Chapter 19: TEMPERATURE. HEAT. AND THE

1. If two objects are in thermal equilibrium with each other:
   A. they cannot be moving
   B. they cannot be undergoing an elastic collision
   C. they cannot have different pressures
   D. they cannot be at different temperatures
   E. they cannot be falling in Earth's gravitational field

   ans: D

2. When two gases separated by a diathermal wall are in thermal equilibrium with each other:
   A. only their pressures must be the same
   B. only their volumes must be the same
   C. they must have the same number of particles
   D. they must have the same pressure and the same volume
   E. only their temperatures must be the same

   ans: E

3. A balloon is filled with cold air and placed in a warm room. It is NOT in thermal equilibrium with the air of the room until:
   A. it rises to the ceiling
   B. it sinks to the floor
   C. it stops expanding
   D. it starts to contract
   E. none of the above

   ans: C

4. Suppose object C is in thermal equilibrium with object A and with object B. The zeroth law of thermodynamics states:
   A. that C will always be in thermal equilibrium with both A and B
   B. that C must transfer energy to both A and B
   C. that A is in thermal equilibrium with B
   D. that A cannot be in thermal equilibrium with B
   E. nothing about the relationship between A and B

   ans: C

5. The zeroth law of thermodynamics allows us to define:
   A. work
   B. pressure
   C. temperature
   D. thermal equilibrium
   E. internal energy

   ans: C

6. If the zeroth law of thermodynamics were not valid, which of the following could not be considered a property of an ol
   A. Pressure
   B. Center of mass energy
   C. Internal energy
   D. Momentum
   E. Temperature

   ans: E

7. The international standard thermometer is kept:
   A. near Washington, D.C.
   B. near Paris, France
   C. near the north pole
   D. near Rome, Italy
   E. nowhere (there is none)

   ans: E

8. In constructing a thermometer it is NECESSARY to use a substance that:
   A. expands with rising temperature
   B. expands linearly with rising temperature
   C. will not freeze
   D. will not boil
   E. undergoes some change when heated or cooled

   ans: E

9. The "triple point" of a substance is that point for which the temperature and pressure are such that:
   A. only solid and liquid are in equilibrium
   B. only liquid and vapor are in equilibrium
   C. only solid and vapor are in equilibrium
   D. solid, liquid, and vapor are all in equilibrium
   E. the temperature, pressure and density are all numerically equal

   ans: D

10. Constant-volume gas thermometers using different gases all indicate nearly the same temperature when in contact with the same object if:
   A. the volumes are all extremely large
   B. the volumes are all the same
   D. the pressures are all extremely large
   C. the pressures are the same
   E. the particle concentrations are all extremely small

   ans: E

11. A constant-volume gas thermometer is used to measure the temperature of an object. When the thermometer is in co[illegible] the thermometer is 8.500×10[illegible] Pa. When it is in contact with the object the pressure is 9.650×10^4 Pa. The temperature of the object is:

A. 37.0 K
B. 241 K
C. 310 K
D. 314 K
E. 2020 K

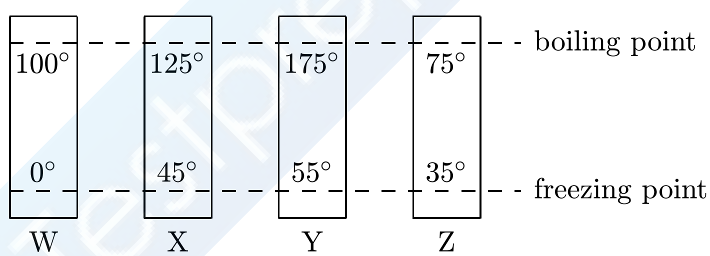
ans: C

12. When a certain constant-volume gas thermometer is in thermal contact with water at its triple point (273.16 K) the pressure is 6.30×10^4 Pa. For this thermometer a kelvin corresponds to a change in pressure of about:

A. 4.34×10^2 Pa
B. 2.31×10^2 Pa
C. 1.72×10^3 Pa
D. 2.31×10^3 Pa
E. 1.72×10^7 Pa

ans: B

13. The diagram shows four thermometers, labeled W, X, Y, and Z. The freezing and boiling points of water are indicated. Rank the thermometers according to the size of a degree on their scales, smallest to largest.



A. W, X, Y, Z
B. Z, Y, X, W
C. Z, Y, W, X
D. Z, X, W, Y
E. W, Y, Z, X

ans: D

14. There is a temperature at which the reading on the Kelvin scale is numerically:

A. equal to that on the Celsius scale
B. lower than that on the Celsius scale
C. equal to that on the Fahrenheit scale
D. less than zero
E. none of the above

ans: C

15. Fahrenheit and Kelvin scales agree numerically at a reading of:
   - A. -40
   - B. 0
   - C. 273
   - D. 301
   - E. 574

   ans: E

16. Which one of the following statements is true?
   - A. Temperatures differing by 25° on the Fahrenheit scale must differ by 45° on the Celsius scale
   - B. 40 K corresponds to −40° C
   - C. Temperatures which differ by 10° on the Celsius scale must differ by 18° on the Fahrenheit scale
   - D. Water at 90° C is warmer than water at 202° F
   - E. 0° F corresponds to −32° C

   ans: C

17. A Kelvin thermometer and a Fahrenheit thermometer both give the same reading for a certain sample. The corresponding Celsius temperature is:
   - A. 574° C
   - B. 232° C
   - C. 301° C
   - D. 614° C
   - E. 276° C

   ans: C

18. Room temperature is about 20 degrees on the:
   - A. Kelvin scale
   - B. Celsius scale
   - C. Fahrenheit scale
   - D. absolute scale
   - E. C major scale

   ans: B

19. A thermometer indicates 98.6° C. It may be:
   - A. outdoors on a cold day
   - B. in a comfortable room
   - C. in a cup of hot tea
   - D. in a normal person's mouth
   - E. in liquid air

   ans: C

20. The air temperature on a summer day might be about:
   - A. 0° C
   - B. 10° C
   - C. 25° C
   - D. 80° C
   - E. 125° C

   ans: C

21. The two metallic strips that constitute some thermostats must differ in:
   - A. length
   - B. thickness
   - C. mass
   - D. rate at which they conduct heat
   - E. coefficient of linear expansion

   ans: E

22. Thin strips of iron and zinc are riveted together to form a bimetallic strip that bends when heated. The iron is on the inside of the bend because:
   - A. it has a higher coefficient of linear expansion
   - B. it has a lower coefficient of linear expansion
   - C. it has a higher specific heat
   - D. it has a lower specific heat
   - E. it conducts heat better

   ans: B

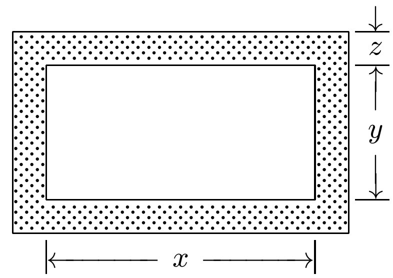
23. It is more difficult to measure the coefficient of volume expansion of a liquid than that of a solid because:
   - A. no relation exists between linear and volume expansion coefficients
   - B. a liquid tends to evaporate
   - C. a liquid expands too much when heated
   - D. a liquid expands too little when heated
   - E. the containing vessel also expands

   ans: E

24. A surveyor's 30-m steel tape is correct at 68° F. On a hot day the tape has expanded to 30.01 m. On that day, the tape indicates a distance of 15.52 m between two points. The true distance between these points is:
   - A. 15.50 m
   - B. 15.51 m
   - C. 15.52 m
   - D. 15.53 m
   - E. 15.54 m

   ans: B

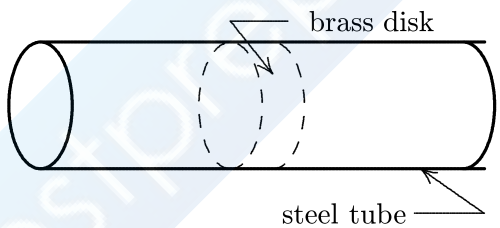
25. The figure shows a rectangular brass plate at 0° C in which there is cut a rectangular hole of dimensions indicated. If tl



A. x will increase and y will decrease
B. both x and y will decrease
C. x will decrease and y will increase
D. both x and y will increase
E. the changes in x and y depend on the dimension z

ans: D

26. The Stanford linear accelerator contains hundreds of brass disks tightly fitted into a steel tube (see figure). The coefficient of linear expansion of the brass is 2.00×10^{-5} per C°. The system was assembled by cooling the disks in dry ice (−57° C) to enable them to just slide into the close-fitting tube. If the diameter of a disk is 80.00 mm at 43° C, what is its diameter in the dry ice?



A. 78.40 mm
B. 79.68 mm
C. 80.16 mm
D. 79.84 mm
E. None of these

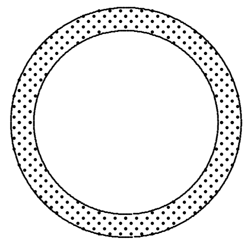
ans: D

27. When the temperature of a copper penny is increased by 100° C, its diameter increases by 0.17%. The area of one of its faces increases by:

A. 0.17%
B. 0.34%
C. 0.51%
D. 0.13%
E. 0.27%

ans: B

28. An annular ring of aluminum is cut from an aluminum sheet as shown. When this ring is heated:



A. the aluminum expands outward and the hole remains the same in size
B. the hole decreases in diameter
C. the area of the hole expands the same percent as any area of the aluminum
D. the area of the hole expands a greater percent than any area of the aluminum
E. linear expansion forces the shape of the hole to be slightly elliptical

ans: C

29. Possible units for the coefficient of volume expansion are:

A. mm/C°
B. mm^3/C°
C. $(C°)^3$
D. $1/(C°)^3$
E. 1/C°

ans: E

30. The mercury column in an ordinary medical thermometer doubles in length when its temperature changes from 95° F to 105° F. Choose the correct statement:

A. the coefficient of volume expansion of mercury is 0.1 per F°
B. the coefficient of volume expansion of mercury is 0.3 per F°
C. the coefficient of volume expansion of mercury is (0.1/3) per F°
D. the vacuum above the column helps to "pull up" the mercury this large amount
E. none of the above is true

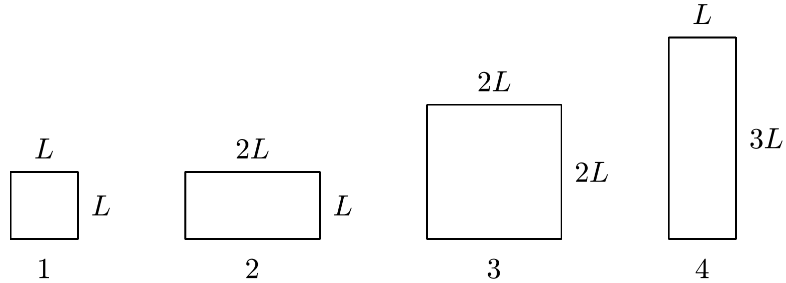
ans: E

31. The coefficient of linear expansion of iron is 1.0×10^{-5} per C° . The surface area of an iron cube, with an edge length of 5.0 cm, will increase by what amount if it is heated from 10° C to 60° C?

A. $0.0125\,cm^2$
B. $0.025\,cm^2$
C. $0.075\,cm^2$
D. $0.15\,cm^2$
E. $0.30\,cm^2$

ans: D

32. The diagram shows four rectangular plates and their dimensions. All are made of the same material. The temperature



A. the vertical dimension of plate 1 increases the most and the area of plate 1 increases the most
B. the vertical dimension of plate 2 increases the most and the area of plate 4 increases the most
C. the vertical dimension of plate 3 increases the most and the area of plate 1 increases the most
D. the vertical dimension of plate 4 increases the most and the area of plate 3 increases the most
E. the vertical dimension of plate 4 increases the most and the area of plate 4 increases the most

ans: D

33. The coefficient of linear expansion of steel is 11×10^{-6} per C° . A steel ball has a volume of exactly $100\,\text{cm}^3$ at 0° C. When heated to 100° C, its volume becomes:
A. $100.33\,\text{cm}^3$
B. $100.0011\,\text{cm}^3$
C. $100.0033\,\text{cm}^3$
D. $100.000011\,\text{cm}^3$
E. none of these

ans: A

34. The coefficient of linear expansion of a certain steel is 0.000012 per C° . The coefficient of volume expansion, in $(\text{C}°)^{-1}$, is:
A. $(0.000012)^3$
B. $(4\pi/3)(0.000012)^3$
C. 3×0.000012
D. 0.000012
E. depends on the shape of the volume to which it will be applied

ans: C

35. Metal pipes, used to carry water, sometimes burst in the winter because:
A. metal contracts more than water
B. outside of the pipe contracts more than the inside
C. metal becomes brittle when cold
D. ice expands when it melts
E. water expands when it freezes

ans: E

36. A gram of distilled water at 4° C:

A. will increase slightly i
B. will decrease slightly in weight when heated to 6° C
C. will increase slightly in volume when heated to 6° C
D. will decrease slightly in volume when heated to 6° C
E. will not change in either volume or weight

ans: D

37. Heat is:

A. energy transferred by virtue of a temperature difference
B. energy transferred by macroscopic work
C. energy content of an object
D. a temperature difference
E. a property objects have by virtue of their temperatures

ans: A

38. Heat has the same units as:

A. temperature
B. work
C. energy/time
D. heat capacity
E. energy/volume

ans: B

39. A calorie is about:

A. 0.24 J
B. 8.3 J
C. 250 J
D. 4.2 J
E. 4200 J

ans: D

40. The heat capacity of an object is:

A. the amount of heat energy that raises its temperature by 1° C
B. the amount of heat energy that changes its state without changing its temperature
C. the amount of heat energy per kilogram that raises its temperature by 1° C
D. the ratio of its specific heat to that of water
E. the change in its temperature caused by adding 1 J of heat

ans: A

41. The specific heat of a substance is:

A. the amount of heat en
B. the amount of heat energy per unit mass emitted by oxidizing the substance
C. the amount of heat energy per unit mass to raise the substance from its freezing to its boiling point
D. the amount of heat energy per unit mass to raise the temperature of the substance by 1° C
E. the temperature of the object divided by its mass

ans: D

42. Two different samples have the same mass and temperature. Equal quantities of energy are absorbed as heat by each. Their final temperatures may be different because the samples have different:

A. thermal conductivities
B. coefficients of expansion
C. densities
D. volumes
E. heat capacities

ans: E

43. The same energy Q enters five different substances as heat.

The temperature of 3 g of substance A increases by 10 K
The temperature of 4 g of substance B increases by 4 K
The temperature of 6 g of substance C increases by 15 K
The temperature of 8 g of substance D increases by 6 K
The temperature of 10 g of substance E increases by 10 K

Which substance has the greatest specific heat?

ans: B

44. For constant-volume processes the heat capacity of gas A is greater than the heat capacity of gas B. We conclude that when they both absorb the same energy as heat at constant volume:

A. the temperature of A increases more than the temperature of B
B. the temperature of B increases more than the temperature of A
C. the internal energy of A increases more than the internal energy of B
D. the internal energy of B increases more than the internal energy of A
E. A does more positive work than B

ans: B

45. The heat capacity at constant volume and the heat capacity at constant pressure have different values because:

A. heat increases the temperature at constant volume but not at constant pressure
B. heat increases the temperature at constant pressure but not at constant volume
C. the system does work at constant volume but not at constant pressure
D. the system does work at constant pressure but not at constant volume
E. the system does more work at constant volume than at constant pressure

ans: D

46. A cube of aluminum has an edge length of 20 cm. Aluminum has a density 2.7 times that of water ($1\,g/cm^3$) and a spe nal energy of the cube increases by 47000 cal its temperature increases by:

A. 5 C°
B. 10 C°
C. 20 C°
D. 100 C°
E. 200 C°

ans: B

47. An insulated container, filled with water, contains a thermometer and a paddle wheel. The paddle wheel can be rotated by an external source. This apparatus can be used to determine:

A. specific heat of water
B. relation between kinetic energy and absolute temperature
C. thermal conductivity of water
D. efficiency of changing work into heat
E. mechanical equivalent of heat

ans: E

48. Take the mechanical equivalent of heat as 4 J/cal. A 10-g bullet moving at 2000 m/s plunges into 1 kg of paraffin wax (specific heat $0.7\,cal/g \cdot C°$). The wax was initially at 20° C. Assuming that all the bullet's energy heats the wax, its final temperature (in ° C) is:

A. 20.14
B. 23.5
C. 20.006
D. 27.1
E. 30.23

ans: D

49. The energy given off as heat by 300 g of an alloy as it cools through 50 C° raises the temperature of 300 g of water from 30° C to 40° C. The specific heat of the alloy (in $cal/g \cdot C°$) is:

A. 0.015
B. 0.10
C. 0.15
D. 0.20
E. 0.50

ans: D

50. The specific heat of lead is $0.030\,cal/g \cdot C°$. 300 g of lead shot at 100° C is mixed with 100 g of water at 70° C in an insulated container. The final temperature of the mixture is:

A. 100° C
B. 85.5° C
C. 79.5° C
D. 74.5° C
E. 72.5° C

ans: E

51. Object A, with heat capacity C_A and initially at temperature T_A, is placed in thermal contact with object B, with heat [illegible] n is thermally isolated. If the heat capacities are independent of the temperature and no phase changes occur, the final temperature of both objects is:

A. $(C_AT_A - C_BT_B)/(C_A + C_B)$
B. $(C_AT_A + C_BT_B)/(C_A + C_B)$
C. $(C_AT_A - C_BT_B)/(C_A - C_B)$
D. $(C_A - C_B)|T_A - T_B|$
E. $(C_A + C_B)|T_A - T_B|$

ans: B

52. The heat capacity of object B is twice that of object A. Initially A is at 300 K and B is at 450 K. They are placed in thermal contact and the combination is isolated. The final temperature of both objects is:

A. 200 K
B. 300 K
C. 400 K
D. 450 K
E. 600 K

ans: C

53. A heat of transformation of a substance is:

A. the energy absorbed as heat during a phase transformation
B. the energy per unit mass absorbed as heat during a phase transformation
C. the same as the heat capacity
D. the same as the specific heat
E. the same as the molar specific heat

ans: B

54. The heat of fusion of water is cal/g. This means 80 cal of energy are required to:

A. raise the temperature of 1 g of water by 1 K
B. turn 1 g of water to steam
C. raise the temperature of 1 g of ice by 1 K
D. melt 1 g of ice
E. increase the internal energy of 80 g of water by 1 cal

ans: D

55. Solid A, with mass M, is at its melting point T_A. It is placed in thermal contact with solid B, with heat capacity C_B and initially at temperature T_B ($T_B > T_A$). The combination is thermally isolated. A has latent heat of fusion L and when it has melted has heat capacity C_A. If A completely melts the final temperature of both A and B is:

A. $(C_AT_A + C_BT_B - ML)/(C_A + C_B)$
B. $(C_AT_A - C_BT_B + ML)/(C_A + C_B)$
C. $(C_AT_A - C_BT_B - ML)/(C_A + C_B)$
D. $(C_AT_A + C_BT_B + ML)/(C_A - C_B)$
E. $(C_AT_A + C_BT_B + ML)/(C_A - C_B)$

ans: A

56. During the time that latent heat is involved in a change of state:

A. the temperature does
B. the substance always expands
C. a chemical reaction takes place
D. molecular activity remains constant
E. kinetic energy changes into potential energy

ans: A

57. The formation of ice from water is accompanied by:

A. absorption of energy as heat
B. temperature increase
C. decrease in volume
D. an evolution of heat
E. temperature decrease

ans: A

58. How many calories are required to change one gram of 0° C ice to 100° C steam? The latent heat of fusion is 80 cal/g and the latent heat of vaporization is 540 cal/g. The specific heat of water is 1.00 cal/g · K.

A. 100
B. 540
C. 620
D. 720
E. 900

ans: D

59. Ten grams of ice at −20° C is to be changed to steam at 130° C. The specific heat of both ice and steam is 0.5 cal/g · C°. The heat of fusion is 80 cal/g and the heat of vaporization is 540 cal/g. The entire process requires:

A. 750 cal
B. 1250 cal
C. 6950 cal
D. 7450 cal
E. 7700 cal

ans: D

60. Steam at 1 atm and 100° C enters a radiator and leaves as water at 1 atm and 80° C. Take the heat of vaporization to be 540 cal/g. Of the total energy given off as heat, what percent arises from the cooling of the water?

A. 100
B. 54
C. 26
D. 14
E. 3.6

ans: E

61. A certain humidifier operates by raising water to the boiling point and then evaporating it. Every minute 30 g of wate The heat of fusion of water is 333 kJ/kg, the heat of vaporization is 2256 kJ/kg, and the specific heat is 4190 J/kg · K. How many joules of energy per minute does this humidifier require?

A. 3.0×10^4
B. 8.8×10^4
C. 7.8×10^4
D. 1.1×10^5
E. 2.0×10^4

ans: B

62. A metal sample of mass M requires a power input P to just remain molten. When the heater is turned off, the metal solidifies in a time T. The specific latent heat of fusion of this metal is:

A. P/MT
B. T/PM
C. PM/T
D. PMT
E. PT/M

ans: E

63. Fifty grams of ice at 0° C is placed in a thermos bottle containing one hundred grams of water at 6° C. How many grams of ice will melt? The heat of fusion of water is 333 kJ/kg and the specific heat is 4190 J/kg · K.

A. 7.5
B. 2.0
C. 8.3
D. 17
E. 50

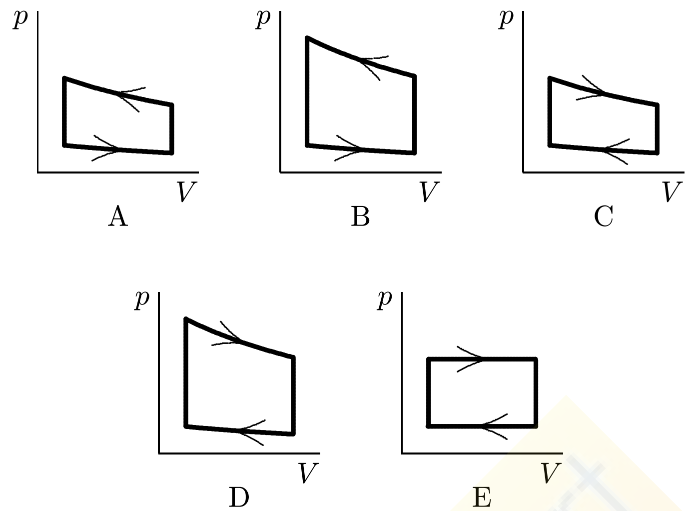
ans: A

64. According to the first law of thermodynamics, applied to a gas, the increase in the internal energy during any process:

A. equals the heat input minus the work done on the gas
B. equals the heat input plus the work done on the gas
C. equals the work done on the gas minus the heat input
D. is independent of the heat input
E. is independent of the work done on the gas

ans: B

65. Pressure versus volume graphs for a certain gas undergoing five different cyclic processes are shown below. During whic



ans: D

66. During an adiabatic process an object does 100 J of work and its temperature decreases by 5 K. During another process it does 25 J of work and its temperature decreases by 5 K. Its heat capacity for the second process is:

A. 20 J/K
B. 24 J/K
C. 5 J/K
D. 15 J/K
E. 100 J/K

ans: D

67. A system undergoes an adiabatic process in which its internal energy increases by 20 J. Which of the following statements is true?

A. 20 J of work was done on the system
B. 20 J of work was done by the system
C. the system received 20 J of energy as heat
D. the system lost 20 J of energy as heat
E. none of the above are true

ans: A

68. In an adiabatic process:

A. the energy absorbed as heat equals the work done by the system on its environment
B. the energy absorbed as heat equals the work done by the environment on the system
C. the absorbed as heat equals the change in internal energy
D. the work done by the environment on the system equals the change in internal energy
E. the work done by the system on its environment equals to the change in internal energy

ans: D

69. In a certain process a gas ends in its original thermodynamic state. Of the following, which is possible as the net result c

A. It is adiabatic and the gas does 50 J of work
B. The gas does no work but absorbs 50 J of energy as heat
C. The gas does no work but loses 50 J of energy as heat
D. The gas loses 50 J of energy as heat and does 50 J of work
E. The gas absorbs 50 J of energy as heat and does 50 J of work

ans: E

70. Of the following which might NOT vanish over one cycle of a cyclic process?

A. the change in the internal energy of the substance
B. the change in pressure of the substance
C. the work done by the substance
D. the change in the volume of the substance
E. the change in the temperature of the substance

ans: C

71. Of the following which might NOT vanish over one cycle of a cyclic process?

A. the work done by the substance minus the energy absorbed by the substance as heat
B. the change in the pressure of the substance
C. the energy absorbed by the substance as heat
D. the change in the volume of the substance
E. the change in the temperature of the substance

ans: C

72. The unit of thermal conductivity might be:

A. $\text{cal} \cdot \text{cm}/(\text{s} \cdot \text{C}^\circ)$
B. $\text{cal}/(\text{cm} \cdot \text{s} \cdot \text{C}^\circ)$
C. $\text{cal} \cdot \text{s}/(\text{cm} \cdot \text{C}^\circ)$
D. $\text{cm} \cdot \text{s} \cdot \text{C}^\circ\text{C}/\text{cal}$
E. $\text{C}^\circ/(\text{cal} \cdot \text{cm} \cdot \text{s})$

ans: B

73. A slab of material has area A, thickness L, and thermal conductivity k. One of its surfaces (P) is maintained at temperature T_1 and the other surface (Q) is maintained at a lower temperature T_2. The rate of heat flow by conduction from P to Q is:

A. $kA(T_1 - T_2)/L^2$
B. $kL(T_1 - T_2)/A$
C. $kA(T_1 - T_2)/L$
D. $k(T_1 - T_2)/(LA)$
E. $LA(T_1 - T_2)/k$

ans: C

74. The rate of heat flow by conduction through a slab does NOT depend upon the:

A. temperature difference
B. thermal conductivity of the slab
C. slab thickness
D. cross-sectional area of the slab
E. specific heat of the slab

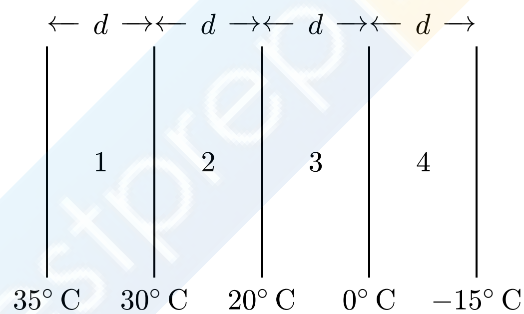
ans: E

75. The rate of heat flow by conduction through a slab is P_{cond}. If the slab thickness is doubled, its cross-sectional area is halved, and the temperature difference across it is doubled, then the rate of heat flow becomes:

A. $2P_{\text{cond}}$
B. $P_{\text{cond}}/2$
C. P_{cond}
D. $P_{\text{cond}}/8$
E. $8P_{\text{cond}}$

ans: B

76. The diagram shows four slabs of different materials with equal thickness, placed side by side. Heat flows from left to right and the steady-state temperatures of the interfaces are given. Rank the materials according to their thermal conductivities, smallest to largest.



A. 1, 2, 3, 4
B. 2, 1, 3, 4
C. 3, 4, 1, 2
D. 3, 4, 2, 1
E. 4, 3, 2, 1

ans: D

77. Inside a room at a uniform comfortable temperature, metallic objects generally feel cooler to the touch than wooden objects do. This is because:

A. a given mass of wood contains more heat than the same mass of metal
B. metal conducts heat better than wood
C. heat tends to flow from metal to wood
D. the equilibrium temperature of metal in the room is lower than that of wood
E. the human body, being organic, resembles wood more closely than it resembles metal

ans: B

78. On a very cold day, a child puts his tongue against a fence post. It is much more likely that his tongue will stick to a s

A. steel has a higher specific heat
B. steel is a better radiator of heat
C. steel has a higher specific gravity
D. steel is a better heat conductor
E. steel is a highly magnetic material

ans: D

79. An iron stove, used for heating a room by radiation, is more efficient if:

A. its inner surface is highly polished
B. its inner surface is covered with aluminum paint
C. its outer surface is covered with aluminum paint
D. its outer surface is rough and black
E. its outer surface is highly polished

ans: D

80. To help keep buildings cool in the summer, dark colored window shades have been replaced by light colored shades. This is because light colored shades:

A. are more pleasing to the eye
B. absorb more sunlight
C. reflect more sunlight
D. transmit more sunlight
E. have a lower thermal conductivity

ans: C

81. Which of the following statements pertaining to a vacuum flask (thermos) is NOT correct?

A. Silvering reduces radiation loss
B. Vacuum reduces conduction loss
C. Vacuum reduces convection loss
D. Vacuum reduces radiation loss
E. Glass walls reduce conduction loss

ans: D

82. A thermos bottle works well because:

A. its glass walls are thin
B. silvering reduces convection
C. vacuum reduces heat radiation
D. silver coating is a poor heat conductor
E. none of the above

ans: E