DPP
DAILY PRACTICE PROBLEMS

CLASS : XITH   SUBJECT : PHYSICS
DATE :   DPP NO. :3

Topic :- THERMAL PROPERTIES OF MATTER

1. The coefficient of volume expansion of a liquid is $49 \times 10^{-5} K^{-1}$. Calculate the fractional change in its density when the temperature is raised by $30°C$.
    a) 7.5×10^{-3} b) 3.0×10^{-3} c) 1.5×10^{-2} d) 1.1×10^{-3}

2. A body takes 5 $minutes$ to cool from $90°C$ to $60°C$. If the temperature of the surroundings is $20°C$, the time taken by it to cool from $60°C$ to $30°C$ will be
    a) $5\ min$ b) $8\ min$ c) $11\ min$ d) $12\ min$

3. Four pieces of iron heated in a furnace to different temperatures show different colours listed below. Which one has the highest temperature
    a) White   b) Yellow   c) Orange   d) Red

4. No other thermometer is as suitable as a platinum resistance thermometer to measure temperature in the entire range of
    a) $0°C$ to $100°C$ b) $100°C$ to $1500°C$ c) $-50°C$ to $+350°C$ d) $-200°C$ to $600°C$

5. Which of the following is the correct device for the detection of thermal radiation
    a) Constant volume thermometer   b) Liquid-in-glass thermometer
    c) Six's maximum and minimum thermometer   d) Thermopile

6. The cause of Fraunhoffer lines is
    a) Reflection of radiations by chromosphere   b) Absorption of radiations by chromosphere
    c) Emission of radiations by chromosphere   d) Transmission of radiations by chromosphere

7. While measuring the thermal conductivity of a liquid, we keep the upper part hot and lower part cool, so that
    a) Convection may be stopped   b) Radiation may be stopped
    c) Heat conduction is easier downwards   d) It is easier and more convenient to do so

8. One gram of ice is mixed with one gram of steam. At thermal equilibrium the temperature of mixture is
    a) $0°C$ b) $100°C$ c) $55°C$ d) $80°C$

9. The dimensions of thermal resistance are
   a) $M^{-1}L^{-2}T^3K$ b) $ML^2T^{-2}K^{-1}$ c) $ML^2T^{-3}K$ d) $ML^2T^{-2}K^{-2}$

10. Two rectangular blocks A and B of different metals have same length and same area of cross-section. They are kept in such a way that their cross-sectional area touch each other. The temperature at one end of A is 100°C and that of B at the other end is 0°C. If the ratio of their thermal conductivity is 1 : 3, then under steady state, the temperature of the junction in contact will be
    a) 25°C b) 50°C c) 75°C d) 100°C

11. Two identical metal balls at temperature 200°C and 400°C kept in air at 27°C. The ratio of net heat loss by these bodies is
    a) 1/4 b) 1/2 c) 1/16 d) $\frac{473^4-300^4}{673^4-300^4}$

12. Water is used to cool radiators of engines, because
    a) Of its lower density b) It is easily available
    c) It is cheap d) It has high specific heat

13. The graph, shown in the adjacent diagram, represents the variation of temperature (T) of two bodies, x and y having same surface area, with time (t) due to the emission of radiation. Find the correct relation between the emissivity and absorptivity power of the two bodies.
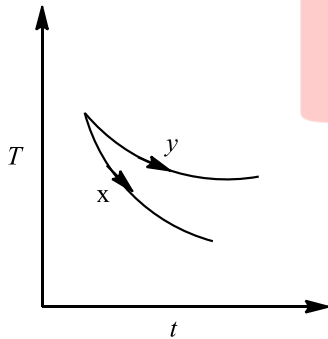
   a) $E_x > E_y$ and $a_x < a_y$ b) $E_x < E_x$ and $a_x > a_y$
   c) $E_x > E_x$ and $a_x > a_y$ d) $E_x < E_x$ and $a_x < a_y$

14. Two black metallic spheres of radius $4m$, at $2000\,K$ and $1m$ at $4000\,K$ will have ratio of energy radiation as
    a) 1 : 1 b) 4 : 1 c) 1 : 4 d) 2 : 1

15. Which one of the following processes depends on gravity?
    a) Conduction b) Convection c) Radiation d) None of these

16. A body has same temperature as that of the surrounding. Then
    a) It radiates same heat as it absorbs   b) It absorbs more, radiates less heat
    c) It radiates more, absorbs less heat   d) It never radiates heat

17. If at temperature $T_1 = 1000K$, the wavelength is $1.4 \times 10^{-6}m$, then at temperature the wavelength will be $2.8 \times 10^{-6}m$
    a) $2000K$ b) $500K$ c) $250K$ d) None of these

18. Temperature of a black body increases from $327°C$ to $927°C$, the initial energy possessed is $2KJ$, what is its final energy
    a) $32\ KJ$ b) $320\ KJ$ c) $1200\ KJ$ d) None of these

19. Two vessels of different materials are similar in size in every respect. The same quantity of ice filled in them gets melted in $20\ minutes$ and $40\ minutes$ respectively. The ratio of thermal conductivities of the materials is
    a) $5 : 6$ b) $6 : 5$ c) $3 : 1$ d) $2 : 1$

20. The weight of a person is $60\ kg$. If he gets 10^5 calories heat through food and the efficiency of his body is 28%, then upto how much height he can climb (approximately)
    a) $100\ m$ b) $200\ m$ c) $400\ m$ d) $1000\ m$