

Name of the Student: _____

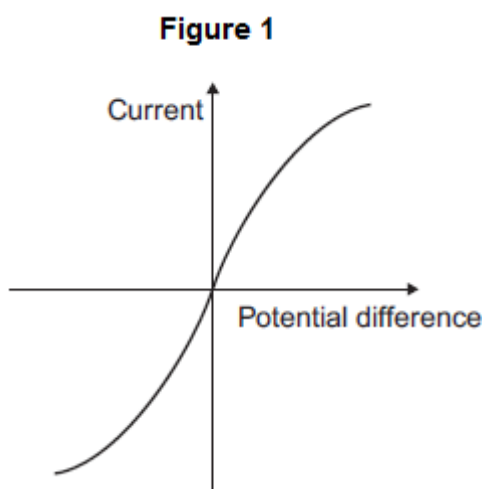
Max. Marks : 18 Marks

Time : 18 Minutes

Q1.

The current in a circuit depends on the potential difference provided by the cells and the total resistance of the circuit.

- (a) **Figure 1** shows the graph of current against potential difference for a component.



What is the name of the component?

Draw a ring around the correct answer.

diode

filament bulb

thermistor

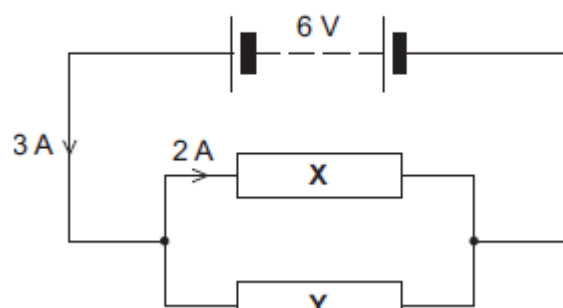
(1)

- (b) **Figure 2** shows a circuit containing a 6 V battery.

Two resistors, **X** and **Y**, are connected in parallel.

The current in some parts of the circuit is shown.

Figure 2



- (i) What is the potential difference across **X**?

Potential difference across **X** = _____ V

(1)

- (ii) Calculate the resistance of **X**.

Resistance of **X** = _____ Ω

(2)

- (iii) What is the current in **Y**?

Current in **Y** = _____ A

(1)

- (iv) Calculate the resistance of **Y**.

Resistance of **Y** = _____ Ω

(1)

- (v) When the temperature of resistor **X** increases, its resistance increases.

What would happen to the:

- potential difference across **X**
- current in **X**
- total current in the circuit?

Tick (✓) **three** boxes.

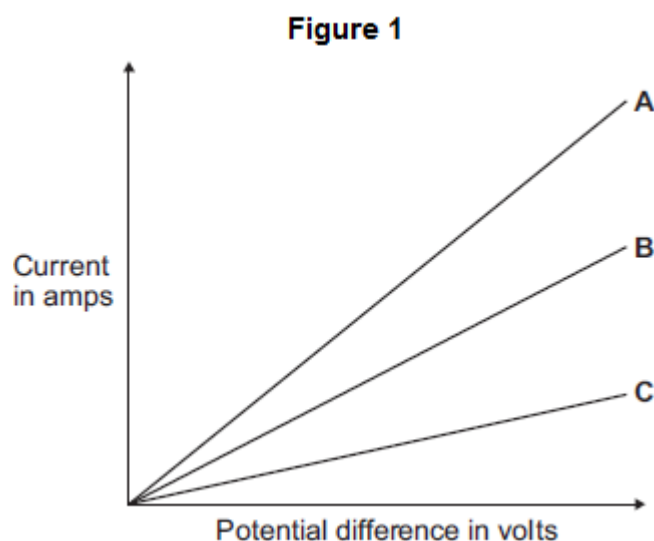
	Decrease	Stay the same	Increase
Potential difference across X			
Current in X			

Total current in the circuit			
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(3)
(Total 9 marks)

Q2.

- (a) **Figure 1** shows the current–potential difference graph for three wires, **A**, **B** and **C**.



- (i) Using **Figure 1**, how can you tell that the temperature of each wire is constant?

(1)

- (ii) Which **one** of the wires, **A**, **B** or **C**, has the greatest resistance?

Write the correct answer in the box.

Give a reason for your answer.

(2)

- (b) A student measured the resistance of four wires.

The table below shows the resistance of, and other data about, each of the four wires, **J**, **K**, **L** and **M**.

Wire	Type of metal	Length in cm	Diameter in mm	Resistance in
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J	copper	50	0.17	0.36
K	copper	50	0.30	0.12
L	copper	100	0.30	0.24
M	constantan	100	0.30	7.00

- (i) The last column of the table should include the unit of resistance.

What is the unit of resistance?

(1)

- (ii) The resistance of a wire depends on many factors.

Look at the table. Which **two** wires from **J**, **K**, **L** and **M** show that the resistance of a wire depends on the **length** of the wire?

Wire and wire

Give a reason for your answer.

(2)

- (iii) A student looked at the data in the table and wrote this conclusion:

‘The resistance of a wire depends on the type of metal from which the wire is made.’

The student could **not** be certain that her conclusion is true for **all** types of metal.

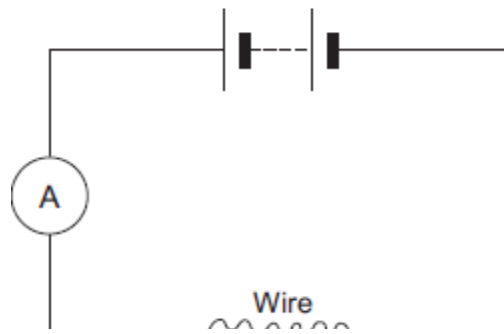
Suggest what extra data is needed for the student to be more certain that the conclusion is correct

(1)

- (c) The resistance of a wire can be calculated using the readings from an ammeter and a voltmeter.

- (i) Complete **Figure 2** by drawing a voltmeter in the correct position in the circuit. Use the correct circuit symbol for a voltmeter.

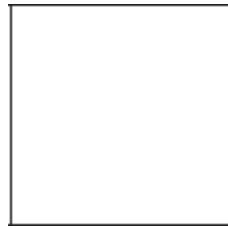
Figure 2



(1)

- (ii) In a circuit diagram, a wire can be represented by the symbol for a resistor.

In the box below, draw the circuit symbol for a resistor.



(1)

(Total 9 marks)