

Syllabus For **XII – IIT [Advanced Type Test]**

Date: 01–10–2020

PHYSICS

Capacitor, current electricity, centre of mass, rotational, Shm, conservation of energy,

Photoelectric effect, ray optics.

CHEMISTRY

Redox reactions, hydrogen, thermodynamics, thermochemistry, hydro carbon, Solid state, haloalkane and haloarene, alcohol, phenol, ether, p-block elements, coordination compound, general organic chemistry, solution (concentration terms and equivalent concept).

MATHEMATICS

ALGEBRA

Quadratic equation with real coefficients, relations between roots and coefficients, formation of quadratic equation with given roots, symmetric functions of roots.

Arithmetic, Geometric, and Harmonic progression, Arithmetic, Geometric, and Harmonic means, sums of finite arithmetic and geometric progressions, infinite geometric series, sum of squares and cubes of the first n natural numbers.

Logarithms and their properties.

Permutations and Combinations, Binomial theorem for a positive integral index properties of binomial coefficients.

MATRICES AND DETERMINANTS

Matrices as a rectangular array of real numbers, Equality of Matrices, Addition, Multiplication by a scalar and product of matrices, Transpose of a matrix, Determinant of a square matrix of order up to three, Properties of determinant, Inverse, inverse of a square matrix of order up to three, properties of these matrix operations, diagonal, symmetric and skew-symmetric matrices and their properties, solutions of simultaneous linear equations in two or three variables.

TRIGONOMETRY

Trigonometric functions, their periodicity and graphs, addition and subtraction formulae, formulae involving multiple and sub-multiple angles, general solution of trigonometric equations.

Relation between sides and angles of a triangle, sine rule, cosine rule, half-angle formula and the area of a triangle, inverse trigonometric functions (principal value only).

DIFFERENTIAL CALCULUS

Real valued functions of a real variable, into, onto and one-to-one functions, sum, difference, product and quotient of two functions, composite functions, absolute value, polynomial, rational trigonometric, exponential and logarithmic function. Limit and continuity of a function, limit and continuity of the sum, difference, product and quotient of two functions, L'Hospital rule of evaluation of limits of functions. Even and odd functions, inverse of a function continuity of composite functions, intermediate value property of continuous functions.

Derivative of a function, derivative of the sum difference, product and quotient of two functions, chain rule, derivatives of polynomial, rational trigonometric, inverse trigonometric, exponential and logarithmic functions.

Derivatives of implicit functions, derivatives up to order two, geometrical interpretation of the derivative, tangents and normals.

INTEGRAL CALCULUS

Integration as the inverse process of differentiation, indefinite integrals of standard functions, Integration by parts, Integration by the methods of substitution and partial fractions,

VECTORS

Addition of vectors, scalar multiplication, dot and cross products, scalar triple products and their geometrical interpretations.