MADRAS SCHOOL OF ECONOMICS M.A. ENTRANCE TEST – MSEET-2023

Entrance Test Pattern

Number of parts	**Two Parts** **Part-A (compulsory)** **Part-B (to choose between Mathematics/Statistics stream and Economics stream**
Total number of questions	**100; Part-A: 60; Part-B: 40**
Test duration	**120 minutes (2 hours)**
Coverage of topics and Number of Questions	
Part-A	**Basic Quantitative Ability – 20 questions** **Data Interpretation & Logical Reasoning – 20 questions** **Reading Comprehension – 20 questions** **Total – 60 questions**
Part-B (Mathematics/Statistics stream)	**Advanced Mathematics – 20 questions** **Advanced Statistics – 20 questions** **Total – 40 questions**
Part-B (Economics stream)	**Microeconomics – 10 questions** **Macroeconomics – 10 questions** **Indian Economy & Related Topics – 20 questions** **Total – 40 questions**

Note:

(i) **The Part-B questions will be at UG level courses in Economics (for Economics Stream) and in Mathematics/Statistics (for Mathematics/Statistics Stream) programs.**

(ii) **Indicative syllabus for both Part-A and Part-B questions is provided below.**

(iii) **All questions MCQ type with four options.**

(iv) **One mark for each correct answer.**

Syllabus for Part-A

- Part-A consists of 60 questions, divided equally among three sub-sections, basic quantitative ability, data interpretation & logical reasoning, and reading comprehension
- The syllabus for this part will be similar to the one followed in other standard aptitude tests such as CAT, MAT, XAT etc.
- Indicative topics covered under the three sub-sections of Part-A are listed below:

Basic Quantitative Ability	**Data Interpretation & Logical Reasoning**	**Verbal Ability & Reading Comprehension**
Number Systems; Profit, loss and discount; LCM & HCF; Speed, time and distance; Percentages; Ratio & proportion; Averages; Linear & Quadratic equations; Complex numbers; Simple and compound interest; Logarithm; Sequences and series; Inequalities; Surds & Indices; Permutation & Combination; Probability; Trigonometry; Geometry; Coordinate geometry; Mensuration	Tables; Graphs & Charts – Bar, Line, Column, Pie, Venn; Calendars; Numbers and Letter Series; Clocks; Binary Logic; Seating Arrangements; Logical Sequence; Logical Matching; Logical Connectives; Syllogism	English Usage and Grammar; Synonyms & Antonyms; Fill in the Blanks; Sentence Correction; Jumble Paragraph; Analogies; Verbal Reasoning; Reading Comprehension

Syllabus for Part-B: Mathematics/Statistics Stream

Algebra: Groups, subgroups, Abelian groups, non-Abelian groups, cyclic groups, permutation groups; Normal subgroups; Lagrange's Theorem for finite groups; Group homomorphism and quotient groups; Rings, Subrings, Ideal, prime ideal, maximal ideals; Fields, quotient field; Vector spaces, Linear dependence and Independence of vectors, basis, dimension, linear transformations, matrix representation with respect to an ordered basis; Range space and null space, rank-nullity theorem; Rank and inverse of a matrix; Determinant; Solutions of systems of linear equations; Consistency conditions; Eigenvalues and Eigenvectors; Cayley-Hamilton theorem; Symmetric, Skewsymmetric, Hermitian, Skew-Hermitian, Orthogonal and Unitary matrices.

Real Analysis: Sequences and series of real numbers; Convergent and divergent sequences; Bounded and monotone sequences; Convergence criteria for sequences of real numbers; Cauchy sequences; Absolute and conditional convergence; Tests of convergence for series of positive terms-comparison test, ratio test, root test, Leibnitz test for convergence of alternating series.

Functions of one variable: Limit, continuity, differentiation; Rolle's Theorem; Taylor's theorem; Interior points, limit points; Open sets, closed sets, bounded sets, connected sets, compact sets; Completeness of R; Power series (of real variable) including Taylor's and Maclaurin's; Domain of convergence; Term-wise differentiation and integration of power series.

Functions of two real variables: Limit, continuity, partial derivatives, differentiability, maxima and minima; Method of Lagrange multipliers; Homogeneous functions including Euler's theorem.

Complex Analysis: Functions of a complex Variable; Differentiability and analyticity; Cauchy Riemann Equations; Power series as an analytic function; Properties of line integrals; Goursat Theorem; Cauchy theorem; Consequence of simply connectivity; Index of closed curves; Cauchy’s integral formula; Morera’s theorem; Liouville’s theorem; Fundamental theorem of Algebra; Harmonic functions.

Integral Calculus: Integration as the inverse process of differentiation; Definite integrals and their properties; Fundamental theorem of integral calculus; Double and triple integrals; Change of order of integration; Calculating surface areas using double integrals and applications; Calculating volumes using triple integrals and applications.

Differential Equations: Ordinary differential equations of the first order of the form y' = f(x,y); Bernoulli's equation; Exact differential equations; Integrating factor; Orthogonal trajectories; Homogeneous differential equations-separable solutions; Linear differential equations of second and higher order with constant coefficients; Method of variation of parameters; Cauchy-Euler equation.

Vector Calculus: Scalar and vector fields, gradient, divergence, curl and Laplacian; Scalar line integrals and vector line integrals; Scalar surface integrals and vector surface integrals; Green's, Stokes and Gauss theorems and their applications.

Linear Programing: Convex sets, extreme points, convex hull, hyper plane & polyhedral sets; Convex function and concave functions; Concept of basis, basic feasible solutions; Formulation of Linear Programming Problem (LPP); Graphical method of LPP, Simplex Method.

Probability: Axiomatic definition of probability and properties; Conditional probability; Multiplication rule; Theorem of total probability; Bayes' theorem and independence of events.

Random Variables: Probability mass function; Probability density function, Cumulative distribution functions; Distribution of a function of a random variable; Mathematical expectation; Moments and moment generating function; Chebyshev's inequality.

Standard Distributions: Binomial, negative binomial, geometric, Poisson, hypergeometric, uniform, exponential, gamma, beta and normal distributions; Poisson and normal approximations of a binomial distribution.

Joint Distributions: Joint, marginal and conditional distributions; Distribution of functions of random variables; Product moments, correlation, simple linear regression; Independence of random variables.

Sampling Distributions: Chi-square, t and F distributions, and their properties; Limit Theorems: Weak law of large numbers; Central limit theorem (i.i.d. with finite variance case only).

Statistical Inference: Estimation (unbiasedness, consistency, efficiency of estimators, uniformly minimum variance unbiased estimators, Rao-Cramer inequality, sufficiency, factorization theorem); Method of moments and method of maximum likelihood; Confidence intervals for the parameters of univariate normal, two independent normal, and one parameter exponential distributions.

Testing of Hypotheses: Basic concepts; Applications of Neyman-Pearson Lemma for testing simple and composite hypotheses; Likelihood ratio tests for parameters of univariate normal distribution.

Syllabus for Part-B: Economics Stream

Micro Economics

Consumer Theory or Behaviour: Demand; Utility; Indifference Curve; Revealed Preference Theory; Consumer Surplus

Production Theory: Production Function; Law of Variable Proportions; Returns to Scale; Cost Function – types and concepts

Price and Output Determination in Market: Perfect and Imperfect Competition (Monopoly, Price Discrimination, Monopolistic, Duopoly and Oligopoly models)

General Equilibrium, Efficiency and Welfare: Equilibrium and efficiency under pure exchange and production; Overall efficiency and welfare economics; Externality

Macro Economics

National Income Accounting

Income and Output Determination: Aggregate Demand and Aggregate Supply; Effective Demand Principle; Classical and Keynesian Theory

Money and Inflation: Demand and Supply of Money; Money Multiplier and High Powered Money; Credit Creation; Role of Central Bank and Commercial Banks; Quantitative Theories of Money; Philip's Curve

Consumption and Investment Function: Permanent, Relative and Life Cycle Hypothesis; Determinants of business fixed investment; Residential investment and inventory investment; Multiplier and accelerator

Open Economy Models: Mundell and Fleming Model (IS, LM and BP curve); Balance of payments; Exchange rate determination; Purchasing Power Parity

Economic Growth: Harrod-Domar model; Solow model

Indian Economy

Overview of colonial economy: The imperial priorities and the Indian economy; Drain of wealth; International trade; capital flows and the colonial economy – changes and continuities

Macro Trends: National Income; Population; Occupational structure

Poverty in India: Magnitude and determinants; Concepts of Poverty and Poverty Line; Trends and pattern of Urban and Rural Poverty; Committees on poverty estimation; Poverty eradication programmes; Pattern of income distribution and the question of inequality in India

Agriculture: Agrarian structure and land relations; Agricultural markets and institutions – credit, commerce and technology; Trends in performance and productivity; famines

Economic Crisis of early 1990s: Macro economic reforms since 1991; Structural Adjustment Programmes; Globalisation; Liberalisation and Privatisation; Impact of 25 years of reforms on various sectors of the economy; Planning to markets - NITI Aayog and discontinuation of Central Planning; Demonetisation and its macro-economic impact; Growth and inequality from regional perspective in India; Agriculture during the reform period - New Agricultural Policy; WTO and Indian Agriculture; Current Issues in Indian agriculture; Investments and subsidies in Indian agriculture; Agrarian distress and related issues; The de-industrialisation debate;

Evolution of entrepreneurial and industrial structure; Nature of industrialisation in the interwar period; Constraints to industrial breakthrough; Labour relations; New Industrial Policy 1991; Public enterprises; Micro, Small and Medium Scale Industries (MSMEs) – Role, problems and remedies; Role of FDI in industrialization process; ICT based industrial development strategy; Make in India.

Service Sector – as the engine of growth in India; Trade in services; Global technological change and Indian IT boom; Challenges of India's Service sector; External Sector; Foreign Trade – Salient features, Composition and Direction; Trade reforms - Balance of Payment; Exchange rate- India and WTO; Money and Banking- Organisation of India's money market and capital market; Changing role of Reserve Bank of India, Commercial banks, Development finance institutions, foreign banks and Non-banking financial institutions.

Issues in Indian Public Finance – Fiscal reforms in India post 1991; Tax reforms and reforms in public expenditure management; Goods and Services Tax; Public Debt and Sustainability issues; Implementation of FRBM Act; Fiscal and Monetary Policy dynamics in India; Centre State Fiscal relationship; Cooperative and competitive federalism in India; Role of Finance Commission, Local Bodies in India.