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| Centre Number | | | | | | Candidate Number | | | | |
| Surname | | | | | | | | | | |
| Other Names | | | | | | | | | | |
| Candidate Signature | | | | | | | | | | |

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



General Certificate of Education
Advanced Subsidiary Examination
June 2011

Physics PHA3/B3/XPM2 (Specifications A and B)

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

Section A Part 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 Part 2 is 15.



J U N 1 1 P H A 3 B 3 X 0 1

WMP/June11/PHA3/B3/XPM2

PHA3/B3/XPM2

Section A Part 2

Follow the instructions given below.

Answer **all** the questions in the spaces provided.

No description of the experiment is required.

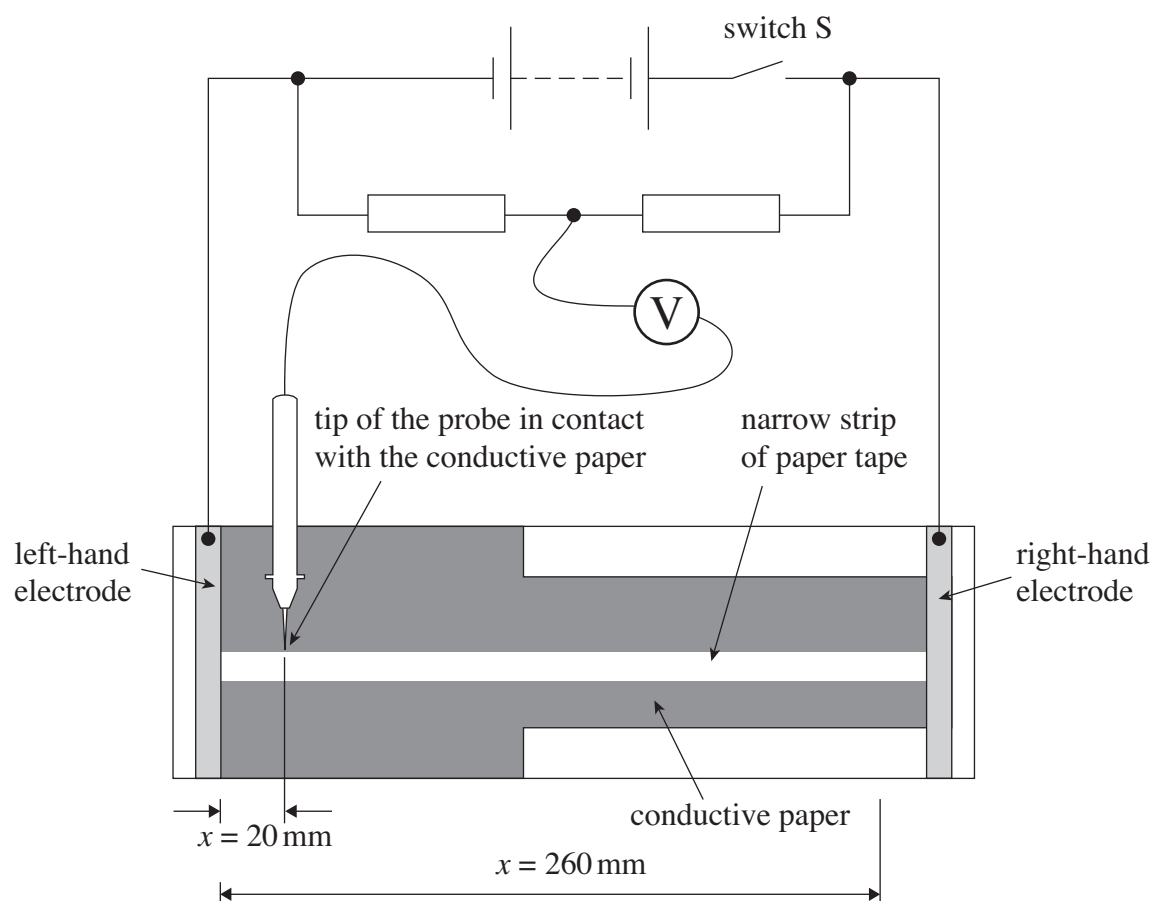
- 1** In this experiment you are to investigate the variation of potential difference along a piece of conductive paper of two different widths.

A narrow strip of paper tape has been stuck to the conductive paper.

Make a faint pencil mark on this paper tape at a distance, $x = 20$ mm from the left-hand electrode.

- 1 (a)** Close switch S and place the tip of the probe in contact with the conductive paper next to the pencil mark as shown in **Figure 4**.

Figure 4



- 1 (a) (i)** Taking account of the sign shown on the meter, read and record V_{20} , the voltmeter reading when $x = 20$ mm.

$$V_{20} = \dots\dots\dots$$

- 1 (a) (ii)** Repeating the procedure as above and taking account of the sign shown on the meter, read and record V_{260} , the voltmeter reading when $x = 260$ mm.

$$V_{260} = \dots\dots\dots$$

- 1 (a) (iii)** Evaluate $\frac{V_{260}}{V_{20}}$.

$$\frac{V_{260}}{V_{20}} = \dots\dots\dots$$

(1 mark)

Question 1 continues on the next page

Turn over ►

- 1 (b) Using the same procedure as in part (a), investigate how V varies for values of x **between** 20 mm and 260 mm.
You should take sufficient readings so that when a graph is plotted of these data, you can establish clearly how V varies with x in both the wide and narrow parts of the conductive paper.
Open switch S when you have completed your measurements.

Record below all your measurements and observations.

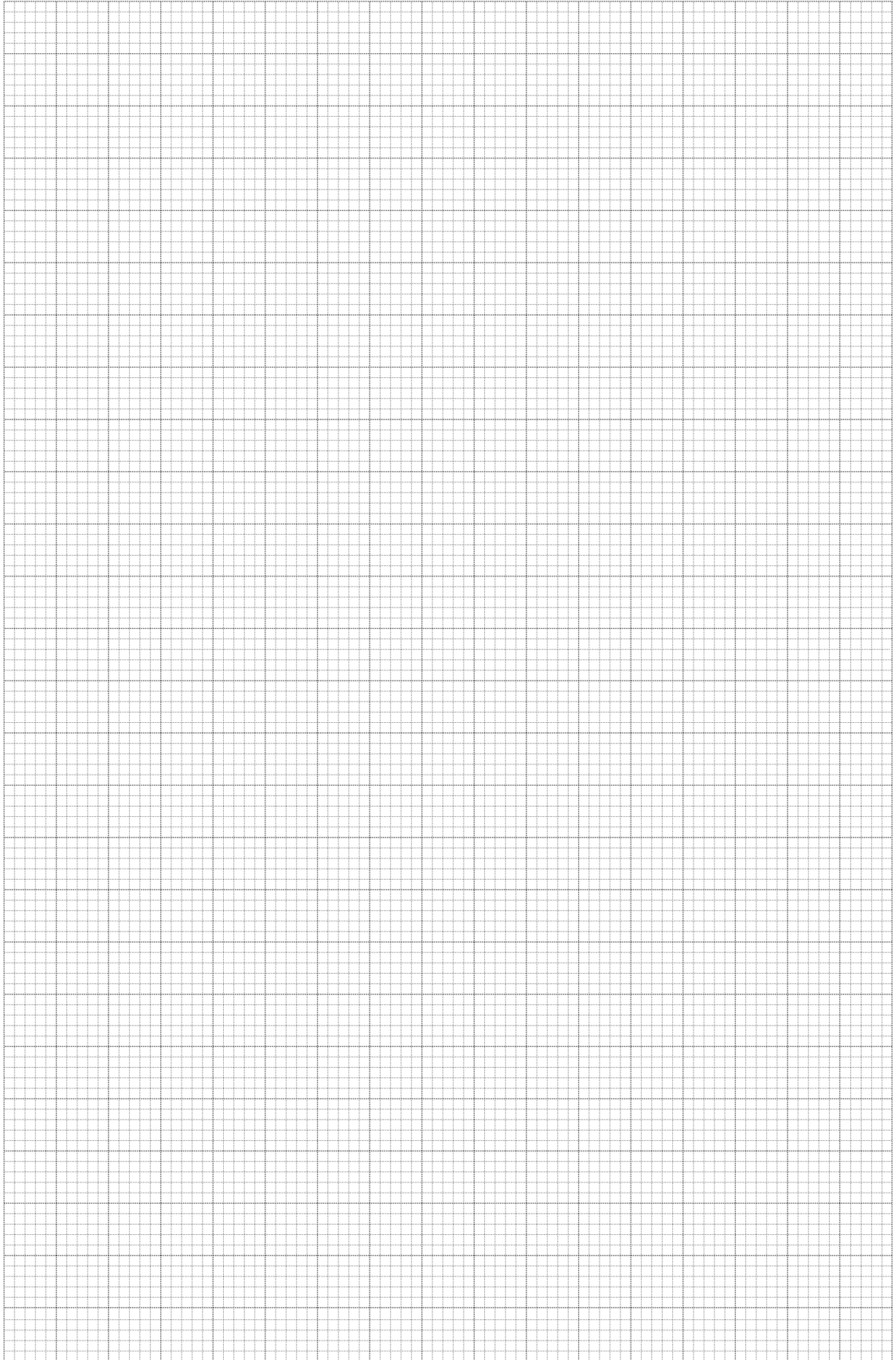
Note that the independent variable should be recorded in the **left-hand** column of your table.

(5 marks)

- 1 (c) Using all your data from part (a) and part (b), plot, on the grid on **page 5**, a graph with V on the vertical axis and x on the horizontal axis.

(9 marks)

END OF SECTION A PART 2



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ANSWER IN THE SPACES PROVIDED**

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