Calvin Kong
Physics Tuition

Name:	Class:	Date:

| **Unit 11** **THERMAL PROPERTIES OF MATTER** | **WORKSHEET** LEVEL STRUCTURED QUESTIONS | **1** |

Level 1 Worksheets comprises of knowledge questions and questions that involve simple calculations to build concepts.

11.1 Heat Capacity

(A) Heat Capacity

(B) Specific Heat Capacity

1. Define the terms, "heat capacity" and "specific heat capacity"

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2. 60000 J of thermal energy is given to a Material X in order to raise its temperature from 255 K to 258 K.

(a) Calculate the heat capacity of Material X.

heat capacity = …………………………

(b) Given that there was 8 kg of Material X, calculate its specific heat capacity.

specific heat capacity = …………………………

Ans: (a) 20000 JK^{-1} (b) 2500 Jkg^{-1}K^{-1}

3. Find the amount of thermal energy needed to raise the temperature of 500 g of liquid water from 0 °C to 100 °C. Take the specific heat capacity of water to be 4.2 J g^{-1} °C^{-1}.

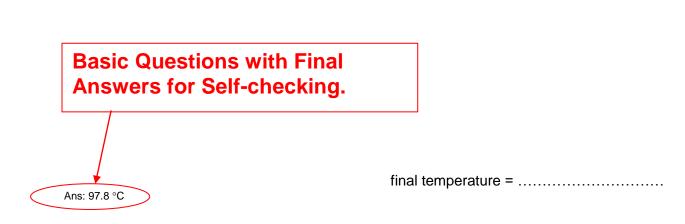thermal energy = …………………………

Ans: 210000 J

4. What is the final temperature when 0.03 kJ of energy is supplied to a 5 g iron rod at 3 °C. The specific heat capacity of iron is 460 J kg^{-1} °C^{-1}

temperature = …………………………

Ans: 16 °C

5. Water has a very high specific heat capacity of 4186 J/kg °C. Comparatively, the heat capacity of copper is 385 J/kg °C. This means that water can absorb a lot of heat before raising its temperature by 1 °C. What are the applications that make use of the high specific heat capacity of water?

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6. 0.3 kg of water at 100 °C is poured into a copper vessel of mass 0.1 kg at 30 °C. What is the final temperature of water assuming there is no heat lost to the surrounding? (specific heat capacity of copper = 400 Jkg^{-1}°C^{-1} and specific heat capacity of water = 4200 Jkg^{-1}°C^{-1})
[Hint: Let the final temperature be x. Consider heat lost by water equals heat lost by vessel]

Basic Questions with Final Answers for Self-checking.

final temperature = …………………………

Ans: 97.8 °C

Only Section 11.1 - Heat Capacity is shown in this sample