PRISM WORLD

Std.: 10 (English) Science - I

Chapter: 5

Q.1 Textbook activity question **6**

1 How will you explain following statements with the help of the anomalous behaviour of water?
In regions with cold climate, the aquatic plants and animals can survive even when the atmospheric temperature goes below 0 ^{o}C.

Ans When the atmospheric temperature goes below 0˚C, the water at the surface gradually freezes to ice, but the water under the ice layer remains at 4˚C. The ice has little passageways to let air in and out. Hence, the oxygen gets dissolved and other gases are pushed out.

2 You know that as we go higher than the sea level, the boiling point of water decreases What would be effect on the melting point of solid?

Ans a) With increased height from sea level, i.e., at high altitudes atmospheric pressure decreases, causing melting point of solids that expand on solidifying (ice) to increase.
b) If the solid contracts on solidifying, then low pressure at high altitude causes its melting point to lower.

3 What is the difference between heat and temperature?

Ans The core difference is that heat deals with thermal energy, whereas temperature is more concerned with molecular kinetic energy. Heat is the transfer of thermal energy, whereas temperature is a property the object exhibits.

4 How will you explain following statements with the help of the anomalous behaviour of water?
In cold regions in winter the pipes for water supply break and even rocks crack.

Ans In winter the pipes for water supply break or even rocks crack because at temperatures below freezing the water expands. When the water resource expands on freezing it bursts.

5 In the above experiment, the wire moves through the ice slab. However, the ice slab does not break. Why?

Ans The wire cuts through water and shifts downward. As the wire displaces, pressure applied by wire on ice slab vanishes and its melting point is restored to 0 °C causing freezing of ice. In this manner, due to regelation wire moves through the ice slab completely without breaking it.

6 Is there any relationship of latent heat with the regelation?

Ans Yes there is relationship between latent heat and regelation.
The amount of heat energy absorbed or relased during change of state in called Latent heat.

Q.2 Name the following **1**

1 Which principle is used to measure the specific heat capacity of a substance?

Ans Heat exchange.

Q.3 Give scientific reasons **2**

1 In cold regions in winter, the rocks crack due to anomalous expansion of water.

Ans i. Occasionally, water enters into the crevices of rocks.
ii. When the temperature of the surroundings falls below 4^{0}C, the water begins to expand.
iii. As there is no place in the crevices for expansion of the water, tremendous pressure is exerted on the rocks.
iv. This results in crumbling of rocks into pieces.
v. Hence, in cold regions in winter, the rocks crack due to anomalous expansion of water.

Q.4 **Solve Numerical problems.** **2**

1 Equal heat is given to two objects A and B of mass 1g. Temperature of A increases by 3°C and B by 5°C. Which object has more specific heat? And by what factor?

Ans **Given:** mass of object A = 1 g
Mass of object B =1 g
Temperature difference T for A=3°C
Temperature difference T for B=5°C

To find: c_A = ?, c_B = ?

Formula: $Q = m \times c \times T$

$Q_A = Q_B$

$$m_A \times c_A \times T_A = m_B \times c_B \times T_B$$

$$1 \times c_A \times 3 = 1 \times c_B \times 5$$

$$3\ c_A = 5\ c_B$$

$$c_A = 5/3\ c_B$$

Ans: The specific heat of A is more. It is greater than B by a factor of 5/3.

Q.5 **Answer the following.** **4**

1 What is the value of relative humidity at the dew point temperature ?

Ans At the dew point temperature, relative humidity is 100%

2 Which principle is used to measure the specific heat capacity of a substance?

Ans Principle of heat exchange is used in the calorimetry method to determine the specific heat capacity of a substance.

Q.6 **Solve Numerical problems** **12**

Q.7 **Write answers based on given diagram/figure** **3**

Q.8 **Answer the following** **15**

Q.9 **Answer the following in detail** **5**