



Phase– II: Paper-II - Descriptive Type (on Economics) (Question paper displayed on computer, answers to be written on paper)

Module on Quantitative Methods in Economics

- Mathematical Methods in Economics: Differentiation and Integration, Optimisation, Sets, Matrices, Linear algebra and Linear programming
- Statistical Methods in Economics: Measures of central tendency and dispersions, Probability, Time series, Index numbers.
- Econometrics and advanced Applications: Regression analysis, Panel data econometrics, Time Series econometrics, Basics of Bayesian Econometrics, Basic application of Artificial Intelligence/ Machine Learning

Module on Indian Economy – Policy and Trends

- Fiscal policy in India: Evolution, scope and limitations, current trends
- Monetary Policy in India: Evolution, Functions of the Reserve Bank of India, Monetary-Fiscal coordination, Inflation targeting, Operating framework of Monetary Policy, Current trends
- Banking and financial sector development in India: Banks and other constituents of Indian financial markets and related developments, Current trends
- Inflation in India: Trends and drivers
- External sector developments in India: Exchange rate management, external debt, Balance of payments, Current trends
- Sectoral and other developments in India: Agriculture, industry, services and social sector-related developments

(Equal weightage will be given to Quantitative Economics and Indian Economy-related modules)

B. Officers in Grade 'B' (DR) – DSIM- PY 2025 - Job Requirement, Scheme of Selection and Syllabus

(i) Job Requirements

The role involves collection, compilation, analysis, and interpretation of data related to banking, corporate, and external sectors, with a strong emphasis on applications of advanced statistical and econometric techniques for modelling and forecasting key macroeconomic indicators such as inflation and growth. This includes the use of classical and Bayesian inference methods, high-dimensional regression techniques, time series models, and simulation-based methods. The job requires conducting policy-relevant analytical studies, designing and executing complex sample surveys, and understanding theoretical foundations of economic statistics, index number construction, and inequality measurement. Candidates are expected to manage large-scale structured and unstructured datasets using various databases, develop, maintain, and optimize queries for data integration and



reporting, and contribute to the maintenance and advancement of technology-driven centralized reporting systems and data warehouse. The role also calls for the application of data science, artificial intelligence, and machine learning techniques to extract insights from voluminous datasets. A solid grasp of optimization techniques, statistical coding logic, and macroeconomics, along with the ability to intuitively interpret and communicate empirical results for operational and policy use by the Reserve Bank.

(ii) Scheme of Selection

Selection will be through Online/ Written Examination (WE) and Interview. There are 3 papers for the Examination. Paper-I: Objective Type (on Statistics) to be held on **October 19, 2025** and Paper-II & III will be held on **December 07, 2025** (date to be confirmed in Admit Cards). The details are as follows:

Name of Paper	Duration	Maximum Marks
Paper-I: Objective Type (on Statistics)	120 minutes	100
Paper-II: Descriptive Type (on Statistics) (Question paper displayed on computer, answers to be written on paper)	180 minutes	100
Paper-III: English – Descriptive (To be typed with help of keyboard)	90 minutes	100
Total		300

Other detailed information regarding the examination will be given in an Information Handout, which will be made available to the candidates for download along with the Admit Card for examination from the RBI website.

Candidates have to secure minimum marks as may be prescribed by the Board.

Candidates, who secure minimum aggregate marks in Paper-I, as prescribed, will be shortlisted for Paper-II and Paper-III of the examination based on the aggregate marks obtained in Paper-I. The minimum aggregate cut-off marks for being shortlisted for Paper-II and Paper-III of the examination will be decided by the Board in relation to the number of vacancies. Roll Number of the candidates shortlisted for Paper-II and Paper-III examination will be published on the RBI website, in due time after Paper-I examination.

(iii) Paper – II and Paper-III - Online/Written Examination

The Paper-II and Paper-III Examination will be conducted on **December 07, 2025** only for the candidates who are shortlisted on the basis of results of Paper-I. The Paper-II and Paper-III examination will be in shifts. Candidates are required to appear for all the papers in all the shifts. A single Admit Card will be issued for both the shifts. The timetable for Paper-II and Paper-III will be intimated to the candidates concerned along with Admit Card for Paper-II and Paper-III.

(iv) Question papers for 'WE' will be set in Hindi and in English (except Paper-III on English). Answers for Paper-II may be written either in Hindi or English. Paper-III will have to be answered in English only. Candidates may opt for Interview in Hindi or English.



(v) The number of candidates to be called for the Interview will be decided by the Board.

(vi) Final selection will be on the basis of performance in the 'Online / WE' (Paper-I, II and III) and Interview taken together. Interview will be of 75 marks. Candidate may opt for Interview either in Hindi or English.

(vii) Candidate shall be required to undergo Personality Assessment conducted by the Bank before appearing for the Interview. No marks will be allotted for the same and it will not form part of the final selection criteria.

Syllabi

Standard of papers would be that of Post-Graduation Degree Examination of any recognized Institution/ University in India.

Paper - I and Paper – II

(i) Theory of Probability, Probability Distributions and Sampling Theory, (ii) Linear Models and Economic Statistics, (iii) Statistical Inference: Estimation, Testing of Hypothesis and Non-Parametric Test, (iv) Stochastic Processes, (v) Multivariate Analysis, (vi) Econometrics and Time Series, (vii) Optimization and Statistical Computing; (viii) Data Science, Artificial Intelligence and Machine Learning Techniques, (ix) Database and Data Warehouse Management

Detailed Syllabus

1. Theory of Probability, Probability Distributions and Sampling Theory

- Classical and axiomatic approach of probability and its properties, Bayes Theorem and its application, strong and weak laws of large numbers, characteristic functions, central limit theorem, probability inequalities.
- Standard probability distributions - Binomial, Poisson, Geometric, Negative binomial, Uniform, Normal, exponential, Logistic, Log-normal, Beta, Gamma, Weibull, Bivariate normal etc.
- Exact Sampling distributions - Chi-square, student's t, F and Z distributions and their applications. Asymptotic sampling distributions and large sample tests, association, and analysis of contingency tables.
- Standard sampling methods such as simple random sampling, Stratified random sampling, Systematic sampling, Cluster sampling, Two stage sampling, Probability proportional to size etc. Ratio estimation, Regression estimation, non-sampling errors and problem of non-response.

2. Linear Models and Economic Statistics

- Linear algebra - Vector, matrices, spanning of vector space, matrix algebra, inverse of partitioned matrices, g-inverse, orthogonal matrices, properties of idempotent matrices, characteristic roots and vectors, Cayley-Hamilton theorem, quadratic forms, definite, semi-definite and indefinite forms, simultaneous reduction of two quadratic forms, properties of similar matrices.
- Simple linear regression - assumptions, estimation, and inference diagnostic checks;



polynomial regression, transformations on Y or X (Box-Cox, square root, log etc.), method of weighted least squares, inverse regression. Multiple regression - Standard Gauss Markov setup, least squares estimation and related properties, regression analysis with correlated observations. Simultaneous estimation of linear parametric functions, Testing of hypotheses; Confidence intervals and regions; Multicollinearity and shrinkage models (ridge regression, LASSO, Elastic Net) model selection criteria, residual diagnostics, categorical data analysis using dummy variables; Outlier detection and treatment.

- Definition and construction of index numbers, Standard index numbers; Conversion of chain base index to fixed base and vice-versa; base shifting, splicing and deflating of index numbers; Measurement of economic inequality: Gini's coefficient, Lorenz curves etc. Basics of macroeconomics and national accounts.

3. Statistical Inference: Estimation, Testing of Hypothesis and Non-Parametric Test

Estimation

- Concepts of estimation, unbiasedness, sufficiency, consistency, and efficiency. Factorization theorem. Complete statistic, Minimum variance unbiased estimator (MVUE), Rao-Blackwell and Lehmann-Scheffe theorems and their applications. Cramer-Rao inequality.

Methods of Estimation

- Method of moments, method of maximum likelihood estimation, method of least square, method of minimum Chi-square, basic idea of Bayes estimators.

Principles of Test of Significance

- Type-I and Type-II errors (False-positive and False-negative errors), critical region, level of significance, size, p value & its interpretation and power, best critical region, most powerful test, uniformly most powerful test, Neyman Pearson theory of testing of hypothesis. Likelihood ratio tests, Tests of goodness of fit. Bartlett's test for homogeneity of variances.

Non-Parametric Test

- The Kolmogorov-Smirnov test, Sign test, Wilcoxon Signed-rank test, Wilcoxon Rank-Sum test, Mann Whitney U-test, Kruskal-Wallis one way ANOVA test, Friedman's test, Kendall's Tau coefficient, Spearman's coefficient of rank correlation.
- Distribution of order statistics, distribution fitting, kernel density estimation.

4. Stochastic Processes

Poisson process

- Arrival, interarrival and conditional arrival distributions. Non-homogeneous Processes. Law of Rare Events and Poisson Process. Compound Poisson Processes.

Markov Chains

- Transition probability matrix, Chapman- Kolmogorov equations, Regular chains and Stationary distributions, Periodicity, Limit theorems. Patterns for recurrent events. Brownian Motion - Limit of Random Walk, its defining characteristics, and peculiarities; Martingales.



5. Multivariate Analysis

- Multivariate normal distribution and its properties and characterization; Logit-Probit models Mahalanobis' D2 statistics; linear discriminant analysis (LDA); Canonical correlation analysis, Principal components analysis, Factor analysis, Cluster analysis.

6. Econometrics and Time Series

- General linear model and its extensions, ordinary least squares and generalized least squares estimation and prediction, heteroscedastic disturbances, pure and mixed estimation. Auto correlation, its consequences, and related tests; Theil BLUS procedure, estimation, and prediction; issue of multi-collinearity, its implications, and tools for handling it; Ridge regression.
- Linear regression and stochastic regression, instrumental variable regression, panel regression, autoregressive linear regression, distributed lag models, estimation of lags by OLS method. Simultaneous linear equations model and its generalization, identification problem, restrictions on structural parameters, rank and order conditions; different estimation methods for simultaneous equations model, prediction and simultaneous confidence intervals.
- Exploratory analysis of time series; Concepts of weak and strong stationarity; AR, MA and ARMA processes and their properties; model identification based on ACF and PACF; model estimation and diagnostic tests; Box- Jenkins models; ARCH/GARCH models.

Inference with Non-Stationary Models

- ARIMA/SARIMA model, determination of the order of integration, trend stationarity and difference stationary processes, tests of non-stationarity.

7. Optimization and Statistical Computing

- Unconstrained optimization using calculus (Taylor's theorem, convex functions, coercive functions). Unconstrained optimization via iterative methods (Newton's method, Gradient/conjugate gradient-based methods, Quasi Newton methods). Constrained optimization (Penalty methods, Lagrange multipliers). Convex sets, Convex hull, Formulation of a Linear Programming Problem, Theorems dealing with vertices of feasible regions and optimality, Graphical solution, Simplex method.
- Simulation techniques for various probability models, and resampling methods jack-knife, bootstrap and cross-validation; techniques for robust linear regression, nonlinear and generalized linear regression problem, tree-structured regression and classification; Analysis of incomplete data - EM algorithm, single and multiple imputation; Bayesian modelling and estimation; Markov Chain Monte Carlo and annealing techniques, Gibbs sampling, Metropolis-Hastings algorithm; Neural Networks, Association Rules and learning algorithms.

8. Data Science, Artificial Intelligence and Machine Learning Techniques

- Introduction to supervised and unsupervised pattern classification; unsupervised and reinforcement learning, basics of optimization, model accuracy measures. Linear Regression, Logistic Regression, Penalized Regression, Naïve Bayes, Nearest Neighbor, Decision Tree, Support Vector Machine, Kernel density estimation and kernel discriminant analysis; Classification under a regression framework, neural network, kernel regression



and tree and random forests. Hierarchical and non-hierarchical methods: k-means, k-medoids and linkage methods, Cluster validation indices: Dunn index, Gap statistics. Bagging (Random Forest) and Boosting (Adaptive Boosting, Gradient Boosting) techniques; Recurrent Neural Network (RNN); Convolutional Neural Network; Natural Language Processing. Recursive Feature Elimination (RFE), Variance Inflation Factor (VIF), ensembling and stacking methods, Elastic Net regularization, hyperparameter tuning via Grid Search, feature importance interpretation, and cross-validation strategies.

9. Database and Data Warehouse Management

- Data structures; Fundamentals of Relational Database Management Systems (RDBMS) and non-traditional (NoSQL) databases. Principles of database normalization, data redundancy elimination, and consistency maintenance. Structured Query Language (SQL) – querying, updating, aggregating, and managing relational data. Database joins – inner join, left join, right join, outer join – with applications to data merging and integration. Overview of NoSQL databases – document-based, key-value, wide-column stores, and graph databases. Data warehousing concepts, star and snowflake schemas, ETL (Extract, Transform, Load) processes, and OLAP vs OLTP. Database indexing and optimization. Basics of big data frameworks and storage systems for large-scale data handling.

Paper-III

English: The paper on English shall be framed in a manner to assess the writing skills including expression and understanding of the topic.

C. Manner of conduct of examinations for Grade 'B' (DR)-DEPR /DSIM

DEPR :

(i) The examination will be conducted on two days i.e. Phase-I (Paper-I & II) (Online Examination) on **October 19, 2025** and Phase-II (Paper-I & II) (Online / Written Examination) will be held separately on **December 07, 2025** (date to be confirmed in Admit Cards).

(ii) Phase-I : Paper-I - Objective Type (on Economics) will be conducted online and comprise multiple choice questions. Paper-II - Descriptive Type (on English) to be typed with help of keyboard.

(iii) Phase-II : Paper-I & II will be a Descriptive Type (on Economics) pen / paper based examination where the questions will be displayed on computer screen, answers to be written on paper.

DSIM :

(i) The examination will be conducted on two days i.e. Paper-I on **October 19, 2025** and Paper-II & III will be held separately on **December 07, 2025** (date to be confirmed in Admit Cards).

(ii) Paper - I (Objective type on Statistics) will be conducted online and comprise multiple choice questions.

(iii) Paper - II (on Statistics) will be a Descriptive Type pen/paper based examination where the questions will be displayed on computer screen, answers to be written on paper.



(iv) Paper –III (English) will be of Descriptive Type where the candidates will be expected to type out answers on a computer.

The Board reserves the right to modify the exam dates and time entirely at its discretion.