St. Lawrence High School

A Jesuit Christian Minority Institution

Work Sheet

Date – 09.04.20 | Class – X

Subject – Physical Science | Topic – Thermal Phenomena

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1. MCQ.

i) The increase in length in case of thermal expansion does not depend on

a) Initial length b) increase in temperature

c) nature of material d) measuring unit of temperature

ii) The value of α of a metal is given as $1.6 \times 10^{-6}\ K^{-1}$ in SI unit. In C.G.S system, α will be –

a) More b) less c) equal d) $\frac{1}{273}$ times

iii) The C.G.S unit of β is –

a) $/K$ b) K^{-1} c) °C d) $°C^{-1}$

iv) Value of coefficient of volume expansion i.e. γ, depends on –

a)The initial volume b) change in temperature

c)nature of the material d) all of these

v) If $\alpha : \beta : \gamma = 1 : 2 : 3$ then which relation is correct?

a) $\frac{\alpha}{3} = \frac{\beta}{2} = \gamma$ b) $\alpha : \beta : \gamma = 1 : \frac{1}{2} : \frac{1}{3}$ c) $3\alpha = 2\beta$ d) $3\beta = 2\gamma$

2. Answer the following questions in short.

i) In the equation $(l_2 - l_1) = \alpha l_1 (t_2 - t_1)$, which parameter depends only on the nature of the material?

ii) The C.G.S units of all three expansion coefficients are same and that is $/°C\ or\ °C^{-1}$ - write true or false.

iii) The coefficient of superficial expansion of a metal is $10^{-6}/K$. Its α will be _____ /°C.

iv) β of iron is $24 \times 10^{-6}/°C$. The coefficient of volume expansion of iron will be _____.

v) Define "coefficient of superficial expansion".

3. Answer the following questions.

i) If the temperature of two iron rods of length 1cm and 1m respectively, changed by same amount, then which one will increase more and why?

ii) γ of a material is $36 \times 10^{-6}/°C$. What do you mean by this?

iii) α of iron is $12 \times 10^{-6}/K$ and α of silver is $18 \times 10^{-6}/K$. If two identical rods of iron and silver are heated through same temperature difference, then in which case the increase in length will be more? And why?

iv) Why do the numerical values of coefficient of linear expansions remain same in both the systems (i.e. in SI and C.G.S) ?

vi) For which condition, the increase in length of two strings (one made up of iron and another made up of silver) be always same when heated through same temperature difference? Given α of iron is $12 \times 10^{-6}/K$ and α of silver is $18 \times 10^{-6}/K$.

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