

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 Level Examination
June 2015

Physics (Specifications A and B)

PHA6/B6/XPM2

Unit 6 Investigative and Practical Skills in A2 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 15.

PHA6/B6/XPM2

Section A Task 2

Follow the instructions given below.

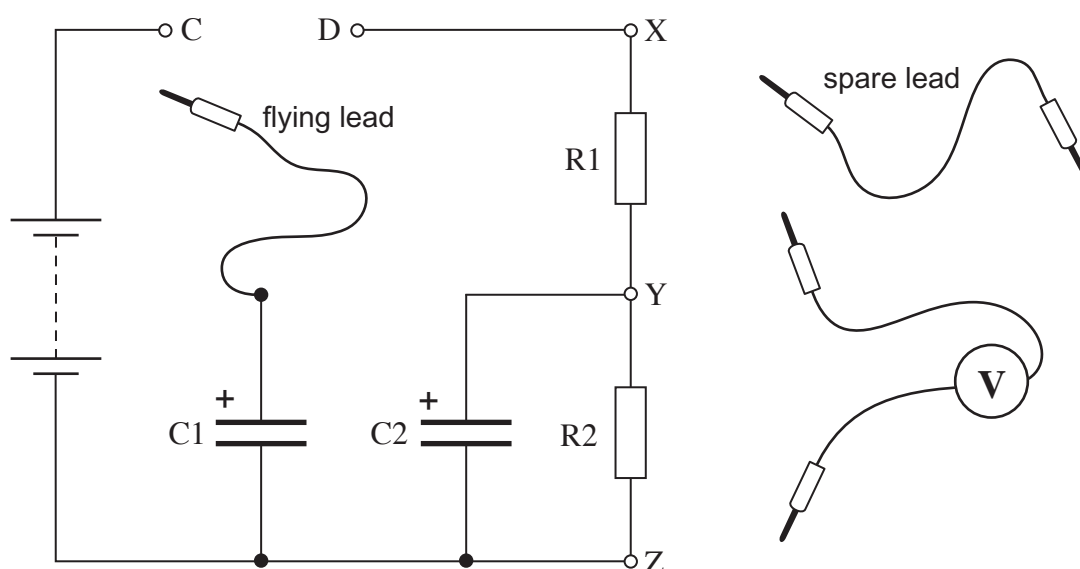
Provide the information required in the spaces provided.

No description of the experiment is required.

- 1** In this experiment you are to investigate the potential difference (pd) across resistor R1 and the pd across resistor R2 as capacitor C1 is discharged through a combination of R1, R2 and another capacitor, C2.

You are provided with the circuit and additional apparatus shown in **Figure 6**. You are also provided with a stopwatch which will be used later.

Figure 6



- 1 (a)** Connect the voltmeter between terminal C and terminal Z. The positive lead of the voltmeter should be connected to terminal C. Read and record the voltmeter reading, V_0 .

[1 mark]

$V_0 = \dots\dots\dots$

- 1 (b) (i)** Connect the voltmeter between terminal X and terminal Y with the positive lead connected to terminal X.
Connect the **spare lead** between terminal Y and terminal Z so capacitor C2 is fully discharged.

Disconnect the spare lead from the circuit.

Charge C1 by connecting the flying lead to terminal C.

Connect the flying lead to terminal D and start the stopwatch at the same time.
Make suitable measurements to determine how V_1 , the pd across R1, changes with time t , until $t = 60$ s.

You may assume that $V_1 = V_0$ when $t = 0$ s.

Disconnect the flying lead from terminal D.

Note that to repeat the procedure you must first discharge C2.

- 1 (b) (ii)** Connect the voltmeter between terminal Y and terminal Z with the positive lead connected to terminal Y.
Use the **spare lead** as before so C2 is fully discharged.

Disconnect the spare lead from the circuit.

Charge C1 by connecting the flying lead to terminal C.

Connect the flying lead to terminal D and start the stopwatch at the same time.
Make suitable measurements to determine how V_2 , the pd across R2, changes with time t , until $t = 60$ s.

You may assume that $V_2 = 0$ when $t = 0$ s.

Note that to repeat the procedure you must first discharge C2.

Record all your measurements for part (b) on page 4 of this booklet.

Turn over ►

Measurements from part (b).

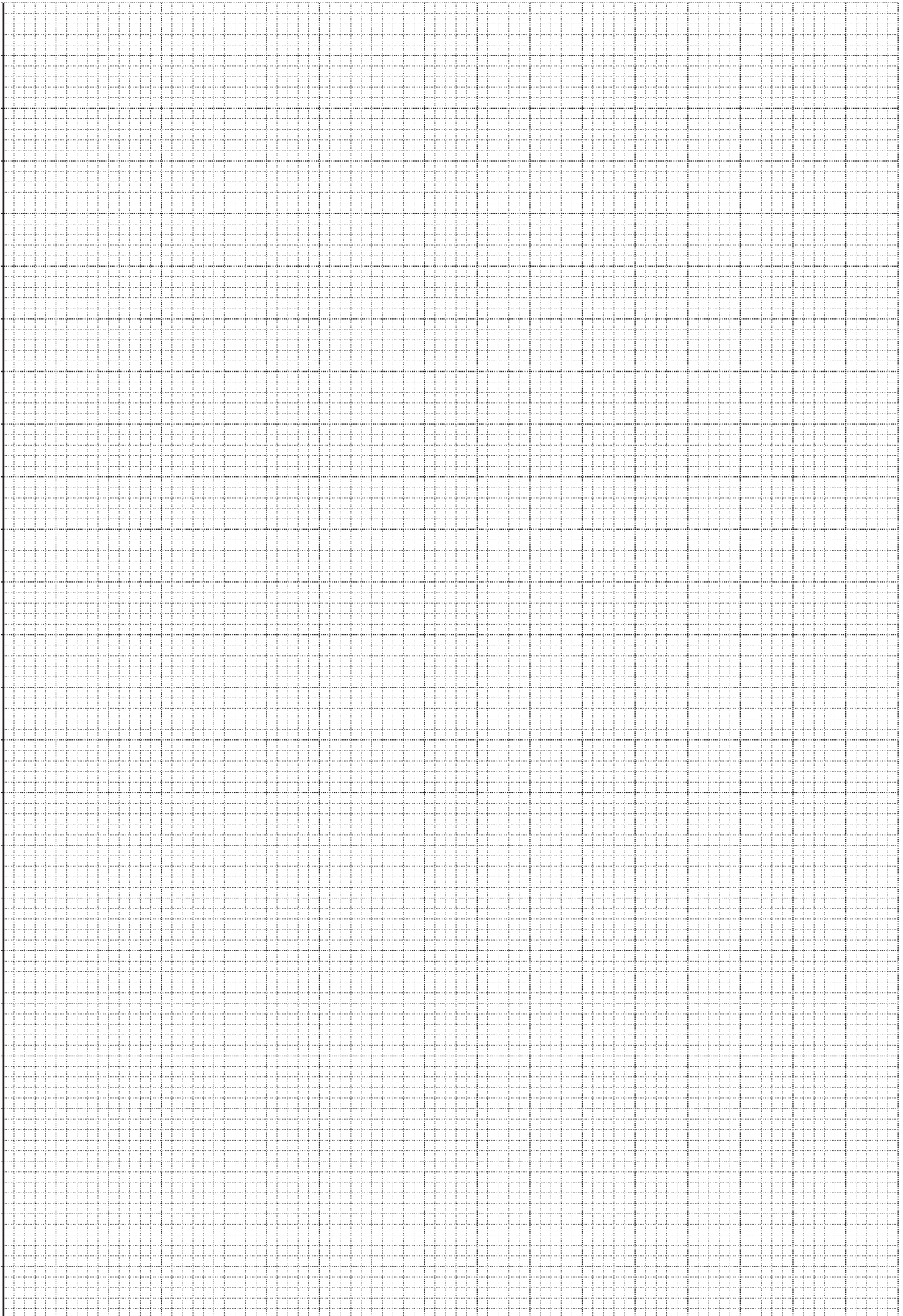
[5 marks]

- 1 (c)** Plot, on **Figure 7** and on a **single set of axes**, a graph of V_1 against t and V_2 against t with V on the vertical axis and t on the horizontal axis. Label the graphs V_1 and V_2 respectively.

[9 marks]

END OF QUESTIONS

Figure 7



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ANSWER IN THE SPACES PROVIDED**

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