

CONTENTS

PHYSICS

Chapter 1. Units and Measurement 1-7

- Physical Quantities 1
- Classification of Units 2

Chapter 2. Motion 8-13

- Rest and Motion 8
- Speed 9
- Velocity 10
- Acceleration 10
- Graphical Representation of Motion 11

Chapter 3. Force and Newton's Laws of Motion 14-21

- Force 14
- Inertia 15
- Newton's Laws of Motion 16
- Law of Conservation of Linear Momentum 18
- Friction 18
- Centripetal Force 20
- Centrifugal Force 21

Chapter 4. Work, Energy and Power 22-30

- Work 22
- Energy 23
- Law of Conservation of Energy 24
- Rate of Doing Work : Power 25
- Sources of Energy 25
- Environmental Consequences 30

Chapter 5. Gravitation 31-35

- Universal Law of Gravitation 31
- Gravity and Free Fall 32
- Mass and Weight 32
- Gravitational Field 33
- Weightlessness 33
- Escape Speed 33
- Planets 33
- Satellites 34

Chapter 6. Mechanical Properties of Matter 36-42

- Hooke's Law 37
- Thrust and Pressure 38
- Density 38
- Pressure in Fluids 38
- Pascal's Law 40
- Buoyancy 40
- Flow of Liquids 41
- Viscosity 41
- Terminal Velocity 41
- Intermolecular Forces 42
- Surface Tension 42

Chapter 7. Heat and Thermodynamics 43-55

- Temperature and Heat 43
- Thermal Expansion 44
- Heat Capacity 46
- Principle of Calorimetry 46
- Change of State 46
- Humidity 47
- Evaporation 47
- Heat Transfer 48
- Absorptive and Emissive Powers 51
- Black Body 51
- Greenhouse Effect 52
- Thermodynamics 52
- Molecular Nature of Matter 54

Chapter 8. Oscillations 56-59

- Periodic Motion 56
- Simple Harmonic Motion 56
- Natural or Free Vibrations 58

Chapter 9. Wave Motion 60-69

- Waves 60
- Wave Velocity 63
- Progressive and Stationary Waves 64
- Sound Waves 64
- Refraction of Sound Waves 68
- Interference 69

Chapter 10. Electricity **70-82**

• Electric Charge	70
• Electric Field	71
• Capacitance	71
• Electric Current	72
• Electric Potential	72
• Ohm's Law	72
• Combination of Resistance	74
• Electric Energy	75
• Heating Effect of Electric Current	75
• Electric Power	76
• Chemical Effects of Electric Current	76
• Electric Cell	77
• Magnetic Effect of Electric Current	78
• Domestic Electric Circuits	81

Chapter 11. Magnetism and Electromagnetic Induction **83-87**

• Magnet	83
• Magnetic Field	84
• Magnetic Field Lines	84
• Electromagnet	85

Chapter 12. Light **88-102**

• Light Sources	88
• Reflection of Light	89
• Mirror	90
• Refraction of Light	93
• Total Internal Reflection (TIR)	94
• Lens	95
• Diffraction of Light	99
• Human Eye	99
• Optical Instruments	101

Chapter 13. Dual Nature of Radiation and Matter **103-104**

• Electron Emission	103
• Photoelectric Effect	103
• Einstein's Photoelectric Equation	104

Chapter 14. Semiconductor Electronics **105-107**

• Solid and Energy Band	105
• Solar Cell	107

Chapter 15. Stars and Solar System **108-113**

• Celestial Bodies	108
• Constellations	109
• Solar System	110
• Artificial Satellites	113

CHEMISTRY

Chapter 1. Atomic Structure & Radioactivity **114-119**

• Dalton's Atomic Theory	114
• Atomic Models	115
• Characteristics of an Atom	116
• Types of Atomic Species	116
• Structural Features of the Atom	116
• Valency	117
• Molecular Mass	118
• Mole Concept	118
• Radioactivity	118

Chapter 2. Physical & Chemical Changes of Substances and Their Separation **120-125**

• Changes	120
• Matter	121
• Tyndall Effect	123
• Separation of Substances	124

Chapter 3. Chemical Reaction, Bonds and Chemical Equations **126-130**

• Chemical Reaction	126
• Chemical Equation	126
• Oxidation and Reduction	129

Chapter 4. Periodic Classification of Elements **131-136**

• Development of Periodic Table	131
• Mendeleev's Periodic Table (1869)	132
• Modern Periodic Table	134

Chapter 5. Acids, Bases and Salts 137-141

- Acids 137
- Bases 138
- Indicators 139
- Importance of pH in Everyday Life 139
- Buffer Solutions 140
- Salts 140

Chapter 6. Metals 142-145

- Physical Properties of Metals 142
- Chemical Properties of Metals 142
- Alloy 145
- Some Other Important Metals 145

Chapter 7. Non-Metals 146-151

- Physical Properties of Non-Metals 146
- Chemical Properties of Non-Metals 146
- Carbon 147
- Hydrogen 148
- Noble Gases 151

Chapter 8. Carbon Compounds 152-157

- Petroleum : Source of Organic Compounds 152
- Hydrocarbons 153
- Carboxylic Acids 155
- Some Other Important Organic Compounds 156

Chapter 9. Food Preservatives and Biomolecules 158-160

- Carbohydrates 158
- Protein 159

Chapter 10. Chemistry in Everyday Life 161-166

- Fibres 161
- Drugs 162
- Soaps and Detergents 162
- Dyes 163
- Glass 163

- Cement 164
- Fertilizers 165
- Chemicals in Food 165

Chapter 11. Environmental Chemistry 167-170

- Environment Pollution 167
- Stratospheric Pollution 168
- Water Pollution 169
- Oil Zapper 169
- Green Chemistry 170

BIOLOGY

Chapter 1. Introduction to Biology and Classification of Living Beings 171-180

- Introduction to Biology 171
- Living World 171
- Biodiversity 172
- Classification 172
- Classification of Living Organisms 173

Chapter 2. Cell 181-186

- Cell Theory 181
- Structural Organisation of a Cell 182
- Cell Cycle 185

Chapter 3. Tissues 187-193

- Plant Tissues 187
- Plant Tissue System 189
- Animal Tissues 190

Chapter 4. Genetics 194-198

- Rules of Inheritance 194
- Chromosomal Theory of Inheritance 195
- Sex-Determination 196
- Mutation 196
- Genetic Disorders 196
- Genetic Material 197

Chapter 5. Evolution	199-202		
• Origin of Life	199		
• Organic Evolution	200		
• Speciation	201		
• Human Evolution	201		
Chapter 6. Plant Morphology and Physiology	203-212		
• Plant Morphology	203		
• Plant Physiology	206		
• Photosynthesis in Plants	207		
• Respiration in Plants	207		
• Excretion in Plants	208		
• Coordination in Plants	208		
• Reproduction in Plants	209		
• Sexual Reproduction in Flowering Plants	210		
Chapter 7. Animal Physiology	213-235		
• Integumentary System	213		
• Nutrients	215		
• Digestive System	217		
• Respiration	219		
• Circulatory System	222		
• Excretory System	224		
• Movement in Humans	226		
• Skeletal System	226		
• Joints	227		
• Control and Coordination in Animals	228		
• Human Endocrine System	230		
• Reproduction in Animals	232		
• Sexual Reproduction	233		
• Human Reproductive System	233		
Chapter 8. Human Health and Diseases	236-241		
• Health	236		
		• Disease	236
		• Immunity	241
Chapter 9. Environment and Ecology	242-248		
• Environment	242		
• Ecology	243		
• Population	243		
• Ecological Interactions	244		
• Ecological Adaptations	244		
• Ecosystem	245		
Chapter 10. Biodiversity and Its Conservation	249-252		
• Biodiversity	249		
• Conservation of Biodiversity	251		
Chapter 11. Agriculture Science and Animal Husbandry	253-259		
• Agriculture Science	253		
• Animal Husbandry	257		
Chapter 12. Environmental Issues	260-264		
• Pollution	260		
• Solid Waste and Its Management	263		
Chapter 13. Biotechnology	265-269		
• Techniques of Biotechnology	265		
• Recombinant DNA Technology (RDT)	265		
• Transgenic Animals	268		
• Biotechnological Applications in Agriculture	268		
• Ethical Issues in Applications of Biotechnology	269		
• APPENDIX	270-290		