PHYSICS

BOOKS - TARGET PHYSICS (MARATHI ENGLISH)

Thermal Properties of Matter

Exercise

1. Heat is the form of transfer of ____________

A. liquid

B. energy

C. matter

D. electrons

Answer:

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2. Heat and temperature are

A. same quantities

B. closely related quantities but they are not same things

C. different quantities

D. measured in same unit

Answer:

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3. The degree of hotness and coldness of a body is called______

A. heat

B. temperature

C. temperature gradient

D. coefficient of expension

Answer:

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4. A hot body kept in a surrounding medium becomes cold if

A. temperature of the body is greater than the temperature of surrounding medium

B. temperature of the body is less than the temperature of surrounding medium

C. both body and surrounding medium have same temperature

D. temperature of the body is not related to surrounding medium

Answer:

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5. The thermal energy is also called as _______

A. kinetic energy

B. mechnical energy

C. heat energy of single atom

D. internal kinetic energy of body

Answer:

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6. The solids have definite shape and size because

A. they have weak force of attraction

B. they have comparatively bigger size

C. the molecules of solid exert strong force of attraction

D. the molecules of the solid exert weak force of attraction

Answer:

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7. Solids expand on heating because

A. the K.E. of atoms increases

B. P.E of atoms increases

C. total energy of atoms increases

D. K.E of atom decreases

Answer:

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8. The science of temperature and its measurement is called as _____

A. calorimetry

B. thermomentry

C. speedomentry

D. hygrometry

Answer:

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9. Choose the WRONG statement.

A. The liquid-in-glass thermometer depends on the change in volume of the liquid with temperature

B. The constant volume gas thermometer uses pressure change with temperature

C. The resistance thermometer uses the change of electical specific resistance of a metal with temperature

D. The constant pressure gas thermometer uses volume change with temperature

Answer:

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10. Mercury thermometer can be used to measure temperature upto

A. $260^\circ C$

B. $100^\circ C$

C. $360^{\circ} C$

D. $500^{\circ} C$

Answer:

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11. The range of mercury thermometer is

A. $-40^{\circ} C \rightarrow 200^{\circ} C$

B. $-59^{\circ} C \rightarrow 200^{\circ} C$

C. $0^{\circ} C \rightarrow 180^{\circ} C$

D. $-39^{\circ}C \rightarrow 357^{\circ}C$

Answer:

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12. The alcohol thermometers are used only to measure temperature near______

A. ice point

B. boiling point of water

C. boiling point of mercury

D. condensation point of a gas

Answer:

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13. The temperature at which pure water boils at standard atmospheric pressure is called_______

A. freezing point

B. triple point

C. ice point

D. steam point

Answer:

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14. The temperature of a body is 27 °C on Celsius scale, what is its temperature on kelvin scale?

A. 27K

B. 127K

C. 200K

D. 300K

Answer:

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15. The temperature at the surface of the sun is about 6400 °C. What is this temperature in kelvin scale?

A. 6227K

B. 6500K

C. 6673K

D. 6873K

Answer:

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16. If the room temperature is 20 °C then the temperature on Fahrenheit scale is

A. $300^{\circ} F$

B. $273^{\circ} F$

C. $68^{\circ} F$

D. $20^{\circ} F$

Answer:

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17. At constant temperature, the volume of given mass of a gas is

A. directly proportional to its pressure.

B. directly proportional to its momentum.

C. inversely proportional to its pressure.

D. inversely proportional to product of pv

Answer:

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18. A constant volume gas thermometer works on

A. ideal gas law

B. Boyle's law

C. Pascal's law

D. Charles' law

Answer:

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19. Ideal gas equation for ‘n’ number of moles is given by

A. $PV = nRT$

B. $PV = RT$

C. $PV = Nvr$

D. $PV = \frac{nR}{T}$

Answer:

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20. Select the WRONG statement.

A. Boyle's law states that at constant temperature, the volume of given mass of gas is inversely roportional to its pressure.

B. Charles' law states that at constant pressure, volume of a given mass of gas is directly proportional to its absolute temperature.

C. The value of R is same for all gases.

D. Boyle's law states that at constant temperature, the volume of a gas is directly proportional to its pressure.

Answer:

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21. In constant volume gas thermometer temperature is calibrated in terms of

A. Celsius

B. fahrenheit

C. pressure

D. absolute temperatuer

Answer:

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22. The numerical value of R is

A. $8.31 \times 10^2 JK^{-1} mol^{-1}$

B. $8.31 \times 10^2 JK mol^{-1}$

C. $8.31 JK^2 mol^{-1}$

D. $8.31 JK^{-1} mol^{-1}$

Answer:

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23. A thin bulb containing air at normal pressure at 41 °C is sealed. The bulb burst when heated at 198 °C then bursting pressure is

A. 1 atmosphere

B. 1.5 atmosphere

C. 2 atmosphere

D. 2.5 atmosphere

Answer:

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24. One mole of a gas at pressure 2 Pa and temperature 27 °C is heated till both pressure and volume are tripled. What is the temperature of the gas?

A. 300K

B. 900K

C. 2700K

D. 2900K

Answer:

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25. A constant volume gas thermometer using helium, records pressures of 20.0 kPa at the triple point of water (273.15 K). The pressure of 14.0 kPa is at the temperature of

A. $191.21^{\circ}C$

B. $191.21K$

C. $291.21^{\circ}C$

D. $291.21K$

Answer:

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26. A certain mass of a gas exerts pressure of 72 cm of mercury at 27 °C. It is heated at constant volume and the pressure observed after some time is 90 cm of mercury. Calculate the temperature

A. $375^{\circ} C$

B. $112^{\circ} C$

C. $102^{\circ} C$

D. $92^{\circ} C$

Answer:

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27. A constant pressure air thermometer gave a reading of 47.5 unit of volume when immersed in ice and 67.0 unit when immersed in boiling liquid. The boiling point of liquid is

A. $385.05^{\circ} C$

B. $285.05^{\circ} C$

C. $312.07^{\circ} C$

D. $112.07^{\circ} C$

Answer:

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28. 1 litre of an ideal gas at 27 °C is heated at a constant pressure to 297 °C. The final volume is approximately

A. 1.2 litre

B. 1.9 litre

C. 2.4 litre

D. 19 liter

Answer:

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29. One mole of gas occupies a volume of 100 ml at 50 mm pressure. The volume occupied by 3 moles of the same gas at 100 mm pressure and at the same temperature is

A. 50 ml

B. 100ml

C. 150ml

D. 200ml

Answer:

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30. Which of the following has minimum coefficient of linear expansion?

A. gold

B. aluminium

C. iron

D. platinum

Answer:

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31. Fomenting bottles, are used with hot water because

A. water is easily available

B. is is easier to heat it

C. water does not stick to the walls of the bottle

D. specific heat of water is more

Answer:

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32. When a gas is heated at constant pressure, its volume changes and hence

A. less heat is required when the same gas is heated at constant volume under similar conditons

B. more heat is required when the same gas is heated at constant volume under similar conditions

C. same heat is required, when the same gas is heated at constant volume under similar conditions

D. half of the heat is required when same gas is heated at constant volume under similar condtions

Answer:

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33. In case of gas, slight change in temperature is accompanied with considerable changes in both pressure and volume. Hence there is/are __________type/s of specific heats for gas.

A. 5

B. 3

C. 2

D. 1

Answer:

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34. The relation between molar specific heat, molecular weight and principal specific heat is (Wlieie symbols have Iheii usual meaning)

A. $Cp = M \times Sp$ and $Cv = M \times Sv$

B. $Cp = \frac{M}{S}$ and $Cv = \frac{M}{c_v}$

C. $Cp = \frac{C_p}{M}$ and $Cv = C\frac{v}{M}$

D. $Cp = Mxcp$ and $Cv = \frac{M}{c}v$

Answer:

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35. The quantity of heat, required to raise the temperature of unit mass of gas through 1 °C when its pressure is kept constant, is called as

A. specific heat of a gas at constant volume.

B. molar specific heat of a gas at constant pressure

C. specific heat of a gas at constant pressure.

D. molar specific heat of a gas at constant volume

Answer:

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36. The thermal capacity of a gas is low as compared to liquids hence

A. small changes in temperature can be recorded accurately.

B. gases will take more heat energy and show wrong temperature.

C. only large changes in temperature can be recorded accurately.

D. changes in temperature of gas depends upon the type of the gas

Answer:

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37. Point out the CORRECT relation.

A. $\alpha = \frac{Lf, \ - Li}{Li(t2 - t1 \mid \ )}$

B. $\alpha = \frac{- L_i}{Bj(tf - ti)}$

C. $\alpha = \frac{Li - Lf}{Lf(tf - Li)}$

D. $\alpha = \frac{Lf - Li}{hf(tf - ti, \ )}$

Answer:

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38. A metal rod of diameter 1 cm measures 50 cm in length at 65 °C. If the coefficient of linear expansion of the rod is 16 x 10-6/ °C, the length of the rod at 0 °C will be

A. 49.95cm

B. 50cm

C. 50.5cm

D. 50.95cm

Answer:

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39. Railway lines are laid with the gaps to allow for expansion. The gap between two lines is 0.5 cm at 10 ºC. If the length of a line is 12 m then temperature at which the lines just touch each other is [alpha = 11 x 1O'6/ ºC]

A. $27.8^\circ C$

B. $37.8^\circ C$

C. $47.8^{\circ} C$

D. $57.8^{\circ} C$

Answer:

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40. The increase in area per unit area per degree rise in temperature is called

A. coefficient of superficial expansion of solid

B. coefficient of linear expansion of solid.

C. coefficient of tangential expansion of solid

D. coefficient of volume expansion of solid.

Answer:

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41. The unit of superficial expansion is same as

A. temperature

B. coefficient mass expansion

C. coefficient of volume expansion

D. heat energy per unit time

Answer:

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42. The original area of a metal plate is 110 cm^2 at 20 °C. If beta for the metal is 0.000036/ °C, then what is the area of the plate at 200 °C?

A. $110.17cm2$

B. 1117cm2

C. 110.71cm2

D. 111.70cm2

Answer:

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43. Increase in volume is

A. directly proportional to original volume and inversely proportional to temperature difference

B. inversely proportional to original volume and directly proportional to temperature difference

C. directly proportional to both original volume and temperature difference.

D. inversely proportional to both original volume and temperature difference.

Answer:

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44. The coefficient of cubical expansion of a solid is the increase in volume per unit original volume at 0 °C per

A. unit rise in temperature

B. unit volume

C. degee rise in temperature

D. square metre

Answer:

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45. The volume of a metal block changes by 0.84% when heated through 200 °C then its coefficient of cubical expansion is

A. $42 \times 10^{6} / ^{\circ} C$

B. $84 \times 10^{6} / ^{\circ} C$

C. $4.2 \times 10^{-5} / ^{\circ} C$

D. $8.4 \times 10^{5} / ^{\circ} C$

Answer:

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46. The water has maximum density at

A. $0^{\circ} C$

B. $2^{\circ} C$

C. $4^{\circ} C$

D. $6^{\circ} C$

Answer:

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47. The temperature of water at the surface of deep lake is 2 °C. The temperature expected at the bottom is

A. $0^\circ C$

B. $2^\circ C$

C. $4^\circ C$

D. $6^\circ C$

Answer:

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48. When water is heated from $0^\circ C$ to $10^\circ C$ its density.

A. increases

B. does not change

C. decreases

D. first increases and then decreases

Answer:

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49. The property of water which is a boon to aquatic animals and plants is ____

A. condensation

B. evaportion

C. water is the from of ice

D. anomalous behaviour

Answer:

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50. The amount of heat required to change temperature of a substance is

A. directly proportional to its mass and inversely proportional to the change in temperature.

B. directly proportional to both, its mass and temperature difference.

C. inversely proportional to both, its mass and temperature difference.

D. directly proportional to temperature difference and inversely proportional to its mass.

Answer:

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51. Answer the following questions :

State the SI unit of specific heat capacity.

A. $Jlkg'l^{\circ}C^{-1}$

B. $Jlkg'l^{\circ}C^{-1}$

C. `r1 kg-1^@c'

D. `r1 kg'^@c^(-1)

Answer:

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52. A piece of lead weighing 500 g gives out 1200 calories of heat when it is cooled from 90 °C to 10 °C. Find its specific heat.

A. $0.003cal/g^{\circ}C$

B. $0.033cal / g^{\circ} C$

C. $0.03cal / g^{\circ} C$

D. $0.3cal / g^{\circ} C$

Answer:

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53. The measurement of heat means________

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54. A device in which heat measurement can be made is called

A. thermometer

B. calorimeter

C. speedometer

D. absolute scale

Answer:

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55. Calorimeter is used to determine __________ of a substance.

A. latent heat

B. specific heat

C. temperature

D. quality

Answer:

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56. A system is said to be isolated if

A. no exchange of heat occurs between the system and its surroundings

B. exchange of heat occurs between the system and its surroundings

C. the system interact with other system

D. in the system different parts are at same temperature

Answer:

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57. The change of state occurs when the exchange of heat takes place between

A. the molecules of the substance

B. the molecules and the free electrons

C. the substance and its surroundings

D. earth and body

Answer:

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58. The upper fixed point on Kelvin scale is

A. boiling point of water

B. melting point of ice

C. condensation point of vapour

D. triple point of water

Answer:

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59. The point where water in a solid, liquid and gas states co-exists in equilibrium at unique temperature and pressure is known as ______

A. melting point of water

B. boiling point of water

C. freezing point of water

D. triple point of water

Answer:

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60. Whenever there is a change in the state of a substance, without change in temperature, then

A. heat is always absorbed

B. heart is always given out

C. heat is either absorbed or given out

D. heat is neither absorbed nor given out

Answer:

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61. The quantity of heat required to convert unit mass of a substance from its solid state to the liquid state, at its melting point without change in its temperature is called as

A. latent heat of fusion

B. latent heat of vaporization

C. latent heat of solidification

D. water equivalent of it

Answer:

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62. The unit of latent heat is

A. J kg

B. Jkg^{-1}

C. Wkg

D. Wkg^{-1}

Answer:

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63. A mode of transfer of heat through a material medium from a point at higher temperature to a point at a lower temperature without actual migration of the particles of the medium is _________

A. convection

B. radiation

C. conduction

D. thermal radiation

Answer:

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64. All metals are

A. bad conductors of heat

B. reflectors of heat

C. insulator of heat

D. good conductors of heat

Answer:

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65. Liquids and gases except mercury are

A. bad conductors of heat

B. reflectors of heat

C. poor conductors of heat

D. good conductors of heat

Answer:

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66. Which of the following is a slow process?

A. Conduction

B. Convection

C. Radiation

D. thermal radiation

Answer:

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67. The rate of fall of temperature per unit length of the rod, when the rod is in the steady state is known as____

A. potential gradient

B. temperature gradient

C. velocity gradient

D. pressure gradient

Answer:

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68. The quantity of heat which crosses unit area of a metal plate during conduction depends on

A. the density of the metal

B. the temperature gradient prependicular to the area

C. the temperature to which the metal is heated

D. the area of the metal plate

Answer:

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69. The dimensions of thermal conductivity are

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70. The coefficient of thermal conductivity of a ga is proportional to

A. T^2

B. T

C. $\frac{1}{T}$

D. VT

Answer:

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71. C.G.S unit of coefficient of thermal conductivity is

A. $\dfrac{erg}{(cm)s^{\circ}C}$

B. $erg/s^{3}K$

C. $cal/gs^{\circ}C$

D. $cal/cms^{\circ}C$

Answer:

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72. Large value of coefficient of thermal conductivity is due to

A. small number of free electrons

B. very few number of free electrons

C. large number of free electrons

D. absence of free electrons

Answer:

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73. When hot water is poured in glass beaker.

A. the beaker becomes hot quickly

B. the inner side of beaker becomes hot and outer sied also, hence it expands

C. the inner side of glass expands, the heat does not reach outer surface quickly hence glass cracks

D. the outer surface of beake quickly radiates heat to the surrounding

Answer:

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74. The process of transfer of heat due to difference in densities of the matter is called as______

A. conduction

B. radiation

C. thermal expansion

D. convection

Answer:

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75. Convection is NOT possible in _______

A. solids

B. liquids

C. gases

D. fluids

Answer:

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76. In convection, energy is carried by

A. vibration of molecules about their mean position

B. collision of molecules inside the substance

C. electron in the molecules

D. particles of the medium

Answer:

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77. The motion of the particles of the medium results in _____currents

A. thermic

B. electric

C. water

D. convection

Answer:

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78. We feel cool near sea shore in day time because of

A. cooler air moving fium the sea towards the land.

B. cooler air moving from the land towards the sea.

C. air breeze is always present on the sea shore due to coconut trees.

D. hot air is moving from the sea towards land

Answer:

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79. The result of convection currents in air is:

A. floating of yatch

B. breeze due to sand and trees on sea shore

C. land breeze at night time

D. sea breeze at night time

Answer:

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80. The colour of the body is an indication of

A. its atomic configuration

B. its latent heat

C. amount of heat it can absorb or radiate

D. its thermal conductivity

Answer:

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81. The heat radiated by hot body depends on

A. amount of the hot body

B. initial temperature of the hot body

C. the difference in the temperature between the body and the surroundings

D. final temperature and material of the body

Answer:

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82. The rate of fall of temperature of a body is difrectly proportional to the excess temperature of the body over the surroundings, (for small temperature difference). This is _______

A. Snell's law

B. Newton's law of heating

C. Boyle's law

D. Newtons law of cooling

Answer:

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83. A body cools at the rate of 1.5 °C/min when its temperature is 30 °C above that of the surrounding. At what temperature above the surrounding will it cool at the rate of 1 °C/min?

A. $10^\circ C$

B. $15^\circ C$

C. $20^\circ C$

D. $25^\circ C$

Answer:

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84. A metal sphere cools from 64 °C to 55 °C in 10 minutes and to 42 °C in the next 10 minutes. The ratio of fall of temperature of first 10 minutes to next ten minutes is

A. $\frac{13}{9}$

B. $\frac{7}{6}$

C. $\frac{9}{13}$

D. $\frac{4}{7}$

Answer:

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85. Two rods of length L_1 and L_2 are made up of different material whose coefficient of linear expansion are α_1 and α_2 respectively. The difference between their lengths will be independent of temperature if $\frac{L_1}{L_2}$ is equal to.

A. $\frac{\alpha_1}{\alpha_2}$

B. $\left(\frac{\alpha_1}{\alpha_2}\right)^{\frac{1}{2}}$

C. $\frac{\alpha_2}{\alpha_1}$

D. $\left(\frac{\alpha_2}{\alpha_1}\right)^{\frac{1}{2}}$

Answer:

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86. A body cools from $100^\circ C$ to $70^\circ C$ in 4 minute. If the room temperature is $15^\circ C$ the time taken to cool from $70^\circ C$ to $40^\circ C$ will be

A. 7 minute

B. 6 minute

C. 5 minute

D. 4 minute

Answer:

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87. Heat transfer takes place between the system and surrounding medium until

A. the body and surrounding medium, both attain same temperature.

B. body attains lower temperature than surrounding medium.

C. surrounding medium attains lower temperture than body.

D. the body and surrounding medium, both attain room temperature.

Answer:

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88. The sum of all energies of all molecules in a body is called

A. Kinetic energy

B. potential energy

C. thermal energy

D. vibrational energy

A. kinetic energy

B. potential energy

C. vibrational energy

D. internal energy

Answer:

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89. When three identical thermometers marked kelvin, celsius and fahrenheit scale, placed in boiling water, the temperatures shown on them respectively are

A. $100K, 373.15^{\circ}C, 212^{\circ}F$

B. $373.15K100^{\circ}C, 212^{\circ}F$

C. $212K, 100^{\circ}C, 373.15^{\circ}F$

D. $373.15K, 212^{\circ}C, 100^{\circ}F$

Answer:

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90. Which of the following temperature will read the same value on celsius and Fahrenheit scales.

A. $40^{\circ} C$

B. $-40^{\circ} C$

C. $20^{\circ} C$

D. $-20^{\circ} C$

Answer:

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91. At what temperature the reading of fahrenheit thermometer will be double that of celsius thermometer

A. $160^\circ F$

B. $200^\circ F$

C. $300^\circ F$

D. $320^\circ F$

Answer:

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92. The equal temperature value for Kelvin and Fahrenheit scales is

A. $574.58^{\circ} F$

B. $574.25^{\circ} C$

C. $100^{\circ} F$

D. 273 K

Answer:

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93. At absolute zero, every substance in nature has

A. maximum possible molecular activity.

B. moderate molecular activity.

C. maximam atomic activity.

D. least possible molecular activity,

Answer:

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94. Real gases obey ideal gas laws more closely at

A. high pressure and low temperature.

B. low pressure and high temperature.

C. high pressure and high temperature.

D. low pressure and low temperature.

Answer:

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95. If a given mass of gas occupies a volume $60m^3$ one atmospheric pressure and temperature of $100^\circ C$, what will be its volume at 4 atmospheric pressure when temperature remains same?

A. $25cm^3$

B. 0

C. $50cm^3$

D. $5cm^3$

Answer:

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96. $\frac{PV}{3} = RT$, V represents volume of

A. any amount of gas

B. 2 moles of gas

C. 3 moles of gas.

D. 4 moles of gas.

Answer:

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97. Two thermally insulated vessels 1 and 2 are filled with air at temperatures (T_1, T_2), volumes (V_1, V_2) and pressures (P_1, P_2) respectively. If the valve joining the two vessels is opened, the temperature inside the vessel at equilibrium will

A. $T_1 + T_2$

B. $\dfrac{T_1 + T_2}{2}$

C. $T_1T_2(P_1V_1 + P_2V_2)$/((P_1 V_1 T_2 + P_2 V_2 T_1)`

D. $T_1T_2(P_1V_1 + P_2V_2)$/((P_1 V_1 T_1 + P_2 V_2 T_2)`

Answer:

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98. As the temperature of the solid increases

A. the molecules move freely.

B. the average distance between the molecules increases.

C. the average distance between the molecules remains the same.

D. the molecules collide with each other.

Answer:

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99. A litre of alcohol weighs

A. less in winter than in summer.

B. less in summer than in winter.

C. same in summer and winter.

D. same as a litre of water.

Answer:

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100. A closed bottle containing water at $30^\circ C$ is carried to the moon in a space-ship. If it is placed on the surface of the moon, what will happen to the water as soon as the lid is opened?

A. Water will boil.

B. Water will freeze.

C. Nothing will happen to it.

D. It will decompose into H_2 and O_2

Answer:

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101. Two iron bars of same length with unequal radii are heated for the same rise in temperature. Then linear expansion will be

A. more in thin rod.

B. more in thick rod.

C. same for both rods.

D. twice in thin rod

Answer:

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102. A steel scale gives correct reading at $t_1^\circ C$. When temperature changes to $t_2^\circ C$ then

A. if $t_2 > t_1$ reading is greater than true value.

B. if$t_2 > t_1$, trending is lesser than true-value

C. the reading is always equal to true value.

D. the reading is always less than true value.

Answer:

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103. When a bimetallic strip is heated, it

A. does not bend at all.

B. gets twisted in the form of an helix

C. bends in the form of an are with the more expandable metal outside.

D. bends in the form of an arc with the more expandable metal inside

Answer:

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104. A metal rod having a coefficient of linear expansion of $2 \times \frac{10^{-5}}{\hat{}} \circ C$ has a length of 100 cm at $20^{\circ} C$. The temperature at which it is shortened by 1 mm is

A. $-30^{\circ} C$

B. $70^{\circ} C$

C. $-20^{\circ} C$

D. $-10^{\circ} C$

Answer:

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105. An iron plate has a circular hole of a diameter 10 cm. Find the diameter of the hole when the plate is uniformly heated from $10^\circ C$ to $90^\circ C$. $\left[\alpha = 12 \times \frac{10^{-6}}{\circ} C\right]$

A. 10.0192 cm

B. 10.0096 cm

C. 10.96 cm

D. 11.96 cm

Answer:

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106. A metal sphere 10.01 cm in diameter is placed on a brass ring of internal diameter 10 cm and at the same temperature of $10^\circ C$. The temperature up to which they should be heated together so that the metal sphere just passes through the ring is $\left[\alpha_{metal} = 12 \times \frac{10^{-6}}{\circ} C\right.$and alpha_brass= 18 xx 10^-6/@C]`

A. $167^\circ C$

B. $177^\circ C$

C. $187^\circ C$

D. $197^\circ C$

Answer:

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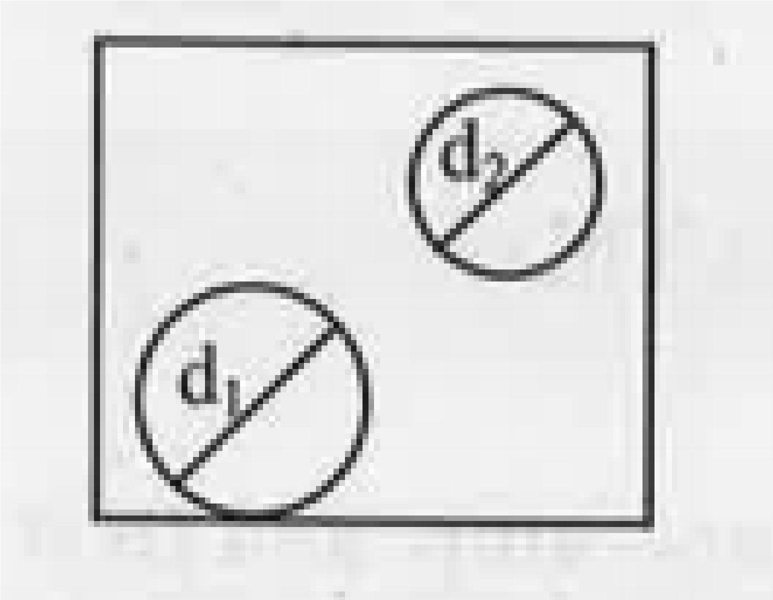
107. The metal sheet shown in figure, with two holes cut of unequal diameters d_1, and

$d_2 (d_1 > d_2)$. If the sheet is heated



A. both d_1 and d_2 will decrease,

B. both d_1 and d_2 will increase,

C. d_1 will increase, d_2 will decrease.

D. d_1 will decrease, d_2 will increase.

Answer:

Watch Video Solution

108. A disc has an area of $0.32m^2$ at $20^\circ C$, what will be its area at $100^\circ C$? $\left[\alpha = 2 \times \frac{10^{-6}}{\circ}C\right]$

A. $0.3210m^2$

B. $0.3201m^2$

C. $0.32005m^2$

D. $0.3102m^2$

Answer:

Watch Video Solution

109. A solid ball of metal has a spherical cavity inside it. If the ball is heated, then volume of the cavity will _______.

A. decrease

B. increase

C. remain same

D. initially increase and finally decrease

Answer:

Watch Video Solution

110. If same amount of heat is supplied to two identical spheres (one is hollow and other is solid), then

A. the expansion in hollow is greater than the solid.

B. the expansion in hollow is same as that in solid.

C. the expansion in hollow is lesser than the solid.

D. the temperature of both must be same to each other.

Answer:

Watch Video Solution

111. Which of the following relation is INCORRECT?

A. $\frac{\alpha}{1} = \frac{\beta}{2} = \frac{\gamma}{3}$

B. $\beta = \frac{2}{3}\gamma = 2\alpha$

C. $6\alpha = 3\beta = 5\gamma$

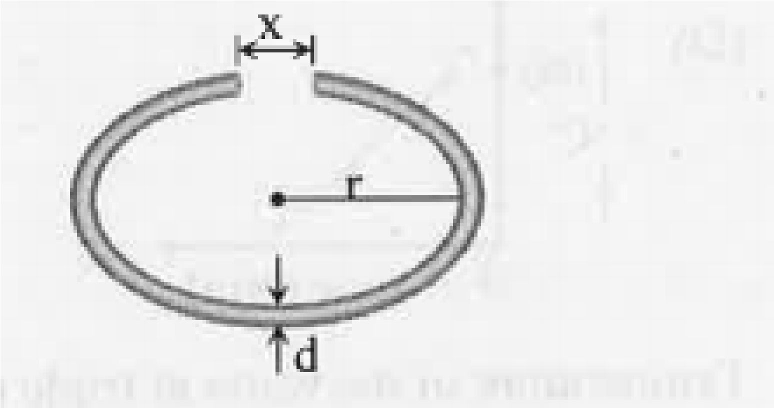
D. $3\alpha = 3\frac{\beta}{2} = \gamma$

Answer:

Watch Video Solution

112. A cylindrical metal rod of length L_0 is shaped into a ring with a small wap as shown.

On heating the system



A. x decreases, r and d increase.

B. x and r increase, d decreases.

C. x. r and d all increase.

D. x and r increase, d remains same.

Answer:

Watch Video Solution

113. When a copper is heated, the largest percentage increase will occur in its

A. diameter

B. area

C. volume

D. density

Answer:

Watch Video Solution

114. A glass flask of volume one liter at $0^\circ C$ is filled, level full of mercury at this temperature. The flask and mercury are now heated to $100^\circ C$. How much mercury will spill out, if co-efficient of volume expansion of mercury is $1.82 \times \frac{10^{-4}}{\circ} C$ and linear expansion of glass is $0.1 \times \frac{10^{-4}}{\hat{}} \circ C$ respectively ?

A. 21.2 cc

B. 15.2 cc

C. 1.52 cc

D. 2.12 cc

Answer:

Watch Video Solution

115. A beaker is completely filled with water at $4^\circ C$. It will overflow

A. when heated, but not when cooled

B. when cooled, but not when heated.

C. both when heated or cooled.

D. when kept at constant temperature.

Answer:

Watch Video Solution

116. A brass disc fits simply in a hole of a steel plate. The disc from the hole can be loosened if the

A. is first heated then cooled

B. is first cooled then heated.

C. is heated

D. is cooled.

Answer:

Watch Video Solution

117. Two rods, one of aluminum and the other made of steel, having initial length $l_1$and l_2 are connected together to form a single rod of length $l_1 + l_2$. The coefficients of linear expansion for aluminum and steel are alpha_a, and alpha_s, respectively. If the length of each rod increases by the same amount when their temperature are raised by $t^\circ C$, then find the ratio $\frac{l_1}{l_1 + l_2}$

A. $\frac{\alpha_s}{\alpha_a}$

B. $\frac{\alpha_a}{\alpha_s}$

C. $\frac{\alpha_s}{\alpha_a + \alpha_s}$

D. $\frac{\alpha_a}{\alpha_a + \alpha_s}$

Answer:

Watch Video Solution

118. An iron tyre is to be fitted onto a wooden wheel 1 m in diameter. The diameter of tyre is 6 mm smaller than that of wheel. The tyre should be heated so that its temperature increases by a minimum of (the coefficient of cubical expansion of iron is $3.6 \times \frac{10^{-5}}{\hat{}} \circ C\Big)$

A. $167^{\circ} C$

B. $334^{\circ} C$

C. $500^{\circ} C$

D. $1000^{\circ} C$

Answer:

Watch Video Solution

119. A two litre glass flask contains some mercury. It is found that at all temperatures the volume of the air inside the flow remains the same. The volume of the mercury inside the flask is $(\alpha$ for glass = $9 \times \frac{10^{-6}}{\hat{}} \circ C$, gamma f or $mercury$1.8 xx 10^-4/^@C)`

A. 1500 c.c.

B. 150 c.c.

C. 3000 c.c.

D. 300 c.c.

Answer:

Watch Video Solution

120. Two uniform brass rods A and B of length l and 2l and radii 2r and r respectively are heated to the same temperature. The ratio of the increase in the volume of A to that of B is

A. 1:1

B. 1:2

C. 2:1

D. 1:4

Answer:

Watch Video Solution

121. An iron bar of length and having a cross section A is heated from 0 to $100^{\circ} C$. If this bar is so held that it is not permitted to expand or bend, the force that is developed, is

A. inversely proportional to the cross sectional area of the har

B. independent of the length of the bar.

C. inversely proportional to the length of the

D. directly proportional to the length of the bar

Answer:

Watch Video Solution

122. The specific heal capacity of a body depends upon __________.

A. the nature of the body.

B. the state of the body.

C. the nature and state of the body.

D. the shape and mass of the body.

Answer:

Watch Video Solution

123. The value of specific heat of an ideal gas, with rise in temperature

A. increases

B. decreases

C. remains the same

D. becomes double

Answer:

Watch Video Solution

124. The specific heat of gas under constant pressure as compared to specific heat under constant volume at the same temperature is

A. more

B. less

C. equal

D. may be more or less according to the nature of the gas

Answer:

Watch Video Solution

125. Boiling water is changing into steam. Under this condition, the specific heat of water is

A. 1

B. 0

C. Infinite

D. < 1

Answer:

Watch Video Solution

126. In terms of mechanical unit, $c_p - c_\gamma$ where c_p and c_γ, are principal specific heats.

A. R

B. $\frac{R}{J}$

C. $\frac{R}{M}$

D. $\frac{R}{M}J$

Answer:

Watch Video Solution

127. 50 g of copper is heated to increase its temperature by $10^{\circ} C$. If the same quantity of heat is given to 10 g water, the rise in its temperature is Specific heat of copper = 420 joule-kg^-1^@ C^-1` , Specific heat of water = 4200 joule-kg^-1^@ C^-1

A. $5^{\circ} C$

B. $6^{\circ} C$

C. $7^{\circ} C$

D. $8^{\circ} C$

Answer:

Watch Video Solution

128. Three liquids with masses m_1, m_2, m_3 are thoroughly mixed. If their specific heats are c_1, c_2, c_3 and their temperatures T_1, T_2, T_3 respectively, then the temperature of the mixture is

A. $\dfrac{c_1T_1 + c_2T_2 + c_3T_3}{m_1c_1 + m_2c_2 + m_3c_3}$

B. $\dfrac{m_1c_1T_1 + m_2c_2T_2 + m_3c_3T_3}{m_1c_1 + m_2c_2 + m_3c_3}$

C. $\dfrac{m_1c_1T_1 + m_2c_2T_2 + m_3c_3T_3}{m_1T_1 + m_2T_2 + m_3T_3}$

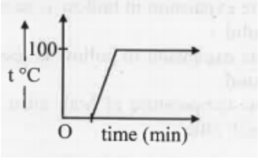
D. $\dfrac{m_1T_1 + m_2T_2 + m_3T_3}{c_1T_1 + c_2T_2 + c_3T_3}$

Answer:

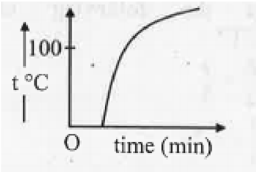
Watch Video Solution

129. The graph of temperature against time is

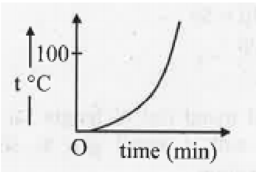
A.



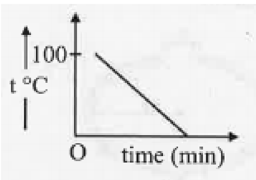
B.



C.



D.



Answer:

Watch Video Solution

130. Temperature of the water at triple point is

A. O K

B. $-273K$.

C. 273 K

D. 373 K.

Answer:

Watch Video Solution

131. The point on the pressure temperature phase diagram where all the phases co-exist is called

A. sublimation

B. fusion point

C. triple point

D. vaporisation point

Answer:

Watch Video Solution

132. Intemal latent heat is defined as

A. amount of heat needed to do work against external pressure.

B. amount of heat needed to do work against intermolecular force.

C. amount of heat needed to increase the K.F. of the molecules

D. Heat needed to change the state of a substance.

Answer:

Watch Video Solution

133. A unit mass of solid is converted to liquid at its melting point. Heat is required for this process

A. Specific heat

B. latent heat of vaporisation

C. latent heat of fusion

D. external latent heat.

Answer:

Watch Video Solution

134. A metallic ball and highly retched spring are made of the same material and have the same mass. They are heated so that they melt the latent heat required

A. are the same for both.

B. is greater for the ball.

C. is greater for the spring

D. for the two may or may not be the same depending upon the metal

Answer:

Watch Video Solution

135. The latent heat of vaporization of a substance is always

A. greater than its latent heat of fusion.

B. greater than its latent heat of sublimation.

C. equal to its latent heat of sublimation.

D. less than its intent heat of fusion.

Answer:

Watch Video Solution

136. 2 kg of ice at $-20^{\circ}C$ is mixed with 5 kg of water at $20^{\circ}C$ in an insulating vessel having a negligible heat capacity. Calculate the final mass of water remaining in the container. It is given that the specific beats of water and ice are $1\frac{kcal}{kg^{\circ}C}$ and $0.5\frac{kcal}{kg^{\circ}C}$ while she latent heat of fusion of ice is $80\frac{kcal}{kg}$

A. 7 kg

B. 6 kg

C. 4 kg

D. 2 kg

Answer:

Watch Video Solution

137. Work done in converting one gram of ice at $-10^\circ C$ into steam at $100^\circ C$ is

A. 3045 J

B. 6056 J

C. 721 J

D. 616 J

Answer:

Watch Video Solution

138. If the pressure of the surrounding is decreased, then the latent heat of steam

A. remains unchanged.

B. increases

C. decreases

D. changes erratically.

Answer:

Watch Video Solution

139. 1 of a steam at $100^{\circ} C$ melts how much ice at $0^{\circ} C$? $(Latentheatofice = 80ca\frac{l}{g}$ and $latentheatofsteam = 540ca\frac{l}{g})$

A. 1 g

B. 2 g

C. 4 g

D. 8 g

Answer:

Watch Video Solution

140. Assertion: Latent heat of fusion of ice is $336000 Jkg^{-1}$. Reason: Latent hem refers to change of state without any change in temperature.

A. Assertion is True Reason is True Reason is a correct explanation for Assertion

B. Assertion is True, Reasons True, Reason is not a correct explanation for Assertion.

C. Assertion is True Reason is False

D. Assertion is False, Reason is False

Answer:

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141. During steady state of a rod heated at one end and surrounded by bad conductor, the rate of flow of heat is

A. same through any cross-section

B. more through nearer Cross-section at higher temperature.

C. more through nearer cross-section at lower temperature.

D. different through any cross-section

Answer:

Watch Video Solution

142. While measuring the thermal conductivity of a liquid, we keep the upper part hot and lower part cool, so that

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.

Answer:

Watch Video Solution

143. Liquid is filled in a vessel which is kept in a room with temperature $20^{\circ} C$. When the temperature of the liquid is $80^{\circ} C$, then it loses heat at the rate of $60 \frac{cal}{s}$. What will be the rate of loss of heat when the temperature of the liquid is $40^\circ C$?

A. 180 cal/s

B. 40 cal/s

C. 30 cal/s

D. 20 cal/s

Answer:

Watch Video Solution

144. The coefficients of thermal conductivity of copper, mercury and glass are respectively K_c, K_m and K_g such that $K_c > K_m > K_g$. If the same quantity of heat is to flow per second per unit area of each and corresponding temperature gradients are $(T_g)_c$, $(T_g)_m$ and $(T_g)_g$ then

A. $(T_g)_c = (T_g)_m = (T_g)_g$

B. $(T_g)_c > (T_g)_m > (T_g)_g$

C. $(T_g)_c < (T_g)_m < (T_g)_g$

D. $(T_g)_m < (T_g)_c < (T_g)_g$

Answer:

Watch Video Solution

145. The heat is flowing through two cylindrical rods of same material. The diameters of the rods are in the ratio $1:2$ and their lengths are in the ratio $2:1$. If the temperature difference between their ends is the same, the ratio of rate of flow of hest through them will be

A. 1:1

B. 2:1

C. 0.04444444444444444

D. 1:8

Answer:

Watch Video Solution

146. A cylindrical rod having temperature T_1, and T_2 at its ends. The rate of flow of heat is $Q_1 \frac{cal}{s}$. If all the linear dimensions are doubled keeping temperature constant then rate of flow of heat Q_2, will be

A. $4Q_1$

B. $2Q_1$

C. $\frac{Q_1}{4}$

D. $\frac{Q_1}{2}$

Answer:

Watch Video Solution

147. One end of a metal rod is kept in steam. In steady state, the temperature gradient $\left(\frac{d\theta}{dx}\right)$

A. may be variable.

B. must be constant.

C. must be variable.

D. must be unity.

Answer:

Watch Video Solution

148. On a cold morning, a metal surface will feel colder to touch than a wooden surface because

A. metal has high specitic heat.

B. metal has high thermal conductivity.

C. metal has low specific heat.

D. metal has low thermal conductivity.

Answer:

Watch Video Solution

149. Which of the following circular rods (given radius r length x and each made of the same material) whose ends are maintained at the same temperature will conduct most heat?

A. $r = 2r_0, x = 2x_0$

B. $r = 2r_0, x = x_0$

C. $r = r_0, x = x_0$

D. $r = r_0, x = 2x_0$

Answer:

Watch Video Solution

150. The coefficient of thermal conductivity depends upon

A. temperature difference of two surfaces.

B. area of the plate.

C. thickness of the plate.

D. material of the plate.

Answer:

Watch Video Solution

151. The two ends of a rod of length x and a uniform cross-sectional area A are kept at two temperatures θ_1 and θ_2, $(\theta_1, > \theta_2)$. The rate of heat transfer $\frac{dQ}{dt}$ through the rod in a steady state is given by

A. $\frac{dQ}{dt} = K\frac{\theta_1 - \theta_2}{x}A$

B. $\frac{dQ}{dt} = KxA(\theta_1 - \theta_2)$

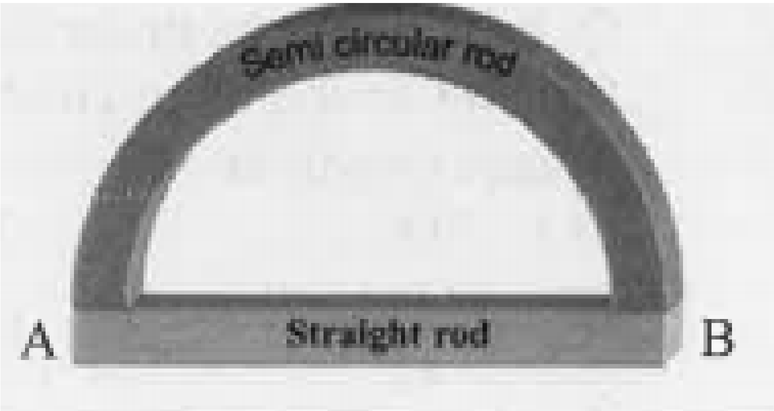
C. $\frac{dQ}{dt} = KA\frac{\theta_1 - \theta_2}{x}$

D. $\frac{dQ}{dt} = Kx\frac{\theta_1 - \theta_2}{A}$

Answer:

Watch Video Solution

152. Two rods (one semi-circular and other straight) of same material and of same cross-sectional area are joined as shown in the figure. The points A and B are maintained at different temperature. The ratio of the heat transferred through a cross-section of a semi-circular rod to the heat transferred through a cross section of the straight red in a given time is



A. $2 : \pi$

B. $1 : 2$

C. $\pi : 2$

D. $3 : 2$

Answer:

Watch Video Solution

153. Two rods of same length and material transfer a given amount of heat in 12 second, when they are joined end to end. But when they are joined lengthwise, then they will transfer same heat in same conditions in

A. 24 s

B. 3 s

C. 1.5 s

D. 48 s

Answer:

Watch Video Solution

154. The thermal conductivity of a material in CGS system is 0.8. In steady state, the rate of flow of heat `20 cal/s-cm^2', then the thermal gradient will

A. $\frac{10^{\circ C}}{cm}$

B. $\frac{12^{\circ C}}{cm}$

C. $\frac{25^{\circ C}}{cm}$

D. $\frac{20^{\circ C}}{cm}$

Answer:

Watch Video Solution

155. When fluids are heated from the bottom convection currents are produced because

A. molecular motion of fluid becomes aligned.

B. molecular collisions take place within the fluid

C. heated fluid becomes more dense than the cold fluid above it

D. heated fluid becomes less dense than the cold fluid above it.

Answer:

Watch Video Solution

156. The freezer in a refrigerator is located at the top section so that

A. the entire of the refrigerator is cooled quickly due to convection

B. the motor is not heated.

C. the heart wained from the environment is high

D. the heat gained from the environment islow.

Answer:

Watch Video Solution

157. In which of the following process, convection does not take place primarily?

A. Sea and land breeze.

B. Boiling of water.

C. Warming of glass of bulb due to filament.

D. Heating air around a furnace.

Answer:

Watch Video Solution

158. In Newton's law of cooling, the rate of fall of temperature _________.

A. remains constant

B. increases

C. decreases

D. doubles

Answer:

Watch Video Solution

159. Lavanya has a sphere, Divya has a cube and Vidya has a disc and all of them are made of same material, same mass and same volume. Which of the objects will have the lowest rate of cooling if they are heated to $600^{\circ} C$ and left in air?

A. Sphere

B. Cube

C. Disc

D. All will have same rate

Answer:

Watch Video Solution

160. 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

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.

Answer:

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161. Equal masses of two liquids are filled in two identical calorimeters. The rate of cooling will

A. depend on the nature of calorimeters.

B. depend on the specific heat of liquids.

C. be same for both the liquids.

D. depend on the mass of the liquids.

Answer:

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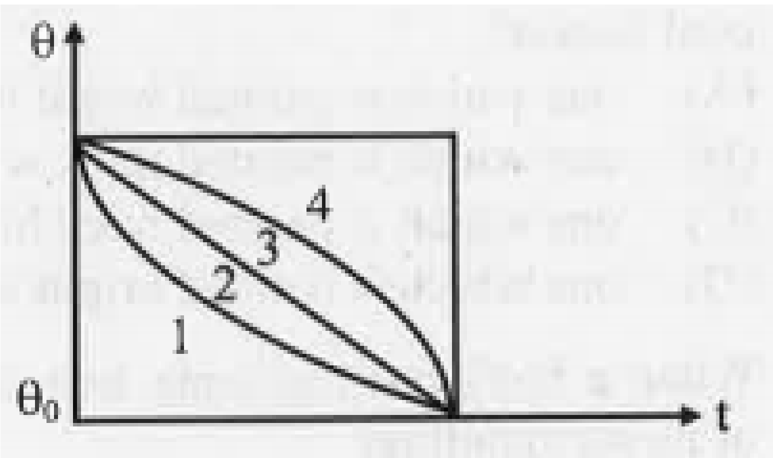
162. A hot liquid is kept in a big room. Its temperature is plotted as a function of time Which of the following curves may represent the plot?



A. 1

B. 2

C. 3

D. 4

Answer:

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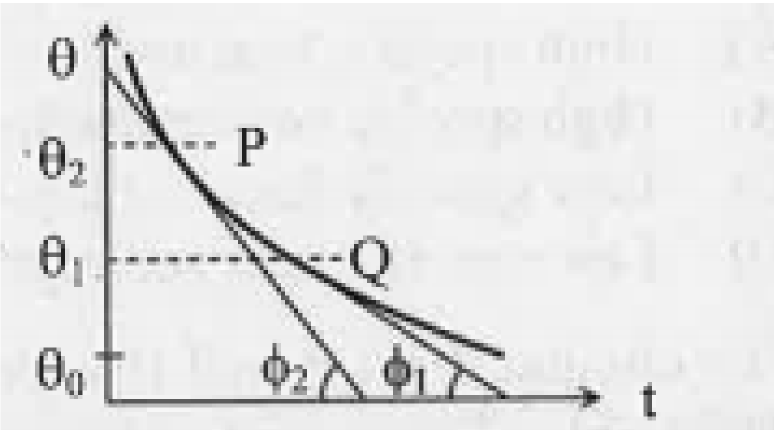
163. A body cools in a surrounding which is at a constant temperature of θ_0.Assume that it obeys Newton's law of cooling. Its temperature θ

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 $0\angle 2$ and $0\angle 1$ as shown



A. $\tan 0\angle \frac{2}{\tan 0}\angle 1 = \frac{\theta_1 - \theta_2}{\theta_2 - \theta_0}$

B. $\tan 0\angle \frac{2}{\tan 0}\angle 1 = \frac{\theta_2 - \theta_0}{\theta_1 - \theta_0}$

C. $\tan 0\angle \frac{1}{\tan 0}\angle 2 = \left(\frac{\theta_1}{\theta_1}\right.$

D. $\tan 0\angle \frac{1}{\tan 0}\angle 2 = \left(\frac{\theta_2}{\theta_1}\right.$

Answer:

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164. In an experiment of Newton's law or cooling the graph between the rate of cooling of the body and excess of temperature with the surrounding is _____

A. parabola

B. hyperbola

C. straight line of negative gradient

D. straight line of positive gradient

Answer:

Watch Video Solution

165. A body cools at the rate 0.50^@C's when it is at $50^\circ C$ above the surrounding temperature. Its rate of cooling when it is $30^\circ C$ above the same surrounding temperature will be

A. $\frac{0.32^{\circ C}}{s}$

B. $\frac{0.36^{\circ C}}{s}$

C. $\frac{0.40^{\circ C}}{s}$

D. $\frac{0.3^{\circ C}}{s}$

Answer:

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166. A liquid with a certain surface area takes 5 minutes to cool from $80^{\circ} C$ to $70^{\circ} C$. The time taken by it to cool from $80^{\circ} C$ to $60^{\circ} C$ is [The surrounding temperature being $40^{\circ} C$]

A. 9 minute

B. 10 minute

C. 11 minute

D. 12 minute

Answer:

Watch Video Solution

167. A bucket full of hot water cools from $75^\circ C$ to $70^\circ C$ in time T_1 from $70^\circ C$ to $65^\circ C$ in time T_2 , and from $65 \circ C$ to $60^\circ C$ in time T_3, then

A. $T_1 = T_2 = T_3$

B. $T_1 > T_2 > T_3$

C. $T_1 < T_2 < T_3$

D. $T_1 > T_2 < T_3$

Answer:

Watch Video Solution

168. A liquid cools down from $70^\circ C$ to $60^\circ C$ in 5 minute. The time taken to cool it from $60^\circ C$ to $50^\circ C$ will be

A. 5 minute

B. lesser than 5 minute

C. greater than 5 minute.

D. lesser or greater than 5 minute depending upon the density of the liquid.

Answer:

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169. A body cools in 7 minute from $60^{\circ}C$ to $40^{\circ}C$. What time does it take to cool from $40^{\circ}C$ to $28^{\circ}C$ if the surrounding temperature is $10^\circ C$? [Assume that Newton's law of cooling is valid.]

A. 3.5 minute

B. 14 minute

C. 7 minute

D. 10 minute

Answer:

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170. A body cools from $50^\circ C$ to $49.9^\circ C$ in 5 s. How long will it take to cool from $40^\circ C$ to $39.9^\circ C$? [Assume the temperature of surroundings to be $30^\circ C$ and Newton's law of cooling to be valid]

A. 2.5 s

B. 10 s

C. 20 s

D. 5 s

Answer:

Watch Video Solution

171. Rate of cooling of a body is $0.2^{\circ} \frac{C}{\text{min}}$, when excess temperature is $20^{\circ} C$. The proportionality constant is

A. 0.01/min

B. 0.02/min

C. 0.03/min

D. 0.04/min

Answer:

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172. Hot water cools from $60^\circ C$ to $50^\circ C$ in the first 10 minute and to $42^\circ C$ in the next 10 minute The temperature of the surrounding is

A. $5^\circ C$

B. $10^\circ C$

C. $15^\circ C$

D. $20^\circ C$

Answer:

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173. Steel rods are used in RCC rootings because

A. cohesive force exist between steel and concrete

B. steel diffuses into concrete.

C. coefficient of expansion of both are equal.

D. coefficient of expansion of steel is smaller than that of concrete.

Answer:

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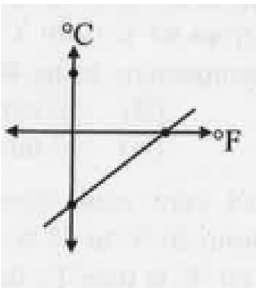
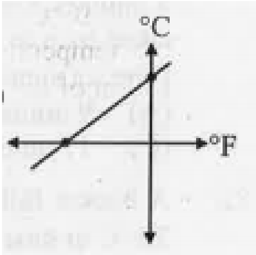
174. Which of the following graph represents the relation `t_f= 9/5 t_c +32?

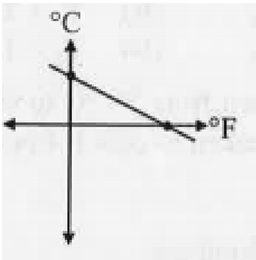
A.



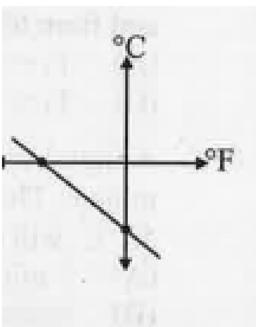
B.



C.



D.



Answer:

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175. A cylindrical rod with one end in a steam chamber and the other and in ice results in melting of 0.1g of ice per second. If the rod is replaced by another with half the length and double the radius of the first and if the thermal conductivity of material of second rod is $\frac{1}{4}$ that of first the rate at which ice melts in g/s will be

A. 3.2

B. 1.6

C. 0.2

D. 0.1

Answer:

Watch Video Solution

176. A plate made up of anisotropic material is circular in shape at temperature T_o. The coefficients of thermal expansion are X_A and X_B in two mutually perpendicular directions.

When heated slightly, the shape of the plate will be

A. smaller size circular

B. large size circular

C. randomly bent

D. elliptical

Answer:

Watch Video Solution

177. Four identical calorimeters painted in different colors, are heated to same temperature and then allowed to cool in vacuum. Which will cool fastest?

A. one which is painted bright black.

B. one which is painted thick white

C. one which is painted thick black

D. one which is painted bright white

Answer:

Watch Video Solution

178. When a body has the same temperature as that of its surroundings

A. it does not radiate heat or absorb heat.

B. its rate of emission is same as that of rate of loss of heat.

C. it radiates less quantity of heat as received from the surroundings.

D. is rate of emission is greater than that of rate of absorption of heat.

Answer:

Watch Video Solution

179. For cooking the food, which of the following type of utensil is most suitable?

A. High specific heat and low conductivity.

B. High specific heal and high conductivity.

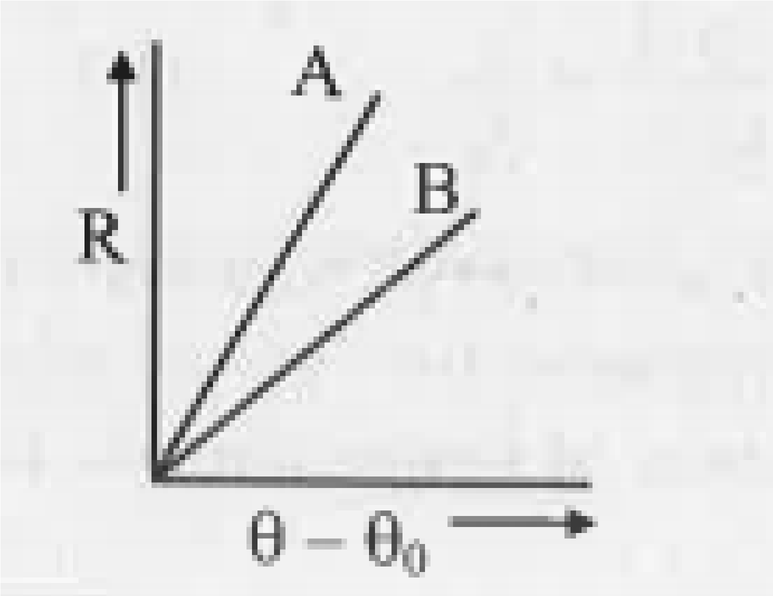
C. Low specific heat and low conductivity.

D. Low specific heat and high conductivity

Answer:

Watch Video Solution

180. Two circular dises A and B with equal radii are blackened. These are being cooled under identical circumstances. What inference can be drawn from their cooling curves?



A. Both are at the same temperature but the specific heat of A is less

B. Temperatures of both are same.

C. Specific heats of both are same

D. Specific heats of both are same but the temperature of B is more.

Answer:

Watch Video Solution

181. It is known that wax contracts on solidification. If molten wax is taken in a large vessel and it is allowed to cool slowly, then

A. it will start solidifying from the top to downward.

B. it will start solidifying from the bottom lo

upward.

C. it will start solidifying from the middle, upward and downward at equal rates.

D. the whole mass will solidify simultaneously.

Answer:

Watch Video Solution

182. A substance of mass m kg requires a power input of P watts to remain in the molten state at its melting point. When the power is turned off, the sample completely solidifies in time t s. What is the latent heat of fusion of the substance?

A. $P\frac{m}{t}$

B. $P\frac{t}{m}$

C. $\frac{m}{P}t$

D. $\frac{t}{P}m$

Answer:

Watch Video Solution

183. The freezing point of the liquid decreases when pressure is increased, if the liquid

A. expands while freezing

B. contracts while freezing.

C. does not change in volume while freezing,

D. has low specific heat.

Answer:

Watch Video Solution

184. Two thin blankets keep more hotness than one blanket of thickness equal to these two. The reason is

A. their surface area increases

B. a layer of air is formed between these two blankets, which is a bad conductor

C. these have more wool

D. they absorb more heat from outside

Answer:

Watch Video Solution

185. An ideal gas is expanding such that $PT^2 = cons\tan t$. The coefficient of volume expansion of the gas is

A. $\frac{1}{T}$

B. $\frac{2}{T}$

C. $\frac{3}{T}$

D. $\frac{4}{T}$

Answer:

Watch Video Solution

186. An ice box used for keeping cold eatables has a total wall area of $1 metre^2$ and a wall thickness of 5.0 cm. The thermal conductivity of the ice box is $K = 0.01 \frac{joule}{(metre)^{\circ}} C$. It is filled with ice at $0^{\circ} C$ along with eatables on a day when the temperature is $30^{\circ} C$. The latent heat of fusion of ice is $334 x 10^3$ joules/kg. The amount of ice melted in one day is (1 day = 86,400 seconds)

A. 776g

B. 1552g

C. 7760g

D. 11520g

Answer:

Watch Video Solution

187. A metal ball immersed in alcohol weighs W_1 at $0^\circ C$ and W_2 at $59^\circ C$. The coefficient of cubical expansion of the metal is less than that of alcohol. Assuming that the density of metal is large compared to that of alcohol, it can be shown that

A. $W_1 > W_2$

B. $W_1 \geq W_2$

C. $W_1 < W_2$

D. $W_2 = \left(\frac{W_1}{2}\right)$

Answer:

Watch Video Solution

188. For any given scale X, the ice point is 40° and the steam point is 120°. For another scale Y, the ice point and steam point are -30° and 130° respectively. If X reads 50°, then Y would read

A. -5°

B. -8°

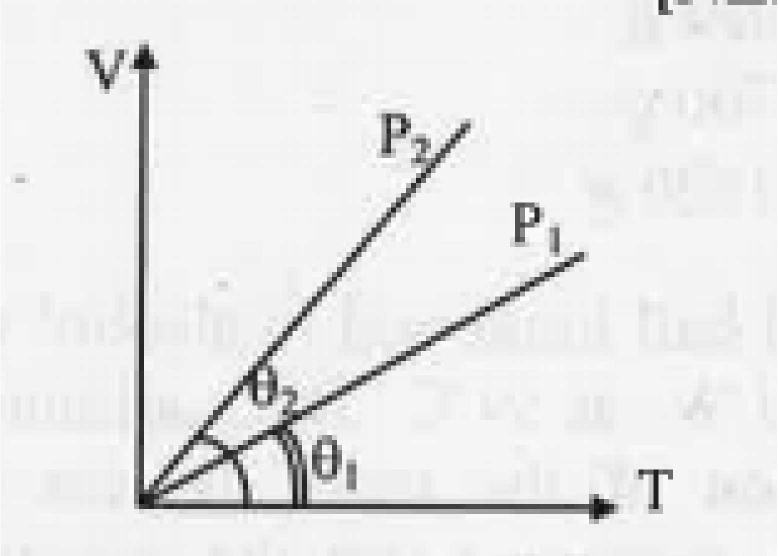
C. -10°

D. -12°

Answer:

Watch Video Solution

189. In the given (V - T) diagram, what is the relation between pressures P_1 and P_2?



A. $P_2 = P_1$

B. $P_2 > P_1$

C. $P_2 < P_1$

D. Cannot be predicted

Answer:

Watch Video Solution

190. Two non-reactive monoatomic ideal gases have their atomic masses in the ratio $2:3$. The ratio of their partial pressures, when enclosed in a vessel kept at a constant temperature, is $4:3$. The ratio of their densities is

A. $1:4$

B. $1:2$

C. $6:9$

D. $8:9$

Answer:

Watch Video Solution

191. A barometer tube of length 90 cm contains some air above mercury. The reading of the mercury level is 74.8 cm when the atmospheric pressure is 76 cm and temperature is $30^\circ C$. If the reading is observed to be 75.4 cm on some another day when temperature is $10^\circ C$, then what will be true pressure?

A. 74.25 cm

B. 75.65 cm

C. 76.57 cm

D. 77.26 cm

Answer:

Watch Video Solution

192. Absolute zero may be regarded as that temperature at which

A. molecular motion in a gas would be the minimum possible.

B. Water freezes.

C. all gases become liquids.

D. all substances are solid.

Answer:

Watch Video Solution

193. The coefficient of volume expansion of an ideal

A. equal to temperature.

B. equal to square of temperature.

C. inversely proportional to square of temperature

D. equal to inverse of temperature.

Answer:

Watch Video Solution

194. Coefficient of linear expansion of brass and steel rods are a_1 and a_2. Lengths of brass and steel rods arel_1 and l_2 respectively. If $(l_2 - l_1)$ is maintained same at all temperatures, which one of the following relations holds good?

A. a_1^2 l_2 = a_2^2 l_1`

B. $a_1 l_1 = a_2^2 l_2$

C. $a_1 l_2 = a_2^2 l_1$

D. $a_1 l_2^2 = a_2 l_1^2$

Answer:

Watch Video Solution

195. The density of mercury at $0^{\circ} C$ is $13600 \frac{kg}{m^3}$ and volume coefficient of expansion of mercury is $1.82 \times \frac{10^{-4}}{{}^{\circ} C}$. The denstiy of mercury at $50^{\circ} C$ is nearly

A. $13333 \frac{kg}{m^3}$

B. $13477 \frac{kg}{m^3}$

C. $13733 \frac{kg}{m^2}$

D. $13900 \frac{kg}{m^3}$

Answer:

Watch Video Solution

196. The value of coefficient of volume expansion of glycerin is $5 \times 10^{-4} K^{-1}$. The fractional change in the density of glycerin for a rise of $40^{\circ} C$ in its temperature, is

A. 0.01

B. 0.015

C. 0.02

D. 0.025

Answer:

Watch Video Solution

197. When water is heated from $0^{\circ}C$ to $10^{\circ}C$, it's volume

A. does not change

B. decreases

C. first decreases and then increases

D. increases

Answer:

Watch Video Solution

198. A metre scale made of steel reads accurately at $25^{\circ}C$. Suppose in an experiment an accuracy of 0.06 mm in 1 m is required, the range of temperature in which the experiment can be performed with this metre scale is (coefficient of linear expansion of stoel is $11 \times \frac{10^{-6}}{{}^{\circ}C}$)

A. $19^{\circ}C$ to$31^{\circ}C$

B. $25^{\circ}C$ to$32^{\circ}C$

C. $18^{\circ}C$ to$25^{\circ}C$

D. $18^{\circ}C$ to$32^{\circ}C$

Answer:

Watch Video Solution

199. A copper rod of 88 cm and an aluminium rod af unknown length have their increase in length independent of increase in temperature. The length of aluminum rod is $(a_{cu} = 1.7 \times 10^{-5} K^{-1}$ and $\alpha_{Al} = 2.2 \times 10^{-5} K^{-1})$

A. 88 cm

B. 68 cm

C. 6.8 cm

D. 113.9 cm

Answer:

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200. A solid rectangular sheet has two different coefficients of linear expansion α_1 and α_2 along its length and breadth respectively. The coefficient of surface expansion is (for

$\alpha_1 t\langle, \alpha_2 t\langle 1)$

A. $\dfrac{\alpha_1 + \alpha_2}{2}$

B. $2(\alpha_1 + \alpha_2)$

C. $\dfrac{1\alpha_1\alpha_2}{\alpha_1 + \alpha_2}$

D. $(\alpha_1 + \alpha_2)$

Answer:

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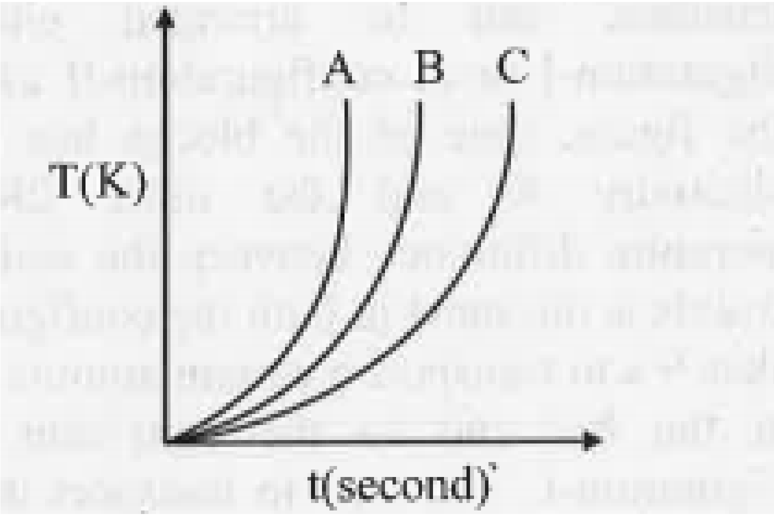
201. Which of the following substances (A, B and C) has the highest specific heat?



A. A

B. B

C. C

D. All have equal specific heat

Answer:

Watch Video Solution

202. Two identical bodies are made of a material for which the heat capacity increases with temperature. One of these is at $100^\circ C$, while the other one is at $0^\circ C$. If the two bodies are brought into contact, then, assuming no heat loss, the final common temperature is

A. $0^\circ C$

B. $50^{\circ} C$

C. more than $50^{\circ} C$

D. less than $50^{\circ} C$ but greater than $0^{\circ} C$

Answer:

Watch Video Solution

203. Steam at $100^{\circ} C$ is passed into 20 g of water at $10^{\circ} C$ When water acquires a temperature of $80^{\circ} C$, the mass of water present will be Take specific heat of

$water = 1calg^{-1}\hat{}\ \circ C^{-1}$ and

$latentheatofsteam = 540calg^{-1}$)

A. 24 g

B. 31.5 g

C. 42.5 g

D. 22.5 g

Answer:

Watch Video Solution

204. Three bodies of the same material and having masses m,m and 3m are at temperatures $40^{\circ} C, 50^{\circ} C$ and $60^{\circ} C$ respectively. If the bodies are brought in thermal contact, the final temperature will be

A. $45^{\circ} C$

B. $54^{\circ} C$

C. $52^{\circ} C$

D. $48^{\circ} C$

Answer:

Watch Video Solution

205. A thermos flask contains 250 g of coffee at $90^{\circ} C$. To this 20 g of milk at $5^{\circ} C$ is added. After equilibrium is established, the temperature of the liquid is (Assume no heat loss to the thermos bottle. Take specific heat of coffee and milk as $1.00 ca \frac{l}{g^{\circ} C}$)

A. $3.23^{\circ} C$

B. $3.17^{\circ} C$

C. $83.7^{\circ} C$

D. $37.8^{\circ} C$

Answer:

Watch Video Solution

206. Three different liduid A , B, C of equal masses have temperatures of $12^{\circ} C$, $19^{\circ} C$ and $28^{\circ} C$. The temperature When A and B are mixed is $16^{\circ} C$ and When B and C are mixed is $23^{\circ} C$. What will be the temperature when A and C are mixed?

A. $19^{\circ} C$

B. $20^{\circ} C$

C. $21^{\circ} C$

D. $22^{\circ} C$

A. $26.02^{\circ} C$

B. $22.60^{\circ} C$

C. $20.26^{\circ} C$

D. $21.62^{\circ} C$

Answer:

Watch Video Solution

207. The water equivalent of a calorimeter is 10 g and it contains 50 g of water at $15^{\circ} C$. Some amount of ice, initially $-10^{\circ} C$ is dropped in it and half of the ice melts till equilibrium is reached. What was the initial amount of ice that was dropped (when specific heat of ice = $0.5 calg^{-1} \hat{} \circ C^{-1}$, $spec$ if $icheatof$water = 1.0 cal g^1^@C^-1 and $latentheatofme < \in gofice$=80 cal g^-1`)?

A. 10 g

B. 18 g

C. 20 g

D. 30 g

Answer:

Watch Video Solution

208. A copper all of mass 100 g is at a temperature T. It is dropped in a copper calorimeter of mass 100 g, filled with 170 g of water at room temperature. Subsequently, the temperature of the system is found to be $75^\circ C$.

T is given by: (Given room temperature $=30^\circ C$, specific heat of copper $=0.1\frac{cal}{g^\circ C}$)

A. $1250^\circ C$

B. $825^\circ C$

C. $800^\circ C$

D. $885^\circ C$

Answer:

Watch Video Solution

209. M' kg of water at 't' ^ $\circ C$ is divided into two parts so that one part of mass 'm' kg when converted into ice $0^{\circ} C$ would release enough heat to vapourise the other part, then $\frac{m}{M}$ is equal to [Specific heat of water = $1 cal g^{-1}$ ^ $\circ C^{-1}$ Latent heat of fusion of ice= $80 cal g^{-1}$ Latent heat of steam = $540 cal g^{-1}$]

A. $640 - t$

B. $\frac{720 - t}{640}$

C. $\frac{640 + t}{720}$

D. $\frac{640 - t}{720}$

Answer:

Watch Video Solution

210. 1 gram of ice is mixed with 1 gram of steam. At thermal equilibrium, the temperature of the mixture is

A. $50^\circ C$

B. $0^\circ C$

C. $55^\circ C$

D. $100^\circ C$

Answer:

Watch Video Solution

211. 60 g of ice at $0^{\circ} C$ is mixed with 60 g of steam at $100^{\circ} C$. At thermal equilibrium, the mixture contains (Latent heat of steam and ice are $540g^{-1}$ and $80calg^{-1}$ respectively, specific heat of water = $1calg^{-1} \hat{} \circ C^{-1}$)

A. 80 g of water and 40 g of steam at$100^{\circ} C$

B. 120 of water at$90^{\circ} C$

C. 120 g of water at$100^\circ C$

D. 40 g of steam and 80 g of water at$0^\circ C$

Answer:

Watch Video Solution

212. Four rods with different radii and length l are used to connect two heat reservoirs at different temperature. Which one will conduct most heat?

A. $r = 1cm, l = 1m$

B. $r = 1cm, l = \frac{1}{2}m$

C. $r = 2cm, l = 2m$

D. $r = 21cm, l = \frac{1}{2}m$

Answer:

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213. Two metal rods of same length and same material conduct a given amount of heat in 8 seconds, when they are joined end to end. But when they are joined in parallel, the time taken to conduct the same amount of heat under same condition is

A. 4s

B. 2 s

C. 16s

D. 1 s

Answer:

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214. A cylindrical metallic rod in thermal contact with two reservoirs of heat at its two ends conducts an amount of heat Q in time t. The metallic rod is melted and the material is formed into a rod of half the radius of the original rod. What is the amount of heat conducted by the new rod, when placed in thermal contact with the two reservoirs in time?

A. $\frac{Q}{4}$

B. $\frac{Q}{16}$

C. $2Q$

D. $\frac{Q}{2}$

Answer:

Watch Video Solution

215. The two ends of a metal rod are maintained temperatures $100^\circ C$ and $110^\circ C$. The rate of heat flow in the rod is found to be $4.0\frac{J}{s}$. If the ends are maintained at temperatures $200^\circ C$ and $210^\circ C$, the rate of heat flow will be

A. $44.0\frac{J}{s}$

B. $16.8\frac{J}{s}$

C. $8.0\frac{J}{s}$

D. $4.0\frac{J}{s}$

Answer:

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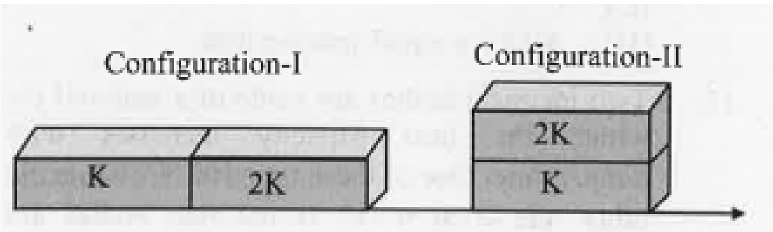
216. Two rectangular blocks, having identical dimensions can be arranged either in configuration-I or in configuration- II as shown in the figure. One of the blocks has thermal conductivity K and the other 2K. The temperature difference between the ends along the x-axis is the same in both the configurations. It takes 9 s to transport a certain amount of heat from the hot and to the cold end in the configuration-I. The time to transport the same amount of heat in the configuration-II is



A. $2.0s$

B. $3.0s$

C. $4.5s$

D. $6.0s$

Answer:

Watch Video Solution

217. Same quantity of ice is filled in each of the two metal containers P and Q having the same size, shape and wall thickness but made of different materials. The containers are kept in identical surroundings. The ice in P melts completely in time t_1, whereas that Q in takes a time t_2. The ratio of thermal conductivities of the materials of P and Q is

A. $t_2 : t_1$

B. $t_1 : t_2$

C. $t_1^2 : t_2^2$

D. $t_2^2 : t_1^2$

Answer:

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218. Three rods of copper, brass and steel are welded together to form a Y-shaped structure. Area of cross-section of each rod $= 4cm^2$. End of copper rod is maintained at $100^\circ C$ whereas ends of brass and steel are kept at $O^\circ C$. Lengths of the copper, brass and steel rods are 46, 13 and 12 cm respectively. The rods are thermally insulated from surroundings except at ends. Thermal conductivities of copper, brass and steel are 0.92, 0.26 and 0.12 CGS units respectively. Rate of heat flow through copper rod is

A. $1.2ca\frac{l}{s}$

B. $2.4ca\frac{l}{s}$

C. $4.8ca\frac{l}{s}$

D. $6.0ca\frac{l}{s}$

Answer:

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219. A refrigerator door is 150 cm high, 80 cm wide and 6 cm thick. If the coefficient of conductiviy is $0.0005\frac{cal}{cms^{\circ}C}$ and the inner and outer surfaces are at $O^{\circ}C$ and $30^{\circ}C$ respectively, then what is the heat loss (in calories) per minute through the door?

A. 900

B. 1800

C. 2700

D. 3600

Answer:

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220. Air conditioners are good example of

A. conduction

B. convection.

C. radiation.

D. both conduction and radiation.

Answer:

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221. The unit of thermal conductivity is:

A. WmK^{-1}

B. $Wm^{-1}K^{-1}$

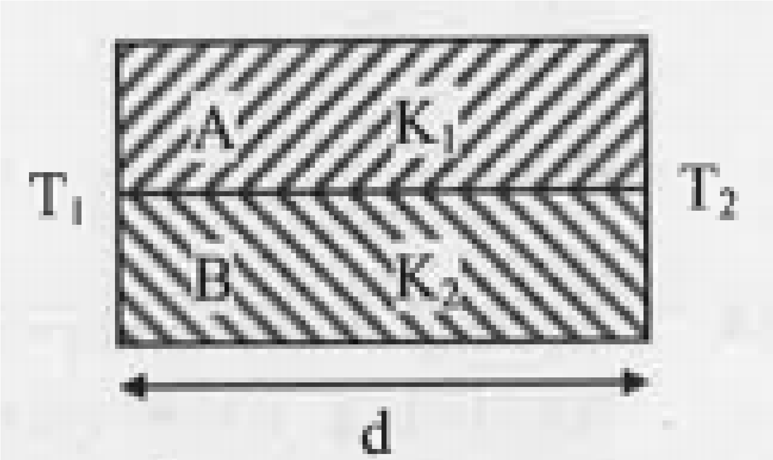
C. JmK^{-1}

D. $Jm^{-1}K^{-1}$

Answer:

Watch Video Solution

222. Two rods A and B of different materials are welded together shown in figure. Their thermal conductivities are K_1 and K_2. The thermal conductivity of the composite rod will be:



A. $\dfrac{K_1 + K_2}{2}$

B. $3\dfrac{K_1 + K_2}{2}$

C. $(K_1 + K_2)$

D. $2(K_1 + K_2)$

Answer:

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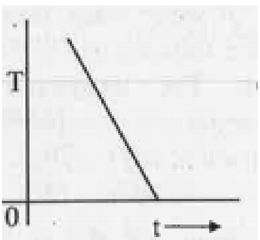
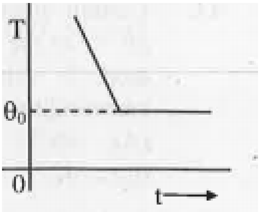
223. If a piece of metal is heated to temperature and then allowed to cool in a room which is at temperature θ_0, the graph between the temperature T of the metal and time I will be closest to :

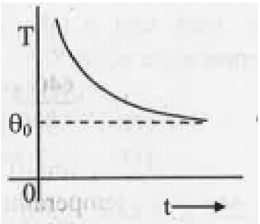
A.



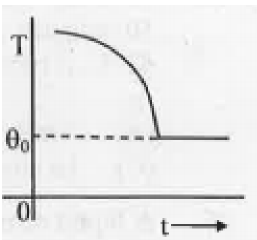
B.



C.



D.



Answer:

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224. Newton's law of cooling leads to the expression

A. $(\theta - \theta_0) = Kt + c$

B. $(\log(\theta - \theta_0)) = -Kt + c$

C. $(\log \theta_0) = Kt + c$

D. $(\theta) = K\theta_0 + c$

Answer:

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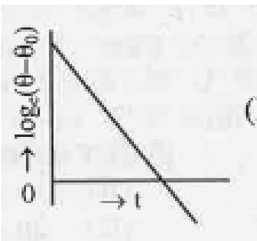
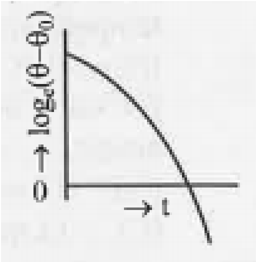
225. A liquid in a beaker has temperature $\theta(t)$ at time t and θ_0 is temperature of surroundings, then according to Newton's law of cooling the correct graph between $\log_e(\theta - \theta_0)$ and t is

A.

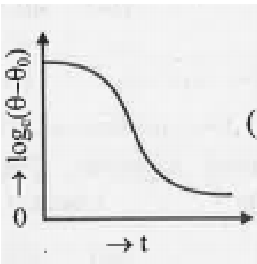


B.



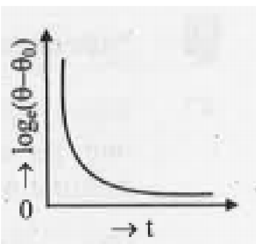
0 → $\log_e(\theta-\theta_0)$
→ t

C.



0 → $\log_e(\theta-\theta_0)$
→ t

D.



0 → $\log_e(\theta-\theta_0)$
→ t

Answer:

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226. A liquid cools from $70^{\circ} C$ to $60^{\circ} C$ in 5 minutes. If the temperature of the surrounding is constant at $30^{\circ} C$, then the time taken by the liquid to cool from $60^{\circ} C$ to $50^{\circ} C$ is

A. 5 minutes

B. 10 minutes

C. 7 minuets

D. 8 minutes

Answer:

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227. A pan filled with hot food cools from $94^\circ C$ to $86^\circ C$ in 2 minutes. When the room temperature is $20^\circ C$. How long will it take to cool from $74^\circ C$ to $66^\circ C$?

A. 2 minutes

B. 2.8 minutes

C. 2.5 minutes

D. 1.8 minutes

Answer:

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228. Certain quantity of water cools from $70^\circ C$ to $60^\circ C$ in the first 5 minutes and to $54^\circ C$ in the next 5 minutes. The temperature of the surroundings is

A. $45^\circ C$

B. $20^{\circ} C$

C. $42^{\circ} C$

D. $10^{\circ} C$.

Answer:

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229. A body cools from $62^{\circ} C$ to $50^{\circ} C$ in 10 minutes. How long will it take to cool to $42^{\circ} C$, if room temperature is $26^{\circ} C$?

A. 5 min

B. 7.5 min

C. 10 min

D. 12.5 min

Answer:

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230. A liquid of mass 250 is kept warm in a vessel using an electric heater. The liquid is maintained at $57^\circ C$ when the power supplied by the heater is 30 W and surrounding temperature is $27^{\circ}C$. As the heater is switched off, it took 10 s time for the temperature of the liquid to fall from $47^{\circ}C$ to $46.9^{\circ}C$. The specific heal capacity of the liquid is

A. $8000 J kg^{-1} K^{-1}$

B. $9000 J kg^{-1} K^{-1}$

C. $6000 J kg^{-1} K^{-1}$

D. $12000 J kg^{-1} K^{-1}$

Answer:

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231. An object kept in a large room having air temperature of $25^\circ C$ takes 12 minutes to cool from $80^\circ C$ to $70^\circ C$. The time taken to cool for the same object from $70^\circ C$ to $60^\circ C$ would be nearly,

A. 15 min

B. 10 min

C. 12 min

D. 20 min

Answer:

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232. Equal masses of two substances of densities p_1 and p_2 are mixed together. The density of mixture would be

A. $\frac{1}{2}(p_1 + p_2)$

B. $\sqrt{p_1 p_2}$

C. $\frac{p_1 p_2}{p_1 + p_2}$

D. $\frac{2(p_1 p_2)}{p_1 + p_2}$

Answer:

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233. The color of star depends upon its

A. density.

B. distance from the sun.

C. radius.

D. surface temperature.

Answer:

Watch Video Solution

234. A pendulum clock loses 12 s a day if the temperature is $40^{\circ} C$ and gains 4s a day if the temperature is $20^{\circ} C$. The temperature at which the clock will show correct time, and the coefficient of linear expansion (α) of the metal of the pendulum shaft are respectively:

A. $60^{\circ} C, \alpha = 1.85 \times \frac{10^{-4}}{\circ C}$

B. $30^{\circ} C, \alpha = 1.85 \times \frac{10^{-3}}{\circ C}$

C. $55^{\circ} C, \alpha = 1.85 \times \frac{10^{-2}}{\circ C}$

D. $25^{\circ} C, \alpha = 1.85 \times \frac{10^{-5}}{\circ C}$

Answer:

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235. A hunter fired a metallic bullet of mass 'm' kg from a gun towards an obstacle and it just melts when it is stopped by the obstacle. The initial temperature of the bullet is 300 K . If $\frac{1}{4}th$ of heat is absorbed by the obstacle, then the minimum velocity of the bullet is Melting point of bullet=600 K Specific heat of bullet =

$0.03 cal g^{-1}$ ^ $\circ C^{-1}$, Latent heat of fusion of bullet= $6 cal g^{-1}$]

A. $410 ms^{-1}$

B. $260 ms^{-1}$

C. $460 ms^{-1}$

D. $310 ms^{-1}$

Answer:

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236. A piece of ice falls from a height h so that it melts completely. Only one-quarter of the heat produced is absorbed by the ice and all energy of ice gets converted into heal during its fall. The value of h is [Latent heat of ice is $3.4 \times 10^5 \frac{J}{k} g$ and g=10 N/kg`]

A. 136 km

B. 68 km

C. 34 km

D. 544 km

Answer:

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237. A uniform steel rod of $2.5mm^2$ cross sectional area is heated through $40^\circ C$. The force exerted it is ________.

$$\left(\alpha_{steel}=1.2\times\frac{10^{-5}}{\hat{}}\circ C, Y_{steel}=2\times10^{11}\frac{N}{m^2}\right)$$

A. 480N

B. 340 N

C. 240 N

D. 140 N

Answer:

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238. An external pressure P is applied on a cube at $0^\circ C$ so that it is equally compressed from all sides. K is the bulk modulus of the material of the cube and α is its coefficient of linear expansion. Suppose we want to bring the cube to its original size by heating. The temperature should be raised by:

A. $3\frac{\alpha}{P}K$

B. $3PK\alpha$

C. $\frac{P}{3}\alpha K$

D. $\frac{P}{\alpha}K$

Answer:

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239. A deep rectangular pond of surface area A, containing water ($density = p, spec \text{ if } icheat \cap acity = s)$ is located in a region where the outside air temperature is at a steady value of $26^{\circ}C$. The thickness of the frozen ice layer in this pond, at a certain instant is x. Taking the thermal conductivity of ice as K, and is specific latent heat of fusion as L, the rate of increase of the thickness of ice layer, at this instant, would be given by

A. $26\frac{K}{p}x(L+4s)$

B. $\frac{26K}{px(L-4s)}$

C. $\frac{26K}{px^2L}$

D. $\frac{26K}{pxL}$

Answer:

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240. Two identical blocks of ice move in opposite directions with equal speed and collide with each other. What will be the minimum speed required to make both the blocks melt completely, if the initial temperatures of the blocks were $-8^{\circ}C$ each? (Specific heat of ice is $2100 Jkg^{-1}K^{-1}$ and Latent heat of fusion of ice is `3.36 xx 10^-5 Jkg^-1')

A. $840ms^{-1}$

B. $420ms^{-1}$

C. $8.4ms^{-1}$

D. $84ms^{-1}$

Answer:

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241. A 15kW drilling machine is used to drill a bore in a small aluminium block of mass 10 kg. Assuming 50% power is used up in heating the machine itself or lost to the surroundings then, the rise in temperature of the block in 2 minutes is (Specific heat capacity of aluminium $= 0.91 Jg^{-1} \hat{} \circ C^{-1}$)

A. $108^\circ C$

B. $88.9^\circ C$

C. $108.8^\circ C$

D. $98.9^\circ C$

Answer:

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242. When a body has the same temperature as that of its surroundings

A. it radiates same heat as it absorbs.

B. it absorbs more and radiates less heat.

C. it radiates more and absorbs less heat.

D. it never radiates heat.

Answer:

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243. A body takes 8 min to cool from $60^\circ C$ to $50^\circ C$. If the temperature of sorrunding is $30^\circ C$, then temperature of body after next 20 min. will be

A. $36.67^\circ C$

B. $42.85^\circ C$

C. $30^\circ C$

D. $32.50^\circ C$

Answer:

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244. How much steam at $100^{\circ} C$ will just melt 1600 g of ice at $-8^{\circ} C$? (Specific heat of ice= $0.5 \frac{cal}{g^{\circ} C}$, specific heat of water= 1/cal/g^@C $, latentoffusionofice = 80$ cal/g $, \text{ and } latentheatofvap \text{ or } isationofwater =$ 540 cal/g`)

A. 425 g

B. 210g

C. 365 g

D. 198 g

Answer:

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245. Assertion: A brass disc is just fitted in a hole in steel plate. The system must be cooled to loosen the disc from the hole. Reason: The coefficient of linear expansion for brass is greater than the coefficient of linear expansion for steel

A. Assertion is True, Reason is True Reason is a correct explanation for Assertion.

B. Assertion is True, Reason is True Reason is not a correct explanation for Assertion.

C. Assertion is True Reason is False.

D. Assertion is False, Reason is False.

Answer:

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246. The coefficient of thermal conductivity of copper is nine times that of steel. In the composite cylindrical bar shown in figure, what will be the temperature at the junction of copper and steel?

A. $56^{\circ} C$

B. $67^{\circ} C$

C. $33^{\circ} C$

D. $70^{\circ} C$

Answer:

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247. Two beakers A and B are filled to the brim with water a $4^\circ C$. When A is heated and B is cooled, the water

A. will overflow in A only.

B. will overflow in only.

C. will overflow in both A and B.

D. level in B will decrease.

Answer:

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248. The length of a wire is l_A when the tension in it is T_A and of another wire is l_B when the tension is T_B. The original length of the wire is

A. $\dfrac{l_A + l_B}{2}$

B. $\dfrac{l_A T_b + l_B T_A}{T_A + T_B}$

C. $\dfrac{l_A T_b - l_B T_A}{T_B - T_A}$

D. $\sqrt{T_A T_b l_A l_B}$

Answer:

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249. A flask of volume 4000 cc is completely filled with mercury at $0^{\circ} C$. The coefficient of cubical expansion of mercury is $180 \times \frac{10^{-6}}{\circ} C$ and that of glass is $40 \times \frac{10^{-6}}{\circ} C$. If the flask is now placed in liquid at $80^{\circ} C$, how much mercury will overflow?

A. 44.8 cc

B. 23.7 cc

C. 14.9 cc

D. 38 cc

Answer:

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250. A balloon contains 600 m^3 of helium a $37^\circ C$ and atmospheric pressure. The volume of helium at $-13^\circ C$ and 0.8 atmospheric pressure will be

A. $896m^3$

B. $629m^3$

C. $1102m^3$

D. $550m^3$

Answer:

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251. The two on pieces A and B appear red and yellow respectively when placed in dark. Then,

A. temperature of piece A and picee B are different.

B. temperature of piece A and piece B is same.

C. temperature of piece A and piece B is same but steady state has not reached.

D. given data is insufficient to conclude about temperature of bodies.

Answer:

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252. Expansion during heating

A. increases weight.

B. decreases weight.

C. decreases density and weight.

D. decreases density.

Answer:

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253. What is the temperature of the triple-point of water on an absolute scale whose unit interval size is equal to that of the Fahrenheit scale?

A. 273.15

B. 0

C. 491.69

D. 100

Answer:

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254. Newton's law of cooling is used in laboratory for the determination of the

A. specific heat of the gases.

B. the latent heat of gases.

C. specific heat of liquids.

D. latent heat of liquids.

Answer:

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255. A body of length l m having cross-sectional area $0.75m^2$ conducts heat $6000Js^{-1}$. Then find the temperature difference if K=200 J m^-1 K^-1`.

A. $20^{\circ}C$

B. $40^{\circ}C$

C. $80^{\circ}C$

D. $100^{\circ}C$

Answer:

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256. Pressure at the triple point of water is

A. $4\frac{N}{m^2}$

B. 760 mm of Hg

C. 611.73 Pa

D. 0.544 mm of Hg

Answer:

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257. For a certain gas the ratio of specific heats is 3/2. What is the value of C_p for it?

A. R

B. 2R

C. 3R

D. 5R

Answer:

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258. When a metal rod is heated it expands because

A. the size of its atoms increases.

B. the distance among its atoms increases.

C. atmospheric air rushes into it.

D. none of the above.

Answer:

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259. A hot ball of iron weighing 200 g is dropped into 500 g of water at $10^\circ C$. The resulting temperature is $22.8^\circ C$. If the specific heat of iron is $0.08 \frac{cal}{g^\circ C}$ then the temperature of hot ball is

A. $422.8^\circ C$

B. $400^\circ C$

C. $62.8^\circ C$

D. $42.8^\circ C$

Answer:

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