

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
TOTAL	



General Certificate of Education
Advanced Subsidiary Examination
June 2015

Physics (Specifications A and B)

PHA3/B3/XPM2

Unit 3 Investigative and Practical Skills in AS Physics
Route X Externally Marked Practical Assignment (EMPA)

Section A Task 2

For this paper you must have:

- a calculator
- a pencil
- a ruler.

Instructions

- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Show all your working.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for Section A Task 2 is 14.

Section A Task 2

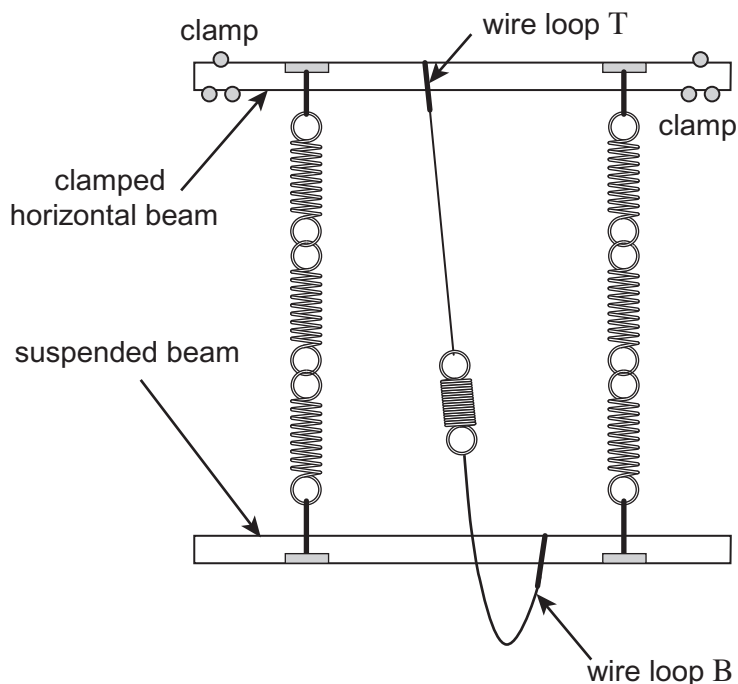
Follow the instructions given below.

Give the information required in the spaces provided.

No description of the experiment is required.

- 1 You are to investigate the spring system shown in **Figure 4**.

Figure 4



The suspended beam is supported from a clamped horizontal beam by two sets of three coupled springs.

Do not move or adjust the clamps.

Another spring has been connected between the beams by pieces of thread joined to wire loops T and B. The loops can slide along both beams between the coupled springs.

- 1 (a) Attach the 100 g mass hanger to wire loop B.
Adjust the position of B until the suspended beam is horizontal.
Adjust the position of T until it is vertically above B and the apparatus appears as shown in **Figure 5**, on page 3.

Explain how you ensured that loop T was vertically above loop B.

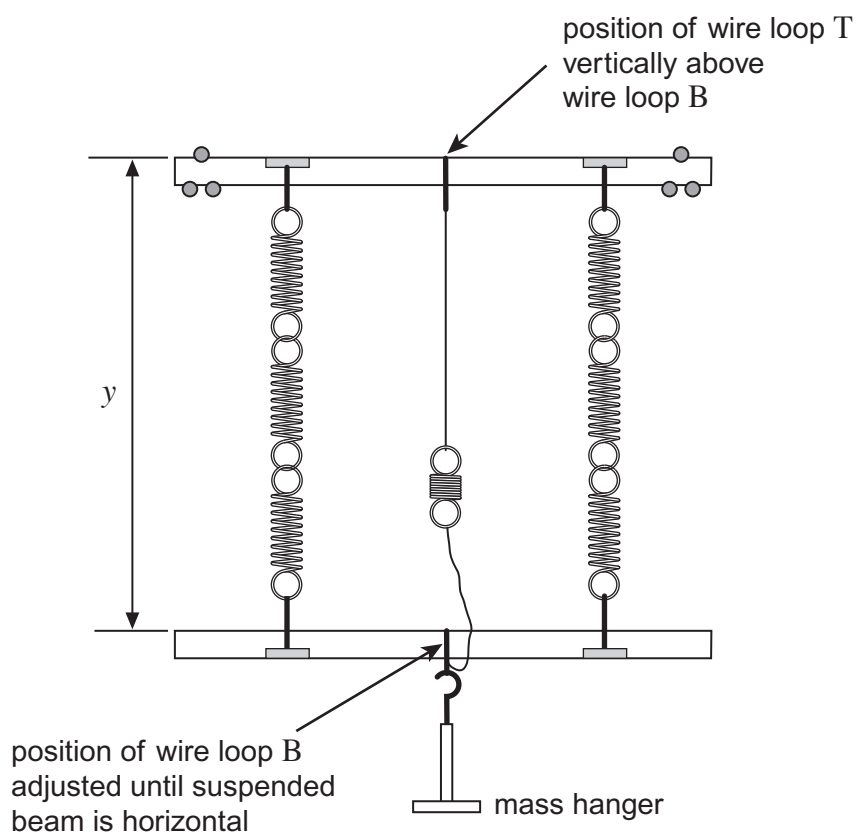
[1 mark]

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Figure 5



- 1 (b) (i)** Record m , the total mass supported from wire loop B.
- 1 (b) (ii)** Measure and record y , the vertical distance between the **top** of the clamped beam and the **top** of the suspended beam.
- 1 (c)** You are to make suitable measurements to determine values of y that correspond to different values of m .

You are provided with additional slotted masses.

Add these masses, in turn, to the mass hanger so that m increases in several stages until all the masses have been used.

As each additional mass is added make any necessary adjustment to the position of B to keep the suspended beam horizontal and adjust the position of T so that it remains vertically above B.

Record all your measurements for part (b) and part (c) on page 4 in a single well-organised table; the independent variable should be in the left-hand column of your table.

Question 1 continues on the next page

Turn over ►

Measurements and observations.

[4 marks]

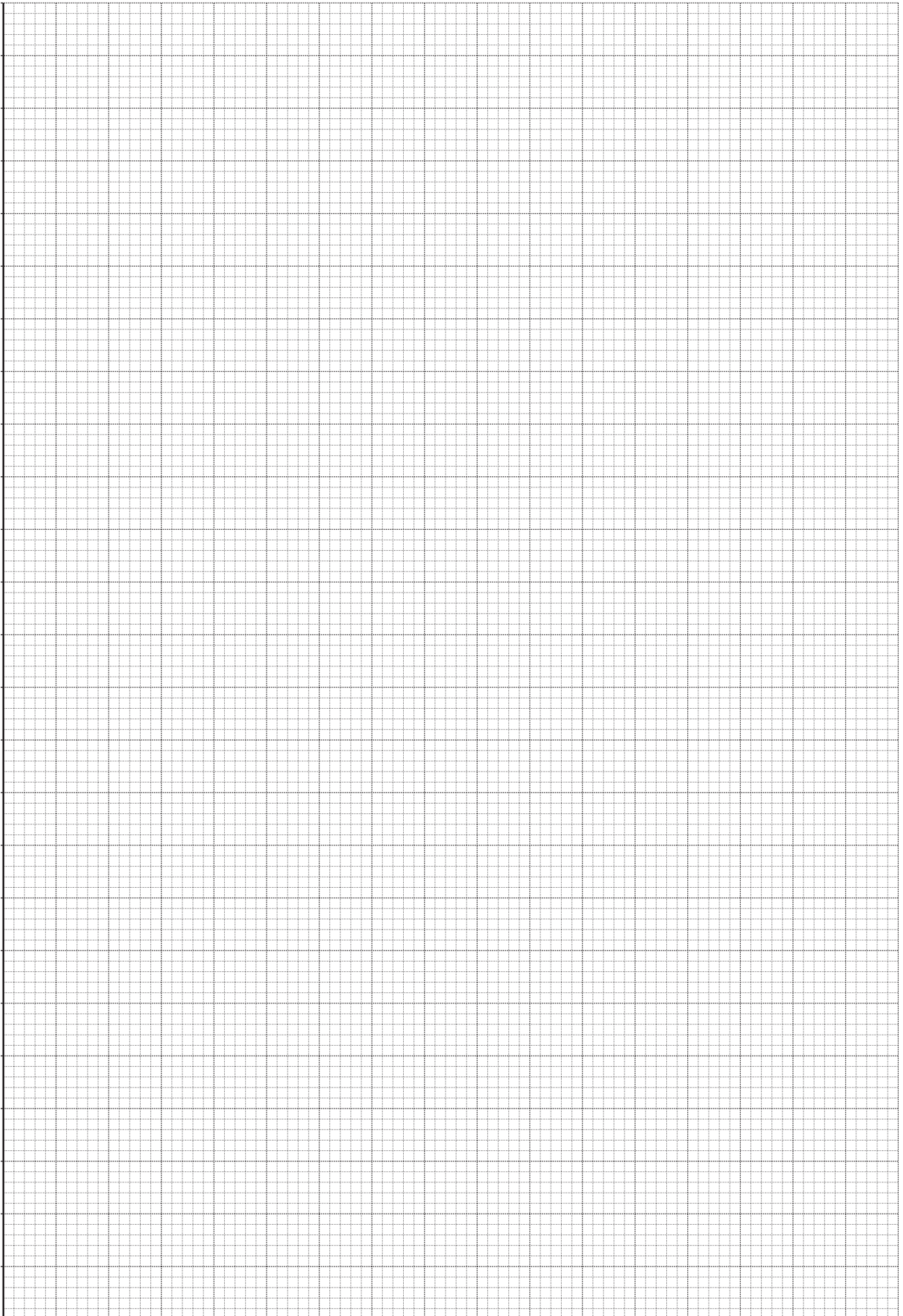
1 (d) Plot on **Figure 6** a graph with y on the vertical axis and m on the horizontal axis.

[9 marks]

14

END OF QUESTIONS

Figure 6



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