

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 2013

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 16.

There are no questions printed on this page

**DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED**

SECTION A TASK 2

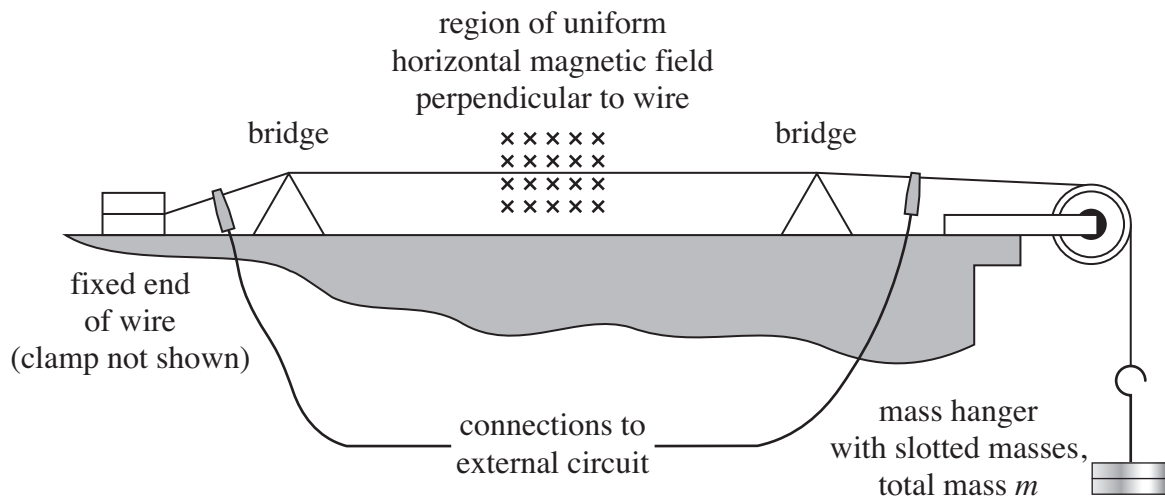
Follow the instructions given below.

Give the information required in the spaces provided.

No description of the experiment is required.

- 1** In this experiment you are required to investigate transverse stationary waves on a wire. You are provided with the arrangement shown in **Figure 7**.

Figure 7



When an alternating current passes along the wire, the wire vibrates because it is in tension and the magnetic field exerts an alternating force on it. Stationary waves are formed on the wire if the length of the vibrating section is adjusted suitably by moving the bridges.

- 1 (a)** Use the micrometer screw gauge to determine the diameter, d , of the wire.

.....
.....

$d =$

(1 mark)

Turn over ►

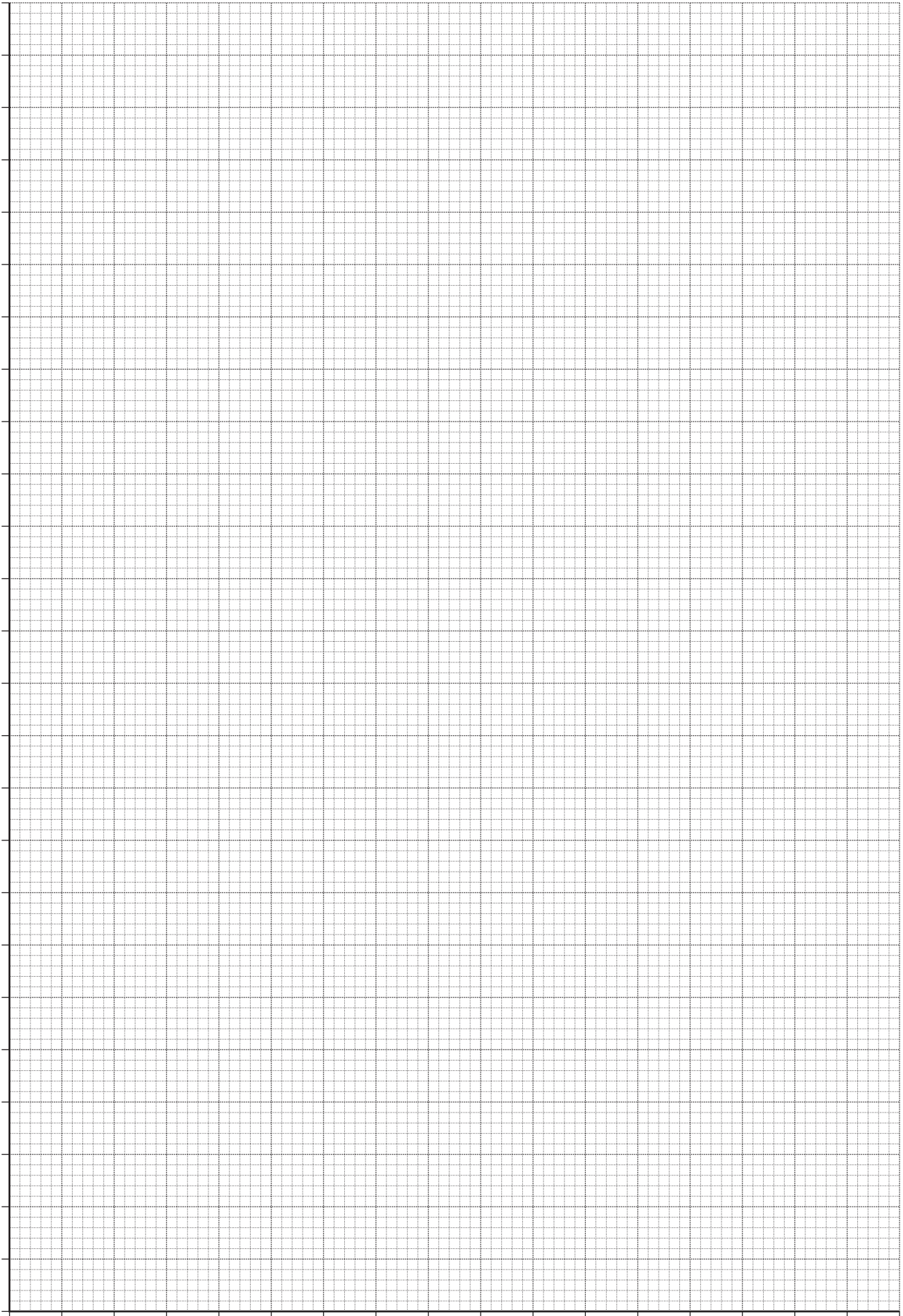
- 1 (b)** Place sufficient slotted masses on the hanger so that the **total** mass, m , supported by the wire is 0.100 kg.
Adjust the separation of the bridges so that the length of the wire, l , between them is approximately 0.20 m.
Turn on the ac power supply.
Keeping the horizontal magnetic field at the centre of the vibrating section of the wire, **increase** l by moving the bridges apart until the wire is seen to vibrate at the fundamental frequency.
Record your measurements of m **in kilograms** and l **in metres** then repeat the procedure for **five larger** values of m .
When you have completed your measurements, **turn off** the ac power supply.
- Record your measurements below.
Note that the independent variable should be recorded in the **left-hand** column of your table.
Leave space in your table for an extra column for the data you will be required to plot on your graph (see part (c) below).

(6 marks)

- 1 (c)** Plot, on the grid opposite, a graph with l on the vertical axis and \sqrt{m} on the horizontal axis.

(9 marks)

END OF QUESTIONS



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