

Name of the Student: _____

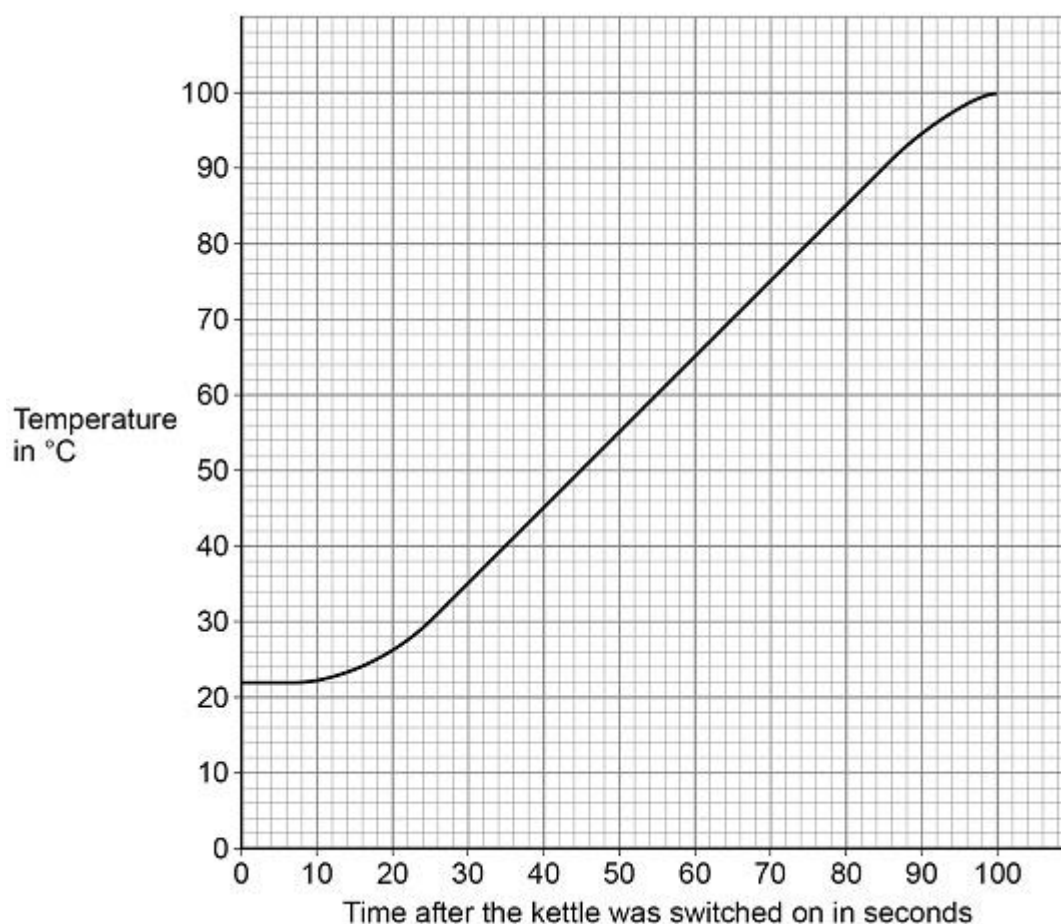
Max. Marks : 19 Marks

Time : 19 Minutes

Q1.

An electric kettle was switched on.

The graph below shows how the temperature of the water inside the kettle changed.



- (a) When the kettle was switched on the temperature of the water did **not** immediately start to increase.

Suggest **one** reason why.

(1)

- (b) The energy transferred to the water in 100 seconds was 155 000 J.

specific heat capacity of water = 4200 J/kg °C

Determine the mass of water in the kettle.

Use the graph above.

Give your answer to 2 significant figures.

Mass of water (2 significant figures) = _____ kg

(5)

- (c) The straight section of the line in above graph can be used to calculate the useful power output of the kettle.

Explain how.

(3)

(Total 9 marks)

Q2.

The photograph below shows a balloon filled with helium gas.



(a) Which statements describe the movement of the gas particles in the balloon?

Tick (✓) **two** boxes.

The particles all move in a predictable way.

☐

The particles move at the same speed.

☐

The particles move in circular paths.

☐

The particles move in random directions.

☐

The particles move with a range of speeds.

☐

The particles vibrate about fixed positions.

☐

(2)

(b) The pressure of the helium in the balloon is 100 000 Pa.

The volume of the balloon is 0.030 m^3 .

The balloon is compressed at a constant temperature causing the volume to decrease to 0.025 m^3 .

No helium leaves the balloon.

Calculate the new pressure in the balloon.

New pressure = _____ Pa

(4)

- (c) The temperature of the helium in the balloon was increased.

The mass and volume of helium in the balloon remained constant.

Explain why the pressure exerted by the helium inside the balloon would increase.

(4)

(Total 10 marks)