

Syllabus For
XII–IIT JEE-MAIN Type Test (Online)
Date: 19.11.2020

PHYSICS

Electrostatics, Gauss's law, Capacitor, Current, Magnetism, Bohr's Theory of H atom, Atomic nucleus, Binding energy and Calculation, α -emission, Heat and Thermodynamics (all units). Photoelectric effect, Matter waves, X-rays

CHEMISTRY

Chemical and Ionic equilibrium, chemical bonding, s-block, p-block (group- 13, 14, 15, 16, 17, 18) Organic chemistry – some basic principles and techniques, hydrocarbon, solid state, haloalkane and haloarene, alcohol, phenol, ether, aldehyde and ketone, coordination compound, General organic chemistry, Solution.

MATHEMATICS

ALGEBRA

Algebra of complex numbers, addition, multiplication, conjugation, polar representation, properties of modulus and principal argument, triangle inequality, cube roots of unity, geometric interpretations.

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

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

Logarithms and their properties

Permutation and combinations, Binomial theorem for a positive integral index, properties of binomial coefficients.

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, 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.

Addition and multiplication rules of probability, conditional probability, Bayes Theorem, independence of events, computation of probability of events using permutation and combinations

TRIGONOMETRY

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

ANALYTICAL GEOMETRY

Relations 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).

THREE DIMENSIONS DIFFERENTIAL CALCULUS

Direction cosines and direction ratios, equation of a straight line in space, equation of a plane, distance of a point from a plane.

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 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, increasing and decreasing functions, maximum and minimum values of a function, Rolle's Theorem and Lagrange's Mean Value Theorem.

INTEGRAL CALCULUS

Integration as the inverse process of differentiation, indefinite integrals of standard functions.

VECTORS

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