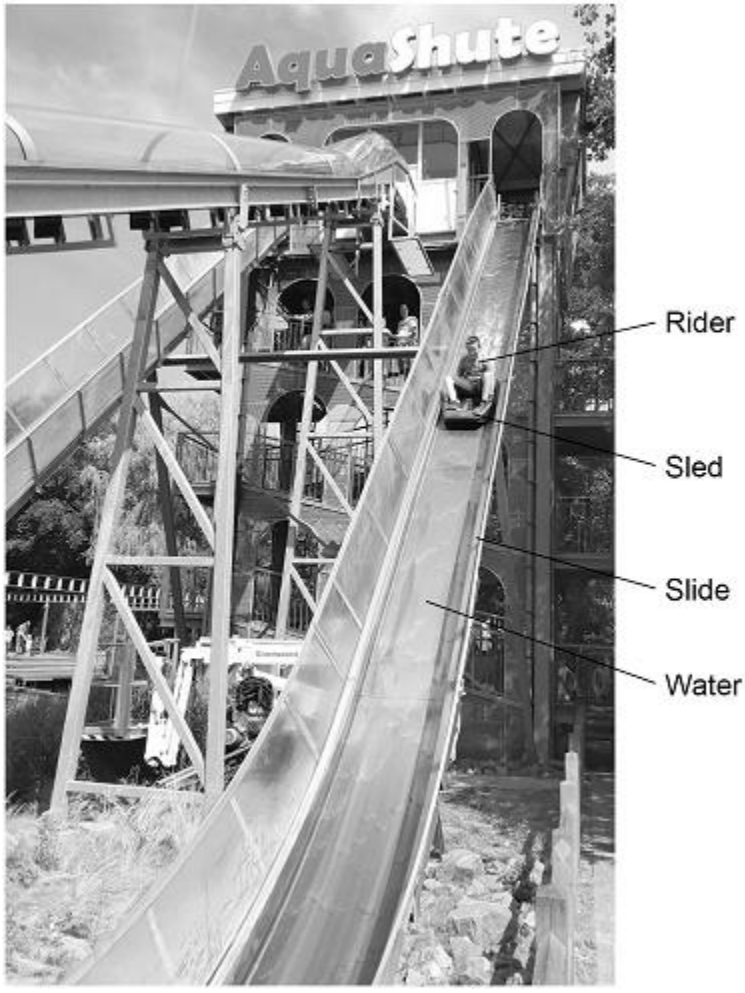
Name of the Student:_____

Max. Marks : 19 Marks **Time : 19 Minutes**

Q1.

The photograph below shows a theme park ride called AquaShute.

Riders of the AquaShute sit on a sled and move down a slide.



(a) A light gate and data logger can be used to determine the speed of each rider and sled.

What two measurements are needed to determine the speed of a rider and sled?

Tick (✓) **two** boxes.

Gravitational field strength ☐

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Length of sled ☐

Mass of rider and sled ☐

Temperature of surroundings ☐

Time for sled to pass light gate ☐

(2)

(b) The decrease in gravitational potential energy of one rider on the slide was 8.33 kJ.

The rider moved through a vertical height of 17.0 m.

gravitational field strength = 9.8 N/kg

Calculate the mass of the rider.

_____

_____

_____

_____

Mass of rider = _____ kg

(4)

(c) At the bottom of the slide, all riders and their sleds have approximately the same speed.

Explain why.

_____

_____

_____

_____

_____

_____

_____

_____

(4)

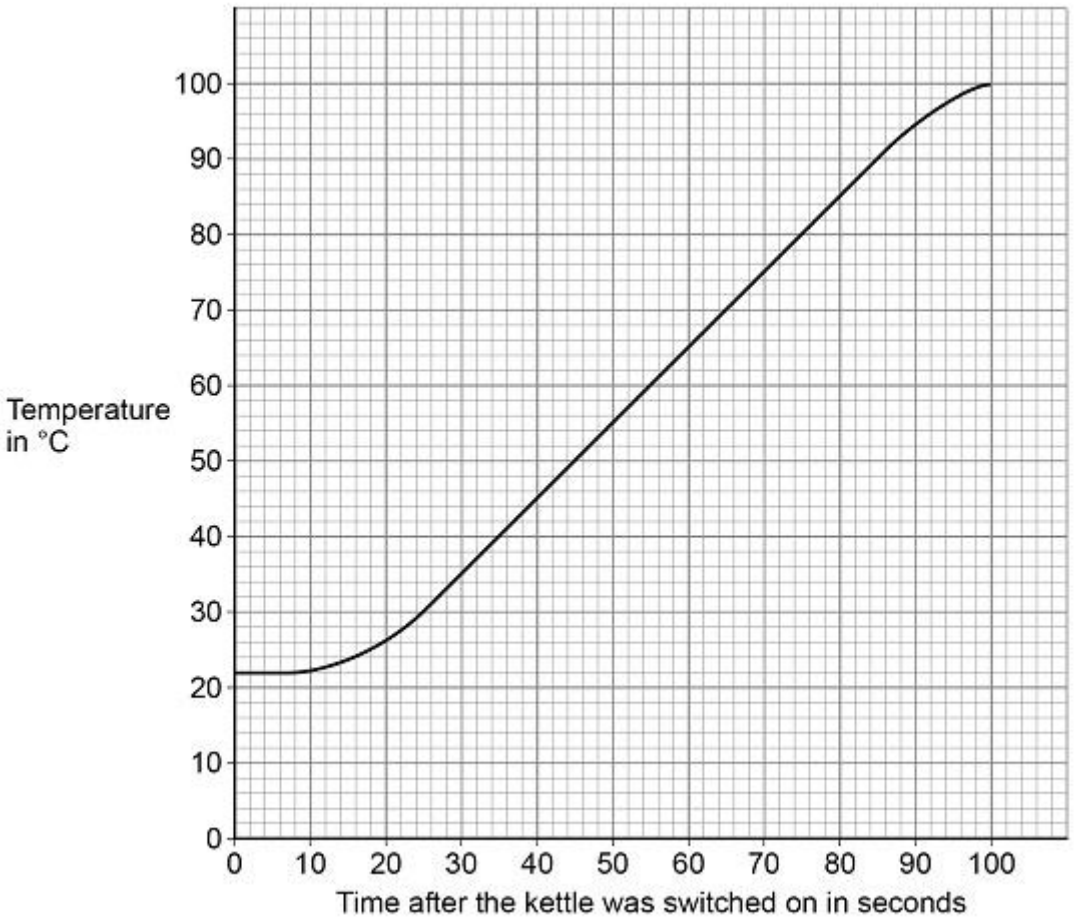
(Total 10 marks)

Q2.

An electric kettle was switched on.

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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.

_____

_____

_____

_____

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_____

_____

_____

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)

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