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**YEAR 11 PHYSICS**

**Task 1A – Test 1A Heating and Cooling**

**Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ / 30**

**ANSWER ALL QUESTIONS IN THE SPACES PROVIDED**

**Formulae and Selected Constants**

Specific heat of ice = 2.10 x 103 J kg-1 K-1

Specific heat of steam = 2.00 x 103 J kg-1 K-1

Specific heat of water = 4.200 x 103 J kg-1 K-1

Specific heat of stainless steel = 445 J kg-1 K-1

Specific heat of aluminium = 900 J kg-1 K-1

Latent heat of fusion of water = 3.34 x 105 J kg-1

Latent heat of vaporisation of water = 2.25 x 106 J kg-1

*Q = mc∆t*

*Q = mL*

Short answer (30 marks)

Section A consists of seven questions. Write your answers in the spaces provided.

1 Dogs don’t sweat like humans do, after exercising they pant to cool down. When dogs pant, they stick out their wet tongue and blow air over it. Explain how the action of panting helps the dog cool down.

(4 Marks)

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2 200g of ice is taken from a freezer where it is kept at -11.0°C. It is heated till it becomes steam at 112°C. Calculate how much energy it has absorbed.

(4 Marks)

3 Hypothermia can occur even at moderately cold temperatures if the body is also exposed to wind and water. Explain why.

(3 Marks)

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4 As a solid object melts, the latent heat of fusion does not increase the Kinetic energy of the object, explain where that energy is used.

(2 Marks)

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5 A solar heating panel on a roof is used to heat 110L of water initially at 18°C, using the sun, it can absorb 800 Joules per second. What would the temperature of this water be after 1 hour?

(5 Marks)

6 A 75kg athlete takes in 12 MJ of energy from her food per day. If this energy were converted to heat what would be the theoretical temperature rise of her body if her Specific Heat Capacity is 3.49 kJkg-1 K-1

(5 Marks)

7 A football coach has a large container holding 65 L of sports drink for his team. The sports drink starts at 25 °C and needs to be cooled down to 0 °C before half time.

1. Calculate the mass of ice (initially at -10 °C) the coach needs to add to the sports drink in order to cool it down to 0 °C. (Assume sports drink has the same properties as water and that all the ice melts).

(4 Marks)

1. Draw a graph showing the energy change over time.

(3 Marks)

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