AQA

Please write clearly in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname _____

Forename(s) _____

Candidate signature _____

Level 3 Certificate and Extended Certificate in Applied Science

KEY CONCEPTS IN SCIENCE

Unit Number: ASC1

Section C – ASC1/P (Physics)

Thursday 22 June 2017 Morning

Time allowed: 1 hour 30 minutes. You are advised to spend approximately 30 minutes on this section

Materials

For this paper you must have:
- a calculator
- Formula sheet

Instructions
- Use black ink or black ball-point pen.
- Answer **all** questions in each section.
- You must answer the questions in the spaces provided.
- Do not write outside the box around each page or on blank pages.
- Do all rough work in this book.
- Cross through any work you do not want to be marked.
- The total time for all three sections of this paper is one-and-a-half hours.

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
TOTAL	

Information
- You will be provided with a copy of the formula sheet.
- There are three sections in this paper:
  Section A – Biology Section B – Chemistry Section C – Physics.
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 60 and the maximum mark for this section is 20.

Advice

Read each question carefully.

Section C – Physics

Answer **all** questions in this section.

0 1 A technician investigated the voltage and current characteristics for an electrical component.

Table 1 shows the technician's results.

Table 1

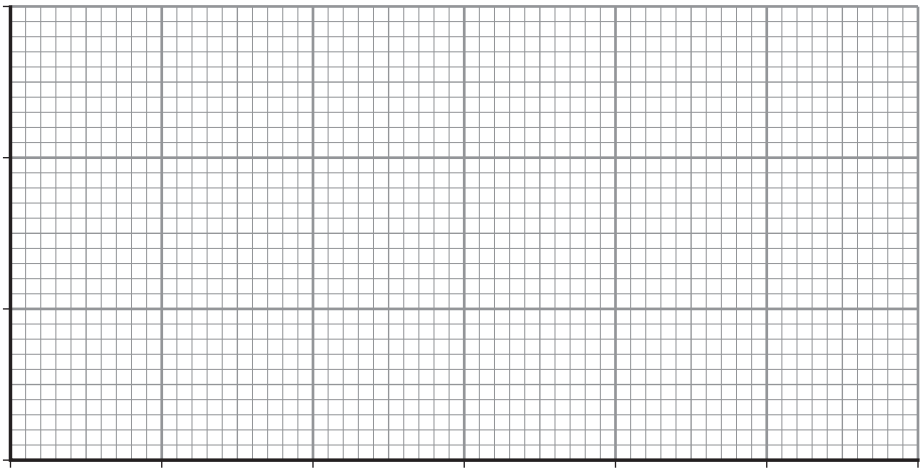
Voltage (V)	0.00	2.00	4.00	6.00	8.00	10.00	12.00
Current (A)	0.00	0.74	1.38	1.90	2.23	2.42	2.50

0 1 . 1 Plot a graph of the values in **Table 1** on **Figure 1**.
Add appropriate scales and labels to the axes.

Draw a line of best fit.

[3 marks]

Figure 1



0 1 . 2 State the name of the electrical component which the technician was investigating.

[1 mark]

Tick (✓) **one** box.

A Semi-conducting diode ☐

B Filament lamp ☐

C Thermistor ☐

D Resistor at constant temperature ☐

0 1 . 3 Calculate the resistance of the electrical component when the voltage across it is 2 V.

State the correct unit in your answer.

[2 marks]

Resistance = _____

0 1 . 4 As the voltage across the electrical component increases, its resistance increases. Explain why.

[3 marks]

9

0 2 An automotive engineer is performing crash tests on a new model of car.

The 'crumple zone' at the front of the car is designed to reduce injuries in a crash.

Figure 2 shows one of the tests carried out by the automotive engineer.

Figure 2

0 2 . 1 State the Law of Conservation of Momentum.

[2 marks]

0 2 . 2 Explain how the 'crumple zone' can reduce the chance of serious injury in a crash.

[4 marks]

0 2 . 3 Describe the energy changes as the car crashes.

[3 marks]

0 2 . 4 State **two** ways the engineer could increase the momentum of the test car before the crash.

[2 marks]

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11

END OF QUESTIONS

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