## Contents

**PART II**

*Foreword*  
Preface

### 7. Integrals  (287)

- 7.1 Introduction  
- 7.2 Integration as an Inverse Process of Differentiation  
- 7.3 Methods of Integration  
- 7.4 Integrals of some Particular Functions  
- 7.5 Integration by Partial Fractions  
- 7.6 Integration by Parts  
- 7.7 Definite Integral  
- 7.8 Fundamental Theorem of Calculus  
- 7.9 Evaluation of Definite Integrals by Substitution  
- 7.10 Some Properties of Definite Integrals

### 8. Application of Integrals  (359)

- 8.1 Introduction  
- 8.2 Area under Simple Curves  
- 8.3 Area between Two Curves

### 9. Differential Equations  (379)

- 9.1 Introduction  
- 9.2 Basic Concepts  
- 9.3 General and Particular Solutions of a Differential Equation  
- 9.4 Formation of a Differential Equation whose General Solution is given  
- 9.5 Methods of Solving First order, First Degree Differential Equations

### 10. Vector Algebra  (424)

- 10.1 Introduction  
- 10.2 Some Basic Concepts  
- 10.3 Types of Vectors  
- 10.4 Addition of Vectors
### 10.5 Multiplication of a Vector by a Scalar 432
### 10.6 Product of Two Vectors 441

#### 11. Three Dimensional Geometry 463
11.1 Introduction 463
11.2 Direction Cosines and Direction Ratios of a Line 463
11.3 Equation of a Line in Space 468
11.4 Angle between Two Lines 471
11.5 Shortest Distance between Two Lines 473
11.6 Plane 479
11.7 Coplanarity of Two Lines 487
11.8 Angle between Two Planes 488
11.9 Distance of a Point from a Plane 490
11.10 Angle between a Line and a Plane 492

#### 12. Linear Programming 504
12.1 Introduction 504
12.2 Linear Programming Problem and its Mathematical Formulation 505
12.3 Different Types of Linear Programming Problems 514

#### 13. Probability 531
13.1 Introduction 531
13.2 Conditional Probability 531
13.3 Multiplication Theorem on Probability 540
13.4 Independent Events 542
13.5 Bayes’ Theorem 548
13.6 Random Variables and its Probability Distributions 557
13.7 Bernoulli Trials and Binomial Distribution 572

*Answers* 588