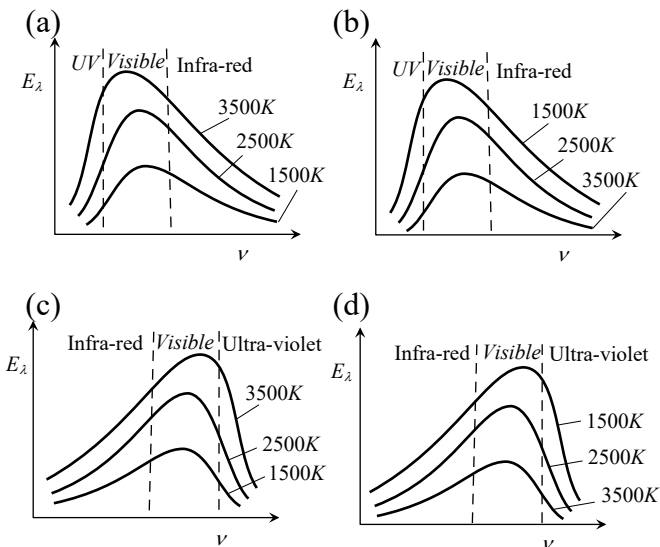
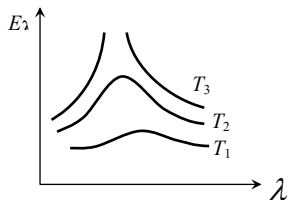


4. Following graph shows the correct variation in intensity of heat radiations by black body and frequency at a fixed temperature

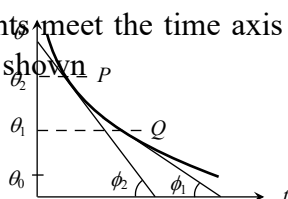


5. Variation of radiant energy emitted by sun, filament of tungsten lamp and welding arc as a function of its wavelength is shown in figure. Which of the following option is the correct match [IIT-JEE (Screening) 2005]



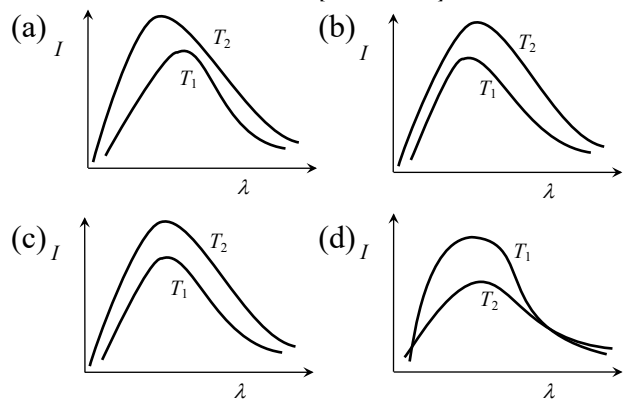
- (a) Sun - T_1 , tungsten filament - T_2 , welding arc - T_3
 (b) Sun - T_2 , tungsten filament - T_1 , welding arc - T_3
 (c) Sun - T_3 , tungsten filament - T_2 , welding arc - T_1
 (d) Sun - T_1 , tungsten filament - T_3 , welding arc - T_2

6. A body cools in a surrounding which is at a constant temperature of θ_0 . Assume that it obeys Newton's law of cooling. Its temperature θ is plotted against time t . Tangents are drawn to the curve at the points $P(\theta = \theta_1)$ and $Q(\theta = \theta_2)$. These tangents meet the time axis at angles of ϕ_2 and ϕ_1 , as shown



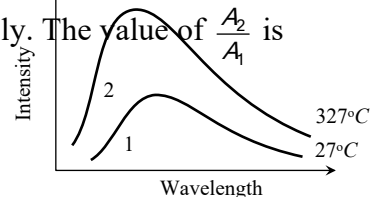
- (a) $\frac{\tan \phi_2}{\tan \phi_1} = \frac{\theta_1 - \theta_0}{\theta_2 - \theta_0}$ (b) $\frac{\tan \phi_2}{\tan \phi_1} = \frac{\theta_2 - \theta_0}{\theta_1 - \theta_0}$
 (c) $\frac{\tan \phi_1}{\tan \phi_2} = \frac{\theta_1}{\theta_2}$ (d) $\frac{\tan \phi_1}{\tan \phi_2} = \frac{\theta_2}{\theta_1}$

7. Shown below are the black body radiation curves at temperatures T_1 and T_2 ($T_2 > T_1$). Which of the following plots is correct [AIIMS 2003]

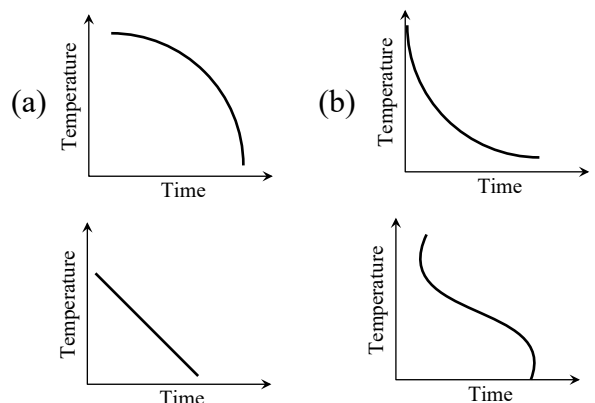


8. The spectrum of a black body at two temperatures 27°C and 327°C is shown in the figure. Let A_1 and A_2 be the areas under the two curves respectively. The value of $\frac{A_2}{A_1}$ is

- (a) 1 : 16
 (b) 4 : 1
 (c) 2 : 1
 (d) 16 : 1

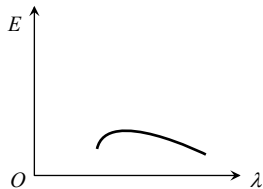


9. A block of metal is heated to a temperature much higher than the room temperature and allowed to cool in a room free from air currents. Which of the following curves correctly represents the rate of cooling [Manipal MEE 1995]



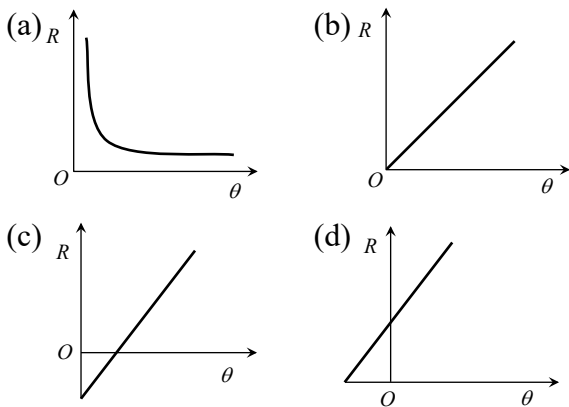
(c) (d)

10. The energy distribution E with the wavelength (λ) for the black body radiation at temperature T Kelvin is shown in the figure. As the temperature is increased the maxima will

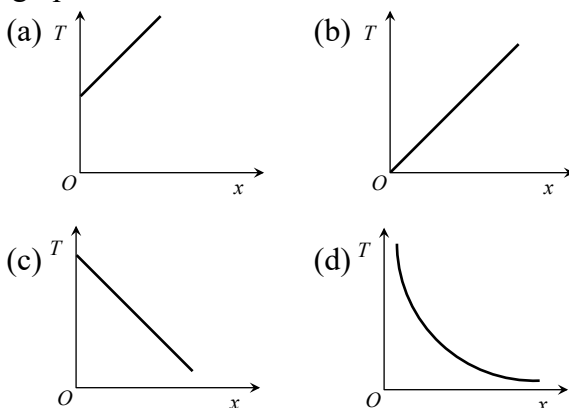


- (a) Shift towards left and become higher
 (b) Rise high but will not shift
 (c) Shift towards right and become higher
 (d) Shift towards left and the curve will become broader

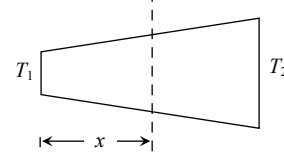
11. For a small temperature difference between the body and the surroundings the relation between the rate of loss heat R and the temperature of the body is depicted by



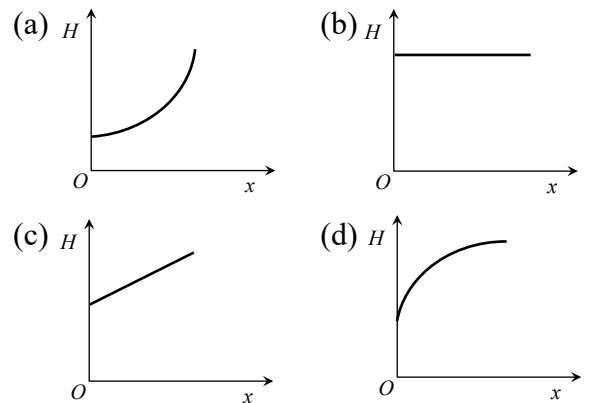
12. Heat is flowing through a conductor of length l from $x = 0$ to $x = l$. If its thermal resistance per unit length is uniform, which of the following graphs is correct



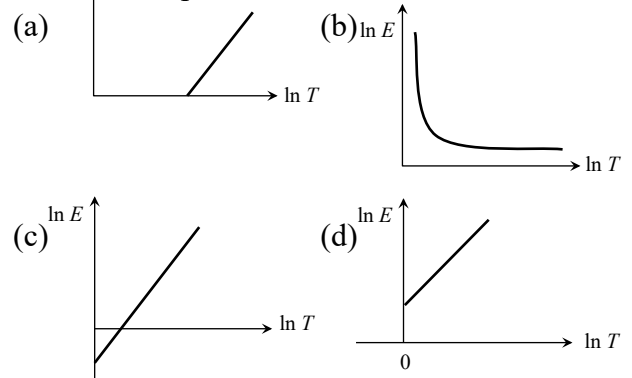
13. Radius of a conductor increases uniformly from left end to right end as shown in fig.



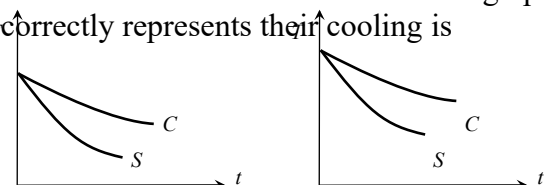
Material of the conductor is isotropic and its curved surface is thermally isolated from surrounding. Its ends are maintained at temperatures T_1 and T_2 ($T_1 > T_2$): If, in steady state, heat flow rate is equal to H , then which of the following graphs is correct



14. Which of the following graphs correctly represents the relation between $\ln E$ and $\ln T$ where E is the amount of radiation emitted per unit time from unit area of a body and T is the absolute temperature [DCE 2002]

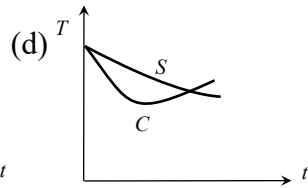
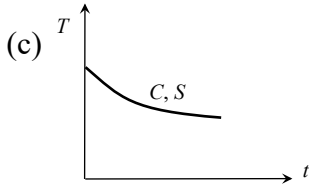


15. A hollow copper sphere S and a hollow copper cube C , both of negligible thin walls of same area, are filled with water at 90°C and allowed to cool in the same environment. The graph that correctly represents their cooling is

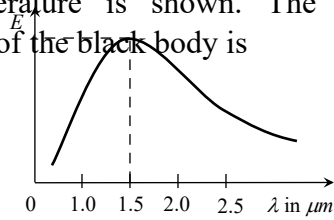


(a)

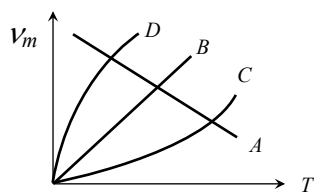
(b)



16. In the figure, the distribution of energy density of the radiation emitted by a black body at a given temperature is shown. The possible temperature of the black body is



- (a) 1500 K (b) 2000 K
(c) 2500 K (d) 3000 K
17. Which of the following is the $\nu_m = T$ graph for a perfectly black body (ν_m = maximum frequency of radiation)



[RPMT 1996]

- (a) A (b) B
(c) C (d) D