

## Lesson Plan

Name of the Institute:	C. V. Raman Polytechnic
Department:	Basic Science
Semester/Division/Branch:	1 <sup>st</sup> & 2 <sup>nd</sup> Sem/ All Branches
Subject Name with code:	Engineering Physics (2.a.)
Total No. of Class (Required):	60
Faculty Name:	Ashok Kumar Mahapatra

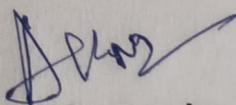
Theory		Remarks
Class No.	Topic (including assignment /test)	
1	Introduction of units and Dimensions Physical quantities, Fundamental and derived units, Systems of units	
2	Dimensional formulae of physical quantities. Dimensional equations and Principle of homogeneity.	
3	Checking the dimensional correctness of Physical relations, Limitations of dimensional analysis	
4	Scalar and Vector quantities (definition and concept), Representation of a Vector – examples, types of vectors.	
5	Introduction of Force and motion and scalar and vector quantities with Examples, representation of vector	
6	. Triangle and Parallelogram law of vector Addition. Numericals. Resolution of Vectors – Simple Numericals on Horizontal and Vertical components. Vector multiplication (scalar product and vector product of vectors).	
7	<b>Revision and numerical practice</b>	
8	Concept of Rest and Motion. Displacement, Speed, Velocity, Acceleration & FORCE (Definition, formula, dimension & SI units).	

9	Equations of Motion under Gravity (upward and downward motion) - no derivation. Circular motion: Angular displacement, Angular velocity and Angular acceleration (definition, formula & SI units).	
10	Relation between –(i) Linear & Angular velocity, (ii) Linear & Angular acceleration).	
11	Define Projectile, Examples of Projectile. Expression for Equation of Trajectory, Time of Flight, Maximum Height	
12	Horizontal Range for a projectile fired at an angle, Condition for maximum Horizontal Range	
13	Numerical practice and derivations <b>Revision test</b>	
14	Work – Definition, Formula & SI units. Friction – Definition & Concept. Types of friction (static, dynamic), Limiting Friction	
15	Laws of Limiting Friction, Coefficient of Friction – Definition & Formula	
16	Methods to reduce friction, Simple Numericals.	
17	Numerical practice and derivations <b>Revision</b>	

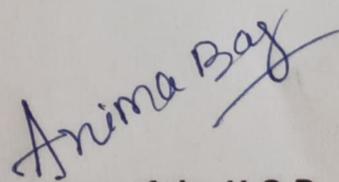
18	<b>Class test</b>	
19	Newton's Laws of Gravitation, Universal Gravitational Constant (G)- Definition, Unit and Dimension.	
20	Acceleration due to gravity (g)-Definition and Concept.	
21	Definition of mass and weight. Relation between g and G. Variation of g with altitude and depth	
22	Kepler's Laws of Planetary Motion (Statement only).	
23	<b>Revision and examples.</b>	
24	Simple Harmonic Motion (SHM) - Definition & Examples. Expression (Formula/Equation) for displacement, velocity, acceleration of a body/ particle in SHM.	
25	Wave motion – Definition & Concept. Transverse and Longitudinal wave motion – Definition, Examples & Comparison	
26	Definition of different wave parameters (Amplitude, Wavelength, Frequency, Time Period)	
27	Derivation of Relation between Velocity, Frequency and Wavelength of a wave	
28	Ultrasonics – Definition, Properties & Applications	
29	<b>Class test</b>	
30	Heat and Temperature – Definition & Difference, Units of Heat, Mechanical Equivalent of Heat (Definition, Unit)	
31	Thermal Expansion – Definition & Concept, Expansion of Solids (Concept) Specific Heat, Numericals on specific heat	
32	Change of state, Latent Heat, Numericals on Latent Heat	
33	Coefficient of linear, superficial and cubical expansions of Solids – Definition & Units., Relation between $\alpha$ , $\beta$ & $\gamma$ , Work and Heat - Concept & Relation	
34	First Law of Thermodynamics (Statement and concept only)	

35	<b>Class test</b>	
36	Reflection & Refraction –Laws of reflection and refraction Refractive index – Definition, Formula & Simple numerical.	
37	Critical Angle and Total internal reflection	
38	Refraction through Prism (Ray Diagram & Formula	
39	Fiber Optics – Definition, Properties & Applications	
40	Electrostatics, Explanation of Coulomb's laws, Definition of Unit charge.	
41	Absolute & Relative Permittivity ( $\epsilon$ ), Electric potential and Electric Potential difference	
42	Electric field, Electric field intensity (E) Capacitance - Definition, Formula & Unit	
43	Coulomb's Laws in Magnetism – Statement & Explanation, Unit Pole	
44	Series and Parallel combination of Capacitors -Formula for effective/Combined/total capacitance & numericals	
45	Magnet, Properties of a magnet, Magnetic field, Magnetic Field intensity (H) , Magnetic lines of force (Definition and Properties)	
46	Magnetic Flux ( $\Phi$ ) & Magnetic Flux Density (B) – Definition, Formula & Unit.	
47	Electric Current, Ohm's law and its applications. Kirchhoff's laws (Statement & Explanation with diagram )	
48	Series and Parallel combination of resistors, Formula for effective/ Combined/ total resistance & Simple numericals	
49	Kirchhoff's laws (contd..). Application of Kirchhoff's laws to Wheatstone bridge	
50	Balanced condition of Wheatstone's Bridge –Condition of Balance (Equation).	
51	Numericals	

52	<b>Class test</b>	
53	Electromagnetism – Definition & Concept., Lenz's Law	
54	Force acting on a current carrying conductor placed in a uniform magnetic field	
55	Fleming's Right Hand Rule, Fleming's Left Hand Rule, Faraday's Laws of Electromagnetic Induction	
56	Comparison between Fleming's Right Hand Rule and Fleming's Left Hand Rule.	
57	LASER & laser beam (Concept and Definition) Principle of LASER (	
58	Population Inversion & Optical Pumping, Properties & Applications of LASER	
59	Wireless Transmission – Ground Waves, Sky Waves, Space Waves (Concept & Definition)	
60	<b>Revision and test</b>	



Signature of the Faculty



Signature of the H.O.D