Contents

- Mathematical Symbols 3–4
- Greek Alphabets 5–5
- Roman Numerals 6–6
- **Arithmetic 7–30**
  1. Natural Numbers 9
  2. LCM and HCF of Numbers 12
  3. Percentage 13
  4. Simple and Compound Interest 14
  5. Square and Cube Root 16
  6. Surds and Indices 18
  7. Logarithms 19
  8. Ratio and Proportion 20
  9. Average 22
  10. Trains 23
  11. Ages 24
  12. Time and Distance 25
  13. Boat and Stream 26
  14. Time and Work 27
  15. Discount and Stock 29
  16. Partnership 30
- **Plane Geometry 31–39**
  1. Triangle 33
  2. Similar and Congruence of Triangles 34
  3. Quadrilaterals 35
  4. Circles 36
  5. Polygon 39
- **Mensuration 41–53**
  1. Area and Perimeter 43
  2. Volume and Surface Area 46
  3. Sphere 49
  4. Right Circular Cylinder 51
  5. Cone 52
  6. Pyramid 53
- **Plane Trigonometry 55–63**
  1. Trigonometry 57
- **Algebra 65–94**
  1. Elements of Set Theory 67
  2. Relation and Function 69
  3. Number Theory 71
  4. Equations and Inequalities 80
  5. Quadratic Equation 81
  6. Mathematical Induction 82
  7. Permutation and Combination 83
  8. Binomial Theorem 85
  9. Exponential and Logarithmic Series 86
  10. Polynomials, Division and Algorithm 89
  11. Theory of Equations 91
- **Analytic Plane Geometry 95–127**
  1. Fundamental Concepts of 2D 97
  2. Straight Line 99
  3. Pair of Straight Lines 102

4. Circle 103
5. Parabola 107
6. Ellipse 111
7. Hyperbola 116
8. Conic Section 121
9. Polar Equations 124

● **Analytic Solid Geometry 129–146**
1. Fundamental Concepts of 3D 131
2. Plane 134
3. Straight Line 136
4. Sphere 139
5. Cone 142
6. Cylinder 145

● **Sequences and Series 147–153**
1. Sequences 149
2. Series 152

● **Differential Calculus 155–191**
1. Function 157
2. Limit, Continuity and Differentiability 161
3. Rolle's Mean Value and Taylor's Theorem 166
4. Rate of Change 169
5. Tangent and Normals 170
6. Maxima and Minima 175
7. Curvature 177
8. Asymptotes 180
9. Singular Points 183
10. Curve Tracing 186
11. Partial Differentiation 190

● **Integral Calculus 193–206**
1. Indefinite Integrals 195
2. Definite Integrals 199
3. Rectification, Quadrature, Volume and Surfaces 201
4. Multiple Integration 205

● **Differential Equations 207–222**
1. Differential Equation 209
2. Ordinary Differential Equation 214
3. Partial Differential Equation 218

● **Matrices 223–235**
1. Matrices and its Types 225
2. Determinant 230
3. Operations with Matrices 233

● **Abstract Algebra 237–257**
1. Group 239
2. Ring, Integral Domain and Field 247
3. Vector Spaces 251
4. Linear Transformations 255

● **Vector Analysis 259–270**
1. Vector Analysis 261

● **Statics 271–282**
1. Force 273
2. Friction 277
3. Centre of Gravity and Mass 279

● **Dynamics 283–302**
1. Motion of a Particle in a Straight Line 285
2. Newton's Laws of Motion 288
3. Motion in a Plane 290
4. Projectiles 292
5. Simple Harmonic Motion 294
6. Circular Motion 296
7. Motion Under Central Forces 300

● **Complex Analysis 303–312**
1. Complex Analysis 305

● **Numerical Analysis 313–323**
1. Numerical Analysis 315

- **Integral Transform** **325–333**
  1. Integral Transform 327
- **Calculus of Variations** **335–340**
  1. Calculus of Variations 337
- **Statistics** **341–347**
  1. Statistics 343
- **Probability Theory** **349–358**
  1. Probability Theory 351
- **Discrete and Computer Mathematics** **359–377**
  1. Discrete Mathematics 361
  2. Computer Mathematics 370
- **Operations Research** **379–399**
  1. Operations Research Models 381
  2. Linear Programming Problems 396