

# Contents

<i>Special Features</i>	i
<i>Instructions on Accessing Online Interactive Learning Resources</i>	v
<i>Exam Paper Format</i>	vi
<i>Comparison between NEW and OLD syllabuses</i>	vii
<i>New Types of Questions in the Examination</i>	ix

## 1 Heat ..... 2

1.1 Temperature, heat and internal energy	4
1.2 Transfer processes	11
1.3 Change of state	16
Demonstration	25
Practice	32

## 2 Position and Movement ..... 40

2.1 Scalar and vector	42
2.2 Uniform motion	48
2.3 Acceleration	50
2.4 Equations of uniformly accelerated motion	57
2.5 Summary of graphs	61
2.6 Vertical motion under gravity	63
Demonstration	69
Practice	76

## 3 Force and Motion ..... 84

3.1 Mass, weight and force	86
3.2 Newton's First Law of motion	92

3.3 Newton's Second Law of motion	93
3.4 Newton's Third Law of motion	100
Demonstration	103
Practice	113

## **4 Work, Energy and Power ..... 124**

4.1 Mechanical work	126
4.2 Energy and power	132
Demonstration	137
Practice	145

## **5 Momentum Extension ..... 156**

5.1 Linear momentum and change in momentum	158
5.2 Conservation of momentum	161
Demonstration	166
Practice	172

## **6 Nature and Properties of Waves ..... 184**

6.1 Nature of waves	186
6.2 Properties of waves	197
Demonstration	209
Practice	220

*Solution Guide* ..... 234

*Index* ..... 270

*Question Commands* ..... 272