

THERMAL PROPERTIES OF MATTER AND HEAT TRANSFER

- Q1. A faulty thermometer reads freezing point and boiling point of water as -5°C and 95°C respectively. What is the correct value of temperature as it reads 60°C on faulty thermometer?
- (a) 60°C (b) 65°F
(c) 64°C (d) 62°C
- Q2. Temperature of equal masses of three different liquids A, B and C are 10°C , 15°C and 20°C respectively. The temperature when A and B are mixed is 13°C and when B and C are mixed, it is 16°C . What will be the temperature ($^{\circ}\text{C}$) when A and C are mixed is:
- (a) $140/11$ (b) $130/11$
(c) $150/11$ (d) $160/11$
- Q3. Two liquids A and B are at 32°C and 24°C . When mixed in equal masses the temperature of the mixture is found to be 28°C . Their specific heats are in the ratio of
- (a) $3 : 2$ (b) $2 : 3$
(c) $1 : 1$ (d) $4 : 3$
- Q4. A pendulum clock is 5s fast at temperature of 15°C and 10s slow at a temperature of 30°C . At what temperature does it give the correct time?
- (a) 18°C (b) 20°C
(c) 22°C (d) 25°C
- Q5. The thermal conductivity of a rod depends on
- (a) length
(b) mass
(c) area of cross-section
(d) material of the rod
- Q6. Two cylindrical rods of lengths l_1 and l_2 , radii r_1 and r_2 have thermal conductivities K_1 and K_2 respectively. The ends of the rods are maintained at the same temperature difference. If $l_1 = 2l_2$ and $r_1 = \frac{r_2}{2}$, the rates of heat flow in them will be the same if $\frac{K_1}{K_2}$ is—
- (a) 1 (b) 2
(c) 4 (d) 8

Q7. Two solid cylinders of equal length are made of material of thermal conductivity K_1 and K_2 . Their thermal resistance will be same if the ratio of their diameters is–

- (a) $\frac{K_1}{K_2}$ (b) $\left(\frac{K_1}{K_2}\right)^2$
(c) $\sqrt{\frac{K_2}{K_1}}$ (d) $\frac{K_2}{K_1}$

Q8. The ratio of energy of radiation emitted by a black body at 27°C and 927°C is–

- (a) 1 : 4 (b) 1 : 16
(c) 1 : 64 (d) 1 : 256

Q9. A body cools down from 80°C to 50°C in 5 minutes. How much time it will take to cool down from 50°C to 30°C ? The temperature of the surrounding is 20°C . Assume Newton's law of cooling to be valid.

- (a) 5 minutes
(b) More than 5 minute
(c) Less than 5 minute
(d) Depends on the temperature of the surrounding.

Q10. Two rods of same length and material transfer a given amount of heat in 12s, when they are joined end to end. But when they are joined

lengthwise, they will transfer same heat in same conditions in

- (a) 24 s (b) 3 s
(c) 1.5 s (d) 4.8 s

Q11. A black body at 200 K is found to emit maximum energy at a wavelength of $14\ \mu\text{m}$. When its temperature is raised to 1000 K, the wavelength at which maximum energy is emitted is–

- (a) 14 micrometer
(b) 70 micrometer
(c) 2.8 micrometer
(d) 28 micrometer

Q12. Two rods of same dimensions, but made of different materials are joined end to end with their free ends being maintained at 0°C and 100°C respectively. The temperature of the junction is

70°C . If the ratio $\frac{K_1}{K_2} = \frac{n}{7}$, then

find the value of n.

- (a) 3 (b) 4
(c) 5 (d) 6