table of contents

Chapter 1: Time

1.1 What is time? 1
1.2 Various methods of measuring time 3
1.3 Astronomical time and local time 4
1.4 Definition of Common Time 5
1.5 Relationship between time and space 8
1.6 On the contradictions of Special Theory of Relativity theory 10

Chapter 2: Speed

2.1 Velocity and Relative Velocity 13
2.2 Acceleration without using relative quantities 15
2.3 Velocity measured by an accelerometer 17
2.4 Relationship between inertial velocity and coordinate velocity 18

Chapter 3: Space

3.1 Method of measuring distance 21
3.2 Locally dependent distance and non-locally dependent distance 23
3.3 Coordinates 25

Chapter 4: The Principle of Relativity

4.1 Galileo's Principle of Relativity 27
4.2 Galileo's Inertial Coordinate System 36
4.3 Michelson-Morley Experiment 38
4.4 Einstein's Special Theory of Relativity 38
4.5 Understanding of Coordinate Systems in Special Relativity 43
4.6 Inertial Coordinate System Applicable to Waves 56
4.7 On the Adjunction of Light Propagation Paths 58
4.8 The Concept of Absolute Velocity 60
4.9 Types of acceleration methods 63
4.10 Regarding the maximum speed 64

Chapter 5: Conservation of Momentum

5.1 Physicists' interpretation of the elastic collision of two spheres 66
5.2 What is wrong with the physicists' interpretation of
the elastic collision of two spheres? 68
5.3 Law of Conservation of Momentum 70
5.4 Law of Conservation of Kinetic Energy 75
5.5 Correct Application of the Law of Conservation of Momentum 77
5.6 Momentum and Relative Velocity 84

Chapter 6: Vector

6.1 Scalars and Vectors 88
6.2 Representation of Vectors 88
6.3 Composition of Vectors 89
6.4 Product of Vectors and Scalars 90
6.5 Analytical Representation of Vectors 91
6.6 Position Vectors 93
6.7 Analytical Addition, Subtraction, and Product with Scalars of Vectors . 93
6.8 Inner Product of Vectors 94
6.9 Cross Product of Vectors 96
6.10 Product of Three Vectors 99
6.11 Quotient of Vectors 99

Chapter 7: Motion ~Basic Concepts of Differential and Integral Calculus~

7.1 Description of the phenomenon 102
7.2 Basic Concepts of Differentiation 104
7.3 Functions and Increments 108
7.4 Basic Techniques for Differential Calculus 109
7.5 Definition of Differential 111
7.6 Differential Formulas 112
7.7 Differentiation in Three Dimensions 113
7.8 Differentiation of Vectors 114
7.9 Basic Concepts of Definite Integrals 115
7.10 Relationship between Antiderivatives and Derivatives 117
7.11 Calculation of Indefinite Integrals 119
7.12 Relationship between Definite and Indefinite Integrals 121
7.13 Integrals of Zero 124
7.14 Integral Formulas 124
7.15 Improper Integrals 125
7.16 Integrals of Vectors 130

Chapter 8: Force and Energy ~Accelerating Forces and Forces with Zero Acceleration~

8.1 Consideration of phenomena related to force 131
8.2 What is Force? 132
8.3 Force and Acceleration 134
8.4 Force with Zero Acceleration 136
8.5 Force and Energy 137
8.6 Relationship between Forces with Zero Acceleration
and Forces with Non-Zero Acceleration 141
8.7 Is energy required for a force applied to an object
when it is not moving? 142
8.8 Analogy of Wind 145
8.9 Composition of Forces 146

Chapter 9: Apparent Forces ~Forces due to Relative and Non-Relative Accelerations~

9.1 What is explained as an apparent force 149
9.2 The concept of apparent velocity 151
9.3 Terminology related to appearance 152
9.4 Existing knowledge of physics cannot describe real forces 152
9.5 What is velocity that is not apparent? 153
9.6 The concept of real force 154
9.7 Forces associated with acceleration 155
9.8 The difference between relative and inertia 156
9.9 Forces associated with rotation 157

Chapter 10: Representation of Force ~Representation of Force using Time and Spatial Differentials of Acceleration~

10.1 Measurement of Acceleration by Time Differential 161
10.2 Measurement of Acceleration by Spatial Differential 163
10.3 Relationship between Acceleration by Time Differential and Acceleration by Spatial Differential 164
10.4 Algebraic Derivation 168
10.5 Velocity as a Function of Position 169
10.6 Representation in Three Dimensions 170
10.7 Difference between Ordinary and Partial Differentials 172
10.8 Positional Acceleration and Hamilton's Principle 175

Chapter 11: Vector Analysis

11.1 Scalar Gradient 176
11.2 Differentiation of Indirect Functions 178
11.3 Multiple Integrals 179
11.4 Line Integrals 182
11.5 Area Integrals 188
11.6 Gauss's Divergence Theorem 192
11.7 Vector Divergence 194
11.8 Relationship between the normal vector and direction cosine of a curved surface 197
11.9 Green's Theorem in the Plane 198
11.10 Stokes' Theorem 200
11.11 Rotation of a Vector 204
11.12 Vector Formula 205

Chapter 12: The Law of Universal Gravitation

12.1 Setting the Coordinate System 207
12.2 The Law of Universal Gravitation 209
12.3 Representation of the Law of Universal Gravitation as a Field 210
12.4 Acceleration of a stationary object 212
12.5 Conservative Force Field 213
12.6 Conservative Force Field of Wind 217
12.7 The Concept of Potential Energy 219
12.8 The Physical Meaning of Potential 222
12.9 Derivation of Gravitational Velocity 224
12.10 The Law of Conservation of Mechanical Energy 225
12.11 What is the Law of Conservation of Kinetic Energy? 228
12.12 Representation of Gravitational Velocity by the Speed of Light 231

Chapter 13: Laws of Static Fields ~Coulomb's Law and the Law of Universal Gravitation~

13.1 Coulomb's Law 234
13.2 Electric Field 238
13.3 Electric Potential 239
13.4 Gradient of Electric Potential 241
13.5 Charge Distribution 242
13.6 Electric Flux and Gauss's Law 242
13.7 Differential Form of Gauss's Law 245
13.8 Electrodynamic Expression of the Law of Universal Gravitation 246

Chapter 14: The Concept of Magnetic Fields

14.1 Electric Current 247
14.2 Mass Flow 250
14.3 Right-Hand Rule 254
14.4 Ampère's Law 256
14.5 Mathematical Derivation of Electrical Magnetic Fields 259
14.6 Gravitational Magnetic Fields 262
14.7 Hydrodynamic Magnetic Fields 263
14.8 Does Gravitational Magnetism Exist? 267
14.9 Gravity-based propulsion systems 269
14.10 Ampère-Maxwell's Law in a Gravitational Field 270
14.11 Magnetic fields and relativity 274

Chapter 15: The Gravitational Representation of Faraday's Law

15.1 Electrostatic Polarization 276
15.2 Magnetic Induction 278
15.3 Magnetic Flux 279
15.4 Faraday's Law 280
15.5 Vector Potential 285
15.6 Alternative expressions of the stationary form of Faraday's Law..... 290
15.7 Fundamental Differences Between Electricity and Gravity 293
15.8 Rewriting Ampère's Law in a Gravitational Field 293
15.9 Faraday's Law in a Gravitational Field 295
15.10 Forces Affected by a Moving Gravitational Field 297
15.11 Energy of a Moving Gravitational Field 301
15.12 Gravity-Based Perpetual Energy Engine 302
15.13 Interactions in Relative Motion 303
15.14 What does it mean for energy to be conserved 304

Chapter 16: Applications of Gravity Control

16.1 Propulsion system using a rotating gravitational field with an asymmetric mass distribution 307
16.2 Propulsion system using a rotating gravitational field interference .. 309
16.3 Gravity generator (free energy device) 311
16.4 Speed of gravity-based propulsion systems 313
16.5 Which is smarter, dinosaurs or humans? 314