Syllabus of F.Y.B.Sc. (Statistics)

Sem. I & II to

be effective from June 2014

F.Y.B.Sc. Sem-I

PAPER - 101

Descriptive statistics

Unit-1: **Collection of data :** (30%)

- Concept of Data, Variables and Attributes,
- Types of data:
  - Qualitative and quantitative data, Discrete and continuous data,
  - Different types of scales: For attributes - Nominal and Ordinal,
    For variables - Ratio and Interval.
  - Primary data,
    - Methods of collecting primary data (with advantages and limitations),
    - Characteristics of an ideal questionnaire.
  - Secondary data,
    - Sources of secondary data,
    - Precautions while using secondary data,
  - Difference between primary data and secondary data.

Unit-2: **Classification and Tabulation of data :** (30%)

- **Classification:**
  - Meaning of classification,
  - Characteristics of a good classification,
  - Advantages of classification,
  - Types of classification,
- **Tabulation:**
  - Meaning of tabulation,
  - Objectives of tabulation,
  - Guiding rules for tabulation,

- Essential parts of a statistical tables,
- Types of tables,

- Difference between classification and tabulation
- Frequency distribution: Discrete and continuous frequency distribution, Cumulative frequency distribution,
- Bivariate frequency distribution: Discrete and continuous bivariate frequency distribution.
- Simple Numerical Problems.

Unit-3: **Diagrammatic and graphic presentation of data :** (40%)

- **Diagrams:**
  - Introduction,
  - Rules for construction of diagrams,
  - Types of diagrams: Line diagrams, Bar diagrams (simple, multiple, Simple sub-divided and percentage-divided), Stem and leaf chart, Box plot, Circle diagram, Pie diagram.
  - Importance and limitations of diagrams,
- **Graphs:**
  - Introduction,
  - Graphs of frequency distributions: Histogram, Frequency polygon, Frequency curve, Cumulative frequency polygon, Cumulative frequency curve.
  - Importance and limitations of graphs,
- Difference between diagram and graph.

Books: (i)

(ii) Gupta S. C and Kapoor V.K. : Fundamentals of Mathematical Statistics, S. Chand and Sons, New Delhi

(iii) Gupta S.P. (2006) : **Statistical Methods** - 34th Edition S. Chand & Sons., New Delhi

PAPER – 102

Different Measures of Statistics

Unit-1: **Measures of central tendency :** (40%)

- Meaning of central tendency,
- Measures of central tendency: Mean (Arithmetic Mean, Geometric Mean, Harmonic Mean, Weighted Mean, Combined Mean), Median, Mode.
- Merits, demerits and uses of above measures of central tendency,
- Characteristic of an ideal measure of central tendency,
- Partition values: Quartiles, Deciles, Percentiles.
- Percentile rank,
- Limitations of measure of central tendency,
- Simple Numerical Problems.

Unit-2: **Measures of Dispersion :** (50%)

- Meaning of dispersion, Significance of measuring variation,
- Absolute and relative measures of dispersion: Range, Quartile deviation, Mean deviation, Standard deviation,
- Merits, demerits and uses of above different measures of dispersion,
- Characteristic of an ideal measure of dispersion,
- Variance, Combined variance, Coefficient of Variation.
- Empirical relationships among Quartile deviation, Mean deviation, Standard deviation.
- Simple Numerical Problems.

Unit-3: **Moments:** (10%)

- Moments (for simple and with frequency data) : Central

moments, Raw moments (about origin) , Moments about arbitrary value,

- Relations of above moments (Without Proof),
- Purpose of moments,
- Sheppard's correction for moments for grouped data (without derivation),
- Conditions for applying Sheppard's correction,
- Coefficients based on moments (β_1,β_2,γ_1 and γ_2),
- Simple Numerical Problems.

Books :

(i)

(ii) Gupta S. C and Kapoor V.K. : Fundamentals of Mathematical Statistics, S. Chand and Sons, New Delhi

(iii) Gupta S.P. (2006) : **Statistical Methods** - 34th Edition S. Chand & Sons., New Delhi.

***

F.Y.B.Sc. Sem-II

PAPER – 201

Skewness, Kurtosis, Probability

Unit:1 **Skewness and Kurtosis:** (40%)

- **Skewness:**
  - Meaning of skewness,
  - Symmetric and skew symmetric frequency distribution,
  - Types of skewness,
  - Test of skewness,
  - Characteristics of a good measure of a skewness,
  - Methods of determining skewness and the coefficient of skewness (i) Karl Pearson's coefficient of skewness, (ii) Bowley's coefficient of skewness (iii) skewness based on the moments.
- **Kurtosis:**
  - Kurtosis of a curve,
  - Types of Kurtosis curves,
  - Measures of Kurtosis.
- Simple Numerical Problems.

Unit-2: **Probability - I:** (35%)

- Concepts in probability,
- Some important terms: Random experiment, Sample space, Event, Mutually exclusive events, Exhaustive events, Equally likely events, Favourable cases, Independent events.
- Classical and statistical definition of probability,
- Axiomatic approach to probability,
- Theorem based on above topics.

Unit-3: **Probability - II:** (25%)

- Conditional Probability and its related theorem,
- Bayes' theorem and its applications,

- Problems of above topics.

Books: (i)

(ii) Gupta S. C and Kapoor V.K. : Fundamentals of Mathematical Statistics, S. Chand and Sons, New Delhi

(iii) Gupta S.P. (2006) : **Statistical Methods** - 34th Edition S. Chand & Sons., New Delhi.

PAPER – 202

Univariate and Bivariate Probability functions and Moments

Unit-1: **Random Variables, Probability functions and Mathematical expectation:** (30%)

- Random variables: Discrete and Continuous,
- Probability functions: Probability mass function (p.m.f), Probability density function (p.d.f) and Cumulative distribution function (c.d.f.) with properties,
- Mathematical expectation,
- Problems of above topics.

Unit-2: **Bivariate Random Variables:** (30%)

- Bivariate Random Variables:
  - Joint, marginal and conditional p.m.f. and p.d.f. of two random variables,
  - Independence of two random variables,
  - Examples of above topics for only continuous random variables.
- Properties of mathematical expectation,
- Problems of above topics.

Unit-3: **Moments, Measure of central tendency and dispersion for discrete & continuous random variables:** (40%)

- Moments (of a random variable): Raw moments, Central moments, Factorial moments.
- Relations of above moments,
- Variance and its properties.
- Measure of Central tendency: Mean, Mode, Median, Harmonic mean and Geometric mean. Quartiles.
- Measure of Dispersion: Range, Quartile deviation, Mean

deviation, Standard deviation.

- Problems of above topics.

Books: (i)

(ii) Gupta S. C and Kapoor V.K. : Fundamentals of Mathematical Statistics, S. Chand and Sons, New Delhi

(iii) Gupta S.P. (2006) : **Statistical Methods** - 34th Edition S. Chand & Sons., New Delhi.

***

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

B.Sc. Semester – I

STATISTICS PRACTICAL PAPER – I

[Effective from June-2014]

Practical based on Statistics Paper I

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

B.Sc. Semester – I

STATISTICS PRACTICAL PAPER – II

[Effective from June-2014]

Practical based on Statistics Paper II

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

B.Sc. Semester – II

STATISTICS PRACTICAL PAPER – III

[Effective from June-2014]

Practical based on Statistics Paper III

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

B.Sc. Semester – II

STATISTICS PRACTICAL PAPER – IV

[Effective from June-2014]

Practical based on Statistics Paper IV