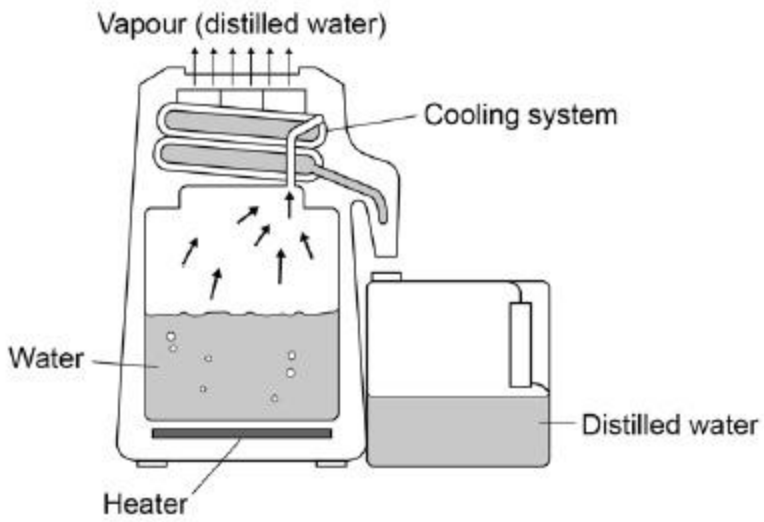
Name of the Student:_____
Max. Marks : 17 Marks **Time : 17 Minutes**

Q1.

Figure 1 shows a water distiller which is used to purify water.

Figure 1



The distiller boils water and then condenses most of the water vapour back to water.

(a) The water distiller is filled with 5.0 kg of water at 20 °C

The specific heat capacity of water = 4 200 J/Kg °C

Calculate the energy needed to raise the temperature of the water to 100 °C

Use the Physics Equations sheet.

_____

_____

_____

_____

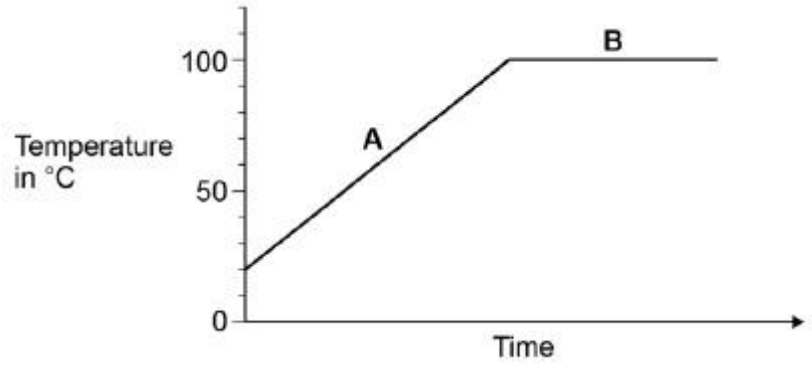
_____

Energy = _____ J

(3)

Figure 2 shows how the temperature of the water in the distiller changes with time.

Figure 2



(b) Energy is transferred to the water at a constant rate.

Explain why the graph is a different shape in parts **A** and **B**.

_____

_____

_____

_____

_____

_____

(3)

(c) When the water drops to a low level, the heater automatically switches off.

Explain what problem would be caused if the heater did **not** automatically switch off.

_____

_____

_____

_____

_____

_____

(3)

(d) The distiller is connected to the mains by a three-core cable.

The wires are covered by different coloured insulation.

What colour is the insulation covering each of the wires?

Live wire _____

Neutral wire _____

Earth wire _____

(2)

(e) Which statement gives the purpose of the earth wire?

Tick **one** box.

It carries an alternating potential difference.	☐
It melts if the current in the circuit is too high.	☐
It provides a connection to complete the circuit.	☐
It stops the casing of the appliance becoming live.	☐

(1)

(f) The heating element has a power of 2.5 kW

The resistance of the heating element is 17 Ω

Calculate the current in the heating element.

Give your answer to 2 significant figures.

Write any equations that you use.

_____

_____

_____

_____

_____

_____

_____

_____

Current = _____ A

(5)

(Total 17 marks)