Practice Question Set For GCSE
Subject : Physics
Paper-2 Topic :10_ Electricity And Circuits

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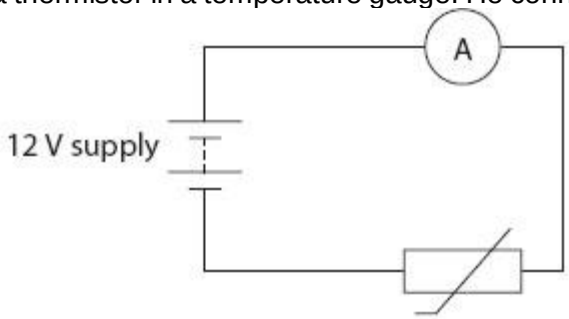
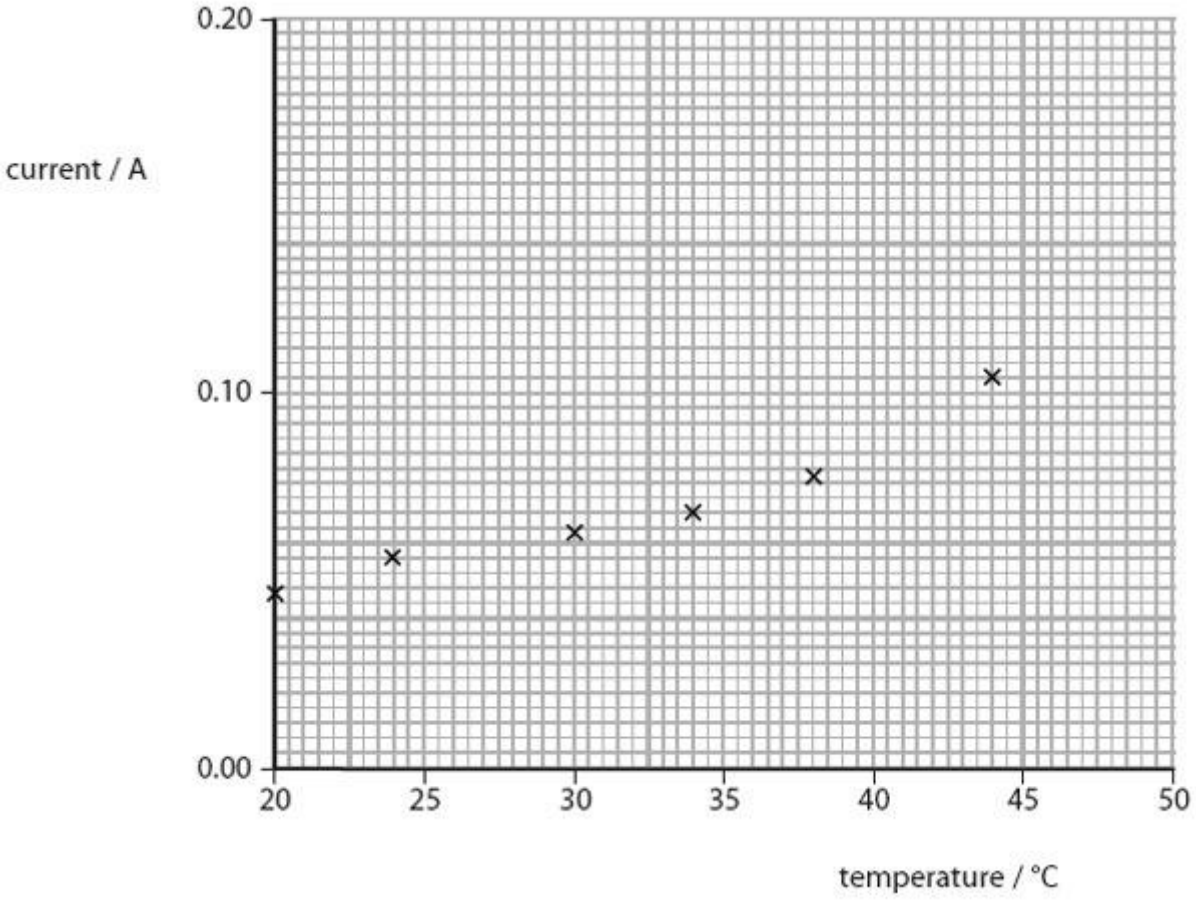
Name of the Student:_____
Max. Marks : 24 Marks **Time : 24 Minutes**

Q1.

A designer is going to use a thermistor in a temperature gauge. He connects the thermistor into this circuit.



He heats the thermistor and measures the current at different temperatures. Here are some of the results plotted on a graph.



At 47 °C the current was 0.138 A.

(i) Plot this value on the graph.

(1)

(ii) Draw the curve of best fit through the points.

(1)

(iii) The supply voltage is 12 V.
At 20 °C the current is 0.047 A.

Calculate the resistance of the thermistor at this temperature.

(3)

.....

(iv) Use this graph of current against temperature to explain the relationship between resistance and temperature for this thermistor.

(2)

.....

.....

.....

.....

Q2.

Figure 9 shows a lamp connected to a d.c. power supply.

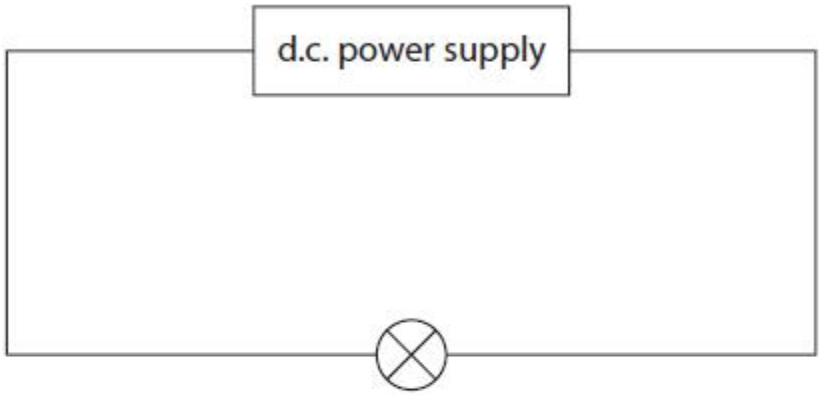


Figure 9

Another **identical** lamp is added to the circuit, as shown in Figure 10.

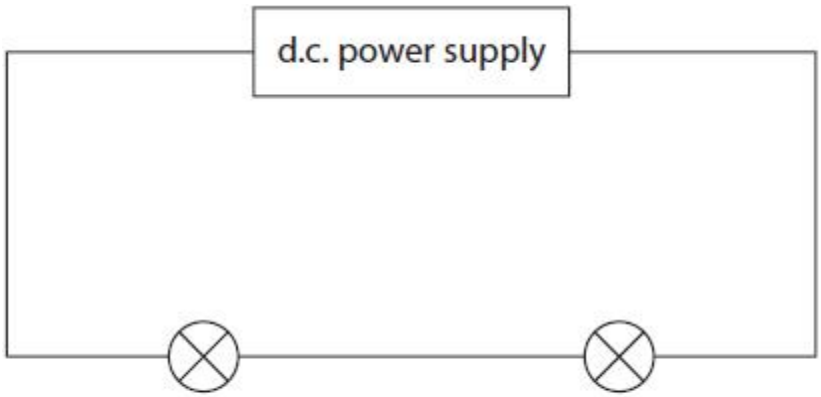


Figure 10

The power supply provides the same potential difference as it provided in the circuit in Figure 9.

The current in the lamp is 0.30 A.

State and explain the difference between the brightness of the lamp in Figure 9 and the brightness of a lamp in Figure 10.

(3)

.....

.....

.....

.....

.....

(Total for question = 3 marks)

Q3.

A car headlamp has a power rating of 55 W when the current in the headlamp is 4.4 A.

(i) State the equation relating power, current and resistance.

(1)

(ii) Calculate the resistance of the headlamp.

(3)

resistance = ... Ω

(Total for question = 4 marks)

Q4.

Figure 2 shows an ammeter that can read up to 5 A.

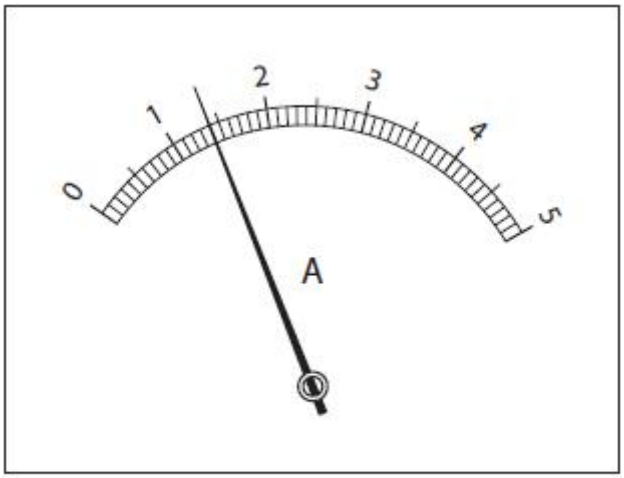


Figure 2

State the value of the current shown on the ammeter in Figure 2.

(1)

current = ... A

(Total for question = 1 mark)

Q5.

A student investigates resistors connected in series in an electrical circuit.

The student has

- a 3.0 V battery
- a 22 Ω resistor
- a resistor marked X.

The student does not know the value of the resistor marked X.

The student decides to measure the potential difference (voltage) across resistor X.

Figure 8 shows the circuit that the student connected.

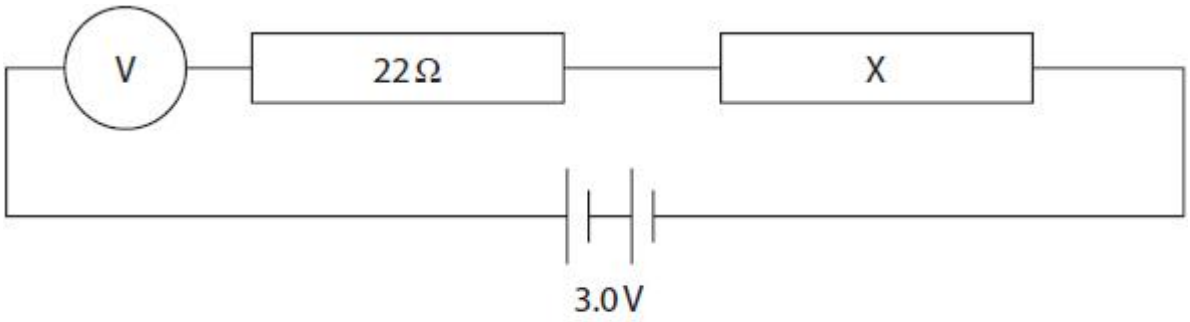


Figure 8

The circuit is connected incorrectly.

The student corrects the mistake.

The voltage across resistor X is 2.1 V.

The circuit is connected to a 3 V battery.

(i) State the value of the voltage across the 22 Ω resistor.

(1)

voltage across 22 Ω resistor = ... V

(ii) The current in resistor X is 0.041 A.

The voltage across resistor X is 2.1 V.
Show that the resistance of resistor X must be about 50 ohms.
Use the equation

$$V = I \times R$$

(2)

(iii) Calculate the power in resistor X when the voltage across X is 2.1 V and the current in resistor X is 0.041 A.

(2)

power = ... W

(iv) Calculate the overall resistance of the 22 ohm resistor and resistor X.

(2)

overall resistance = ... Ω

(v) The current in the circuit is 0.041 A.

The voltage across the battery is 3.0 V.
Calculate the energy transferred in 2 minutes.
Use the equation

$$E = I \times V \times t$$

(2)

energy = ... J

(Total for question = 9 marks)