QB365 Question Bank Software Study Materials

Thermal Physics Important 2 Marks Questions With Answers (Book Back and Creative)

10th Standard

Science

Total Marks : 60

2 Marks

30 x 2 = 60

1) Define one calorie.

Answer : One calorie is defined as the amount of heat energy required to raise the temperature of 1 gram of water through 1^{o} C.

2) Distinguish between linear, Arial and superficial expansion.

Answer :

	LINEAR EXPRESSION	**ARIAL EXPANSION**	**SUPERFICIAL EXPANSION**
(i)	When a body is heated or cooled, the length of the body changed due to change in its temperature, then the expansion is called as linear expansion.	If there is an increase in the area of a solid object due to heating, then the expansion is called as superficial expansion.	If there is an increase in the volume of a solid due to heating, then the expansion is called as cubical expansion.
(ii)	The ratio of increase in length of the body per degree rise in temperature to its unit length is called as the co-efficieny of linear expansion.	The ratio of the increase in ratio of the body per degree rise in temperature to its unit area is called as co- efficient of superficial expansion.	The ratio of the increase in volume of the body per degree rise in temperature to its unit volume is called as co-efficient of cubical expansion.
(iii)	This is otherwise called as longitudinal expansion.	This is otherwise called as Areal expansion.	This is otherwise called as volumetric expansion.

3) What is co-efficient of cubical expansion?

Answer : (i) The ratio of increase in volume of the body per degree rise in temperature to its unit volume is called as co-efficient of cubical expansion.

(ii) SI unit is K^{-1}.

(iii) Co - efficient of cubical expansion can be expressed as $\frac{\Delta V}{V_o} = \alpha_v \Delta T$

4) State Boyle's law

Answer : When the temperature of a gas is kept constant, the volume of a fixed mass of gas is inversely proportional to its pressure. $\mathrm{P}\alpha\frac{1}{\mathrm{V}}$

5) State-the law of volume

Answer : Charles's law is otherwise called as the law of volume. It states that, when the pressure of gas is kept constant, the volume of the gas is directly proportional to the temperature of the gas.

$\mathrm{V} \propto T$

6) Distinguish between ideal gas and real gas.

Answer :

S.NO	IDEAL GAS	REAL GAS
i)	If the atoms or molecules of a gas do not interact with each other, then the gas is said to be an ideal gas or a perfect gas.	If the molecules or atoms of a gas interact with each other with a definite amount of intermolecular or interatomic force of attraction, then the gases are said to be a real gases.

7) What is co-efficient of real expansion?

Answer : (i) Co-efficient of rear-expansion is defined as the ratio of the true rise in the volume of the liquid per degree rise in temperature to its unit volume.
(ii) Its SI unit is K^{-1}

8) What is co-efficient of apparant expansion?

Answer : (i) Co-efficient of apparent expansion is defined as the ratio of the apparent rise in the volume of the liquid per degree rise in temperature to its unit volume.
(ii) Its SI unit is K^{-1}.

9) Define temperature.

Answer : Temperature is defined as the degree of hotness of a body. It is also defined as the property which determines whether a body is in equilibrium or not with the surroundings.

10) What is thermal energy?

Answer : Thermal energy is a form of energy which is transferred between any two objects due to the difference in their temperatures.

11) What is meant by heating?

Answer : The process in which heat energy flows from a object at a higher temperature to another object at lower temperature is known as heating.

12) Name the process of heat transmission.

Answer : This process of transmission may be done in any of the ways like conduction, convection or radiation.

13) Define one kilocalorie.

Answer : One kilocalorie is the amount of heat required to rise the temperature of 1 kilogram of water through 1°C.

14) What are the changes that will occur when heat energy is given to a substance?

Answer : (i) Temperature of the substance rises.
(ii) The substance may change its state from solid to liquid or liquid to gas.
(iii) The substance will expand when heated.

15) Define coefficient of linear expansion. Write its equation.

Answer : (i) Increase in length per unit of the length of the solid object per degree celsius rise in temperature is called 'coefficient of linear expansion'.
(ii) Its SI unit is per kelvin.

$$\frac{\triangle L}{L_0} = \alpha_L \triangle T \Rightarrow \alpha_L \frac{\triangle L}{\triangle T . L_0}$$

ΔL - change in length
L_0 - original length
ΔT - change in Temperature
α_L - coefficient of Linear expansion

16) Define coefficient of superficial expansion. Write its equation.

Answer : Increase in area per unit original area, per degree celsius rise in temperature is called coefficient of superficial expansion.

$\frac{\triangle L}{A_0} = \alpha_A \triangle T \Rightarrow \alpha_A \frac{\triangle A}{\triangle T . A_0}$

ΔL = change in Area

A_0 = original Area

ΔT =change in Temperature

α_A = coefficient of superficial expansion

17) What is cubical expansion?

Answer : If there is an increase in the volume of a solid object due to heating, then the expansion is called cubical or volumetric expansion.

18) What is real gas?

Answer : If the molecules or atoms of a gas interact with each other with a definite amount of intermolecular or inter atomic force of attraction, then, the gas is said to be real.

19) What are the other commonly used units of temperature?

Answer : There are other commonly used units of temperature such as degree celsius (°C) and degree fahrenheit (°F).

20) Write the relation between the different types of scale of temperature?

Answer : The relation between the different types of scale of temperature:

Celsius and Kelvin: K = C + 273,

Fahrenheit and Kelvin: [K] = (F + 460) x 5/9

0K = - 273°C.

21) Define thermal equilibrium.

Answer : Two or more physical systems or bodies are said to be in thermal equilibrium if there is no net flow of thermal energy between the systems.

22) Define thermal energy.

Answer : Thermal energy is a form of energy which is transferred between any two bodies due to the difference in their temperatures.

23) Define the term Heating.

Answer : The process in which heat energy flows from a body at a higher temperature to another object at lower temperature is Known as heating.

24) Define the term Kilocalorie.

Answer : Kilocalorie: One kilocalorie is defined as the amount of heat energy required to rise the temperature of 1 kilogram of water through 1°C

25) Write the different types of expansion of solid.

Answer : i) Linear expansion

ii) Superficial expansion

iii) Cubical expansion.

26) Tabulate the cubical expansion of some materials.

Answer :

S.No	Name of the material	Coefficient of cubic expansion (K^{-1})
i)	Aluminium	7×10^{-5}
ii)	Brass	6×10^{-5}
iii)	Glass	2.5×10^{-5}
iv)	Water	20.7×10^{-5}
v)	Mercury	18.2×10^{-5}

27) Define absolute scale of temperature. (or) Define thernnodynamic temperature.

Answer : The temperature measured in relation to absolute zero using the kelvin scale is known as absolute temperature.

28) Define thermodynamic temperature

Answer : The temperature measured in relation to absolute zero using the kelvin scale is known as absolute temperature.

29) What do you mean by Avogadro's number?

Answer : (i) It is the total number of atoms per mole of the substance.
(ii) It is equal to 6.023×10^{23} / mole.

30) Convert 80°F temperature into kelvin scale.

Answer : Fahrenheit [F] to Kelvin [K] = (F + 460) x 5/9

= (80 + 460) x 5/9 $= \frac{540 \times 5}{9}$

=300 K