness. Measure of skewness-Karl Pearson's coefficient of skewness.. Meaning of Kurtosis, Types of Kurtosis.

8. Probability
Probability- random experiment, sample point, sample space, events, simple and compound events, algebra of events, mutually exclusive events, exhaustive events and equally likely events. Mathematical definition of probability and axiomatic approach to probability. Addition theorem and its applications.

9. Conditional Probability.
Meaning of conditional probability. Definition of conditional probability . Multiplication theorem. Independent and dependent events and its applications.

10. Sampling techniques
Census and sampling - advantages and disadvantages. Need and importance of sampling. Sampling and non sampling errors. Methods of sampling- probability sampling and non probability sampling. Methods of non probability sampling- convenience sampling, judgment sampling, quota sampling. Method of probability sampling- simple random sampling (wor & wr)