ANNEXURE 1

ASE 2019 : SYLLABUS

(The scope of syllabus is only of standard 9th and 10th State / CBSE)

PHYSICS :

- **Motion :** Motion, distance, displacement, speed, velocity, acceleration, Uniform, & non uniform motion (Definition only). Graphical Representation of motion (s-t, v-t graph). Three equations of motion. Uniform circular motion (Definition only).
- **Force :** Unbalanced & balanced forces. Inertia. Newton's first law, second Law, third law of motion. Force equation, Conservation of linear momentum. Gravitational force, weight, free fall. Thrust, pressure in fluids and gases, Buoyant Force, Archimedes Principle, Relative Density.
- **Work And Energy :** Work, work done by constant force, Energy. Kinetic & Potential. Law of conservation of energy, power.
- **Waves :** Waves (longitudinal & Transverse) Characteristics of waves. Relation between wave velocity, frequency and wavelength.
- **Sound :** Propagation of sound, reflection of sound, echo, determination of velocity of sound.
- **Light :** Reflection, spherical mirrors & its uses. Image formation by Concave mirror, Convex mirror. Mirror formula, magnification. Refraction of light through a glass slab, refractive indices.

  Lenses, Image formation by Convex lens & Concave lens, Lens formula, Power of Lens.

  Prism, Dispersion of white light, atmospheric refraction & scattering of light.

  Human eye; Defects of eye (Myopia, Hypermetropia, Astigmatism, Presbyopia) & its Correction.
- **Current Electricity :** Electric current and circuit, Electric Potential and Potential Difference, Ohm's Law, E.M.F., Resistance in series and parallel.
- **Effect of Electric Current :** Heating effect, Joule's Law, Electric Power, Magnetic effect of electric current (Straight Conductor, Circular Coil, Solenoid), Right hand Rule, Force on current carrying conductor in magnetic field, Electric Motor, Generator, Safety Measures. Domestic electric circuits.

CHEMISTRY :

- **Classification of Elements :** Early attempts of classification of elements, Dobereiner's triad, Newland's law of octaves. Mendeleev's Periodic law & Periodic table, Moseley's experiments; Modern periodic table; Electronic configuration & major types of elements (introductory concepts);
  Trends in atomic properties : atomic size, metallic & non-metallic character, valency.
- **Structure of Atom :** Dalton's Atomic theory, Atomic models: Thomson's model; Rutherford's Model; Bohr's model (Introductory concept); Atomic mass unit, Mass number and atomic number, Isotopes and Isobars; Electronic configuration.
- **States of Matter :** Three states of matter; intermolecular forces, Chemical constitution of matter; evaporation, sublimation, condensation; Types of elements, Types of mixture, alloys, Solution, Suspension & Colloidal Solution;.
- **Chemical Bond :** Stability of atoms on the basis of electronic configuration (octet rule); Ionic Bond; Covalent bond; Polar and non-polar bonds; Ionisation and dissociation; Different ions/radicals and their formulae; Types of covalent bonds : single, double, triple bonds.
- **Metal & Non-metals :** Extraction – General principles (brief idea). Physical & Chemical properties: a) Reaction with H_2O, dilute acids, air b) Nature of oxides c) Electropositive & electronegative character d) Reactivity series. Extraction of Iron and Aluminium; Preparation, properties and uses of hydrogen, ammonia, sulphur, sulphur dioxide, sulphuric acid.
- **Expressing concentration & mole concept :** Law of constant proportion, Atomic mass, Molecular mass; Avogadro's law, Gram molecular mass; Gram atomic mass;
- **Chemical Equations & balancing :** Types of chemical reaction a) Exothermic & Endothermic b) Displacement c) Combination d) Double displacement e) Decomposition. Preliminary concepts of oxidation and reduction, balancing of chemical equation and their interpretation; simple calculations based on chemical equations; Corrosion.
- **Study of following Compounds :** Properties and uses of Baking soda, Bleaching powder, Plaster of Paris, Washing Soda, Lime, Cement, Glass, Steel
- **Chemistry of carbon compounds :** Hydrocarbons : a) Open chain b) Closed chain c) Saturated and unsaturated d) Aromatic (Benzene). Nomenclature of organic compounds: Chemical properties of carbon compounds such as combustion, oxidation, addition reaction, substitution reaction.

  Homologous series; Properties of a) Acetic acid, b) Ethanol, c) Methanal, d) Propanone; Polymers and their uses in soaps and detergents.
- **Acids, Bases and Salts :** Neutralisation; Acid-Base indicators, Reaction of acids and bases with metals, metal carbonates, metal bicarbonates; pH of a solution (brief idea), Common Salt.

MATHS :

(Some important topics from standard 8th are also taken)

- **Real Numbers :** Rational numbers & irrational numbers, their decimal form and representation on number line, Properties of rational numbers, Order relation on R, Absolute value. H.C.F., L.C.M., Euclid's division Lemma, Fundamental theorem of arithmetic.
- **Surds :** Laws, forms of surds, simplest form, comparison, multiplication, division, rationalization, binomial expansion of quadratic surds.
- **Rational exponents and radicals (indices) :** Laws of exponents. Radicals and radicands. (Refer 8th Std. Books)
- **Polynomials:** Degree, types of polynomials, their sums, difference, division, product, H.C.F., L.C.M. factor theorem, remainder theorem, synthetic division, zeroes of polynomial, its geometrical meaning. Relationship between zeroes and coefficients of polynomial. Division algorithm for polynomials.
- **Algebraic identities and algebraic expressions :** Factorization, addition, subtraction, multiplication, division and rational algebraic expressions.
- **Ratio and Proportion.**
- **Quadratic equations :** Solution by factorization, by completing square, by formula. Nature of roots. Equations reducible to quadratic equations.

  Applications of quadratic equations. Relation between roots and coefficients, formation of equation.
- **Linear equations in one and two variables and their graphs :** Solutions of equations by graphical method, substitution method, elimination method, cross multiplication method (determinant method or Crammer's rule).

  (Condition for unique solution, no solution, infinitely many solutions). Word problems.
- **Arithmetic progressions**
- **Profit-loss, Percentage, Simple and Compound intrest**
- **Probability.**
- **Statistics :** Bar graph, Histogram, frequency polygon. Mean, mode, median, cumulative frequency for grouped and ungrouped data.
- **Trigonometry :** Trigonometric ratios and identities. Height and distances, complementary angles.
- **Mensuration :** Volume, surface area of cube, cuboids, right circular cone, right circular cylinder, sphere and their combinations, Frustum of a cone.
- **Lines and Angles.**
- **Triangles :** Area by herons' formula, its application in area of quadrilateral. Angle sum property of triangles, criterion for congruency and similarities of triangles, inequalities in triangles. Pythagoras theorem and converse. Basic proportionality theorem and converse and applications. Property of angle bisector. Areas of similar triangles, Apollonius theorem. Medians, altitudes, centroid, orthocenter, cicumcentre of triangle, incentre. Midpoint theorem.
- **Quadrilateral :** Angle sum property, types of quadrilateral, properties of parallelogram, condition for quadrilateral to be parallelogram. Area of quadrilateral.
- **Circles :** Arc and congruence of arcs, chords, tangents, segments of circle. Area of segment and sector of circle. Circumference of circle. Theorems related to chords, arcs, tangents, segments. Cyclic quadrilateral.
- **Coordinate Geometry :** Coordinates of a point, quadrants, and axes. Distance formula. Internal and external division section formula. Centroid formula. Area of triangle. Equation of line.

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