**ARANMORE CATHOLIC COLLEGE**

**YEAR 11 ATAR PHYSICS**

**HEATING/COOLING ASSIGNMENT 5**

/50

**NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ MARK:**

**Instructions:**

1. Answer all questions on separate lined paper.
2. Show full working out to get marks as shown in brackets after each question.

**Questions:**

1. a) Why does the temperature rise steadily when water at 20°C is heated at a constant rate?

[3 marks]

b) Why does the temperature of water at 100°C remain constant when heated at a constant rate?

[3 marks]

1. How do fish survive in Antarctica with sub-zero temperatures for long periods of time?

[4 marks]

1. Why does a piece of metal get so hot sitting in the sun, while the same mass of water becomes only lukewarm? [4 marks]
2. a) Calculate the final temperature when 10 kg of water at 30 °C is added to 10 kg of water at 90 °C.

[3 marks]

b) Calculate the final temperature when 10 kg of water at 30 °C is added to 20 kg of water at 90 °C.

[4 marks]

1. a) Calculate the mass of water at 90 °C that must be added to 10 kg of water at 30 °C to produce a final temperature of 50 °C.

[5 marks]

b) Calculate the mass of aluminium at 90 °C that must be added to 10 kg of water at 30 °C to produce a final temperature of 50 °C.

[6 marks]

1. Calculate the total energy required to heat a 100 g block of ice at -10 °C to steam at 110 °C.

[6 marks]

1. a) Calculate the final temperature when 30 g of water at 0 °C is added to 200 g of water at 26 °C.

[5 marks]

b) Calculate the final temperature when 30 g of **ice** at 0 °C is added to 200 g of water at 26 °C.

[7 marks]