

# Contents

● Previous Years' Solved Papers

## Part-I PHYSICS

### A. MEASUREMENT

1. Fundamental Quantities and Units..... 3
2. Measurement of Small-lengths  
Vernier Calliper..... 6

### B. PURE KINEMATICS

1. Elements of Vectors..... 9
2. Acceleration..... 12

### C. MECHANICS

1. Laws of Motion..... 15
2. Moment of a Force..... 18

### D. WORK, ENERGY AND POWER..... 21

### E. HYDROSTATICS..... 24

### F. VIBRATIONS, WAVES AND SOUND

1. Vibrations..... 28
2. Wave Motion and Sound..... 31

### G. HEAT

1. Kinetic Theory of Matter..... 35
2. Thermal Expansion..... 38
3. Thermal Energy..... 41
4. Thermal Radiation..... 44

### H. LIGHT

1. Introduction to Light ..... 47
2. Reflection of Light..... 50
3. Refraction of Light through Plane  
Surface..... 54
4. Refraction of Light through  
Thin Lenses..... 59
5. Optical Instruments..... 62

### I. ELECTROSTATICS..... 66

### J. CURRENT ELECTRICITY

1. Simple Circuits..... 69
2. Applications of Electric Current :  
Electric Appliances..... 74

### K. ELECTROMAGNETISM

1. Magnetic Field..... 78
2. Force on a Moving Charge in  
a Magnetic Field..... 81
3. Electromagnetic Induction..... 85
- Important Points..... 89

## Part-II CHEMISTRY

### PHYSICAL CHEMISTRY..... 1-72

1. Science and Scientific Method..... 3
2. State of Matter—Solid, Liquid  
and Gaseous..... 8
3. Atoms and Molecules Laws of  
Chemical Combination..... 13
4. Atomic Structure and Radioactivity..... 19
5. Valency or Chemical Bonding..... 26
6. Symbols, Formulae and Chemical  
Equations..... 32
7. Gaseous laws..... 37
8. Atomic Weight, Molecular Weight  
and Equivalent Weight..... 43
9. Electrolysis, Acid, Base and Salt..... 49
10. Various Chemical Reactions and  
Catalysis..... 55
11. Solutions..... 61
- Some Noteworthy Points..... 67

### INORGANIC CHEMISTRY..... 1-35

1. Periodic Classification of Elements..... 3
2. Water..... 9
3. Hydrogen, Sulphurated Hydrogen,  
Hydrogen Chloride and Chlorine..... 15
4. Nitrogen, Ammonia, Oxygen and  
Sulphurdioxide..... 20

5. Metals and Non-metals.....	26	8. Simultaneous Equations.....	73
● Some Networthy Points.....	31	9. Set Theory.....	78
<b>ORGANIC CHEMISTRY.....</b>	<b>1-40</b>	10. Mapping.....	83
1. An Introduction to Organic Chemistry.....	3	<b>D. TRIGONOMETRY</b>	
2. Classification of Organic Compounds.....	8	1. Circular Measure, Radian and Trigonometrical Ratios.....	87
3. Saturated and Unsaturated Hydrocarbons.....	14	2. Trigonometrical Ratios of Sum & Difference of Two Angles.....	92
4. Plastics, Artificial Fibres, Medicines Explosives and Detergents.....	22	3. Ratios of Multiple and Sub-multiple Angle.....	95
5. Chemical Calculations.....	28	4. Transformation of Sums into Products and <i>Vice-versa</i> .....	99
● Some Noteworthy Points.....	38	5. Height and Distance.....	103
<b>Part-III</b>		<b>E. GEOMETRY</b>	
<b>MATHEMATICS</b>		1. Locus, Pythagoras Theorem and its Application.....	107
<b>A. ARITHMETIC</b>		2. Circles, Tangents to the Circles and Cyclic Quadrilaterals.....	111
1. Compound Interest.....	1	3. Theorems on Angles in Alternate Segment and Proportion.....	117
2. Questions Based on Work and Speed.....	7	<b>F. MENSURATION</b>	
3. Bank Deposits and Payment in Instalments.....	15	1. Cube, Cuboid and Right Prism.....	122
<b>B. STATISTICS</b>		2. Right Pyramid and Right Circular Cylinder.....	125
1. Elementary Statistics.....	25	3. Right Circular Cone, Sphere and Frustum of Cone.....	129
2. Frequency Graph.....	27	<b>G. COORDINATE GEOMETRY</b>	
3. Measures of Central Tendency.....	32	1. Distance of Two Points, Section Formula and Area of the Triangle.....	134
4. Mean Deviation and Standard Deviation.....	37	2. Straight Line.....	138
<b>C. ALGEBRA</b>		3. Angle between Two Straight Lines, their Point of Intersection and Length of Perpendicular.....	141
1. Simple Formulae and their Use.....	42		
2. Number System.....	46		
3. Laws of Indices and their Application....	49		
4. Logarithms and their Use.....	53		
5. Factors.....	58		
6. L.C.M. and H.C.F.....	63		
7. Quadratic Polynomials and Quadratic Equations.....	67		