

Surname						Other Names					
Centre Number						Candidate Number					
Candidate Signature						Date					

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General Certificate of Secondary Education
June 2008 / June 2009



ADDITIONAL SCIENCE/PHYSICS
ISA P2.1 Resistance

ASCC/PHYC/P2.1

To be conducted before 4 May 2009
For submission in May 2008 or May 2009 or May 2010

<p>For this paper you must have:</p> <ul style="list-style-type: none"> ● results tables and charts or graphs from your own investigation. <p>You may use a calculator.</p>

For Teacher's Use	
Section	Mark
1	
2	
Total (max 34)	

Time allowed: 45 minutes

Instructions

- Use blue or black ink or ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions in **Section 1** and **Section 2**.
- Answer the questions in the spaces provided.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The maximum mark for this paper is 34.
- The marks for questions are shown in brackets.
- You are reminded of the need for good English and clear presentation in your answers.

Did this candidate take part in the practical activity?	YES / NO
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Signature of teacher marking this ISA Date

SECTION 1

These questions are about the investigation that **you** did.

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

1 What were you trying to find out in your investigation?

.....
.....
.....
.....

(2 marks)

2 In your investigation there were variables that could have been measured – eg the current, the potential difference (voltage), the resistance.

(a) Write down **one** of the variables that you measured

Which term best describes this variable? Draw a ring around your answer.

categoric control dependent independent

(1 mark)

(b) Name the instrument that you used to **measure** this variable.

.....
(1 mark)

(c) You could have used an instrument which was more sensitive or had a smaller scale division.

What effect would this have had on the measurements?

Put a tick (✓) in the box next to your choice.

They would have been more precise.

They would have been more reliable.

They would have been more valid.

(1 mark)

3 In your investigation, what was the **independent** variable?

.....
(1 mark)

4 To make your investigation a fair test, you needed to control some variables.

(a) Name **one** of the variables that you needed to control.

.....
(1 mark)

(b) Explain why you needed to control this variable.

.....
.....
(1 mark)

5 In your investigation, did you notice anything that might have caused an error in your results?

Draw a ring around your answer. **Yes / No**
Explain your answer.

.....
.....
(1 mark)

6 Did you decide to check any of your readings?

Draw a ring around your answer. **Yes / No**
Give a reason for your answer.

.....
.....
(1 mark)

7 What did you find out from your investigation?

I found out that
.....
.....
.....
(2 marks)

8 Make sure that **your** results tables and charts or graphs are handed in with this paper.

You will be awarded up to 6 marks for these. (6 marks)

SECTION 2

These questions are about an investigation that may be similar to the one that you did.

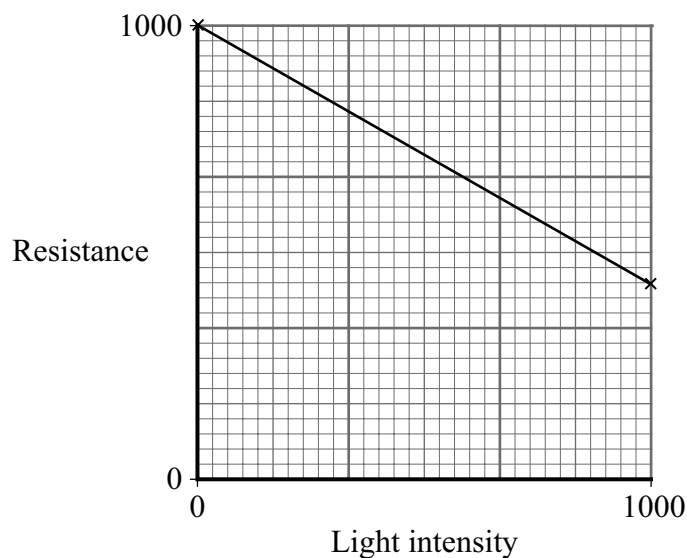
Answer **all** questions in the spaces provided.

A company called 'LDR'S Unlimited' manufactures light-dependent resistors (LDRs). An LDR is a resistor whose resistance changes with light intensity. LDRs can be used to switch electric circuits on or off at different light intensities. For example, they could switch on a streetlight when it gets dark.

'LDR'S Unlimited' recently supplied a batch of these LDRs to 'Lighting for All'. This company uses them to make porch lights that come on automatically when it gets dark.

'Lighting for All' complained that it had received a batch of LDRs that did not work properly, and asked 'LDR'S Unlimited' to check them. Here is part of the report from 'LDR'S Unlimited'.

We have checked one of the LDRs from the batch of 1000 that we recently supplied to you, and have found that it worked perfectly. We tested the LDR at two different light intensities, as shown on the graph. You require the LDR to operate at a light intensity in the middle of the range that we tested, so this should work well.



9 What information is missing from the graph?

.....
(1 mark)

10 'LDR'S Unlimited' tested only one LDR from the batch.

(a) Why should the company have tested more than one?

.....
.....
(1 mark)

(b) Suggest a suitable number that it should have tested.
(1 mark)

(c) If the company had tested more than one LDR, what effect would this have had on their findings?

Put a tick (✓) in the box next to your choice.

The results would have been more precise.

The results would have been more reliable.

The results would have been more reproducible.

(1 mark)

(d) 'LDR'S Unlimited' tested the LDR at only two light intensities.

(i) Explain why this was not a good idea.

.....
.....
.....
.....
(2 marks)

(ii) Suggest the **number** and **values** of light intensities that **should** also have been tested.

Number Values

Explain your answer.

.....
.....
.....
.....
(2 marks)

11 'Lighting for All' was not satisfied with the report. 'Lighting for All' decided to get a second opinion and asked another company to test the LDRs.

(a) Explain why asking another company to test the LDRs was a good idea.

To gain full marks in this question you should write your ideas in good English. Put them into a sensible order and use the correct scientific words.

.....
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.....
.....

(3 marks)

(b) This company tested more of the LDRs. It disagreed with the results of the test carried out by 'LDR'S Unlimited'. The company's report stated:

It is a fact that all of the LDRs supplied to you were faulty.

We also suspect that one of the measuring instruments used in the original test either was not calibrated correctly or had a zero error.

(i) Are the faults in the LDRs a matter of fact or opinion?

Draw a ring around your answer. **Fact / Opinion**

Give a reason for your answer.

.....
.....

(1 mark)

(ii) What is meant by the word *calibrated*?

.....
.....
.....
.....

(2 marks)

(iii) Suppose that the instrument that you used in your investigation (see Question 2(b)) had a *zero error*. There is no other instrument available, so you have to use this one.

Explain what you could do to take account of the zero error.

.....
.....
.....
.....

(2 marks)

END OF QUESTIONS

There are no questions printed on this page