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Elementary Engineering Mechanics

G. E. Drabble

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Contents

<i>Introduction</i>	<i>vii</i>
Programme 1: Elementary Statics	1
Equilibrium of two forces	3
Parallelogram law: resultant	4
Resolution: components	7
Triangle of forces	9
Polygon of forces	10
Exercises: forces acting at a point	20
Moment of a force	22
Parallel forces: equilibrium: resultant	26
Centre of gravity	42
Mass centre: flat body	48
Mass centre: solid body	54
Centroid	63
Exercises: parallel forces: mass centre: centroid	70
Revision exercises	71
Programme 2: Elementary Kinematics	75
Displacement: velocity: speed: acceleration	76
Velocity–time graph	83
Kinematic equations of translational motion	85
Exercises: motion in a straight line	102
Motion under gravity	104
Exercises: motion under gravity	108
Angular motion: radian	110
Relation between linear and angular kinematics	112
Centripetal acceleration	125
Exercises: angular motion: motion in a circular path	135
Revision exercises	136
Programme 3: Elementary Kinetics	139
Newton's second law of motion: mass: weight	142
Vehicles: tractive force	149
The free-body diagram	152
Friction	158
Motion in a circular path	164
Exercises: dynamics of particles	172
Work: energy: conservation of energy	174

Efficiency	175
Kinetic and potential energy	176
Power	184
Exercises: work, energy and power	186
Momentum: impulse: collision of two bodies	188
Exercises: momentum	198
Moment of inertia	200
Radius of gyration	212
Exercises: moment of inertia: rotating bodies	216
Connected systems	218
Exercises: connected systems	240
Rigid bodies: vehicles in translation	242
Rigid bodies: vehicles on a circular track	252
Exercises: dynamics of rigid bodies	260
D'Alembert's principle: reversed effective force	262
<i>Index</i>	267

Introduction

This book comprises a set of three 'programmed texts' designed to help you in learning the fundamental principles of statics, kinematics and kinetics. You may have encountered similar texts elsewhere, but if you have not, you should understand that they are designed to be read, one Frame at a time, in order, without skipping, and without looking ahead at subsequent Frames out of order. Moreover, you should not attempt to work through Programme 3 (Kinetics) until you have thoroughly covered the work of Programmes 1 and 2 (Statics and Kinematics). When working through the texts you might find it helpful to have a card or a sheet of paper, to cover up the Frames ahead of you, so that you do not see answers to any of the questions asked before you have had time to work out the answer yourself. Wherever questions are asked, or exercises set, it is very important that you attempt to answer the questions, or go through the exercises, before reading on; this is how you will learn. If you make any mistakes (and you almost certainly will) you should hopefully find out your errors from the subsequent Frames. Try to understand clearly the reason for your mistake. If you cannot do this, then make a note, and get some help from your lecturer as soon as you get the opportunity.

To work through these texts, you will need

1. A ruler, or draughtsman's scale
2. A protractor
3. A set-square
4. A 2H (or equivalent) pencil
5. A pen and paper
6. A calculator.

You should get guidance from your lecturers about when you should read these texts, but you should understand that they are designed as revision for A-level or equivalent work, so that ideally, you should have completed working through them before you start on the first year of a Degree course in Engineering. Like most students, you have probably been accepted for a Degree course while feeling that you did not perform as well as you had hoped on your A-levels. You may have been lucky enough to scrape a Grade C in Physics or Applied Mathematics and still have only a very vague notion of centroids, or moments of inertia. Here is a chance to catch up.