

CONTENTS

1	Relations and Functions	1-36
1.1	Introduction	1
1.2	Ordered Pair	2
1.3	Cartesian Product	2
1.4	Relations	6
1.5	Functions	10
1.6	Representation of Functions	15
1.7	Types of functions	17
1.8	Special cases of Functions	23
1.9	Composition of Functions	26
1.10	Identifying the graphs of Linear, Quadratic, Cubic and Reciprocal functions	29
2	Numbers and Sequences	37-85
2.1	Introduction	38
2.2	Euclid's Division Lemma	38
2.3	Euclid's Division Algorithm	40
2.4	Fundamental Theorem of Arithmetic	44
2.5	Modular Arithmetic	47
2.6	Sequences	53
2.7	Arithmetic Progression	56
2.8	Series	63
2.9	Geometric Progression	68
2.10	Sum to n terms of a Geometric Progression	74
2.11	Special Series	77
3	Algebra	86-156
3.1	Introduction	86
3.2	Simultaneous Linear Equations in three variables	88
3.3	GCD and LCM of Polynomials	94
3.4	Rational expressions	99
3.5	Square Root of Polynomials	104
3.6	Quadratic Equations	107
3.7	Quadratic Graphs	124
3.8	Matrices	133

4	Geometry	157-199
4.1	Introduction	157
4.2	Similarity	158
4.3	Thales Theorem and Angle Bisector Theorem	167
4.4	Pythagoras Theorem	179
4.5	Circles and Tangents	184
4.6	Concurrency Theorems	191
5	Coordinate Geometry	200-236
5.1	Introduction	200
5.2	Area of a Triangle	202
5.3	Area of a Quadrilateral	204
5.4	Inclination of a Line	209
5.5	Straight Line	218
5.6	General Form of a Straight Line	228
6	Trigonometry	237-266
6.1	Introduction	237
6.2	Trigonometric Identities	240
6.3	Heights and Distances	248
7	Mensuration	267-299
7.1	Introduction	267
7.2	Surface Area	268
7.3	Volume	280
7.4	Volume and Surface Area of Combined Solids	289
7.5	Conversion of Solids from one shape to another with no change in Volume	293
8	Statistics and Probability	300-334
8.1	Introduction	300
8.2	Measures of Dispersion	302
8.3	Coefficient of Variation	313
8.4	Probability	316
8.5	Algebra of Events	324
8.6	Addition Theorem of Probability	325
	Answers	335-343
	Mathematical Terms	344