Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic: Electricity (Standard demand)

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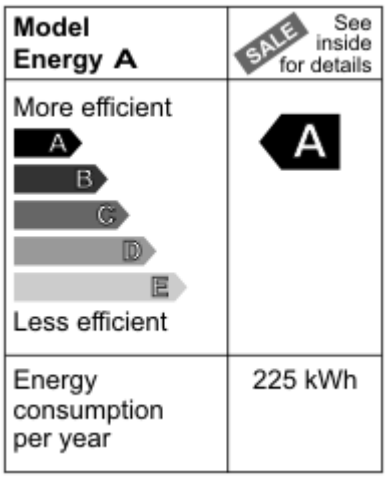
Name of the Student:_____
Max. Marks : 21 Marks **Time : 21 Minutes**

Q1.

The diagram shows the label from a new freezer.



(a) An old freezer has an energy consumption per year of 350 kWh.

Use the equation in the box to calculate the extra cost of using the old freezer for one year compared with using a new 'A' rated freezer.

total cost = number of kilowatt-hours × cost per kilowatt-hour

Assume 1 kilowatt-hour (kWh) of energy costs 12 p.

Show clearly how you work out your answer.

_____

_____

Extra cost per year = £ _____

(2)

(b) The price of the new freezer was reduced in a sale.

Reducing the price reduces the payback time for replacing the old freezer from 12 years to 9 years.

Calculate, in pounds, how much the new freezer was reduced in the sale.

Show clearly how you work out your answer.

_____

_____

Price reduced by = £ _____

(2)

(c) An advertisement in a shop claims that:

'Replacing an old freezer with a new 'A' rated freezer will benefit the environment.'

Do you agree that replacing the freezer will benefit the environment?

Answer yes or no. _____

Explain the reasons for your answer.

_____

_____

_____

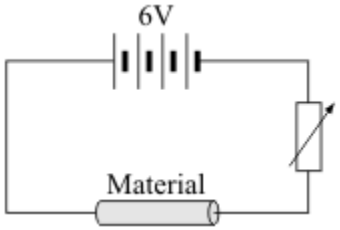
_____

(2)

(Total 6 marks)

Q2.

(a) The diagram shows the circuit used to investigate the resistance of a material. The diagram is incomplete; the ammeter and voltmeter are missing.



(i) Draw the symbols for the ammeter and voltmeter on the diagram in the correct places.

(2)

(ii) How can the current through the material be changed?

_____

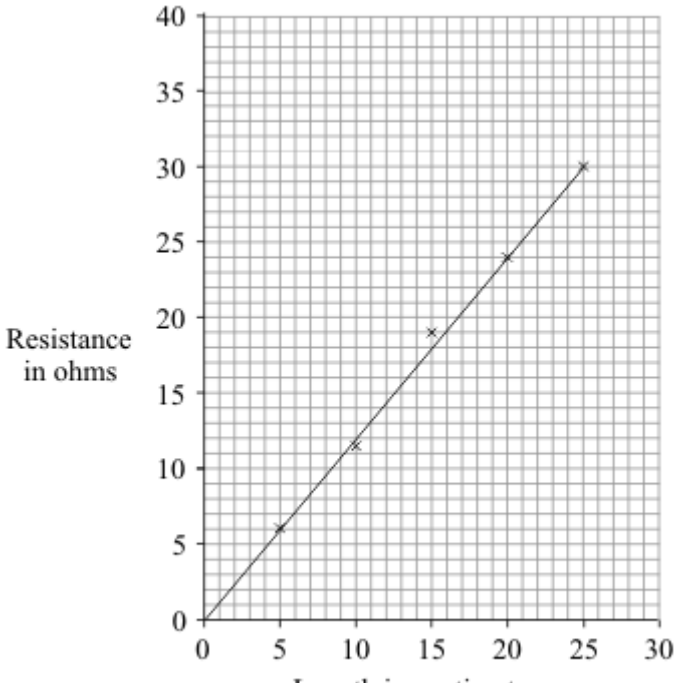
_____

(1)

(b) The material, called conducting putty, is rolled into cylinders of different lengths but with equal thicknesses.

Graph 1 shows how the resistance changes with length.

Graph 1



(i) Why has the data been shown as a line graph rather than a bar chart?

_____

_____

(1)

(ii) The current through a 30 cm length of conducting putty was 0.15 A.

Use **Graph 1** to find the resistance of a 30 cm length of conducting putty.

Resistance = _____ ohms

(1)

(iii) Use your answer to (b)(ii) to calculate the potential difference across a 30 cm length of conducting putty.

Show clearly how you work out your answer.

_____

_____

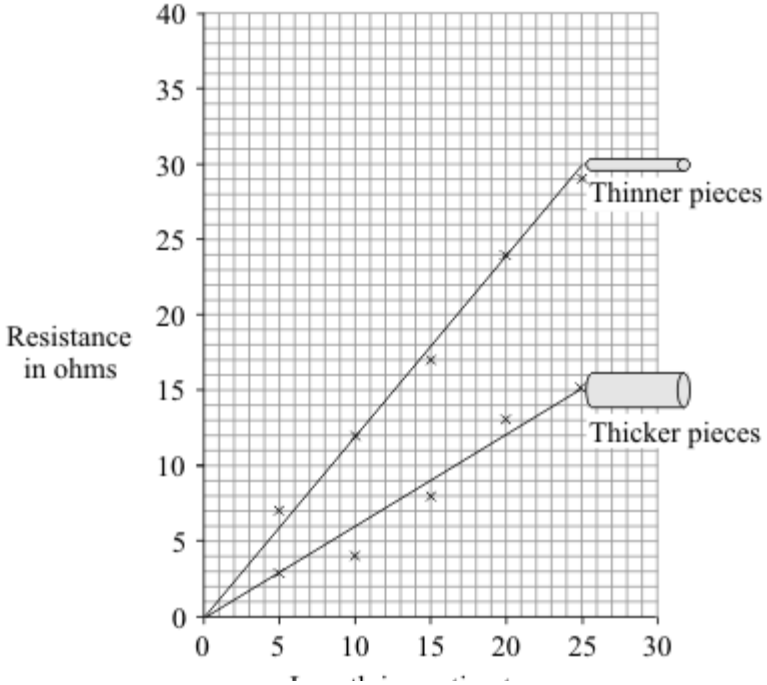
_____

Potential difference = _____ volts

(2)

(c) A second set of data was obtained using thicker pieces of conducting putty. Both sets of results are shown in **Graph 2.**

Graph 2



(i) What is the relationship between the resistance and the thickness of the conducting putty?

_____

_____

(1)

(ii) Name **one** error that may have reduced the accuracy of the results.

_____

(1)

(iii) How could the reliability of the data have been improved?

_____

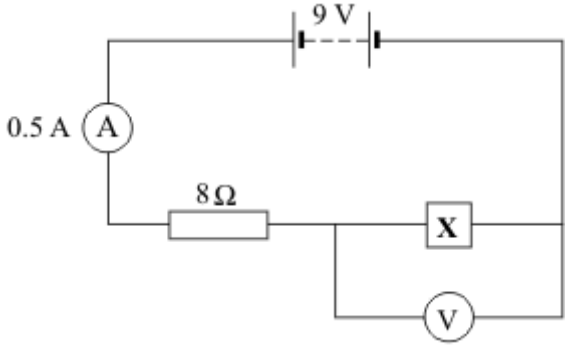
_____

(1)

(Total 10 marks)

Q3.

(a) The circuit diagram drawn below includes a component labelled **X**.



(i) Calculate the potential difference across the 8 ohm resistor.

Show clearly how you work out your answer.

_____

_____

Potential difference = _____ volts

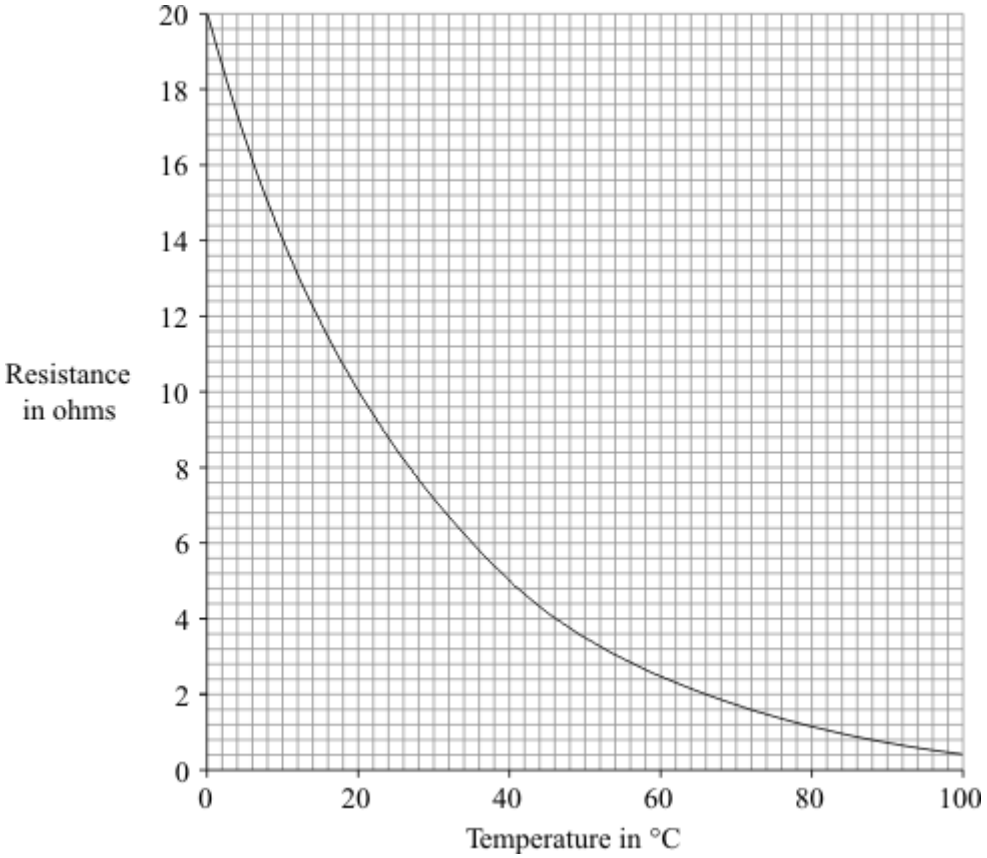
(2)

(ii) What is the potential difference across component **X**?

_____

(1)

(b) The graph shows how the resistance of component **X** changes with temperature.



(i) What is component **X**?

_____

(1)

(ii) Over which range of temperatures does the resistance of component **X** change the most?

Put a tick (✓) next to your choice.

0 °C to 20 °C ☐

20 °C to 40 °C ☐

40 °C to 60 °C ☐

60 °C to 80 °C ☐

80 °C to 100 °C ☐

(1)

(Total 5 marks)