Practice Problems

Problems based on conduction

▶ *Basic level*

1. Mud houses are cooler in summer and warmer in winter because

(a) Mud is superconductor of heat (b) Mud is good conductor of heat

(c) Mud is bad conductor of heat (d) None of these

2. Heat current is maximum in which of the following (rods are of identical dimension)

(a) 

(b) 

(c) 

(d) 

3. Consider the following statements

Assertion (A) : Woolen clothes keep the body warm in winter

Reason (R) : Air is a bad conductor of heat

Of these statements **[AIIMS 2002]**

(a) Both *A* and *R* are true and the *R* is a correct explanation of the *A*

(b) Both *A* and *R* are true but the *R* is not a correct explanation of the *A*

(c) *A* is true but the *R* is false

(d) Both *A* and *R* are false

(e) *A* is false but the *R* is true

4. The lengths and radii of two rods made of same material are in the ratios 1 : 2 and 2 : 3 respectively. If the temperature difference between the ends for the two rods be the same then in the steady state. The amount of heat flowing per second through them will be in the ratio

(a) 1 : 3 (b) 4 : 3 (c) 8 : 9 (d) 3 : 2

5. 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 30 minutes. The ratio of their thermal conductivities will be

(a) 1.5 (b) 1 (c) 2/3 (d) 4

6. If the coefficient of conductivity of aluminium is 0.5 $cal/cm\text{-}sec\text{-}^{o}C$, then in order to conduct 10 $cal/sec\text{-}cm^2$ in the steady state, the temperature gradient in aluminium must be

(a) $5^{o}C/cm$ (b) $10^{o}C/cm$ (c) $20^{o}C/cm$ (d) $10.5^{o}C/cm$

7. The area of the glass of a window of a room is $10m^2$. and thickness 2 *mm*. The outer and inner temperature are $40^{o}C$ and $20^{o}C$ respectively. Thermal conductivity of glass in *MKS* system is 0.2. The heat flowing in the room per second will be **[MP PMT 1989]**

(a) 3×10^4 *Joules* (b) 2×10^4 *Joules* (c) 30 *Joules* (d) 45 *Joules*

8. When two ends of a rod wrapped with cotton are maintained at different temperatures and after some time every point of the rod attains a constant temperature, then

(a) Conduction of heat at different points of the rod stops because the temperature is not increasing

(b) Rod is bad conductor of heat

(c) Heat is being radiated from each point of the rod

(d) Each point of the rod is giving heat to its neighbour at the same rate at which it is receiving heat

9. 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*

10. To a rough approximation, conductivities of metals are about

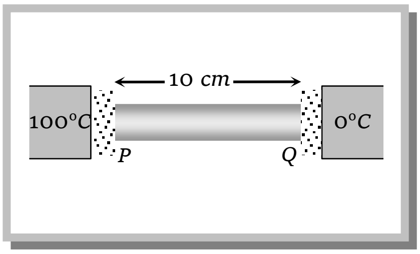
(a) 1000 times as those of liquids and 10,000 times of gases

(b) 10 times as those of liquids and 100 times of gases

(c) 100 times as those of liquids and 1000 times of gases

(d) 10,000 times as those of liquids and 1000 times of gases

11. A copper bar 10 *cm* long has its ends pressed against copper tanks at 0 $^\circ C$ and 100 $^\circ C$. The ends are separated by layers of dust 0.1 *mm* thick. If conductivity of dust is 0.001 times that of copper, the temperatures of end P and Q of bar are [Take rate of flow of heat constant from P to Q]



(a) 33.3 $^\circ C$ and 66.7 $^\circ C$

(b) 66.7 $^\circ C$ and 33.3 $^\circ C$

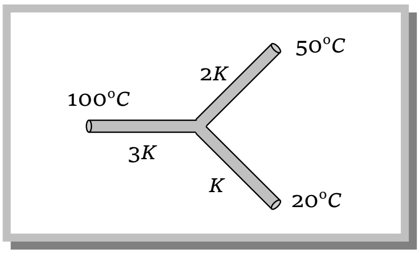
(c) 75 $^\circ C$ and 25 $^\circ C$

(d) 60 $^\circ C$ and 40 $^\circ C$

Problems based on combination of conductors

▶ Basic level

12. Three rods of the same dimension have thermal conductivities $3K$, $2K$ and K. They are arranged as shown in figure given below, with their ends at $100^\circ C$, $50^\circ C$ and $20^\circ C$. The temperature of their junction is



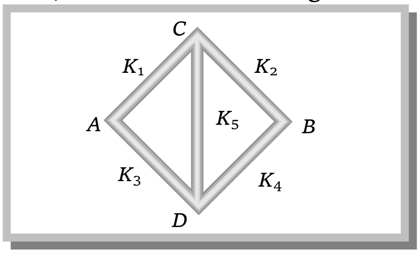
(a) 60°

(b) 70°

(c) 50°

(d) 35°

13. Five rods of same dimensions are arranged as shown in the figure. They have thermal conductivities K_1, K_2, K_3, K_4 and K_5. When points A and B are maintained at different temperatures, no heat flows through the central rod if **[KCET 2002]**



(a) $K_1 = K_4$ and $K_2 = K_3$

(b) $K_1 K_4 = K_2 K_3$

(c) $K_1 K_2 = K_3 K_4$

(d) $\frac{K_1}{K_4} = \frac{K_2}{K_3}$

14. A wall has two layers A and B each made of different materials. The thickness of both the layers is the same. The thermal conductivity of A, $K_A=3K_B$. The temperature difference across the wall is 20^oC in thermal equilibrium **[CPMT 1998]**

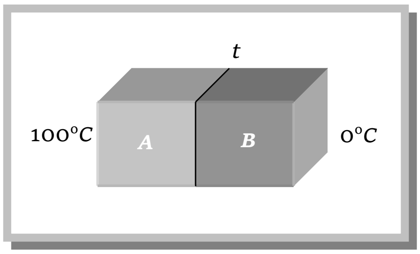
(a) The temperature difference across A is 15^oC

(b) Rate of heat transfer across A is more than across B

(c) Rate of heat transfer across both is same

(d) Temperature difference across A is $5\ ^oC$

15. Two metal cubes A and B of same size are arranged as shown in the figure. The extreme ends of the combination are maintained at the indicated temperatures. The arrangement is thermally insulated. The coefficients of thermal conductivity of A and B are 300 $W/m\ ^oC$ and 200 $W/m\ ^oC$, respectively. After steady state is reached, the temperature t of the interface will be **[IIT-JEE 1996]**



(a) 45^oC

(b) 90^oC

(c) 30^oC

(d) 60^oC

16. Two cylinders P and Q have the same length and diameter and are made of different materials having thermal conductivities in the ratio 2 : 3. These two cylinders are combined to make a cylinder. One end of P is kept at 100^oC and another end of Q at 0^oC. The temperature at the interface of P and Q is

(a) 30^oC (b) 40^oC (c) 50^oC (d) 60^oC

17. Two identical plates of different metals are joined to form a single plate whose thickness is double the thickness of each plate. If the coefficients of conductivity of each plate are 2 and 3 respectively, then the conductivity of composite plate will be **[MP PAT 1990]**

(a) 5 (b) 2.4 (c) 1.5 (d) 1.2

18. Four identical rods of same material are joined end to end to form a square. If the temperature difference between the ends of a diagonal is 100^oC, then the temperature difference between the ends of other diagonal will be **[MP PET 1989]**

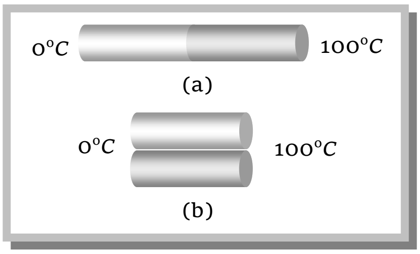
(a) 0^oC

(b) $\frac{100}{l}\ ^oC$; where l is the length of each rod

(c) $\frac{100}{2l}\ ^oC$

(d) 100^oC

19. Two identical rods of metal are welded end to end as shown in figure (a). 20 calories of heat flows through it in 4 minutes. If the rods are welded as shown in figure (b), the same amount of heat will flow through the rods in



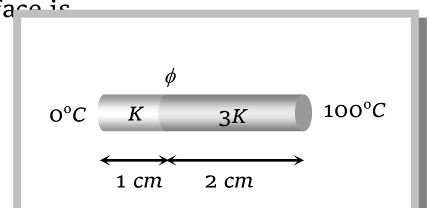
(a) 1 minute

(b) 2 minutes

(c) 4 minutes

(d) 16 minutes

20. Two bars of thermal conductivities k and $3k$ and lengths 1 cm and 2 cm respectively have equal cross-sectional area, they are joined lengths wise as shown in the figure. If the temperature at the ends of this composite bar is 0^oC and 100^oC respectively, then the temperature ϕ of the interface is



(a) 50^oC

(b) $\frac{100}{3}\,^oC$

(c) 60^oC

(d) $\frac{200}{3}\,^oC$

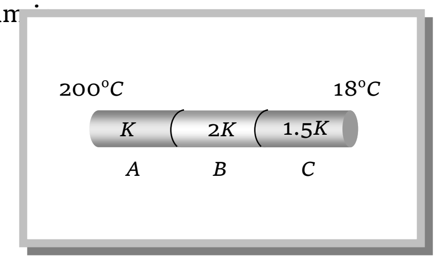
21. Three rods *A, B* and *C* have the same dimensions. Their thermal conductivities are K_A, K_B and K_C respectively. *A* and *B* are placed end to end, with their free ends kept at a certain temperature difference. *C* is placed separately, with its ends kept at the same temperature difference. The two arrangements conduct heat at the same rate. K_C must be equal to

(a) $K_A + K_B$ (b) $\frac{K_A K_B}{K_A + K_B}$ (c) $\frac{1}{2}(K_A + K_B)$ (d) $2.\left(\frac{K_A K_B}{K_A + K_B}\right)$

22. The three rods described in the previous question are placed individually, with their ends kept at the same temperature difference. The rate of heat flow through *C* is equal to the rate of combined heat flow through *A* and *B*. K_C must be equal to

(a) $K_A + K_B$ (b) $\frac{K_A K_B}{K_A + K_B}$ (c) $\frac{1}{2}(K_A + K_B)$ (d) $2.\left(\frac{K_A K_B}{K_A + K_B}\right)$

23. Three rods *A, B* and *C* of the same length and cross-sectional area are joined in series as shown in the figure. Their thermal conductivities are in the ratio 1 : 2 : 1.5 . If the open ends of *A* and *C* are at 200 °*C* and 18 °*C*, respectively, the temperature at junction of *A* and *B* in equilibrium



(a) 74 °*C*

(b) 116 °*C*

(c) 156 °*C*

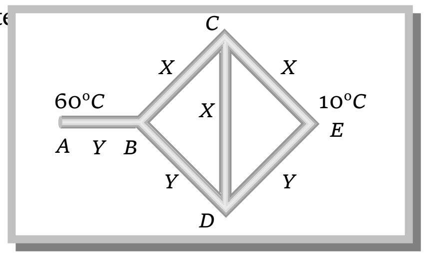
(d) 148 °*C*

▶▶ *Advance level*

24. Three rods of identical area of cross-section and made from the same metal form the sides of an isosceles triangle *ABC*. right angled at *B*. The points *A* and *B* are maintained at temperatures *T* and $\sqrt{2}T$ respectively. In the steady state the temperature of the point *C* is T_C. Assuming that only heat conduction takes place, $\frac{T_C}{T}$ is equal to **[IIT-JEE 1995]**

(a) $\frac{1}{(\sqrt{2}+1)}$ (b) $\frac{3}{(\sqrt{2}+1)}$ (c) $\frac{1}{2(\sqrt{2}-1)}$ (d) $\frac{1}{\sqrt{3}(\sqrt{2}-1)}$

25. Three rods of material *X* and three rods of material *Y* are connected as shown in figure. All are identical in length and cross-sectional area. If end *A* is maintained at 60°*C*, end *E* at 10°*C*, thermal conductivity of *X* is 0.92 *cal/sec-cm-°C* and that of *Y* is 0.46 *cal/sec-cm-°C*, then find the te



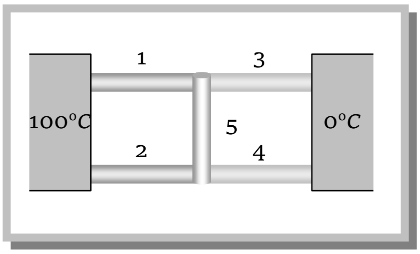
(a) 20°*C*, 30°*C*, 20°*C*

(b) 30°*C*, 20°*C*, 20°*C*

(c) 20°*C*, 20°*C*, 30°*C*

(d) 20°*C*, 20°*C*, 20°*C*

26. Five rods 1, 2, 3, 4, 5 are connected to form the letter H as shown in the figure. The rods are of same length and radii but having conductivities in the ratio $K_1 : K_2 : K_3 : K_4 : K_5 = 1 : 1 : 2 : 2 : 3$. The uniform temperature of the rod 5 in the steady state is



(a) $\frac{100}{3}\,^oC$

(b) 50°C

(c) 60°C

(d) $\frac{200}{3}\,^oC$

Miscellaneous problems based on conduction

▶ *Basic level*

27. There are two identical vessels filled with equal amounts of ice. The vessels are of different metals. If the ice melts in the two vessels in 20 and 35 minutes respectively the ratio of the coefficients of thermal conductivity of the two metals is **[MP PET 2001]**

(a) 4 : 7 (b) 7 : 4 (c) 16 : 49 (d) 49 : 16

28. Temperature at the surface of lake is –20°C. Then temperature of water just below the lower surface of ice layer is **[RPET 2000]**

(a) – 4° C (b) 0° C (c) 4° C (d) – 20° C

29. Two identical rods of copper and iron are coated with wax uniformly. When one end of each is kept at temperature of boiling water, the length upto which wax melts are 8.4 *cm* and 4.2 *cm* respectively. If thermal conductivity of copper is 0.92, then thermal conductivity of iron is

(a) 0.23 (b) 0.46 (c) 0.115 (d) 0.69

30. During severe winter in the low temperature zones of the world, the superficial parts of the lakes are frozen, leaving water below. The freezing at the bottom is prevented because

(a) The conductivity of ice is low (b) The water has large specific heat

(c) The water has large latent heat of fusion (d) The temperature of the earth at the bottom of the lake is high

31. If the steady thickness of ice layer is 100 *cm* and that of water is 4.20 *m* in a lake of a cold country where temperature of air is – 5.0°C and temperature of water at the bottom is 4°C. The ratio of the thermal conductivity of water to that of ice is

(a) 4 : 3 (b) 4.25 : 1 (c) 3 : 1 (d) 5.25 : 1

32. A 10 *cm* layer of ice has been formed over a pond of water. The temperature of air above is –5°C. How long will it take the layer to become 10.1 *cm* thick? (Given K_{ice} = 0.008 *CGS* units, density of ice = 1 *gm/cc* and L_{ice} = 80 *cal/gm*)

(a) 2005 *sec* (b) 1705 *sec* (c) 1405 *sec* (d) 705 *sec*

Problems based on convection

▶ *Basic level*

33. One feels hotter at the top of a flame than the sides because of

(a) Conduction (b) Convection (c) Radiations (d) Both 'a' and 'c'

34. Mode of transmission of heat, in which heat is carried by the moving particles, is **[KCET (Med.) 1999]**

(a) Radiation (b) Conduction (c) Convection (d) Wave motion

35. While measuring the thermal conductivity of a liquid, we keep the upper part hot and lower part cool, so that **[CPMT 1985; MP PMT / PET 1988]**

(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

36. The layers of atmosphere are heated through **[MP PET 1986]**

(a) Convection (b) Conduction (c) Radiation (d) (b) and (c) both

37. The rate of loss of heat from a body cooling under conditions of forced convection is proportional to its (A) heat capacity (B) surface area (C) absolute temperature (D) excess of temperature over that of surrounding state if

(a) A, B, C are correct (b) Only *A* and *C* are correct (c) Only *B* and *D* are correct (d) Only *D* is correct

Problems based on radiation

Basic level

38. Heat travels through vacuum by

(a) Conduction (b) Convection (c) Radiation (d) Both (a) and (b)

39. For a perfectly black body, its absorptive power is **[MP PMT 1989, 92; RPET 2001, 03; AFMC 2003]**

(a) 1 (b) 0.5 (c) 0 (d) Infinity

40. Which of the following is the example of ideal black body

(a) Kajal (b) Black board (c) A pin hole in a box (d) None of these

41. Which of the following is the best example of an ideal black body

(a) Lamp black (b) Platinum black

(c) Highly heated charcoal lamp (d) Cavity maintained at constant temperature

42. The spectrum from a black body radiation is a **[MP PMT 1989; RPET 2000]**

(a) Line spectrum (b) Band spectrum (c) Continuous spectrum (d) Line and band spectrum both

43. In summer one feels cold on entering an air conditioned room. This can be explained by

(a) Newton's law of cooling (b) Stefan's law

(c) Kirchoff's law (d) Prevost's theory of heat exchange

44. Out of the radiations falling on surface of a body, 30% radiations are absorbed and 30% are transmitted then its reflection coefficient will be

(a) 0.3 (b) 0.6 (c) 0.4 (d) Zero

Problems based on Kirchoff's law

Basic level

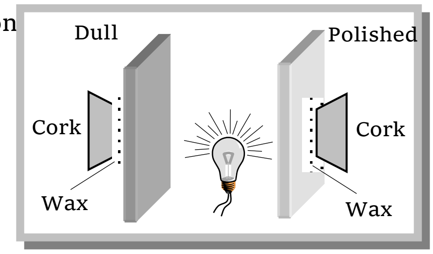
45. There is a black spot on a body. If the body is heated and carried in dark room then it glows more. This can be explained on the basis of

(a) Newton's law of cooling (b) Wien's law (c) Kirchoff's law (d)

46. If between wavelength λ and $\lambda + d\lambda$, e_λ and a_λ be the emissive and absorptive powers of a body and E_λ be the emissive power of a perfectly black body, then according to Kirchoff's law, which is true

(a) $e_\lambda = a_\lambda = E_\lambda$ (b) $e_\lambda E_\lambda = a_\lambda$ (c) $e_\lambda = a_\lambda E_\lambda$ (d) $e_\lambda a_\lambda E_\lambda = constant$

47. The figure shows two similar sheets of tin plate, one polished and the other painted dull black. A piece of cork is attached on the reverse side of each plate by means of melted paraffin wax. What will happen when an electric bulb placed exactly midway between them is switched on



(a) The cork on the polished plate falls off first

(b) The cork on the dull black plate falls off first

(c) Both corks fall off at the same time

(d) Neither cork falls off

48. During total solar eclipse Fraunhoffer's lines appear bright because

(a) Moon totally covers both parts of sun photo sphere and chromosphere

(b) Sun light is scattered by moon

(c) Moon blocks the radiations emitted by chromosphere

(d) Moon blocks the radiations emitted by photosphere and radiations emitted by chromosphere reach the earth

Problems based on Stefan's law

▶ *Basic level*

49. A black body radiates energy at the rate of $E\ watt/m^2$ at a high temperature $T\ K$. When the temperature is reduced to $\frac{T}{2}K$, the radiant energy will be

(a) $\frac{E}{16}$ (b) $\frac{E}{4}$ (c) $4E$ (d) $16E$

50. At temperature T, the power radiated by a body is Q *watts*. At the temperature $3T$ the power radiated by it will be **[MP PET 2000]**

(a) $3Q$ (b) $9Q$ (c) $27Q$ (d) $81Q$

51. A black metal foil is warmed by radiation from a small sphere at temperature T and at a distance d. It is found that the power received by the foil is 'P'. If both the temperature and the distance are doubled, the power received by the foil will be **[MP PMT 1997]**

(a) $16P$ (b) $4P$ (c) $2P$ (d) P

52. A solid sphere and a hollow sphere of the same material and size are heated to the same temperature and allowed to cool in the same surroundings. If the temperature difference between each sphere and its surroundings is T, then **[Manipal MEE 1995]**

(a) The hollow sphere will cool at a faster rate for all values of T

(b) The solid sphere will cool at a faster rate for all values of T

(c) Both spheres will cool at the same rate for all values of T

(d) Both spheres will cool at the same rate only for small values of T

53. Two bodies A and B have thermal emissivities of 0.01 and 0.81 respectively. The outer surface areas of the two bodies are the same. The two bodies emit total radiant power at the same rate. The wavelength λ_B corresponding to maximum spectral radiancy in the radiation from B is shifted from the wavelength corresponding to maximum spectral radiancy in the radiation from A, by 1.00 μm. If the temperature of A is 5802 K **[IIT-JEE 1994]**

(a) The temperature of B is 1934 K (b) $\lambda_B = 1.5\ \mu m$

(c) The temperature of B is 11604 K (d) The temperature of B is 2901 K

54. The temperature of a piece of iron is 27°C and it is radiating energy at the rate of $Q\ kW\ m^{-2}$. If its temperature is raised to 151°C, the rate of radiation of energy will become approximately

(a) $2Q\ kW\ m^{-2}$ (b) $4Q\ kW\ m^{-2}$ (c) $6Q\ kW\ m^{-2}$ (d) $8Q\ kW\ m^{-2}$

55. If E is the total energy emitted by a body at a temperature $T\ K$ and E_{max} is the maximum energy emitted by it at the same temperature, then

(a) $E \propto T^4;\ E_{max} \propto T^5$ (b) $E \propto T^4;\ E_{max} \propto T^{-5}$ (c) $E \propto T^{-4};\ E_{max} \propto T^4$ (d) $E \propto T^5;\ E_{max} \propto T^4$

56. A metal ball of surface area 200 cm^2 and temperature 527°C is surrounded by a vessel at 27°C. If the emissivity of the metal is 0.4, then the rate of loss of heat from the ball is $(\sigma = 5.67 \times 10^{-8}\ J/m^2 - s - K^4)$

(a) 108 *Joules approx.* (b) 168 *Joules approx.* (c) 182 *Joules approx.* (d) 192 *Joules approx.*

57. If the rates of cooling of two bodies are same then for which body the rate of fall of temperature will be more? For the body whose thermal capacity is

(a) More (b) Less (c) Infinity (d) Any value

▶▶ *Advance level*

58. If a sphere of radius R, cube of side R, and a cylinder of radius R and height R made of same substance are heated to same temperature and then cooled, then which of above will radiate maximum

(a) Cylinder (b) Sphere (c) Cube (d) Cylinder and sphere both

59. The temperature of an isolated black body falls from T_1 to T_2 in time t. Let c be a constant

(a) $t = c\left[\frac{1}{T_2} - \frac{1}{T_1}\right]$ (b) $t = c\left[\frac{1}{T_2^2} - \frac{1}{T_1^2}\right]$ (c) $t = c\left[\frac{1}{T_2^3} - \frac{1}{T_1^3}\right]$ (d) $t = c\left[\frac{1}{T_2^4} - \frac{1}{T_1^4}\right]$

60. A sphere of density d, satisfied heat s and radius r is hung by a thermally insulating thread in an enclosure which is kept at a lower temperature than the sphere. The temperature of the sphere starts to drop at a rate which depends upon the temperature difference between the sphere and the enclosure. If the temperature difference is ΔT and surrounding temperature is T_0 then rate of fall in temperature will be (Given that $\Delta T << T_0$)

(a) $\frac{4\sigma T_0^3 \Delta T}{rdc}$ (b) $\frac{12\sigma T_0^3 \Delta T}{rdc}$ (c) $\frac{12\sigma T_0^4 \Delta T}{rdc}$ (d) $\frac{12\sigma \Delta T}{rdcT_0^3}$

Problems based on Newton's law of cooling

▶ *Basic level*

61. According to Newton's law of cooling, the rate of cooling of a body is proportional to $(\Delta\theta)^n$, where $\Delta\theta$ is the difference of the temperature of the body and the surroundings and n is equal to

(a) *One* (b) *Two* (c) *Three* (d) *Four*

62. Newton's law of cooling is used in laboratory for the determination of the **[CPMT 1973, 2002]**

(a) Specific heat of the gases (b) The latent heat of gases (c) Specific heat of liquids (d)

63. Liquid is filled in a vessel which is kept in a room with temperature 20°C. When the temperature of the liquid is 80°C, then it loses heat at the rate of 60 *cal/sec*. What will be the rate of loss of heat when the temperature of the liquid is 40°C **[MP PMT 1994]**

(a) 180 *cal/ sec* (b) 40 *cal/ sec* (c) 30 *cal/ sec* (d) 20 *cal/ sec*

64. A bucket full of hot water is placed in a room. Water takes t_1 seconds to cool from 90°C to 80°C, t_2 seconds to cool from 80°C to 70°C and t_3 seconds to cool from 70°C to 60°C then

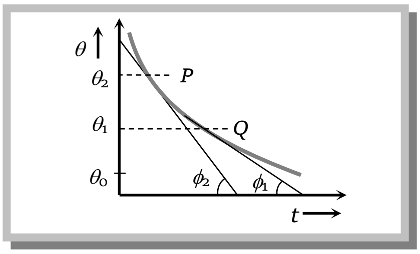
(a) $t_3 > t_2 > t_1$ (b) $t_1 = t_2 = t_3$ (c) $t_1 > t_2 > t_3$ (d) $t_1 > t_2 > t_3$

65. A calorimeter of negligible water equivalent contains 430 *gm* of water and it cools at the rate of 0.24°C per minute in the surroundings at 30°C. If at any moment the temperature of water is 34°C then at what rate the heat should be supplied to it to keep its temperature constant

(a) 0.24 *Cal/minute* (b) 100 *Cal/minute* (c) 103.2 *Cal/minute* (d) None of the above

▶▶ *Advance level*

66. 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) $\dfrac{\tan\phi_2}{\tan\phi_1} = \dfrac{\theta_1 - \theta_0}{\theta_2 - \theta_0}$

(b) $\dfrac{\tan\phi_2}{\tan\phi_1} = \dfrac{\theta_2 - \theta_0}{\theta_1 - \theta_0}$

(c) $\dfrac{\tan\phi_1}{\tan\phi_2} = \dfrac{\theta_1}{\theta_2}$

(d) $\dfrac{\tan\phi_1}{\tan\phi_2} = \dfrac{\theta_2}{\theta_1}$

67. A system S receives heat continuously from an electrical heater of power 10 W. The temperature of S becomes constant at 50°C when the surrounding temperature is 20°C. After the heater is switched off, S cools from 35°C to 34.8°C in 1 minute. The heat capacity of S is

(a) 100 $J/°C$ (b) 300 $J/°C$ (c) 750 $J/°C$ (d) 1500 $J/°C$

Problems based on Wein's displacement law

▶ *Basic level*

68. A black body has maximum wavelength λ_m at temperature 2000 K. Its corresponding wavelength at temperature 3000 K will be

[CBSE PMT 2001]

(a) $\dfrac{3}{2}\lambda_m$ (b) $\dfrac{2}{3}\lambda_m$ (c) $\dfrac{4}{9}\lambda_m$ (d) $\dfrac{9}{4}\lambda_m$

69. Consider the following statements

Assertion (A) : When temperature increases, the colour of a star shifts towards smaller wavelength, i.e., towards violet colour

Reason (R) : Red colour has maximum wavelength

Of these statements **[AIIMS 2000]**

(a) Both A and R are true and the R is a correct explanation of the A

(b) Both A and R are true but the R is not a correct explanation of the A

(c) A is true but the R is false

(d) Both A and R are false

(e) A is false but the R is true

70. The wavelength of radiation emitted by a body depends upon

(a) The nature of its surface (b) The area of its surface

(c) The temperature of its surface (d) All the above factors

71. On investigation of light from three different stars A, B and C, it was found that in the spectrum of A the intensity of red colour is maximum, in B the intensity of blue colour is maximum and in C the intensity of yellow colour is maximum. From these observations it can be concluded that

(a) The temperature of A is maximum, B is minimum and C is intermediate

(b) The temperature of A is maximum, C is minimum and B is intermediate

(c) The temperature of B is maximum, A is minimum and C is intermediate

(d) The temperature of C is maximum, B is minimum and A is intermediate

72. If black wire of platinum is heated, then its colour first appear red, then yellow and finally white. It can be understood on the basis of

[MP PMT 1984]

(a) Wien's displacement law (b) Prevost theory of heat exchange

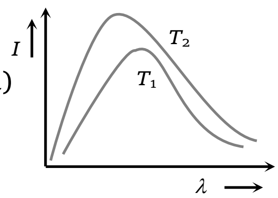
(c) Newton's law of cooling (d) None of the above

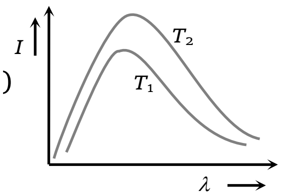
Problems based on energy distribution graph

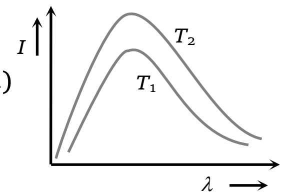
▶ *Basic level*

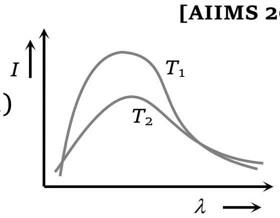
73. Shown below are the black body radiation curves at temperatures T_1 and T_2 ($T_2 > T_1$). Which of the following plots is correct

[AIIMS 2003]

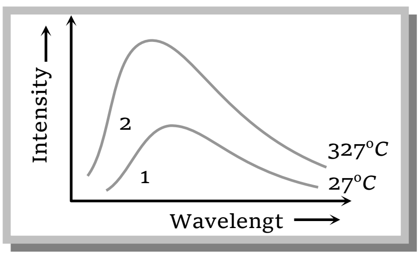
(a) 

(b) 

(c) 

(d) 

74. 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 $\frac{A_2}{A_1}$

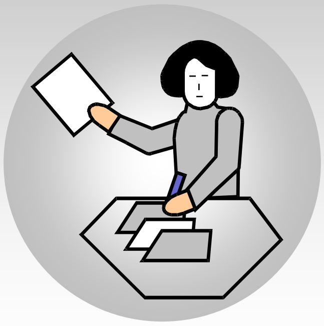


(a) 1 : 16

(b) 4 : 1

(c) 2 : 1

(d) 16 : 1



Answer Sheet (Practice problems)

1.	**2.**	**3.**	**4.**	**5.**	**6.**	**7.**	**8.**	**9.**	**10.**
c	a	a	c	a	c	b	d	a	a
11.	**12.**	**13.**	**14.**	**15.**	**16.**	**17.**	**18.**	**19.**	**20.**
b	b	b	d	d	b	b	a	a	c
21.	**22.**	**23.**	**24.**	**25.**	**26.**	**27.**	**28.**	**29.**	**30.**
b	a	b	b	b	a	b	b	a	a
31.	**32.**	**33.**	**34.**	**35.**	**36.**	**37.**	**38.**	**39.**	**40.**
d	a	b	c	a	a	c	c	a	c
41.	**42.**	**43.**	**44.**	**45.**	**46.**	**47.**	**48.**	**49.**	**50.**
d	c	d	c	c	c	b	d	a	d
51.	**52.**	**53.**	**54.**	**55.**	**56.**	**57.**	**58.**	**59.**	**60.**
b	a	a, b	b	a	c	b	d	c	b
61.	**62.**	**63.**	**64.**	**65.**	**66.**	**67.**	**68.**	**69.**	**70.**
a	c	d	a	c	b	d	b	b	c
71.	**72.**	**73.**	**74.**						
c	a	a	d						