CONTENTS

THEME 1 : NUMBER SYSTEM ... ... 9 – 23

1. **Integers** 11
   - Integers 9 • Fundamental Operations on Integers 11
   - Simplification 19
2. **Fractions** ... ... 24 – 35
   - Various Types of Fractions 24 • Fraction as an Operator 24
   - Multiplication of Fractions 25
   - Activity to Derive a Rule for the Multiplication of Fractions 25
   - Division of Fractions 29
   - Simplifying a Numerical Expression 32
3. **Decimals** ... ... 36 – 52
   - Decimal Fractions 36 • Addition of Decimals (Review) 39
   - Subtraction of Decimals (Review) 39 • Multiplication of Decimals 41
   - Division of Decimals 43 • Terminating and Repeating Decimals 45
   - Approximation (Rounding Off of Decimals) 47
4. **Rational Numbers** ... ... 53 – 75
   - Rational Numbers 53 • General Rules 53
   - Equivalent Rational Numbers 54
   - Comparison of Rational Numbers 57
   - Operations on Rational Numbers 59
   - Representation of Rational Numbers on Number Line 68
   - Rational Numbers as Decimals 70
5. **Exponents** ... ... 76 – 85
   - Power of a Number 76 • Laws of Exponents 77
6. **Sets** ... ... 86 – 102
   - A Set and Its Objects 86 • How to Describe a Set? 87
   - Types of Sets 88 • Subsets 92
   - Operations on Sets 94 • Cardinal Properties of Sets 96

THEME 2 : RATIO AND PROPORTION

7. **Ratio and Proportion** ... ... 103 – 113
   - Ratio 103 • Proportion 108
8. **Unitary Method** ... ... 114 – 120
   - Unitary Method 114 • Direct Proportion or Direct Variation 114
   - Indirect Proportion or Indirect Variation 116
9. **Percentage** ... ... 121 – 131
   - Percentage 121 • Problems Related to Percentage 124
   - Percentage Change 127
10. **Profit and Loss** ... ... 132 – 139
    - Cost Price 132 • Selling Price 132
    - Profit or Gain 132 • Loss 132
11. **Simple Interest** ... ... 140 – 145
    - Introduction 140 • Formula for Calculating Simple Interest 140

12. **Speed, Distance and Time** ... ... 146 – 151
- Speed, Distance and Time 146
- Converting Speed into other Units 147
- Uniform and Variable Speed of a Moving Body 147
- Problems on Trains 148

THEME 3 : ALGEBRA

13. **Algebraic Expressions** ... ... 152 – 162
- Fundamental Concepts of Algebra 152
- Operations on Numbers and Literals 152
- Various Types of Algebraic Expressions 153
- Operations on Algebraic Expressions 156

14. **Linear Equations** ... ... 163 – 175
- Mathematical Sentences 163 • Linear Equation 163
- Rules for Solving Linear Equation 164 • Transposition 164
- Problems based on Linear Equations 168

15. **Inequalities** ... ... 176 – 182
- Inequations 176 • Properties of Inequalities 176

THEME 4 : GEOMETRY

16. **Fundamental Geometrical Concepts** ... ... 183 – 187
- Point 183 • Line Segment 183 • Ray 183
- Line 183 • Plane 184 • Collinear Points 184
- Intersecting Lines 184 • Concurrent Lines 184
- Parallel Lines 184 • Some Important Results 184

17. **Lines and Angles** ... ... 188 – 206
- Angle 188 • Types of Angles 188
- Complementary Angles 189 • Supplementary Angles 189
- Adjacent Angles 191 • Linear Pair of Angles 191
- Angles on a Line 192 • Angles at a Point 192
- Vertically Opposite Angles 192
- Perpendicular Lines 195 • Parallel Lines 196

18. **Properties of Triangles** ... ... 207 – 225
- Triangle 207
- Classification of Triangles According to Sides/Angles 208
- Angle Sum Property of a Triangle 209
- Exterior Angle Property of a Triangle 209
- Pythagoras Theorem 218

19. **Symmetry** ... ... 226 – 237
- Reflection Symmetry or Linear Symmetry 226
- Point Symmetry 229 • Rotational Symmetry 230

20. **Representing 3-D in 2-D** ... ... 238 – 245
- Cuboid 238 • Cube 238 • Cyclinder 239 • Cone 239
- Net of a Three-Dimensional Figure 239 • Mapping the Space 242

21. Congruence ... ... 246 – 256
- Congruent Triangles 247
- Conditions for Congruency of Triangles 247

22. Construction ... ... 257 – 263
- Basic Constructions 257
- Constructions Using Ruler and Set Square 258
- Construction of Triangles 260

THEME 5 : MENSURATION

23. **Mensuration** ... ... 264 – 292
- Perimeter 264 • Area 267
- Using Unit Square Grid Sheet to Find Area 268
- Area of Paths, Roads and Borders 276
- Area of Triangles 279 • Area of Parallelogram 283
- Area of a Rhombus 283 • Area of a Circle 287

THEME 6 : DATA HANDLING

24. **Data Handling** ... ... 293 – 311
- Introduction 293 • Frequency Distribution 294
- Mean of Tabulated Data 295 • Median of Ungrouped Data 297
- Mode of Ungrouped Data 301
- Empirical Formula for Calculating Mode 301
- Graphical Representation of Statistical Data 303

25. **Probability**
- Introduction 312 • Probability 312 ... ... 312 – 315

Answers ... ... 316 – 336