



General Certificate of Education  
Advanced Subsidiary Examination  
June 2014

## Physics

## PHY3T/P14/task

Unit 3 Investigative and Practical Skills in AS Physics  
ISA (P) Resistor characteristics

### Task Sheet

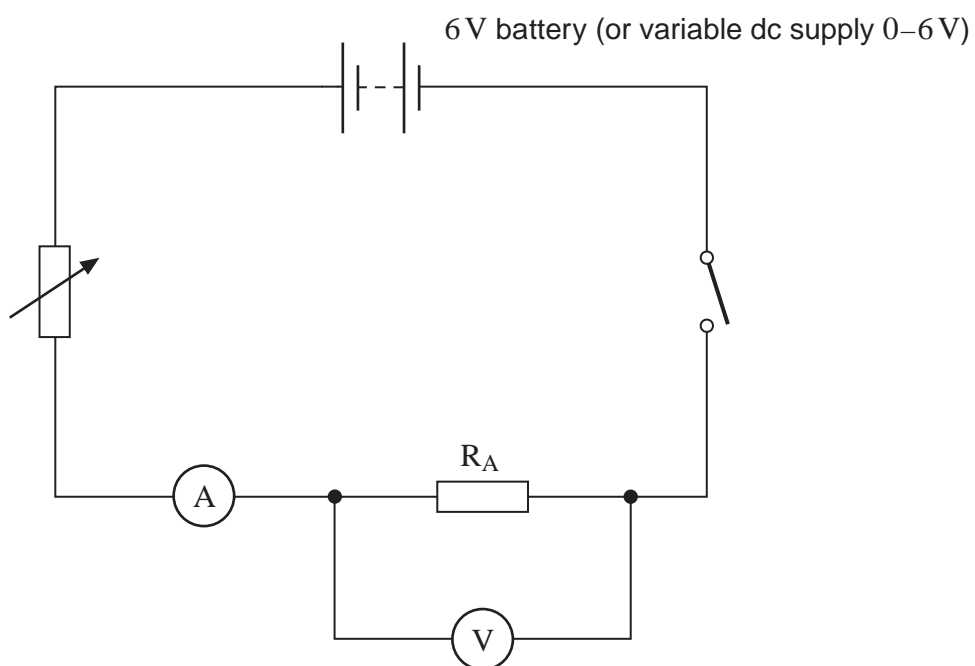
This task is worth 7 marks

You are advised to read through these instructions before beginning your work.

**You are going to investigate how the current varies through two different resistors when the potential difference (pd) across them is changed**

**The resistors used in this experiment may become hot. Take care when changing the resistors.**

- Set up the circuit as shown in **Figure 1** (overleaf), using the resistor labelled  $R_A$ . If a switch has not been provided you will be instructed as to a suitable alternative method to disconnect your circuit.
- **Before switching on you must ask your supervisor to check your circuit.**
- Switch on the circuit and adjust the variable resistor and/or dc supply to achieve a pd,  $V$ , of approximately 1 V across the resistor. Record in a table the value of  $V$  and the corresponding value of current,  $I$ .  
(If your apparatus will not allow a pd of 1 V, use the lowest non-zero value you can achieve)
- Make adjustments to achieve a higher value of  $V$  and take the corresponding reading of  $I$ .
- Repeat this procedure to obtain a **range** of different readings for  $V$  and  $I$ , up to a maximum value for  $V$  of 4 V.
- Switch off the circuit, remove  $R_A$  and replace it with  $R_B$ .
- Repeat the whole procedure to obtain a range of readings of  $V$  and  $I$  for resistor  $R_B$ .
- Switch off the circuit, connect  $R_A$  and  $R_B$  in parallel and repeat the whole procedure to obtain a range of readings of  $V$  and  $I$  for resistor  $R_A$  and  $R_B$  in parallel.
- For  $R_A$  and  $R_B$  in parallel plot a graph of  $I$  on the vertical axis against  $V$ . Draw a straight line of best fit.
- **On the same axes as the previous graph** plot a graph of  $I$  against  $V$  for resistor  $R_A$  and also another graph of  $I$  against  $V$  for resistor  $R_B$  and draw straight lines of best fit.
- Record the precision of the ammeter and voltmeter used in this experiment.

**Figure 1****After the Investigation**

At the end of the investigation, hand in all your written work, including the graph, to the supervisor.

This documentation will be required for stage 2 of the ISA. Ensure that you have entered your centre details, candidate number and name on all the sheets you have completed.