

Name of the Student: \_\_\_\_\_

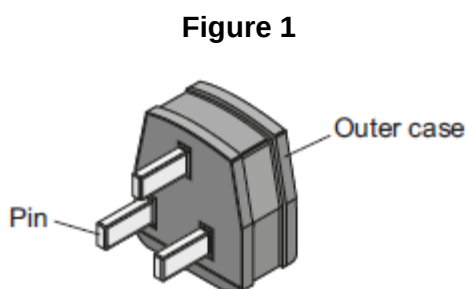
Max. Marks : 18 Marks

Time : 18 Minutes

**Q1.**

- (a) A washing machine is connected to the mains electricity supply using a cable and three-pin plug.

**Figure 1** shows a three-pin plug.



Name the materials used in the structure of a plug. Give the reason why each material is used.

Pin \_\_\_\_\_  
\_\_\_\_\_  
Outer case \_\_\_\_\_  
\_\_\_\_\_

(1)

- (b) The three-pin plug contains a fuse. The fuse is connected to one of the wires inside the cable.

- (i) Which **one** of the wires inside the cable is the fuse connected to?

\_\_\_\_\_

(1)

- (ii) The fuse is a thin wire inside a closed glass tube. The wire acts as a resistor.

What effect does a current through a wire have on the wire?

\_\_\_\_\_

(1)

- (iii) The power of the washing machine varies between 0.7 kW and 2 kW depending on which part of the wash cycle is operating.

Calculate the maximum current drawn from the mains electricity supply by the washing machine.

The mains electricity supply is at a potential difference of 230 V.

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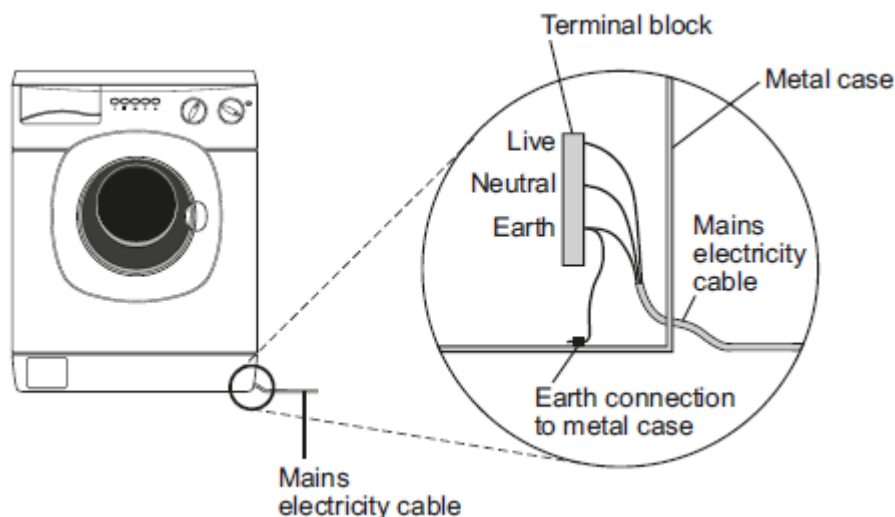
Current = \_\_\_\_\_ A

(2)

- (c) **Figure 2** shows how the mains electricity cable is connected to the washing machine.

The earth wire is connected to the metal case of the washing machine.

**Figure 2**



If a fault makes the metal case live, the earth wire and fuse inside the plug prevent the mains cable from overheating and causing a fire.

Explain how.

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(2)

- (d) New research has shown that many people underestimate the hazards of using mains electricity.

It is important that people do understand the hazards of using mains electricity.

Suggest why.

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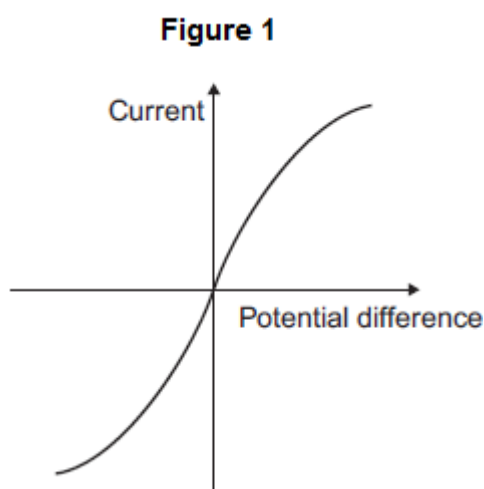
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Q2.

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**

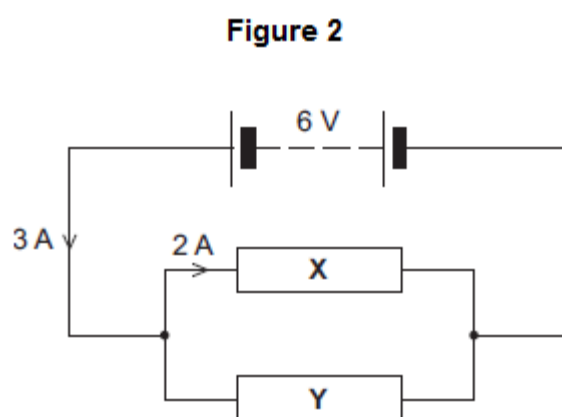
**thermistor**

(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.



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

Potential difference across **X** = \_\_\_\_\_ V

(1)

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

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Resistance of **X** = \_\_\_\_\_  $\Omega$

(2)

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

Current in **Y** = \_\_\_\_\_ A

(1)

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

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Resistance of **Y** = \_\_\_\_\_  $\Omega$

(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 <b>X</b> |          |               |          |
| Current in <b>X</b>                  |          |               |          |
| Total current in the circuit         |          |               |          |

(3)

(Total 9 marks)