

PHYSICS

Part – I	60 Marks
Part – II	60 Marks
Practical	30 Marks
Total	150 Marks

Part-I (Class-IX)	Marks: 60	Time: 2:00 Hours
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UNIT-1 : PHYSICAL QUANTITIES AND MEASUREMENT

- 1.1 Physical and Non-Physical Quantities
- 1.2 Base and Derived Physical Quantities
- 1.3 International System of Units
- 1.4 Scientific Notation
- 1.5 Length Measuring Instruments
- 1.6 Mass Measuring Instruments
- 1.7 Time Measuring Instruments
- 1.8 Volume Measuring Instruments
- 1.9 Errors in Measurements
- 1.10 Uncertainty in a Measurement
- 1.11 Significant Figures
- 1.12 Precision and Accuracy
- 1.13 Rounding off the Digits

UNIT-2 : KINEMATICS

- 2.1 Scalars and Vectors
- 2.2 Rest and Motion
- 2.3 Types of Motion
- 2.4 Distance and Displacement
- 2.5 Speed of Velocity
- 2.6 Acceleration
- 2.7 Graphical Analysis of Motion
- 2.8 Gradient of a Distance-Time Graph
- 2.9 Speed-Time Graph
- 2.10 Gradient of a Speed-Time Graph
- 2.11 Area Under Speed-Time Graph
- 2.12 Solving Problems for Motion Under Gravity
- 2.13 Free Fall Acceleration

Unit-3 : DYNAMICS

- 3.1 Concept of Force
- 3.2 Fundamental Forces
- 3.3 Forces in a Free-Body Diagram
- 3.4 Newton's Laws of Motion
- 3.5 Limitations of Newton's Laws of Motion
- 3.6 Mass and Weight
- 3.7 Mechanical and Electronic Balances
- 3.8 Friction
- 3.9 Momentum and Impulse
- 3.10 Principle of Conservation of Momentum

Unit-4 : TURNING EFFECT OF FORCE

- 4.1 Like and Unlike Parallel Forces
- 4.2 Addition of Forces
- 4.3 Turning Effect of a Force
- 4.4 Resolution of Vectors
- 4.5 Determination of a Force from its Perpendicular Components
- 4.6 Principle of Moments
- 4.7 Centre of Gravity and Centre of Mass
- 4.8 Equilibrium
- 4.9 Conditions of Equilibrium

- 4.10 States of Equilibrium
- 4.11 Improvement of Stability
- 4.12 Application of Stability in Real Life
- 4.13 Centripetal Force
- Unit-5 : WORK, ENERGY AND POWER
 - 5.1 Work
 - 5.2 Energy
 - 5.3 Conservation of Energy
 - 5.4 Sources of Energy
 - 5.5 Renewable and Non-Renewable Sources
 - 5.6 The Advantages and Disadvantages of Methods of Energy Production
 - 5.7 Power
 - 5.8 Efficiency
- Unit-6 : MECHANICAL PROPERTIES OF MATTER
 - 6.1 Deformation of Solids
 - 6.2 Hooke's Law
 - 6.3 Density
 - 6.4 Pressure
 - 6.5 Pressure in Liquids
 - 6.6 Atmospheric Pressure
 - 6.7 Measurement of Atmospheric Pressure
 - 6.8 Measurement of Pressure by Manometer
 - 6.9 Pascal's Law
- Unit-7 : THERMAL PROPERTIES OF MATTER
 - 7.1 Kinetic Molecular Theory of Matter
 - 7.2 Temperature and Heat
 - 7.3 Thermometers
 - 7.4 Sensitivity, Range and Linearity of Thermometers
 - 7.5 Structure of a Liquid-in-Glass Thermometer
- Unit-8 : MAGNETISM
 - 8.1 Magnetic Materials
 - 8.2 Properties of Magnets
 - 8.3 Induced Magnetism
 - 8.4 Temporary and Permanent Magnets
 - 8.5 Magnetic Fields
 - 8.6 Uses of Permanent Magnets
 - 8.7 Electromagnets
 - 8.8 Domain Theory of Magnetism
 - 8.9 Magnetisation and Demagnetisation
 - 8.10 Applications of Magnets in Recording Technology
 - 8.11 Soft Iron as Magnetic Shield
- Unit-9 : NATURE OF SCIENCE
 - 9.1 Scope of Physics
 - 9.2 Branches of Physics
 - 9.3 Interdisciplinary Nature of Physics
 - 9.4 Interdisciplinary Research
 - 9.5 Scientific Methods
 - 9.6 Scientific Base of Technologies and Engineering

Prescribed Book: Physics for Part – I (Class –IX)

Authors: Professor (Rtd.) Muhammad Nisar

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Part-II (Class-X)		Marks: 60	Time: 2:00 Hours
Unit-10 :	SIMPLE HARMONIC MOTION AND WAVES		
10.1	Simple Harmonic Motion		
	10.1.1 Motion of Mass Attached to a Spring		
	10.1.2 Ball and Bowl System		
	10.1.3 Motion of a Simple Pendulum		
10.2	Damped Oscillations		
10.3	Wave Motion		
10.4	Types of Mechanical Waves		
10.5	Waves As Carriers of Energy		
10.6	Ripple Tank		
Unit-11 :	SOUND		
11.1	Sound Waves		
11.2	Characteristics of Sound		
11.3	Reflection of Sound		
11.4	Speed of Sound		
11.5	Noise Pollution		
11.6	Audible Frequency Range		
11.7	Ultrasound		
Unit-12 :	GEOMETRICAL OPTICS		
12.1	Reflection of Light		
	12.1.1 Laws of Reflection		
	12.1.2 Types of Reflection		
12.2	Spherical Mirrors		
12.3	Image Location by Spherical Mirror Formula		
12.4	Refraction of Light		
12.5	Total Internal Reflection		
12.6	Refraction Through Prism		
12.7	Lenses		
12.8	Refraction Through Lenses		
12.9	Formation of Image by Lens Equation		
12.10	Applications of Lenses		
12.11	Simple Microscope		
12.12	Compound Microscope		
12.13	Telescope		
12.14	The Human Eye		
12.15	Defects of Vision		
Unit-13 :	ELECTROSTATICS		
13.1	Production of Electric Charges		
13.2	Electrostatic Induction		
13.3	Electroscope		
13.4	Coulomb's Law		
13.5	Electric Field and Electric Field Intensity		
13.6	Electrostatic Potential		
13.7	Capacitors and Capacitance		
13.8	Different Types of Capacitors		
13.9	Applications of Electrostatics		
13.10	Some Hazards of Static Electricity		
Unit-14 :	CURRENT ELECTRICITY		
14.1	Electric Current		
14.2	Potential Difference		
14.3	Electromotive Force (e.m.f)		
14.4	Ohm's Law		
14.5	V-I Characteristics of Ohmic and Non Ohmic Conductors		
14.6	Specific Resistance (Resistivity)		

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- 14.7 Conductors
 - 14.8 Insulators
 - 14.9 Combination of Resistors
 - 14.10 Electrical Energy and Joule's Law
 - 14.11 Electric Power
 - 14.12 Direct Current and Alternating Current
 - 14.13 Hazards of Electricity
 - 14.14 Safe Use of Electricity in Homes
 - Unit-15 : ELECTROMAGNETISM
 - 15.1 Magnetic Effects of a Steady Current
 - 15.2 Force on a Current – Carrying Conductor Placed in a Magnetic field
 - 15.3 Turning Effect on a Current-Carrying Coil in a Magnetic Field
 - 15.4 D.C. Motor
 - 15.5 Electromagnetic Induction
 - 15.6 Direction of Induced e.m.f. – Lenz's Law
 - 15.7 A.C. Generator
 - 15.8 Mutual Induction
 - 15.9 Transformer
 - 15.10 High Voltage Transmission
 - Unit-16 : BASIC ELECTRONICS
 - 16.1 Thermionic Emission
 - 16.2 Investigating the Properties of Electrons
 - 16.3 Cathode-Ray Oscilloscope (C.R.O)
 - 16.4 Analogue and Digital Electronics
 - 16.5 Basic Operations of Digital Electronics-Logic Gates
 - 16.6 AND Operation
 - 16.7 OR Operation
 - 16.8 NOT Operation
 - 16.9 NAND Gate
 - 16.10 NOR Gate
 - 16.11 Uses of Logic Gates
 - Unit-17 : INFORMATION AND COMMUNICATION TECHNOLOGY
 - 17.1 Information and Communication Technology
 - 17.2 Components of Computer Based Information System (CBIS)
 - 17.3 Flow of Information
 - 17.4 Transmission of Electrical Signal Through Wires
 - 17.5 Transmissions of Radio waves Through Space
 - 17.6 Transmission of Light Signals Through Optical Fibers
 - 17.7 Information Storage Devices
 - Primary Memory
 - Audio and Video Cassettes
 - Hard Disk
 - Flash Drive
 - Data Management
 - Browsers
 - Electronic Mail
 - Secondary Storage Devices
 - Magnetic Disks
 - Compact Disc (CDs)
 - Application of Computer
 - Internet Services
 - How to Search the Web
 - Unit-18 : ATOMIC AND NUCLEAR PHYSICS
 - 18.1 Atom and Atomic Nucleus
 - 18.2 Natural Radioactivity
 - 18.3 Background Radiations
 - 18.4 Nuclear Transmutations
 - 18.5 Half-Life and Its Measurement
 - 18.6 Radioisotopes and their Uses
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- 18.7 Fission Reaction
- 18.8 Nuclear Fusion
- 18.9 Hazards of Radiation and Safety Measures

LIST OF PRACTICALS FOR CLASS-IX (PART-I)

1. Measure the area of cross-section of a solid cylinder by measuring its diameter with Vernier calipers.
2. Determine the volume of a solid cylinder by measuring its length and diameter.
3. Measure the thickness of a metal strip or a wire by using a screw gauge.
4. Find the acceleration of a ball rolling down an inclined angle iron by drawing a graph between $2S$ and t^2 .
5. Find the value of 'g' by free fall method.
6. Investigate the relation between force of limiting friction and normal reaction to find the co-efficient of sliding friction between a wooden block and horizontal surface.
7. Find the force of limiting friction by rolling a roller on a horizontal surface.
8. Determine the value of 'g' by Atwood's machine.
9. Determine the resultant of two forces graphically by using a Horizontal force table.
10. Find the unknown weight of an object by using vector addition of forces.
11. Verify the principle of moments by using a metre rod balanced on a wedge.
12. Find the unknown weight of an object by using principle of moments.
13. Find the tension in the strings by balancing a metre rod on the stands.
14. Study the effect of length of simple pendulum on its time period and hence, find the value of 'g' by calculation.
15. Prove that time period of a simple pendulum is independent of mass of the pendulum.
16. Prove that time period of a simple pendulum is independent of amplitude of vibration.
17. Determine the relationship between load and extension (Helical spring) by drawing a graph.
18. Find the density of a body heavier than water by Archimedes principle.
19. Find the density of a liquid using a disposable syringe.
20. Find the specific heat of a given solid by the method of mixture using polystyrene cup.
21. Draw a graph between temperature and time when ice is converted into water and then to steam by slow heating.
22. Find the latent heat of fusion of ice.

LIST OF PRACTICALS FOR CLASS-X (PART-II)

1. Verify the laws of refraction by using a glass slab.
2. Find the refractive index of water by using concave mirror.
3. Determine the critical angle of glass using a semi-circular glass slab and a light ray box or by prism.
4. Trace the path of a ray of light through a glass prism and measure the angle of deviation.
5. Find the focal length of a convex lens by parallax method.
6. Set up a microscope.
7. Set up a telescope.
8. Verify Ohm's law (using wire as conductor).
9. Study resistors in series circuit.
10. Study resistors in parallel circuit.
11. Find the resistance of galvanometer by half deflection method.
12. Trace the magnetic field using a bar magnet.
13. Trace the magnetic field due to a current carrying circular coil.
14. Verify the truth table of OR, AND, NOT, NOR and NAND gates.
15. Set up a NAND gate burglar Alarm.
16. Set up a NOT gate Fire Alarm.

Prescribed Book: Physics for Part – II (Class –X)

Authors: Dr. Azmat Iqbal , Dr. Ghulam Murtaza

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