Chapter 1 Heating processes –Specific Heat

Chapter test answers Total marks 28

Question 1

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*Q* = *mc*∆*T* or J kg–1 K–1



Since specific heat is a linear relationship, you may also use the following working:

 (2 mark)

Question 2

 (3 marks)

Question 3

*Q* = *mc*∆*T* = 100 × 4200 × (35.0 – 20.0) = 100 × 4200 × 15.0 = 6.3 × 106 J or 6.3 MJ (2 marks)

Question 4

Temperature is a measure of the average kinetic energy of particles within a system. (1)

If the average kinetic energy of the particles within two objects is the same, then their temperature will be the same. (1)

**Question 5**

1. Internal potential energy is contained in the bonds (1 mark) (and can be described mathematically as springs).

Internal kinetic energy is the vibration of the atoms/molecules about their fixed positions (1 mark)

1. As the temperature is increased the average kinetic energy of the vibrations increases.

**Question 6:**

1. Absolute zero is the theoretical temperature at which the molecules don’t move. In reality quantum effects cause a Bose-Einstein condensate to occur near absolute zero
2. The temperature increments for °C or K are the same, that is a 1 degree change in Celsius is the same as a 1 degree change in Kelvin.
3. 200 °C = 200+273.15 = 473.15K = 473 K ( 1mark) 598 K = 598- 273.15 = 324.85= 325 °C ( 1 mk)
4. Answer is C: To compare the energies of two temperatures the temperature needs to be converted to Kelvin, as Kelvin is relative to absolute zero (2 marks)



Double the average energy will be double the temperature in Kelvin

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Convert the temperature back to degrees Celsius.

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Question 7

Energy transferred to water:  (1 mark)

Energy transferred from metal:  (1 mark)

So the specific heat capacity of the unknown metal:  (1 mark)

From table of specific heat capacities this would most closely match aluminium.   
(Note that the question specifies that the substance is a metal.) (1 mark)