MPSAT – 2026

SPARK ENGG SYLLABUS

PHYSICS	**Motion:** Distance and displacement, velocity; uniform and non-uniform motion along a straight line; acceleration, distance-time and velocity-time graphs for uniform motion and non-uniform motion with constant and variable acceleration. Equations of kinematics. **Force and Newton's laws:** Force and Motion, Newton's Laws of Motion, Action and Reaction forces, Inertia of a body, Inertia and mass, Momentum, Force and Acceleration. Conservation of Linear momentum. **Gravitation:** Gravitation; Universal Law of Gravitation, Force of Gravitation of the earth (gravity), Acceleration due to Gravity; Mass and Weight; Free fall. **Work, energy and power:** Work done by a Force, Energy, power; Kinetic and Potential energy; Law of conservation of energy. **Optics:** Reflection of light by curved surfaces; Images formed by spherical mirrors, centre of curvature, principal axis, principal focus, focal length, mirror formula, magnification. Refraction; Laws of refraction, refractive index. Refraction of light by spherical lens; Image formed by spherical lenses; Lens formula; Magnification. Power of a lens. Refraction of light through a prism, dispersion of light, scattering of light, applications in daily life. **Effects of Current:** Electric current, potential difference and electric current. Ohm's law; Resistance, Resistivity, Factors on which the resistance of a conductor depends. Series combination of resistors, parallel combination of resistors and its applications in daily life. Heating effect of electric current and its applications in daily life. Electric power, Interrelation between P, V, I and R. **Magnetic effects of current:** Magnetic field, field lines, field due to a current carrying conductor, field due to current carrying coil or solenoid; Force on current carrying conductor, Fleming's Left-Hand Rule, Electric Motor, Electromagnetic induction. Induced potential difference, Induced current. Fleming's Right Hand Rule.
CHEMISTRY	**Matter:** (i) Compounds (ii) Mixtures (iii) Colloids and suspensions **Atoms and molecules:** (i) Laws of chemical combinations (ii) Mole concept and calculations based on it (iii) Atomic mass & molecular mass (iv) Chemical formula of common compounds and valency **Structure of atom**: (i) Electron, proton & Neutron (ii) Atomic models (Rutherford's model and Bohr's Model) (iii) Atomic number and mass number (iv) Isotopes, Isobars and isotones **Chemical reactions:** (i) Types of chemical reactions (Combination, decomposition, displacement, double displacement, neutralisation, oxidation & reduction). **Acids, Bases and Salts:** (i) Indicators for testing acids & bases

	(ii) Properties of acids & bases (iii) pH and pH scale (iv) Preparation and properties of salts like common salt, washing soda, Baking soda, Bleaching powder, Plaster of Paris. (v) Classification of salts (vi) Hydrated salts. **Metals and Non-metals:** (i) Properties of metals & non metals (ii) Ionic compounds (iii) Ores and alloys **Carbon and its compounds:** (i) Homologous series (ii) Nomenclature of organic compounds (iii) Saturated and unsaturated hydrocarbons (iv) Chemical properties of carbon compounds (combustion, Oxidation, addition and substitution reactions) **Periodic classification of Elements:** (i) Mendeleev's periodic table and modern periodic table (ii) Properties of elements in groups and periods (atomic radius, metallic & non metallic, character, electro negativity)
MATHEMATICS	**Real Number:** (i) Representation of terminating and non-terminating decimals on the number line. (ii) Rationalization of real number of $\frac{1}{a+b\sqrt{x}}$ or $\frac{1}{\sqrt{x}+\sqrt{y}}$. **Algebra:** (i) Basic questions on polynomials like quadratic, Cubic polynomials & nature of roots, Remainder theorem **Co-ordinate Geometry:** (i) Application of distance formula, Section formula, Midpoint formula centroid, Circumcentre, incentre, Angle between two lines, Application of slope of a line. **Triangles:** (i) Nature of triangles, properties and theorem **Trigonometry:** (i) Basic trigonometry on tables, Fundamental formula, Maximum/minimum of trigonometrical terms, Application of Trigonometry (Height and distance). **Probability:** (i) Simple problems on single events or double events **Statistics:** (i) Problems on mean, median, mode and properties **Arithmetic Progression:** (i) Problem on term and sum of an AP. **Mensuration:** (i) Area & volume of different shapes **Arithmetic:** (i) Problems on simple interest, period and time.