Syllabus for Aptitude Test

Class-XI

PHYSICS

1. **Mechanics:**
   Composition and Resolution of Vectors. Kinemetical Equations. Newtons's Laws of Motion. Work, Power and Energy.
2. **General properties of Matter:**
   Newton's law of Gravitation, Motion under gravity, Hydrostatics.
3. **Heat:** Thermometry, Calorimetry, Change of State, First Law of Thermodynamics.
4. **Light:** Reflection on plain surface, Refraction, Total Internal Reflection, Lens.
5. **Electricity:**
   Coulomb's Law, Ohm's Law, Resistance and Resistivity, Series and Parallel combination of resistances, Joule's law of electrical heating, Magnetic effect of current.
6. **Modern Physics:**
   Thermionic emission, Diode valve, X-rays, Natural Radioactivity, Fission, Fusion.
7. Basic ideas about Differential and Integral Calculus.
8. **Machines:** Liver, Pulley and Gear.

CHEMISTRY

1. **Atoms, Molecules and Chemical Arithmetic:**
   Dalton's atomic theory (critical study). Avogadro's Law. Application of Avogadro's law and deduction of M=2D and molar volumes of ideal gases at STP. Avogadro Number. Atomic mass, molecular mass, equivalent weight (no experimental determination required), Valency. A=EV. Gram atomic, Gram molecular and Gram equivalent weight. Law of constant proportions. Gay lussac's law of gaseous volume. Mole concept. Weight – weight, weight-volume calculations. Percentage composition, empirical formula and molecular formula. Numerical problems.
2. **Radioactivity & Atomic Structure:**
   Concept of Nuclear Atom: Electron, Proton and Neutron (charge and mass of). Atomic number (Z), Extra nuclear structure: Rutherford's model and it's limitation.
3. **The Law of conservation of mass and energy.** Electronic theory of valency.
4. **Redox Equilibria:** Oxidation-Reduction reactions as electron transfer processes, oxidation number.

   Gaseous States: Measurable properties of gasses. Boyle's law and Charles's law, absolute scale of temperature: kinetic theory of gasses (postulates only), ideal gas equation: PV=nRT, PV=(w/M)RT.
5. **Inorganic Chemistry:** Common gasses, Acids, Water, Metals, Solution.

6. **Electrolysis**
7. **Organic Chemistry (Madhyamik)** with elementary class XI, eg. IUPAC.
8. **Inorganic and Organic common substances** – Sources, uses and simple properties.
9. **Periodic Table:** Modern Period Law and long form of Periodic Table. Periodic trends in properties of element – atomic radii, ionisation enthalpy, electronegativity, valency.
10. **Chemical Bonding:** Covalent, Ionic & Co-ordinate bonding.

MATHEMATICS

1.
   (i) Percentage and its applications.
   (ii) Ratio and Proportions, Variations, Algebraic Identities and Inequalities.
   (iii)Mensuration
   (iv)Geometry
   (v) Trigonometric Applications
2. Surds and Laws of indices.
3. Logarithm
4. Basic concept of Quadratic Equation.
5. Trigonometrical Ratios of Associated angles.
6. Basic concept of Coordinates.
7. Set Theory.
8. Statistics (Diagrammatic Representation of data, Mean-Median-Mode).
9. Fundamental concept of Real valued function.