

DPP

DAILY PRACTICE PROBLEMS

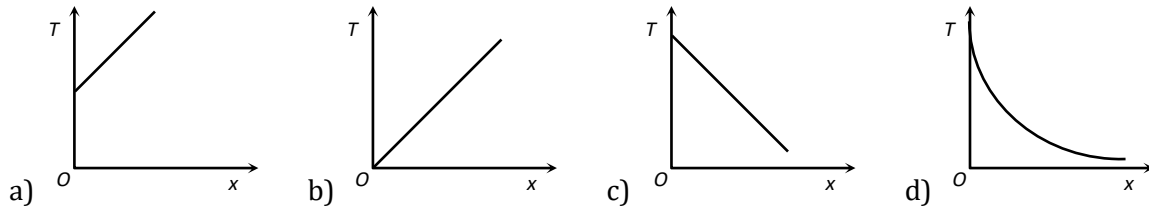
CLASS : XITH
DATE :

SUBJECT : PHYSICS
DPP NO. :9

Topic :- THERMAL PROPERTIES OF MATTER

- A piece of glass is heated to a high temperature and then allowed to cool. If it cracks, a probable reason for this is the following property of glass
 - Low thermal conductivity
 - High thermal conductivity
 - High specific heat
 - High melting point
- A metallic ball and highly stretched spring are made of the same material and have the same mass. They are heated so that they melt, the latent heat required
 - Are the same for both
 - Is greater for the ball
 - Is greater for the spring
 - For the two may or may not be the same depending upon the metal
- The maximum energy in the thermal radiation from a hot source occurs at a wavelength of $11 \times 10^{-5} \text{ cm}$. According to Wien's law, the temperature of the source (on Kelvin scale) will be n times the temperature of another source (on Kelvin scale) for which the wavelength at maximum energy is $5.5 \times 10^{-5} \text{ cm}$. The value n is
 - 2
 - 4
 - $\frac{1}{2}$
 - 1
- Calculate the amount of heat (in calories) required to convert 5 g of ice at 0°C to steam at 100°C
 - 3100 cal
 - 3200 cal
 - 3600 cal
 - 4200 cal
- Which of the following is more close to a black body?
 - Black board paint
 - Green leaves
 - Black holes
 - Red roses
- The initial temperature of a body is 80°C . If its temperature falls to 64°C in 5 minutes and in 10 minutes to 52°C then the temperature of surrounding will be
 - 26°C
 - 49°C
 - 35°C
 - 42°C
- The temperature, at which Centigrade and Fahrenheit scales give the same reading is
 - -40°
 - 40°
 - -30°
 - 30°

8. Heat is flowing through a conductor of length l from $x = 0$ to $x = l$. If its thermal resistance per unit length is uniform, which of the following graphs is correct



9. A wire 3 m in length and 1 mm in diameter at 30°C is kept in a low temperature at -170°C and is stretched by hanging a weight of 10 kg at one end. The change in length of the wire is ($Y = 2 \times 10^{11} \text{ Nm}^{-2}$, $g=10\text{ms}^{-2}$ and $\alpha = 1.2 \times 10^{-5} \text{ }^\circ\text{C}^{-1}$)
- a) 5.2 mm b) 2.5 mm c) 52 mm d) 25 mm

10. The Wien's displacement law express relation between
- a) Frequency and temperature
 b) Temperature and amplitude
 c) Wavelength and radiating power of black body
 d) Wavelength corresponding to maximum energy and temperature

11. In the Ingen Hauz's experiment the wax melts up to lengths 10 and 25cm on two identical rods of different materials. The ratio of thermal conductivities of the two material is
- a) 1 : 6.25 b) 6.25 : 1 c) 1 : $\sqrt{2.5}$ d) 1 : 2.5

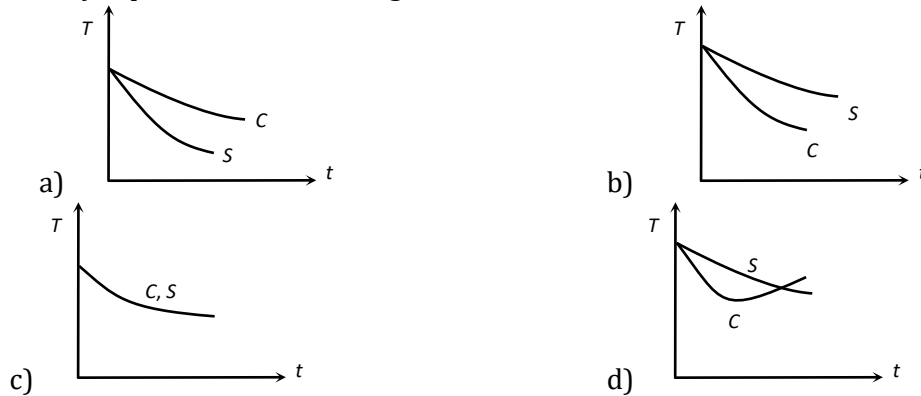
12. A metal rod AB of length $10x$ has its one end A in ice at 0°C and the other end B in water at 100°C . If a point P on the rod is maintained at 40°C , then it is found that equal amounts of water and ice evaporate and melt per unit time. The latent heat of evaporation of water is 540 cal/g latent heat of melting of ice is 80 cal/g . If the point P is at a distance of λx from the ice end A , find the value of λ . [Neglect any heat loss to the surrounding]
- a) 9 b) 2 c) 6 d) 1

13. The freezing point of the liquid decreases when pressure is increased, if the liquid
- a) Expands while freezing b) Contracts while freezing
 c) Does not change in volume while freezing d) None of these

14. If the temperature difference on the two sides of a wall increases from 100°C to 200°C , its thermal conductivity
- a) Remains unchanged b) Is doubled c) Is halved d) Becomes four times

15. The coefficient of apparent expansion of a liquid when determined using two different vessels A and B are γ_1 and γ_2 respectively. If the coefficient of linear expansion of the vessel A is α , the coefficient of linear expansion of the vessel B is
- a) $\frac{\alpha\gamma_1\gamma_2}{\gamma_1+\gamma_2}$ b) $\frac{\gamma_1-\gamma_2}{2\alpha}$ c) $\frac{\gamma_1-\gamma_2+\alpha}{3}$ d) $\frac{\gamma_1-\gamma_2}{3} +$

16. A hollow copper sphere S and a hollow copper cube C , both of negligible thin walls of same area, are filled with water at 90°C and allowed to cool in the same environment. The graph that correctly represents their cooling is



17. A pendulum clock keeps correct time at 0°C . Its mean coefficient of linear expansions is $\alpha/^\circ\text{C}$, then the loss in seconds per day by the clock if the temperature rises by $t^\circ\text{C}$ is

a) $\frac{\frac{1}{2}\alpha t \times 86400}{1 - \frac{\alpha t}{2}}$ b) $\frac{1}{2}\alpha t \times 86400$ c) $\frac{\frac{1}{2}\alpha t \times 86400}{(1 - \frac{\alpha t}{2})^2}$ d) $\frac{\frac{1}{2}\alpha t \times 86400}{1 + \frac{\alpha t}{2}}$

18. In which case the thermal conductivity increases from left to right

a) Al, Cu, Ag b) Ag, Cu, Al c) Cu, Ag, Al d) Al, Ag, Cu

19. A slab consists of two parallel layers of copper and brass of the same thickness and having thermal conductivities in the ratio 1:4. If the free face of brass is at 100°C and that of copper at 0°C , the temperature of interface is

a) 80°C b) 20°C c) 60°C d) 40°C

20. The volume of a metal sphere increases by 0.24% when its temperature is raised by 40°C . The coefficient of linear expansion of the metal is $\dots/^\circ\text{C}$.

a) 2×10^{-5} b) 6×10^{-5} c) 18×10^{-5} d) 1.2×10^{-5}