



(Supervisor's use only)

97262/1



NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

University Entrance, Bursaries and Scholarships Examination

PHYSICS: 2003

ANSWER BOOKLET

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

Answer **ALL** questions and write your answers in this Answer Booklet.

The spaces provided are a guide to the length of your answers, but it is **NOT** essential to use all the space available.

A list of formulae is given on page 17 of Question Booklet 97262 and may be detached along the perforation for use during the examination.

If you need more space for any answer, ask the Supervisor for extra paper. Answers on extra paper should be clearly numbered. Write your NSN on all extra sheets used. Attach the extra sheets at the appropriate places in this booklet. Write the number of extra sheets used in the box at the top of the back flap of this booklet. Write NIL if you have not used any.

Answer spaces for each part begin on the following pages:

Waves	page 2
Mechanics	page 4
Electricity and Electromagnetism	page 8
Atomic and Nuclear Physics	page 11

To receive full marks for numerical questions:

- working should be clearly set out
- answers must be accompanied by the correct units
- answers must have an appropriate number of significant figures.

For 'describe' or 'explain' questions, answers must be written as complete sentences.

Check that this booklet has all of pages 2–12 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION

WAVES

(28 marks; 33 minutes)

QUESTION ONE: HENRY THE HARPSICHORD PLAYER (11 marks)

(a) _____ (1 mark)

(b) _____

frequency = _____ (2 marks)

(c) _____
_____ (2 marks)

(d) _____
velocity = _____ (2 marks)

(e) _____
_____ (2 marks)

(f) _____

_____ (2 marks)

MECHANICS

(56 marks; 66 minutes)

QUESTION THREE: BANKED CURVES (11 marks)Acceleration due to gravity = 9.80 m s^{-2}

(a) _____

_____ (2 marks)

(b) _____

_____ (2 marks)

(c) Show _____

_____ (2 marks)

(d) _____
_____ (1 mark)

(e) _____

_____ (4 marks)

QUESTION FOUR: THE ROUNDABOUT (15 marks)

(a) Show _____

 _____ (2 marks)

(b) _____

 angular velocity = _____ (2 marks)

(c) _____

 angular momentum = _____ (2 marks)

(d) _____

 _____ (2 marks)

(e) _____

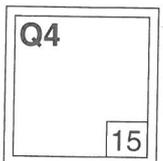
 angular velocity = _____ (3 marks)

(f) Show _____

 _____ (2 marks)

(g) _____

 _____ (2 marks)

**(Turn over**

QUESTION FIVE: A SPACE ODYSSEY (14 marks)

(a) _____
_____ (2 marks)

(b) Show _____

_____ (2 marks)

(c) Show _____

_____ (2 marks)

(d) _____

ratio = _____ (2 marks)

(e) Show _____
_____ (2 marks)

(f) _____

_____ (2 marks)

(g) _____

_____ (2 marks)

QUESTION SIX: BUNGY JUMPING (16 marks)Acceleration due to gravity = 9.80 m s^{-2}

(a) Show _____

 _____ (2 marks)

(b) _____
 _____ (1 mark)

(c) _____

 spring constant = _____ (3 marks)

(d) _____

 _____ (2 marks)

(e) _____

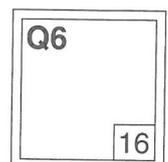
 maximum speed = _____ (4 marks)

(f) _____

 _____ (2 marks)

(g) _____

 _____ (2 marks)

**(Turn over**

ELECTRICITY AND ELECTROMAGNETISM

(44 marks; 52 minutes)

QUESTION SEVEN: KIRCHHOFF'S LAWS (12 marks)

(a) Law 1: _____

Law 2: _____
_____ (2 marks)

(b) Law 1: _____
Law 2: _____ (2 marks)

(c) _____
_____ (2 marks)

(d) _____
_____ (2 marks)

(e) _____

$I_1 =$ _____

$I_2 =$ _____ (4 marks)

Q7

12

QUESTION EIGHT: RECTIFICATION (14 marks)

(a) Show _____ (2 marks)

(b) _____

number of turns = _____ (2 marks)

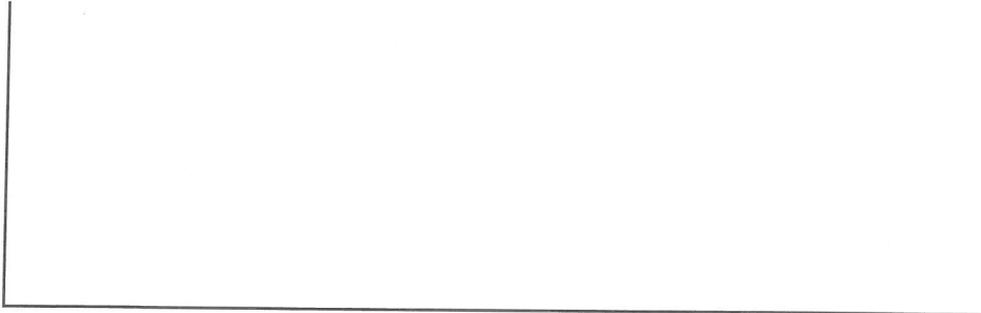
(c) _____

_____ (2 marks)

(d)  (4 marks)

(e) _____

_____ (2 marks)

(f)  (2 marks)

Q8
14

