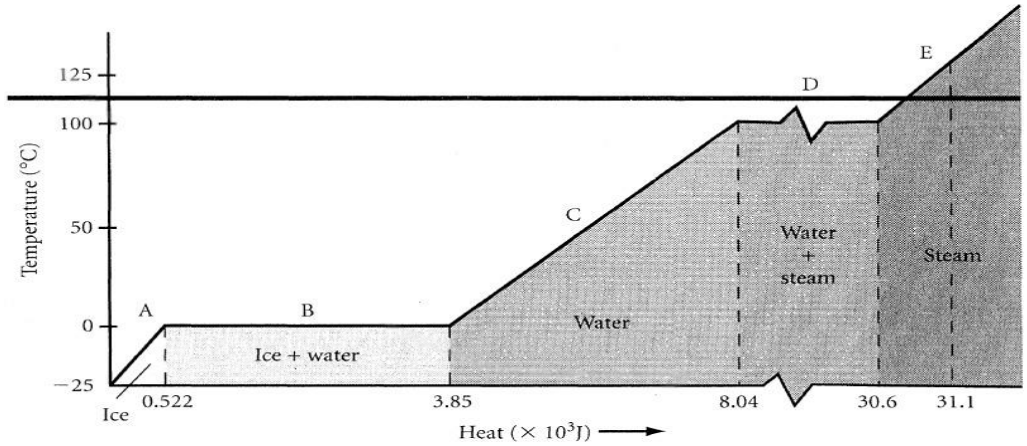
Academic Year: 2018/2019
Revision sheet
Physics / Grade 10

Chapter 9 , Section :1,2,3 Chapter 10, Section :1,2

Name : _____ Date : / 3 / 2019

Q1. The figure below shows how the temperature of 10.0 g of ice changes as energy is added. Use the figure to answer questions 1-3.



1 .What happens to the ice at 0°C?

_____

2 .What happens to the ice at 100°C?

_____

3 .What happens to the ice between 0°C and 100°C?

_____

_____

Q2. What is the temperature increase of 4.0 kg of water when it is heated by an 8.0×10^2 W immersion heater for exactly 10.0 min? (c_p = 4186 J/kg•°C)

Q3. What is the specific heat capacity of a substance?

_____

_____

Q4. Explain if energy can be transferred as heat from an object at a low temperature to an object at a high temperature, and if so, why objects don't become hotter spontaneously.

_____

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_____

Q5. What is true of the internal energy of an isolated system?

_____

_____

Q6 . According to the conservation of energy, what is true about the net work and net heat in a cyclic process?

_____

_____

Q7. A match is struck on a matchbook cover. How is energy transferred so that the match can ignite and produce a flame?

_____

_____

Q8. A 0.10 kg piece of copper at an initial temperature of 95°C is dropped into 0.20 kg of water contained in a 0.28 kg aluminum calorimeter. The water and calorimeter are initially at 15°C. What is the final temperature of the system when it reaches equilibrium?
($c_{p,Cu}$ = 387 J/kg•°C, $c_{p,Al}$ = 899 J/kg•°C, and $c_{p,w}$ = 4186 J/kg•°C)

Q9. Mercury boils at 357°C and freezes at −38.9°C.

a. Convert these temperatures to Kelvin.

_____

b. Can a mercury thermometer be used to measure temperatures between 500°C and 600°C? between 100°C and 200°C?

_____

_____

Q10. Nitrogen becomes a liquid at −195.8°C under atmospheric pressure. Oxygen becomes a liquid at −183.0°C.

a. Convert these temperatures to Kelvin.

_____

b. A sealed tank containing a mixture of nitrogen and oxygen is cooled to 82.8 K and maintained under atmospheric pressure. Are the contents now a liquid or a gas? Explain.

_____

_____

Q11. A 20.0 kg ice block is removed from a freezer whose temperature is −25.0°C and placed in an ice box with freshly caught fish. After a few hours, all the ice was melted. The final temperature of the water and the fish was 5°C.

The melting point of ice is 0.00°C. The heat capacities and latent heats are given as c_p (ice) = 2.09×10^3 J/kg•°C; L_f (ice) = 3.33×10^5 J/kg; c_p (water) = 4.19×10^3 J/kg•°C. Use this information to answer the questions below.

1. How much energy did the solid ice absorb to reach its melting point and remain solid?

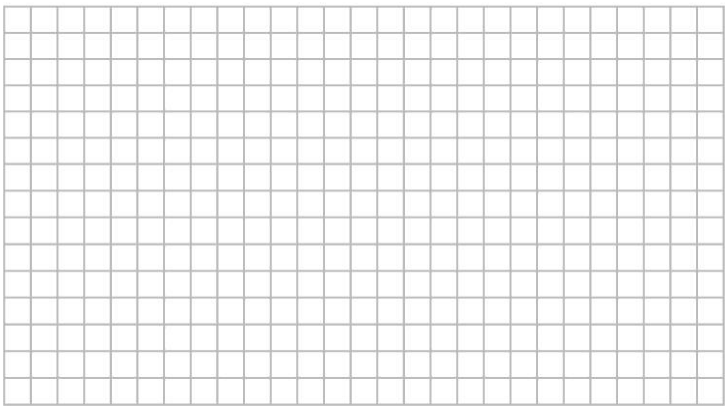
_____

2. How much energy was absorbed to turn the ice into water?

_____

3. How much energy was absorbed to bring the temperature of that water to 5°C?

4. Draw a graph showing all of the process. (Let each box on the grid represent 0.4×10^6 J or 0.5×10^6 J.)



Q12. A container of gas is at a pressure of 3.7×10^5 Pa. How much work is done by the gas if its volume expands by 1.6 m^3?

Q13. A gas enclosed in a cylinder occupies 0.030 m^3. It is compressed under a constant pressure of 3.5×10^5 Pa until its final volume is exactly one-third of its initial volume.

a. What was the change in the gas volume? _____

b. How much work was done? _____

c. The gas lost 5.0×10^3 J as heat during the compression process. Did the internal energy of the gas increase or decrease? By how much?

Q14. The same amount of work (540 J) is done to **compress** the gas, this time in an **isothermal** process.

a. What is the change in internal energy of the gas?

_____

b. How much energy is transferred as heat?

_____

c. Is that energy removed from or added to the gas? Sketch a diagram showing the energy transfers as work and as heat.

Q15. Explain how a cyclic process resembles and differs from an isothermal thermodynamic process.

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Q16. An engine takes in 6.60×10^5 J of energy as heat and gives up 4.82×10^5 J of energy as heat to the surroundings. Because it is not an ideal engine, its internal energy increases by 4.2×10^4 J. How much work does the engine do?