DPP

DAILY PRACTICE PROBLEMS

CLASS : XITH **SUBJECT : PHYSICS**

DATE : **DPP NO. :10**

Topic :- THERMAL PROPERTIES OF MATTER

1.. The original temperature of a black body is 727°C. The temperature at which this black body must be raised so as to double the total radiant energy, is

a) 971 K b) 1190 K c) 2001 K d) 1458 K

2. Three objects coloured black, gray and white can with stand hostile conditions at 2800°C. These objects are thrown into furnace where each of them attains a temperature of 2000°C. Which object will glow brightest?

a) The white object b) The black object

c) All glow with equal brightness d) Gray object

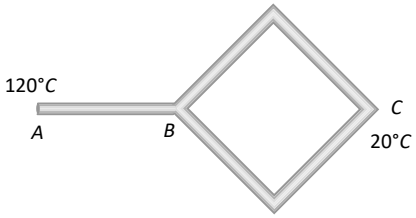
3. Mercury thermometers can be used to measure temperatures upto

a) 100°C b) 212°C c) 360°C d) 500°C

4. Two spheres of radii 8 cm and 2 cm are cooling. Their temperatures are 127°C and 527°C respectively. Find the ratio of energy radiated by them in the same time

a) 0.06 b) 0.5 c) 1 d) 2

5. Five identical rods are joined as shown in figure. Point A and C are maintained at temperature 120°C and 20°C respectively. The temperature of junction B will be



a) 100°C b) 80°C c) 70°C d) 0°C

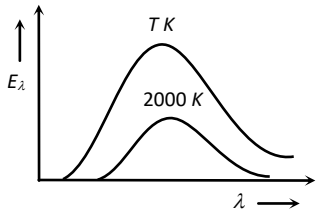
6. The saturation vapour pressure of water at 100°C is

a) 739 mm of mercury b) 750 mm of mercury c) 760 mm of mercury d) 712 mm of mercury

7. Two spheres made of same substance have diameters in the ratio $1:2$. Their thermal capacities are in the ratio of

a) $1:2$ b) $1:8$ c) $1:4$ d) $2:1$

8. The adjoining diagram shows the spectral energy density distribution E_λ of a black body at two different temperatures. If the areas under the curves are in the ratio 16 : 1, the value of temperature T is



a) 32,000 K b) 16,000 K c) 8,000 K d) 4,000 K

9. A constant pressure air thermometer gave a reading of 47.5 units of volume when immersed in ice cold water, and 67 units in a boiling liquids. The boiling point of the liquid will be

a) 135°C b) 125°C c) 112°C d) 100°C

10. A hammer of mass $1kg$ having speed of 50 m/s, hit a iron nail of mass 200 gm. If specific heat of iron is 0.105 cal/gm°C and half the energy is converted into heat, the raise in temperature of nail is

a) 7.1°C b) 9.2°C c) 10.5°C d) 12.1°C

11. If a black body emits 0.5 J of energy per second when it is at 27°C, then the amount of energy emitted by it when it is at 627°C will be

a) 40.5 J b) 162 J c) 13.5 J d) 135 J

12. A calorimeter of mass 0.2 kg and specific heat 900 $J/kg\text{-}K$. Containing 0.5 kg of a liquid of specific heat 2400 $J/kg\text{-}K$. Its temperature falls from 60°C to 55°C in one minute. The rate of cooling is

a) 5 J/s b) 15 J/s c) 100 J/s d) 115 J/s

13. It is difficult to cook rice in an open vessel by boiling it a high altitudes because of

a) Low boiling point and high pressure b) High boiling point and low pressure
c) Low boiling point and low pressure d) High boiling point and high pressure

14. A vessel contains 110 g of water. The heat capacity of the vessel is equal to 10 g of water. The initial temperature of water in vessel in 10°C. If 220 g of hot water at 70°C is poured in the vessel, the final temperature neglecting radiation loss will be

a) 70°C b) 80°C c) 60°C d) 50°C

15. A black body at 227°C radiates heat at the rate of 7 Cal/cm^2s. At a temperature of 727°C, the rate of heat radiated in the same units will be
a) 60 b) 50 c) 112 d) 80

16. A cane is taken out from a refrigerator at 0°C. The atmospheric temperature is 25°C. If t_1 is the time taken to heat from 0°C to 5°C and t_2 is the time taken from 10°C to 15°C, then
a) $t_1 > t_2$ b) $t_1 < t_2$ c) $t_1 = t_2$ d) There is no relation

17. Equal masses of two liquids are filled in two similar calorimeters. The rate of cooling will
a) Depend on the nature heats of liquids b) Depend on the specific heats of liquids
c) Be same for both the liquids d) Depend on the mass of the liquids

18. Absolute zero ($0\ K$) is that temperature at which
a) Matter ceases to exist b) Ice melts and water freezes
c) Volume and pressure of a gas becomes zero d) None of these

19. A wall has two layers A and B made of different materials. The thickness of both the layers is the same. The thermal conductivity of A and B are K_A and K_B such that $K_A = 3K_B$. The temperature across the wall is 20°C. In thermal equilibrium
a) The temperature difference across $A = 15$°C
b) The temperature difference across $A = 5$°C
c) The temperature difference across A is 10°C
d) The rate of transfer of heat through A is more than that through B

20. The apparent coefficient of expansion of a liquid when heated in a copper vessel is C and when heated in a silver vessel is S. If A is the linear coefficient of expansion of copper, then the linear coefficient of expansion of silver is
a) $\frac{C+S-3A}{3}$ b) $\frac{C+3A-S}{3}$ c) $\frac{S+3A-C}{3}$ d) $\frac{C+S+3A}{3}$