SHIKSHA CLASSES

Subject : Physics | **Question Paper** | **Total Marks :25**

Class : XI | **7 : Thermal Properties of Matter** | **Time : 1 Hour**

SECTION - A

Q.1 : Choose the correct option : 4

i) A liquid with coefficient of cubical expansion ? is contained in a vessel having coefficient of linear expansion $\frac{\gamma}{7}$. When heated, what will happen to the level of the liquid in the vessel?

a) It falls b) It rises

c) Remains unchanged

d) It may rise or fall

ii) The density of water at 20°C is 998 kg m^{-3} and that at 40°C is 992 kg m^{-3}. The coefficient of cubical expansion of water is

a) $0.2 \times 10^{-40} C^{-1}$ b) $0.6 \times 10^{-40} C^{-1}$

c) $3.02 \times 10^{-40} C^{-1}$ d) $0.4 \times 10^{-40} C^{-1}$

iii) The SI unit of latent heat is -------.

a) J^{-1} kg b) J kg^{-1}

c) J kg^{-1} ^{0}C d) J^{-1} kg ^{0}C

iv) The top of lake is frozen as the atmospheric temperature is -10°C. The temperature at the bottom of the lake is most likely to be

a) 0°C b) -4°C

c) 4°C d) -10°C

Q.2 : Answer the following : 2

i) Define Heat.

ii) Define Temperature.

SECTION B

: Answer the following : (ANY 3) 6

Q.3 : Write a short note on Absolute scale of temperature.

Q.4 : State the relation between all the three coefficients of thermal expansion.

Q.5 : A metal bar measures 60 cm to 10^0C. What would be its length at 110 ^{0}C?

Q.6 : Give the relation between principle and molar specific heats of a gas.

Q.7 : Explain how Newton's law of cooling can be verified experimentally.

Section C

: Answer the following : (ANY 3) 9

Q.8 : Explain the construction of colorimeter with the help of neat labelled diagram.

Q.9 : The difference in the temperature between the water at the top and bottom of a water fall 50 m high is $\left(\frac{7}{6}\right)^0$C. Calculate specific heat of water.

Q.10 : i) Define coefficient of areal expansion.

ii) A rod P and a rod Q are equal lengths at 0 ^{0}C. It at 100 ^{0}C, they differ in length by 1 mm, find their original lengths at 0^0 C.

(α P = 0.8×10^{-5}/ ^{0}C and α Q = 1.2×10^{-5}/ ^{0}C)

Q.11 : Draw a neat labelled graph showing relation between fahrenheit and celsius scale of temperature.

Q.12 : Distinguish between conduction and radiation.

SECTION D

: Answer the following : (ANY 1) 4

Q.13 : A brass rod has an area of cross - section of 5 cm^2 and has a length 50 cm. One end of of the metal rod is maintained at 127 ^{0}C. The other end is at a lower temperature. If the quantity of heat flowing through the rod is 0.06 Kcal/min, find the temperature of the other end and temperature gradient along the rod (K_{brass} = 109.2 J / ms K)

Q.14 : i) Define coefficient of linear expansion.

ii) Two rods A and B differ in length by 0.5 m at all temperatures. If= $2.4 \times 10^{-5}/^0$C and $\alpha_a = 1.2 \times 10^{-5}/^0$C find the length of the two rods at 0 ^{0}C.

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