U.P. EDUCATION SERVICE SELECTION COMMISSION, PRAYAGRAJ

Syllabus

Maths–TGT (Secondary Education)

(Subject Code-07)

Commercial Mathematics : Work time and Speed time, Simple interest, Compound interest, Banking and taxation.

Statistics : Frequency distribution, Pictorial representation of Statistical data, Measurement of Central tendency, Measurement of deflection, Statistics of birth/death, Index.

Algebra : Surds, Polynomials and Factor of Second degree polynomials, HCF of polynomials, Linear equation of two unknown Variables, Simultaneous equations of three unknown variables, quadratic equation, Logarithmic, Ratios and proportions, Number System, Set operations, Definition of determinants, Minor and cofactors, Expansion of determinants up to 3x3 order and properties of determinants. Solution of simultaneous linear equation in three unknowns using Gramer's Rule. Types of Matrices, addition and Multiplication of matrices up to order 3x3. Transpose of a Matrix, symmetric and skew-symmetric Matrices. Solution of Simultaneous equations in three variables using inverse of Matrix, Theory of equations, Symmetric functions of roots, Arithmetic, Geometric and Harmonic progressions, Sum of Series of Squares and Cubes and Natural Numbers Permutations and Combinations, Binomial Theorem, Sum of exponential and Logarithmic Series.

Probability : Theory of addition and Multiplication.

Set Theory : Rules of Set algebra, Equivalence Relation, Mapping, Composition of mapping, Inverse mapping, Peano's Postulates and principle of mathematical induction, Group and Group homomorphism, Subgroup generated by Subsets, Cyclic group, Order of an element of Group, Subgroup of Cyclic group, Co-set decomposition, Lagrange Theorem.

Real Analysis : Axioms of real numbers, Countability of Sets, metric spaces, Neighbourhood, open and closed sets, Derived Set, Dense set, Perfect Set, Bolzano- Weierstrass theorem and General Theorems. Real Sequences, Limit of Sequence, convergent and divergent sequence, bounded sequence, monotonic sequence, propertities of Convergent Sequences, Cauchy Sequence, Cauchy's theorem on limits and Cauchy Criterian of convergence of real sequence. Limit and Continuity of real valued functions, left and right hand limits, properties of continuous functions. Types of discontinuity, Roll's Theorem.

Trigonometry : Circular measurement and Trigonometrical ratio's of special angles, Trigonometrical ratio's of sum, difference, factors and multiples. Trigonometrical Identities, Trigonometrical equations, solution of Triangle, properties of radius of circumscircle, inner circle, exterior circle, general properties of inverse circular functions.

Complex Numbers : Addition and multiplication of Complex Numbers, De moivre's Theorem and its applications, Height and distance, Exponential, Circular and Hyperbolic functions of complex valued functions, Separation into real and imaginary parts.

Geometry : Baudhayana Pythogoras Theorem and its expansion, circle and sector of circle, Arc and Chord of Circle, Tangent line of circle, alternate sector and angle, segments of chord and formed rectangle, congruence of linear and planer shapes.

Co-ordinate Geometry : Cartesian plane, Homogeneous equation of second degree and pair of straight lines. Equation of bisectors and angle between them. Standard equation of conics (circle, parabola, ellipse and hyperbola) in rectangular Cartesian co-ordinates and parametric equations. Condition of general equation of second degree to represent pair of straight lines, circle, parabola and hyperbola. Equation of circle, parabola, ellipse and hyperbola using transformation of origin and co-ordinate axes. Equation of tangent and normal of conic, section of conic by bisecting lime and condition for tangent in limiting position. Parametric equation of tangent, pair of tangent from point to conics. Condition for any line to be tangent and Normal of conics. Standard polar equation of conics. Three dimensional geometry of Sphere, Cone and Cylinder.

Calculus :

Differentiation- differentiation of algebraic, Trigonometric, exponential and logarithmic functions. Tangent and Normal, Maxima and minima of function of one variable, Tracing of Simple curves;

Integration- Integration by Parts and by Substitution, Integration using Partial fractions, Definite integral and its applications in finding area between curves, volume and surfaces of cylinder, cone and spheres-Order and degree of differential equation. General Solution of ordinary differential equation of first order and first degree.

Vector Analysis : Position vector of Ordered pair and ordered triod, displacement Vector, free vector, Unit Vector, modulus and direction cosines, composition of vectors (Force, Velocity and acceleration). Difference of two Vectors, Relative velocity, scalar and vector products of two vectors and their applications in evaluation of work and moment of force. Tripple Product of vectors.

Statics- Equilibrium of a body under three forces, Lami's Theorem, Rules of Triangle, Trigonometrical theorem and resolution in two perpendicular forces. General conditions of equilibrium, Centre of gravity, common catenary.

Dynamics : Projectile motion, motion of a particle in a plane, radial and transversal velocity and accelerations, Tangential and Normal Velocity and acceleration.