

# नेपाल विद्युत प्राधिकरण

प्रशासन सेवा, विविध समूह, तथ्याङ्कशास्त्र उपसमूह, तह-७ तथ्याङ्कशास्त्री पदको  
खुला प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

द्वितीय पत्र: सेवा सम्बन्धी ज्ञान (१०० पुर्णाङ्क)

## खण्ड-क (५×१०=५०)

### 1. Introduction to statistics:

- 1.1 Historical development of statistics
- 1.2 Role of statistics in physical, biological, medical, Industry, information technology, agriculture, management, engineering, insurance, education, psychology, political science and social sciences.
- 1.3 Role of Statistics in planning and decision making

### 2. Mathematics for Statistics:

- 2.1 Rates, Ratios and Proportion
- 2.2 Permutation and Combination
- 2.3 Principle of least square
- 2.4 Rank of a Matrix
- 2.5 Inverse of a Matrix

### 3. Data Related Activities:

- 3.1 Data gathering processes
- 3.2 Data management system
- 3.3 Methods and techniques of data Summarization/analysis
- 3.4 Data protection system

### 4. Descriptive statistics:

- 4.1 Measure of Central Tendency
- 4.2 Partitioned Statistics: Quartile, Quintiles, and deciles
- 4.3 Choice of appropriate average
- 4.4 Outliers and their consequence
- 4.5 Dispersion
- 4.6 Different methods of measuring dispersion, absolute and relative measures of dispersion.

- 4.7 Five number summary, box plot, normal probability plot, Lorenz curve, Gini coefficient.
  - 4.8 Moments
  - 4.9 Raw moments, moments about an arbitrary and constant, central moments
  - 4.10 Measure of skewness based on partition values
  - 4.11 Measure of skewness based on Moments
  - 4.12 Measure of Kurtosis based on partition values
  - 4.13 Measure of kurtosis based on moments
- 5. Population statistics of Nepal:**
- 5.1 Major sources of population data
  - 5.2 Population censuses of Nepal
  - 5.3 Composition and distribution of population
  - 5.4 Trends of fertility, Mortality, and Migration
  - 5.5 Population growth, population projection, ageing
- 6. Probability:**
- 6.1 Concept of probability, deterministic and random experiments;
  - 6.2 Terminologies of probability
  - 6.3 Definition of probability
  - 6.4 Properties of probability, Rules of probability
  - 6.5 Geometrical Bertrand's paradox
  - 6.6 Conditional probability, Baye's theorem
  - 6.7 Sensitivity, specificity, predictive value positive and predictive value negative of a diagnostic test.
  - 6.8 Discrete distribution: Bernoulli trial, Binomial, and Poisson, Negative binomial distribution, and hypergeometric distribution.
  - 6.9 Continuous distribution: Rectangular and Normal distributions Beta distribution, and Gamma distribution.

**7. Random Variable:**

- 7.1 Concept of random variable, types of random variable
- 7.2 Probability of random variable
- 7.3 Function of random variable
- 7.4 Mathematical expectation
- 7.5 Distribution of independent random variable
- 7.6 Notion of likelihood function.

**खण्ड-ख (५×१०=५०)****8. Statistical Modeling:**

- 8.1 Response and explanatory variables
- 8.2 Bivariate data
- 8.3 Types of correlation
- 8.4 Scatter diagram to explore the type of correlation
- 8.5 Karl Pearson's coefficient of correlation and rank correlations
- 8.6 Coefficient of determination
- 8.7 Simple linear and multiple regressions
- 8.8 Hypothesis testing of regression coefficient
- 8.9 Multicollinearity
- 8.10 Autocorrelation and Durbin- Watson test
- 8.11 Curvilinear models

**9. Data collection and Processing Activities:**

- 9.1 Data Gathering Process
- 9.2 Questionnaire design
- 9.3 Methods and techniques of data summarization/analysis

9.4 Errors in surveys and censuses: Control and measurement of errors

9.5 Quality evaluation of data

**10. Sampling Methods and Distributions:**

10.1 Simple random sampling

10.2 Stratified random sampling

10.3 Systematic sampling

10.4 Cluster sampling

10.5 Standard errors

10.6 Sampling distribution

10.7 Distribution of sample mean

10.8 Student's and chi-square distribution

**11. Economics Statistics:**

11.1 Cobb-Douglas production function

11.2 Time series analysis

11.3 Forecasting

11.4 Prices and Indices

11.5 System of national account: Nominal and real GDP, gross national income (GNI)

11.6 Method on estimation of national income

11.7 Consumption

11.8 Income inequality and poverty measure

11.9 Gaps and Challenges in the SNA

**12. Population Statistics of Nepal:**

12.1 Major sources of population data

12.2 Population censuses of Nepal

12.3 Composition and distribution of population

- 12.4 Fertility, Mortality, and Migration
- 12.5 Population growth population projection

**13. Industry, Trade and service Statistics of Nepal:**

- 13.1 Major sources of data
- 13.2 Censuses and surveys of manufacturing establishments
- 13.3 Internal and international trade statistics
- 13.4 Energy statistics

**14. Design of Experiment:**

- 14.1 Completely randomize design (CRD)
- 14.2 Randomize block design (RBD)
- 14.3 Latin square design (LSD)
- 14.4 Greco-Latin square design
- 14.5 Two level factorial fractional factorial Design.

**The end**