

# RAJASTHAN PUBLIC SERVICE COMMISSION, AJMER

## SYLLABUS FOR SCREENING TEST FOR THE POST OF STATISTICAL OFFICER, ECONOMICS AND STATISTICS DEPARTMENT

1. Collection, Classification, Tabulation and Diagramatic Presentation of data. Measures of Central Tendency, Dispersion, Moments, Skewness and Kurtosis.
2. **Correlation and Regression:** Karl Pearson and Rank correlation coefficients, Multiple and Partial Correlation, Linear Regression.
3. **Probability:** Classical and Axiomatic approaches of probability, Conditional Probability, Bayes theorem, Random variable and Mathematical expectation with applications.
4. **Probability Distributions:** Uniform, Binomial, Poisson, Exponential, Rectangular and Normal Distribution with properties and applications.
5. **Sampling Distributions:** Chi-squares, t and F Distributions.
6. **Multivariate Normal Distribution,** Hotellings  $T^2$  and Discriminant Analysis, Wisharts distribution and its properties.
7. **Theory of Estimation:** Point and Interval estimation, Properties of estimator, Methods of Estimation – Least Square and Maximum Likelihood estimators.
8. **Testing of Hypothesis:** Concept of Hypothesis, Types of error in testing, Critical Region and level of significance, Neyman Pearsan Lemma and two tailed tests based on small and large samples.
9. **Non-Parametric Tests:** Run, Sign, Median, and Kolmogorav Smirnov one sample test.
10. **Design of Sample Survey:** Sampling Unit, Sampling frame, Sampling fraction, Sampling with and without replacement, Population Parameter and Sample estimator, efficiency, accuracy and precision, sampling and non sampling errors, Simple random sampling, Probability proportion to Size with replacement, Sampling with varying probability and without replacement, stratified random sampling, systematic sampling, cluster sampling, multistage sampling, ratio and regression methods of estimation.
11. **Design of Experiments:** Analysis of variance for one way and two way classified data, Principles of Designs, Completely Randomised Designs, Randomised Block Designs, Latin Square Designs,  $2^n$  factorial experiments, Split plot and Strip plot Design, BIBD, Complete and Partial confounding.

**12. Time Series Analysis:** Components, Measurements of Trend, Seasonal, Cyclical and irregular variations.

**13. Index Number:** Uses, types and limitations of index numbers, construction of index numbers, simple and weighted aggregate method, Simple and weighted average price-relatives, Chain base index numbers, Base shifting, Splicing and Deflating of Index numbers, Cost of Living index numbers.

**14. Vital Statistics:** Collection of vital statistics- Measures of Mortality and Fertility rates, life tables, Population growth.

**15. Statistical Organization in India:** CSO, NSSO, National Income Statistics, Population Census, Agricultural Census, Livestock Census.

**16. Economic Concepts:** Law of Demand and Supply, Concept of elasticity, Demand forecasting, Price determination under different markets, National Income, Economic Progress after reforms.

**17. Econometrics:** Assumptions of error term in econometric models, Problems of Multi Collinearity, Auto-correlation, and heteroscedasticity.

**18. Main features of Rajasthan Economy:** Natural Resources, Agriculture, Livestock, Mining, Industry, Finance and Tourism Development.

**19. Basics of Computers:** MS Word, MS Excel and Power Point Presentation.

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**Pattern of Question Papers :**

- 1 Objective Type Paper.
- 2 Maximum Marks : 100
- 3 Number of Questions : 100
- 4 Duration of Paper : Two Hours.
- 5 All Questions carry equal marks.
- 6 There will be Negative Marking.

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