Physics (New Book) - 9th Class Physics Chapter 8 Long Question Preparation

Q1. Explain the scales of temperature

Ans 1: Temperature scales: a scale is marked on thermometer. The temperature of the body in contact with the thermometer can be read on that scale.
Three scales of temperature are in common use. These are:

Ans 2: Celsius scale or centigrade scale: on Celsius scale, the interval between lower and upper fiexd points is divided into 100 equal parts. The lower fixed point is marked as 0C and upper fixed point is marked as 100C.

Ans 3: Fahrenheit scale: on Fahrenheit scale, the interval between lower and upper fixed points is divided into 180 equal parts. Its lower fixed point marked as 32F and upper fixed poin is marked as 212F

Ans 4: Kelvin scale: In SI unit of temperature is kelvin(K) and its scale is called kelvin scale of temperature. The interval between upper and lower fixed points is divided into 100 equal parts. thus, a change in 1C is equal to a change of 1 K. The lower fixed point on this scale corresponds to 273K and the upper fixed point is referred as 373K. The zero on this scale is called the absolute zero and is equal to -273C

Ans 5: From Celsius to kelvin scale; the temperature T on kelvin scale can be obtained by adding 273 in the temperature C on Celsius scale. Thus,
T(K)= 273+C
From kelvin to Celsius scale: the temperature on Celsius scale can be found by subtraction 273 from the temperature in kelvin scale. Thus,
C=T(K)-273
From Celsius to Fahrenheit scale: since 100 divisions on Celsius scale are equal to 180 divisions on Fahrenheit scale. Therefore, each division on Celsius scale is equal to 1.8 divisions on Fahrenheit scale. Moreover, 0C corresponds to 32 F
F= 1.8C+32

Q2. What is meant by evaporation: on what factors the evaporation of a liquid depends.

Ans 1: Evaporation: evaporation is the changing of liquid into vapor's(gaseous state) from the surface of the liquid without heating it.

Ans 2: Explanation: take some water in a dish. The water in the dish will disappeared after sometime. It is because the molecule of water are in constant motion and possess kinetic energy. Fast moving molecules escape out from the surface of water and goes into the atmosphere. This is called evaporation.
Unlike boiling, evaporation takes place at all temperature but noly from the surface of a liquid.

Ans 3: Vapors at boiling point; the process of boiling takes place at a certain fixed temperature which is the boiling point of that liquid. At boiling point, a liquid is changing into vapor's not only from the surface but alos within the liquid. these vapor's come out of the boiling liquid as bubbles which breakdown on reaching the surface.

Ans 4: Evaporation causes cooling: during evaporation fast moving molecules escape out from the surface of the liquid. Molecules that have lower kinetic energies are left behind. this lowers the average kinetic energy of the liquid molecules and the temperature of the liquid. Since temperature of a substance depends on the average kinetic energy of its molecule's. Evaporation of perspiration helps to cool our bodies

Ans 5: Depending factors of evaporation: evaporating depends on following factors

1. Temperature: at higher temperature more molecules of liquid are moving with high velocitites and escaping from its surface. Thus evaporation is faster at high temperature than at low temperature.
2. Surface area: the rate of evaporation increase. Water evaporates faster when spread over large area.
3. Wind; wind blowing over the surface of liquid sweeps away the liquid molecules that have just escaped out. This increases the rate of evaporation.
4. Nature of liquid: the rate of evaporation of liquid for ether r spirit is greater than water.

Q3. Write a note on volume thermal expansion of solids

Ans 1: Volume thermal expansion; the volume of a solid also changes with the change in temperature and is called volume thermal expansion or cubical thermal expansion

Ans 2: Explanation: consider a solid of initial volume V_o at certain temperature T_o. On heating the solid to a temperature T, let its volume becomes V, then
change in the volume of solid=$V-V_o$
change in temperature= $T-T_o$

Q4. What is liquid-in-gas thermometer? explain it

Ans 1: Liquid-in-gas thermometer; a liquid-in-gas thermometer has a bulb with a long capillary tube of uniform a nd fine bore. A suitable liquid is filled in the bulb. When the bulb contacts a hot object, the liquid in it expands and rises in the tube. The glass stem of a thermometer is thick and acts as a cylindrical lens. This makes it easy to see the liquid level in the glass tube.
Mercury freezes at -39C and boils at 357C. It has all the thermometric properties listed above. Thus mercury is one of the most suitable thermometric material. mercury-in glass thermometers are widely used in laboratories, clinics and houses to measure temperature in the range from -10C to 150C

Ans 2: Lowe fixed points: the lower fixed point is marked to show the position of liquid in the thermometer when it is placed in ice.

Ans 3: Upper fixed points: upper fixed point is marked to show the position of liquid in the thermometer when it is placed in steam at standard pressure above boiling water.

Q5. Explain the change of state of matter

Ans 1: Change of state of matter: Matter can be changed from one state to another. For such a change to occur, thermal energy is added to or removed from a substance

Ans 2: Experiment: take a beaker and place it over a stand. put small piece of ice in the beaker and suspended a thermometer in the beaker to measure the temperature of ice.
Now place a burner under the beaker. The ice will start melting . The temperature of the mixture containing ice and water will not increase above 0C until all the ice melts and we get water at 0C. If this water 0c is further heated, its temperature will begin to increase above 0C.

Q6. Q no: 6(A) Explain land and Sea breeze are example of convection.?

Ans 1: Land and Sea Breezes:
Land and Sea breezes are the result of convection.
Sea Breeze:

On a hot day the temperature of the land increase more quickly than the sea. itis because the specific heat of land is much smaller as compared to water. The air above land gets hot and rise up.
Land Breeze.
At night the land codsfasterthan the sea, therforeair above the sea is warmer, rise up and the cold air form the land begins to move towards the sea.

Q7. What is bimetal strip ? explain and write its uses

Ans 1: Bimetal strip: a bimetal strip consists of two thin strips of different metals such as brass and iron joined together. On heating the strip , brass expands more than iron. This unequal expansion causes bending of strip.

Ans 2: Uses; bimetal strip are used for various purposes. bimetal thermometers are used to measure temperature especially in furnaces and ovens. Bimetal strips are also used in thermostats. Bimetal thermostat switch is used to control the temperature of heater coil in an electric iron.

Q8. Q no 6B) How much heat is required to charge10 g of water °C into of vaporization of water is 2.26×10^6 J kg-¹

Ans 1: m= 100g = 0.1kg
$t_1 = 100°$ C
$t_2 = 100°$ C
Hu $=2.26 \times 10^{6}Jk_{-1}$
$\varphi v = ?$
Solution
$\varphi v = m \times Hv$
$\varphi v = 0.1 \times 220 \times 10^6$J
$\varphi v = 2.20 \times 10^5$J
Result
Heat required $= \varphi v = 2.26 \times 10^5$J

Q9. Define latent heat of vaporization. explain it

Ans 1: Latent heat of vaporization: the quantity of heat that changes unit mass of a liquid completely into gas at its boiling point without any change in its temperature is caked latent heat of vaporization.
It is denoted by H_v.
When water is heated, it boils at 10C under standard pressure. its temperature remains 100C until it is changed completely into steam. Its latent heat of vaporization is $2.26*10^6 JKg^{-1}$That is 1kg of water requires $2.26*10^6$J heat to change it completely into gases at its boiling point.

Ans 2: Experiment: take a beaker and place it over a stand. put small pieces of ice in the beaker and suspended a thermometer in the beaker to measure the temperature. Place a burner under the beaker. The ice will start melting. The temperature of the mixture containing ice and water will not increase above 0C until all the ice melts. Note the time which the ice take to melt completely into water at)C. Continue heating the water at 0C in the beaker. Its temperature will begin to increase. Note the time which the water in the beaker takes to reach its boiling point at 100C from 0C.
Continue heating water till all the water changes into steam. Note the time which the water in the beaker takes to change completely into steam at its boiling point 100C.

Q10. What is thermometer? explain it. write the thermometric properties of liquid

Ans 1: Thermometer: a device that is used to measure the temperature of a body is called thermometer.

Ans 2: Explanation: some substances have property that changes with the temperature. Substances that show a change with temperature can be used as a thermometric material. For example, some substances expand on heating , some change their colors, some change their electric resistance etc. Nearly all the substance expands on heating. Liquids also expands on heating and are suitable as thermometric materials.

Ans 3: A thermometric liquid should have the following properties

- It should be visible
- It should have uniform thermal expansion
- It should have a low freezing point
- It should have a high boiling point
- It should not wet glass
- It should be a good conductor of heat
- It should have a small specific heat capacity