Contents

	Fore	rword	iii
	Ratio	onalisation of Content in the Textbooks	v
1.	Sets		1
	1.1	Introduction	1
	1.2	Sets and their Representations	1
	1.3	The Empty Set	5
	1.4	Finite and Infinite Sets	6
	1.5	Equal Sets	7
	1.6	Subsets	9
	1.7	Universal Set	12
	1.8	Venn Diagrams	13
	1.9	Operations on Sets	13
	1.10	Complement of a Set	18
2.	Relations and Functions		24
	2.1	Introduction	24
	2.2	Cartesian Product of Sets	24
	2.3	Relations	28
	2.4	Functions	30
3.	Trigonometric Functions		43
	3.1	Introduction	43
	3.2	Angles	43
	3.3	Trigonometric Functions	49
	3.4	Trigonometric Functions of Sum and Difference of Two Angles	57
4.	Com	plex Numbers and Quadratic Equations	76
	4.1	Introduction	76
	4.2	Complex Numbers	76

	4.3	Algebra of Complex Numbers	77
	4.4	The Modulus and the Conjugate of a Complex Number	81
	4.5	Argand Plane and Polar Representation	83
5.	Linear Inequalities		
	5.1	Introduction	89
	5.2	Inequalities	89
	5.3	Algebraic Solutions of Linear Inequalities in One Variable and their Graphical Representation	91
6.	Permutations and Combinations		
	6.1	Introduction	100
	6.2	Fundamental Principle of Counting	100
	6.3	Permutations	104
	6.4	Combinations	114
7.	Binomial Theorem		126
	7.1	Introduction	126
	7.2	Binomial Theorem for Positive Integral Indices	126
8.	Sequences and Series		135
	8.1	Introduction	135
	8.2	Sequences	135
	8.3	Series	137
	8.4	Geometric Progression (G.P.)	139
	8.5	Relationship Between A.M. and G.M.	144
9.	Straight Lines		151
	9.1	Introduction	151
	9.2	Slope of a Line	152
	9.3	Various Forms of the Equation of a Line	159
	9.4	Distance of a Point From a Line	164
10.	Conic Sections		176
	10.1	Introduction	176
	10.2	Sections of a Cone	176
	10.3	Circle	179

	10.4 Parabola	182	
	10.5 Ellipse	187	
	10.6 Hyperbola	195	
11.	Introduction to Three Dimensional Geometry	208	
	11.1 Introduction	208	
	11.2 Coordinate Axes and Coordinate Planes in Three Dimensional Space	209	
	11.3 Coordinates of a Point in Space	209	
	11.4 Distance between Two Points	211	
12.	Limits and Derivatives		
	12.1 Introduction	217	
	12.2 Intuitive Idea of Derivatives	217	
	12.3 Limits	220	
	12.4 Limits of Trigonometric Functions	234	
	12.5 Derivatives	239	
13.	Statistics	257	
	13.1 Introduction	257	
	13.2 Measures of Dispersion	259	
	13.3 Range	259	
	13.4 Mean Deviation	259	
	13.5 Variance and Standard Deviation	271	
14.	Probability		
	14.1 Event	289	
	14.2 Axiomatic Approach to Probability	295	
	Appendix 1: Infinite Series	314	
	A.1.1 Introduction	314	
	A.1.2 Binomial Theorem for any Index	314	
	A.1.3 Infinite Geometric Series	316	
	A.1.4 Exponential Series	318	
	A.1.5 Logarithmic Series	321	

Appendix 2: Mathematical Modelling	323
A.2.1 Introduction	323
A.2.2 Preliminaries	323
A.2.3 What is Mathematical Modelling	327
Answers	335
Supplementary Material	357