FYJC Physics Syllabus

Sr. No.	Chapter Name	Syllabus
1	Units and Measurements	1. System of units and their uses. 2. Fundamental quantities, derived quantities, supplementary quantities & their units 3. Methods for measurement of length, mass & time. 4. Dimensional analysis, uses of dimensional analysis, Limitations of Dimensional Analysis 5. Accuracy, precision and uncertainty in measurements, combination of errors 6. Identify different types of errors in measurement of physical quantities and estimate them. 7. Significant figures & order of magnitude
2	Mathematical Methods	1. Distinguish between scalar and vector quantities. 2. Perform addition, subtraction and multiplication (scalar and vector product) of vectors. 3. Determine the relative velocity between two objects. 4. Obtain derivatives and integrals of simple functions. 5. Obtain components of vectors. 6. Apply mathematical tools to analyze physics problems.
3	Motion in a Plane	1. Rectilinear motion 2. Graphical study of motion 3. Equations of motion for uniform acceleration 4. Relative velocity 5. Motion in two dimensions (motion in a plane) 6. Projectile motion 7. Uniform circular motion 8. Conical pendulum
4	Laws of Motion	1. Aristotle's Fallacy 2. Newton's laws of motion, their importance and limitations 3. Inertial and non-inertial frames of references 4. Fundamental Forces in Nature 5. State various conservation principles and use these in daily life situations. 6. Contact and Non-Contact Forces, Real and Pseudo Forces 7. Conservative and Non-Conservative Forces and Concept of Potential Energy 8. Work done by constant and variable force, Work energy theorem 9. Principle of Conservation of Linear Momentum 10. Systems and Free body diagrams (FBD) 11. Elastic and inelastic collision, Coefficient of restitution 12. Organize the common principles between collisions and explosions 13. Impulse of a force, Explain the necessity of defining impulse and apply it to collisions 14. Collision in 2- dimensions i.e. a non-head-on collision 15. Rotational analogue of a force (moment of a force or torque) 16. Couple and its torque 17. Stable, unstable and neutral equilibrium 18. Center of mass, Centre of gravity

5	Gravitation	1. Apply the Kepler's laws of planetary motion to solar system.
		2. Elaborate Newton's law of gravitation, measurement of gravitational constant.
		3. Calculate the values of acceleration due to gravity at any height above and depth below the earth's surface. Variation in g with latitude.
		4. Gravitational potential and potential energy.
		5. Projection of satellite, Distinguish between different orbits of earth's satellite.
		6. Explain how escape velocity varies from planet.
		7. Explain weightlessness in a satellite.
		8. Time period of satellite, Binding energy of satellite.
6	Mechanical Properties of Solids	1. Explain the difference between elasticity and plasticity
		2. Elastic behavior of solids
		3. Stress and strain and their types.
		4. Identify elastic limit for a given material.
		5. Differentiate between different types of elasticity modules.
		6. Poisson's ratio.
		7. Stress strain curve.
		8. Strain energy
		9. Hardness and toughness of materials.
		10. Judge the suitability of materials for specific applications in daily life appliances.
		11. Identify the role of force of friction in daily life.
		12. Origin of friction, types of friction, advantages and disadvantages of friction.
7	Thermal Properties of Matter	1. Temperature and heat, Measurement of temperature
		2. Absolute temperature and Ideal gas equation
		3. Thermal expansion
		4. Specific heat capacity of gas, calorimeter
		5. Change of state, phase diagram, gas and vapours
		6. Different modes of heat transfer.
		7. Newton's law of cooling.
		8. Thermal conductivity, thermal resistance
		9. Differentiate between good and bad conductors of heat.
8	Sound	1. Types of waves, common properties of all waves.
		2. Speed of travelling wave
		3. Newton's formula for velocity of sound and Laplace's correction.
		4. Factors affecting speed of sound
		5. Principle of superposition of waves
		6. Echo, reverberation and acoustic
		7. Qualities of sound
		8. Doppler's effect
9	Optics	1. Nature of light
		2. Rayoptics or geometricaloptics, Laws of reflection, Laws of refraction
		3. Cartesian sign conventions
		4. Reflection from plane surface, Images formed by two plane mirrors inclined to each other
		5. Reflection from curved mirrors
		6. Defects or aberration of images

		7.	Identify the defects in images obtained by mirrors and lenses, with their cause and ways of reducing or eliminating them.
		8.	Refraction, Dispersion of light and prisms, deviation curve, minimum deviation, prism formula, lateral dispersion due to plane parallel slab, thin prism
		9.	Angular dispersion and dispersive power
		10.	Relate dispersion of light with colour and apply it analytically with the help of prisms.
		11.	Total internal reflection, Applications of total internal reflection
		12.	Apply the laws of refraction to common phenomena in daily life like, a mirage or a rainbow.
		13.	Refraction at a spherical surface and lenses
		14.	Refraction at a single spherical surface
		15.	Lens maker equation
		16.	Optical instruments, simple microscope, compound microscope, telescope and their magnifying power.
10	Electrostatics	1.	Electric charges and their properties, Quantization of Charge, Conservation of charges
		2.	Coulomb's law in scalar and vector form, Definition of unit charge, Dielectric constant or relative permittivity
		3.	The principle of superposition of forces
		4.	Electric field, electric field intensity due to a point charge, Practical way of calculating electric field
		5.	Properties of electric lines of force
		6.	Electric Flux and Flux density
		7.	Gauss's law in electrostatics
		8.	Electric dipole and electric dipole moment, couple acting on an electric dipole in uniform electric field
		9.	Electric Intensity at a Point due to an Electric Dipole
		10.	Continuous distribution of charge
11	Electric Current Through Conductors	1.	Electric current, drift velocity, Current density
		2.	Ohm's law, Physical origin of Ohm's law, Limitations of Ohm's law
		3.	Electric energy and power
		4.	Resistors, colour code for resistors, Rheostat, Combination of resistors (Series & Parallel), Specific resistance
		5.	Variation of resistance with temperature
		6.	Superconductivity
		7.	Electro motive force and potential difference
		8.	Cells in series and parallel, types of cells
12	Magnetism	1.	Magnetic lines of force and their Properties, magnetic field
		2.	Bar magnet
		3.	Magnetic field due to a bar magnet along the axis, along the equator and at arbitrary point
		4.	Gauss' Law of Magnetism
		5.	Earth's magnetic field
13	Electromagnetic Waves and Communication System	1.	EM wave, Sources of EM waves, Characteristics of EM waves, Electromagnetic Spectrum
		2.	Explain the properties of an electromagnetic wave.
		3.	Distinguish between mechanical waves and electromagnetic waves.
		4.	Identify different types of electromagnetic radiations from gamma rays to radio waves.
		5.	Propagation of EM Waves
		6.	Distinguish between different modes of propagation of EM waves through earth's atmosphere.

		7. Identify different elements of a communication system. 8. Explain different types of modulation and identify the types of modulation needed in given situation.
14	Semiconductors	1. Electrical conduction in solids 2. Band theory of solids 3. Distinguish between conductors, insulators and semiconductors based on band structure. 4. Intrinsic and extrinsic semi-conductor 5. Differentiate between p type and n type semiconductors and their uses. 6. P-N junction 7. Concept of Depletion region and potential barrier, Features of the depletion region 8. Explain working of forward and reverse biased junction. 9. Explain the working of semiconductor diode 10. Characteristics of P-N junction diode, Static and dynamic resistance of a diode 11. Semiconductor devices 12. Semiconductor devices, Advantages, Disadvantages, Applications of semiconductors and p-n junction diode 13. Thermistor 14. Electric and electronic devices