DETAILED SYLLABUS FOR THE POST OF HIGH SCHOOL TEACHER (MATHEMATICS) KANNADA MEDIUM (GENERAL EDUCATION)
(CATEGORY NO: 509/2025,585/2025)

(TOTAL MARKS - 100)

PART I (15 Marks)

General Knowledge, Renaissance and freedom movement and current affairs

Salient Features of Indian Constitution
Salient features of the Constitution - Preamble- Its significance and its place in the interpretation of the Constitution.
Fundamental Rights - Directive Principles of State Policy - Relation between Fundamental Rights and Directive Principles - Fundamental Duties.
Executive - Legislature - Judiciary - Both at Union and State Level. - Other Constitutional Authorities.
Centre-State Relations - Legislative - Administrative and Financial.
Services under the Union and the States.
Emergency Provisions.
Amendment Provisions of the Constitution.
Other Constitution Authorities:- Election Commission of India, Human Rights Commission UPSC, State Public Service Commissions, Information Commission, etc.
Social Welfare Legislations and Programmes
Social Service Legislations like Right to Information Act, Prevention of atrocities against Women & Children, Food Security Act, Environmental Acts etc. and Social Welfare Programmes like Employment Guarantee Programme, Organ and Blood Donation etc.

CURRENT AFFAIRS

RENAISSANCE IN KERALA AND FREEDOM MOVEMENT

Towards A New Society
Introduction to English education - various missionary organisations and their functioning- founding of educational institutions, factories.printing press – CMS Press etc.
Efforts To Reform The Society
(A) Socio-Religious reform Movements
SNDP Yogam, Nair Service Society, Yogakshema Sabha, Sadhu Jana Paripalana Sangham, Vaala Samudaya Parishkarani Sabha, Samathwa Samajam, Islam Dharma Paripalana Sangham, Prathyaksha Raksha Daiva Sabha, Sahodara Prasthanam etc.
(B) Struggles and Social Revolts
Upper cloth revolts.Channar agitation, Vaikom Sathyagraha, Guruvayoor Sathyagraha, Paliyam Sathyagraha. Kuttamkulam Sathyagraha, Temple Entry Proclamation, Temple Entry Act .Malyalee Memorial, Ezhava Memorial etc.
Malabar riots, Civil Disobedience Movement, Abstention movement etc.
Role Of Press In Renaissance
Malayalee, Swadeshabhimani, Vivekodayam, Mithavadi, Swaraj, Malayala Manorama, Bhashaposhini, Mathnubhoomi, Kerala Kaumudi, Samadarsi, Kesari, AI-Ameen, Prabhatham, Yukthivadi, Deepika – Nasrani Deepika, etc
Awakening Through Literature

Novel, Drama, Poetry, *Purogamana Sahithya Prasthanam, Nataka Prashtanam*, Library movement etc

Women And Social Change

Parvathi Nenmenimangalam, Arya Pallam, A V Kuttimalu Amma, Lalitha Prabhu.Akkamma Cheriyan, Anna Chandi, Lalithambika Antharjanam and others

Leaders Of Renaissance

Thycaud Ayya Vaikundar, Sree Narayana Guru, Ayyan Kali.Chattampi Swamikal, Brahmananda Sivayogi, Vagbhadananda, Poikayil Yohannan(Kumara Guru) Dr Palpu, Palakkunnath Abraham Malpan, Mampuram Thangal, Sahodaran Ayyappan, Pandit K P Karuppan, Pampadi John Joseph, Mannathu Padmanabhan, V T Bhattathirippad, Vakkom Abdul Khadar Maulavi, Makthi Thangal, Blessed Elias Kuriakose Chaavra, Barrister G P Pillai, TK Madhavan, Moorkoth Kumaran, C. Krishnan, K P Kesava Menon, Dr.Ayyathan Gopalan, C V Kunjuraman, Kuroor Neelakantan Namboothiripad, Velukkutty Arayan, K P Vellon, P K Chathan Master, K Kelappan, P. Krishna Pillai, A K Gopalan, T R Krishnaswami Iyer, C Kesavan. Swami Ananda Theerthan , M C Joseph, Kuttippuzha Krishnapillai, Nidheerikkal Manikathanar and others

Literary Figures

Kodungallur Kunhikkuttan Thampuran, KeralaVarma Valiyakoyi Thampuran, Kandathil Varghese Mappila. Kumaran Asan, Vallathol Narayana Menon, Ulloor S Parameswara Iyer, G Sankara Kurup, Changampuzha Krishna Pillai, Chandu Menon, Vaikom Muhammad Basheer. Kesav Dev, Thakazhi Sivasankara Pillai, Ponkunnam Varky, S K Pottakkad and others.

PART II (5 Marks)

Module III: Methodology of teaching the subject

- History/conceptual development. Need and Significance, Meaning Nature and Scope of the Subject.
- Correlation with other subjects and life situations.
- Aims, Objectives, and Values of Teaching - Taxonomy of Educational Objectives - Old and revised
- Pedagogic analysis- Need, Significance and Principles.
- Planning of instruction at Secondary level- Need and importance. Psychological bases of Teaching the subject - Implications of Piaget, Bruner, Gagne, Vygotsky, Ausubel and Gardener - Individual difference, Motivation, Maxims of teaching.
- Methods and Strategies of teaching the subject- Models of Teaching, Techniques of individualising instruction.
- Curriculum - Definition, Principles, Modern trends and organizational approaches, Curriculum reforms - NCF/KCF.
- Instructional resources- Laboratory, Library, Club, Museum- Visual and Audio-Visual aids - Community based resources - e-resources - Text book, Work book and Hand book.
- Assessment; Evaluation- Concepts, Purpose, Types, Principles, Modern techniques - CCE and Grading- Tools and techniques - Qualities of a good test - Types of test items- Evaluation of projects, Seminars and Assignments - Achievement test, Diagnostic test – Construction, Characteristics, interpretation and remediation.
- Teacher - Qualities and Competencies - different roles - Personal Qualities - Essential teaching skills - Microteaching - Action research.

PART III (80 Marks)

Module I

Elementary Set Theory, Relations, Partial order, Equivalence relation, Functions, bijections, Composition, inverse function, Quadratic equations –relation between roots and coefficients, Mathematical induction, Permutation and combination.

Trigonometric Functions – Identities solution of triangles, heights and distances.

Geometry – Length and area of Polygons and circle.

Solids – Surface area and volume, Euler's formula.

Module II

Theory of Numbers – divisibility, division algorithm, gcd, lcm. Relatively prime numbers (Co-primes), Fundamental Theorem of Arithmetic, congruences, solution of linear congruences, Fermat's Theorem.

Matrices – Addition, Multiplication, Transpose, Determinants, singular matrices, inverse, symmetric, skew-symmetric, hermitian, skew-hermitian, Orthogonal matrices, normal form, echelon form, rank of a matrix. Solution of system of linear equations. Eigenvalues, eigenvectors, Cayley Hamilton Theorem.

Module III

Calculus - Limits, Continuity, Differentiability, Derivatives, Intermediate Value Theorem, Rolle's Theorem, Mean value Theorem, Taylor and Maclaurin's series, L'Hospital's rule. Partial differentiation, homogeneous functions, Euler's Formula. Applications of differentiation - maxima and minima, critical points, concavity, points of inflection, asymptotes, Tangents and normals.

Integration – methods of integration, definite integrals – properties.

Fundamental theorem of calculus.

Applications of Integration – Area between curves, volume and area of revolution.

Double and Triple Integrals

Conic sections- Standard equations – Parabola, ellipse, hyperbola, Cartesian, Parametric and polar forms.

Module IV

Bounded sets, infinum, supremum, order completeness, neighbourhood, interior, open sets, closed sets, limit points, Bolzano Weierstrass Theorem, closed sets, dense sets, countable sets, uncountable sets.

Sequences – convergence and divergence of sequences, monotonic sequences, subsequences.

Series – Convergence and divergence of series, absolute convergence, Canchy's general principle of convergence of series. The series $\sum 1/n^p$.

Tests for convergence of series – comparison test, root test, ratio test. Continuity and uniform continuity, Riemann integrals, properties, integrability.

Complex numbers, modulus, conjugates, polar form, n^{th} roots of complex numbers. Functions of complex variables – Elementary functions of complex variables, Analytic functions. Taylor series, Laurent's Series.

Module V

Vectors – Unit vector, collinear vectors, coplanar vectors, like and unlike vectors, orthogonal triads (**i, j, k**) Dot product, cross product- properties. Vector differentiation- unit tangent vector, unit normal vector, curvature, torsion, vector fields, scalar fields, gradient divergence, curl, directional derivatives. Vector Integration – Line Integrals, conservative fields, Green's Theorem, Surface Integrals, Stoke's Theorem, Divergence Theorem.

Differential Equations – Order and degree of differential equations. First order differential equations- solution of Linear equations, separable equations and exact equations.
Second order differential equations- Solution of homogeneous equations with constant coefficients – various types non-homogeneous equations, solutions by undetermined coefficients.

Module VI

Data Representation: Raw Data, Classification and tabulation of data, Frequency tables, Contingency tables; Diagrams – Bar diagrams, sub-divided bar diagrams, Pie diagrams, Graphs – Frequency polygon, frequency curve, Ogives.

Descriptive Statistics: Percentiles, Deciles, Quartiles, Arithmetic Mean, Median, Mode, Geometric Mean and Harmonic Mean; Range, Mean deviation, Variance, Standard deviation, Quartile deviation; Relative measures of dispersion – Coefficient of variation; Moments, Skewness and Kurtosis – Measures of Skewness and Kurtosis.

Probability: Random Experiment, Sample space, Events, Type of Events, Independence of events; Definitions of probability, Addition theorem, Conditional probability, Multiplication theorem, Baye's theorem.

Module VII

Random variables and probability distributions: Random variables, Mathematical Expectation, Definitions and properties of probability mass function, probability density function and distribution function. Independence of random variables; Moment generating function; Standard distributions – Uniform, Binomial, Poisson and Normal distribution.

Bivariate distribution: Joint distribution of two random variables, marginal and conditional distributions.

Correlation and regression: Scatter Diagram, Karl Pearson's Correlation Coefficient, Spearman's rank correlation coefficient. Principle of least squares – curve fitting – Simple linear regression.

Module VIII

Random Sampling Methods: Sampling and Census, Sampling and Non-sampling errors, Simple random sampling, Systematic sampling, Stratified sampling.

Sampling distributions: Parameter and statistic; Standard error, sampling distributions – normal, t, F, Chi square distributions; Central limit theorem. Estimates, Desirable properties of estimate – Unbiasedness, consistency, sufficiency and efficiency.

Testing of hypothesis (basic concepts only) - Simple and composite hypotheses, null and alternate hypotheses, Type I error, Type II error, Level of significance, Power of a test.

NOTE: - It may be noted that apart from the topics detailed above, questions from other topics prescribed for the educational qualification of the post may also appear in the question paper. There is no undertaking that all the topics above may be covered in the question paper.