

SCHEME AND SYLLABUS OF EXAMINATION FOR THE PURPOSE OF FILLING UP THE POST OF COMMERCIAL TAXES INSPECTOR UNDER SIKKIM SUBORDINATE REVENUE SERVICE.

The examination will consist of 2 papers:-

PAPERS	SUBJECT	FULL MARKS	TIME ALLOWED
PAPER - I	GENERAL ENGLISH & GENERAL KNOWLEDGE	100 MCQ & Conventional	02:00 HOURS.
PAPER - II	COMMERCE AND ACCOUNTANCY OR MATHEMATICS	300 MCQ & Conventional	03:00 HOURS.

VIVA-VOCE/PERSONALITY - 50 (MARKS)

Paper –I & Paper II will be objective type(OMR) and Conventional mode.

PAPER – I: GENERAL ENGLISH

The question will be designed to test the candidate’s understanding and command of the English language.

English : Candidate will be required to answer questions designed to test their understanding of English. The pattern of questions would be broadly as follows:-

1. Comprehension of given passage.
2. Précis writing
3. Usages and vocabulary
4. Essay.
- 5.

GENERAL KNOWLEDGE:

- i). Current events of Local, National & International importance.
- ii). National level Schemes & Projects undertaken by Government of India/State Government.”

PAPER –II : (COMMERCE AND ACCOUNTANCY OR MATHEMATICS):-

COMMERCE AND ACCOUNTANCY

Accounting

Nature, Scope and Objectives of Accounting-accounting as an Information system Users of Accounting Information.

Generally Accepted Principles of Accounting- the Accounting Equation- Accrual concept- Other concepts and conventions, Distinction between capital and revenue expenditure. Accounting Standards and their application- Accounting standards relating to fixed assets, depreciation, inventory, recognition of revenue.

Final Accounts of Sole Proprietors, Partnership Firms and Limited Companies-Statutory Provisions- Reserves, Provisions and Funds.

Final Accounts of non profit organisation.

Accounting problems related to admission and retirement of a partner and dissolution of a firm.

Accounting for Shares and Debentures_ Accounting Treatment of convertible Debentures.

Analysis and Interpretation of Financial Statements Ratio analysis and interpretation Ratios relation to short terms liquidity, long term solvency and profitability – Importance of the rate of return on investment (ROI) in evaluating the overall performance of a business entity- cash flow Statement and Statement of Source and Application of Funds- Societal obligations of Accounting.

Auditing

- Nature, objectives and basic principles of auditing
- Techniques of Auditing- physical verification, examination of documents and vouching, direct confirmation, analytical review.
- Planning an audit, audit programmes, working papers, audit process
- Evaluation of internal controls
- Test checking and sampling
- Broad outlines of company audit
- Audit of non-corporate enterprises
- Internal and management audit.

Business Organisation:

Distinctive features of different forms of business organisation.

Sole Proprietor:

Partnerships- characteristics, Registrations, Partnership deed, Rights and duties, Retirement dissolution.

Joint Stock Company- Concept, characteristics, types.

Cooperative and State ownership forms of organisation.

Types of securities and methods of their issue.

Economic functions of the capital market, stock exchanges, Mutual Funds, Control and regulation of capital market.

Business combinations, control of Monopolies. Problems of modernisation of industrial enterprises. Social Responsibility of business.

Foreign Trade- Procedure and financing of import and export trade.

Incentives for export promotion. Financing of foreign trade.

Insurance- Principles and practice of Life, Fire, Marine and General Insurance

Management:

Management functions- Planning- Strategies, Organising- Levels of authority Staffing, Line function and staff function, Leadership, Communication, Motivation, Directing- Principles, Strategies.

Coordination- Concept, types, methods.

Control – principles, performance standards, corrective action. Salary and wage administration- job evaluation.

Organisation Structure_ Centralisation and decentralisation- Delegation of authority span of control – Management by objectives and Management by Exception.

Management of change, Crisis Management

Office Management- Scope and principles, systems and routines, handling of records- modern aids to office management, office equipment and machines, automation and Personal computers.

Impact of Organisation and Methods (O&M)

Company Law:

Joint stock companies- incorporation, documents and formalities- Doctrines of indoor management and constructive notice.

Duties and powers of the board of directors of a company

Accounts and Audit of Companies

Company Secretary- role and functions- qualifications for appointment.



SYLLABUS FOR MATHEMATICS

1. Calculus.

Differential and Integral Calculus. The real line and its geometrical representation. *e*-Treatment of limit and continuity. Properties of limit and classification of discontinuities. Properties of continuous functions. Differentiability and differentials. Successive differentiation and Leibnitz Theorem. Statement of Rolle's Theorem. Mean Value Theorem, Taylor and Maclaurin's Theorems, indeterminate forms. Limits and continuity of functions of two variables. Partial derivatives. Methods of Integration: Partial fractions. Definite integrals. Statement of the Fundamental Theorem.

2. Algebra

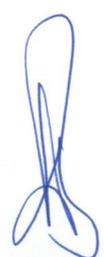
Matrix Theory and Linear Algebra in Rⁿ. Systems of linear equations, Gauss elimination, and consistency. Subspaces of Rⁿ, linear dependence, and dimension. Matrices, elementary row operations, row-equivalence, and row space. Systems of linear equations as matrix equations, and the invariance of its solution set under row-equivalence. Row-reduced matrices, row-reduced echelon matrices, row-rank, and using these as tests for linear dependence. The dimension of the solution space of a system of independent homogeneous linear equations.

Linear transformations and matrix representation. Matrix addition and multiplication. Diagonal, permutation, triangular, and symmetric matrices. Rectangular matrices and column vectors. Non-singular transformations. Inverse of a Matrix. Rank-nullity theorem. Equivalence of row and column ranks. Elementary matrices and elementary operations. Equivalence and canonical form. Determinants. Eigenvalues, eigenvectors, and the characteristic equation of a matrix. Cayley-Hamilton theorem and its use in finding the inverse of a matrix.

Theory of Equations. Polynomials in one variable and the division algorithm. Relations between the roots and the coefficients. Transformation of equations. Descartes rule of signs. Solution of cubic and biquadratic (quartic)

Trigonometry. De-Moivre's theorem and applications. Direct and inverse, circular and hyperbolic, functions. Logarithm of a complex quantity. Expansion of trigonometric functions.

Linear Algebra. Vector spaces over a field, subspaces. Sum and direct sum of subspaces. Linear span. Linear dependence and independence. Basis. Finite dimensional spaces. Existence theorem



for bases in the finite dimensional case. Invariance of the number of vectors in a basis, dimension. Existence of complementary subspace of any subspace of a finite-dimensional vector space. Dimensions of sums of subspaces. Quotient space and its dimension.

Matrices and linear transformations, change of basis and similarity. Algebra of linear transformations. The rank-nullity theorem. Change of basis. Dual space. Bidual space and natural isomorphism. Adjoins of linear transformations. Eigenvalues and eigenvectors. Determinants, characteristic and minimal polynomials, Cayley-Hamilton Theorem. Annihilators. Diagonalization and triangularization of operators. Invariant subspaces and decomposition of operators. Canonical forms.

Inner product spaces. Cauchy-Schwartz inequality. Orthogonal vectors and orthogonal complements. Orthonormal sets and bases. Bessel's inequality. Gram-Schmidt orthogonalization method. Hermitian, Self-Adjoint, Unitary, and Orthogonal transformation for complex and real spaces. Bilinear and Quadratic forms. The Spectral Theorem. The structure of orthogonal transformations in real Euclidean spaces. Applications to linear differential equations with constant coefficients.

3. Differential Equations

Elementary Methods in Ordinary Differential Equations. Formation of a differential equation. Solutions: General, particular, and singular. First order exact equations and integrating factors. Degree and order of a differential equation. Equations of first order and first degree. Equations in which the variable are separable. Homogeneous equations. Linear equations and equations reducible to linear form. First order higher degree equations solvable for x, y, p . Clairaut's form and singular solutions. Orthogonal trajectories. Linear differential equations with constant coefficients. Homogeneous linear ordinary differential equations.

Linear differential equations of second order. Transformation of the equation by changing — the dependent variable and the independent variable. Method of variation of parameters.

Ordinary simultaneous differential equations.

Ordinary Differential Equations. Series solutions of differential equations: Power series method, Bessel, Legendre, and Hypergeometric equations. Bessel, Legendre, and Hypergeometric functions and their properties: Convergence, recurrence, and generating relations. Orthogonality of functions. Sturra-Liouville problem. Orthogonality of eigenfunctions. Reality of eigenvalues. Orthogonality of Bessel functions and Legendre polynomials.

Laplace transforms. Introduction to infinite integrals. Linearity of Laplace transforms. Existence theorem for Laplace transforms.



Laplace transforms of derivatives and integrals. Shifting theorems. Differentiation and integration of transforms. Convolution theorem. Solution of integral equations and systems of differential equations using Laplace transforms.

Partial differential equations. Formation of partial differential equations. Types of solutions. PDEs of the first order. Lagrange's solution. Some special types of equations which can be solved easily by methods other than the general methods. Charpit's and Jacobi's general method of solution.

Partial differential equations of second and higher order. Classification of linear partial differential equations of second order. Homogeneous and non-homogeneous equations with constant coefficients. Partial differential equations reducible to equations with constant coefficients. Monge's methods.

Calculus of variations. Variational problems with fixed boundaries - Euler's equation for functionals containing first-order derivative and one independent variable. Extremals. Functionals dependent on higher order derivatives. Functionals dependent on more than one independent variable. Variational problems in parametric form. Invariance of Euler's equation under coordinate transformation. Variational problems with moving boundaries. Functionals dependent on one and two functions. One sided variations.

Sufficient conditions for an extremum — Jacobi and Legendre conditions. Second variation. Variational principle of least action .Applications.

4. Analysis

Countability of Z and Q . Order properties of Q and its order incompleteness. Construction of R from Q using Dedekind cuts. Order complete ness of R : The least upper bound property and equivalent conditions including the nested interval property. Uncountability of R Bounds, bounded sets, and their properties, sup and inf of sets. Bolzano-Weierstrass theorem.

Sequences. Bounded sequences, monotone sequences and their convergence, limsup and liminf and convergence criterion using them, subsequences, Cauchy sequences and their convergence criterion.

Interior points and limit points, open, closed, and perfect sets. Compact sets.

Limits and continuity. Basic properties of continuous functions. Operations on sequences. Uniform continuity. Bounded functions. Continuous functions defined on a compact set: Their



boundedness, attainment of bounds, and uniform continuity. Intermediate Value Theorem. Discontinuities. Monotonic functions. Infinite series and their convergence. Geometric series. The comparison test. Series of non-negative terms. The condensation test. Integral test. Ratio and root tests. Absolute and conditional convergence. Alternating series and Leibnitz's theorem.

Differentiation. Derivatives. Rolle's theorem. Mean Value Theorem. Darboux's theorem on intermediate value property of derivatives. Taylor's theorem. Indeterminate forms.

Integration. The Riemann Integral and its properties. Integrability of continuous and monotonic functions. Functions of bounded variation, their relation with monotonic functions, and integrability. The fundamental theorem of calculus. Mean value theorems of integral calculus.

Convergence of improper integrals. Comparison tests, Abel's and Dirichlet's tests. Beta and Gamma functions. Frullani's integral. Integral as a function of a parameter, and its continuity, differentiability, and integrability.

5. **Vector Analysis.**

Vector Algebra. Operations with vectors. Scalar and vector product of three vectors. Product of four vectors. Reciprocal vectors.

Vector Calculus. Scalar-valued functions over the plane and the space. Vector function of a scalar variable: Curves and Paths. Vector fields. Vector differentiation. Directional derivatives, the tangent plane, total differential, gradient, divergence, and curl.

Vector integration: Path, line, surface, and volume integrals. Line integrals of linear differential forms, integration of total differentials, conservative fields, conditions for line integrals to depend only on the endpoints, the fundamental theorem on exact differentials. Serret-Frenet Formulas.

Theorems of Green, Gauss, Stokes, and problems based on these.

6. **Probability Theory.** Notion of probability: Random experiment, sample space, axioms of probability, elementary properties of probability, equally likely outcome problems.

Random variables: Concept, cumulative distribution function, discrete and continuous random variables, expectation, mean, variance, moment generating function.



Discrete random variables: Bernoulli random variable, Binomial random variable, geometric random variable, Poisson random variable.

Continuous random variables: Uniform random variable, exponential random variable, Gamma random variable, Normal random variable.

Conditional probability and conditional expectations, Bayes theorem, independence, computing expectation by conditioning; some applications — a list model, a random graph, Polya's urn model.

Bivariate random variables: Joint distribution, joint and conditional distributions, the correlation coefficient. Bivariate normal distribution.

Functions of random variables: Sum of random variables, the laws of large numbers, central limit theorem, approximation of distributions.

7. Linear Programming and Optimization. The Unear programming problem. Problem formulation. Types of solutions. Linear programming in matrix notation. Graphical solution of linear programming problems. Some basic proper ties of convex sets, convex functions, and concave functions. Theory and application of the simplex method of solution of a linear programming problem, Charne's M-technique. The two phase method, principle of duality in linear programming problem, fundamental duality theorem, simple problems, the transportation and assignment problems.

VIVA - VOCE :

The test is intended to judge the mental caliber of candidate. In broad terms this is an assessment of not only his intellectual qualities but also social traits and an interest in current affairs, mental alertness, and critical powers of assimilation, care and logical exposition, balance of judgment, variety and depth of interest.

