PHYSICS

BOOKS - PEARSON IIT JEE FOUNDATION

HEAT

Very Short Answer Type Questions

1. DENSITY,MELTING AND BOILING POINTS

Watch Video Solution

2. What is the water equivalent of a substance of mass 2 kg and specific heat capacity $2.4Jg^{-1}K^{-1}$?

Watch Video Solution

3. In which mode of transmission of heat is the medium not necessary ?

Watch Video Solution

4. 1 Joule =___ calorie

Watch Video Solution

5. Define specific latent heat of melting and specific latent heat of vaporization.

Watch Video Solution

6. In the S.I. system, the unit of energy is-

Watch Video Solution

7. Define 1 calorie and 1 kilocalorie. What is the use of calorimeter?

Watch Video Solution

8. Distinguish between internal and external combustion heat engines.

Watch Video Solution

9. What is evaporation? How the rate of evaporation is related to temperature?

Watch Video Solution

10. Define mechanical equivalent of heat. What is its value ?

Watch Video Solution

11. give a few examples of bad conductors of heat.

Watch Video Solution

12. Among petrol and diesel engines, which is more efficient ?

Watch Video Solution

13. Define heat capacity and specific heat capacity. Give their S.I. units.

Watch Video Solution

14. What is a cyclic process ?

Watch Video Solution

15. Does calorific value of fuel depend upon its mass ?

Watch Video Solution

16. A is in thermal equilbrium with B and B is in thermal equilibrium with C. Are A and C in thermal equilibrium with each other ?

Watch Video Solution

17. In which mode of transmission of heat do the particles of a medium move from one place to another place ?

Watch Video Solution

18. Why does not a diesel engine have a spark plug ?

Watch Video Solution

19. What is minimum possible temperature a body can have ? Given its value in Kelvin and Celsius scale.

Watch Video Solution

20. Heat travels through vaccum by

Watch Video Solution

21. Define relative humidity. State its S.I. unit.

Watch Video Solution

22. According to kinetic theory of gases, what is the cause of gas pressure ?

Watch Video Solution

23. What is the use of a thermopile ?

Watch Video Solution

24. State Boyle's and Charles' laws.

Watch Video Solution

25. Why are burns due to steam more harmful than those due to boiling water ?

Watch Video Solution

26. The S.I. unit of specific latent heat of vapourization is ____

Watch Video Solution

27. Define coefficients of linear, superficial and cubical expansions.

Watch Video Solution

28. Heat energy flows from a body at ____ temperature to a body at _____ temperature.

Watch Video Solution

29. What are the values of specific latent heat of melting of ice and specific latent heat of vaporization of water ?

Watch Video Solution

30. Define coefficient of apparent and real expansion of a liquid.

Watch Video Solution

Short Answer Type Questions

1. Give some advantages of high specific heat capacity of water.

Watch Video Solution

2. If 1050 kJ of heat is required to rise the temperature of 18 kg of substance from $25^{\circ}C$ to $35^{\circ}C$, find the thermal capacity and water equivalent of the substance.

Watch Video Solution

3. What is thermopile? Explain its working.

Watch Video Solution

4. A substance of mass $1 \cdot 5$ kg absorbs 45 kcal of heat energy. If its temperature rises from $28^{\circ} C$ to $38^{\circ} C$, find its specific heat capacity.

Watch Video Solution

5. Explain, how land and sea breezes occur?

Watch Video Solution

6. The density of mercury at $0^\circ C$ is $13.6 gcm^{-3}$. Find the density of mercury at $200^\circ C$ if its coefficient of real expansion is $1 \cdot 8 \times 10^{-4} {}^\circ C^{-1}$.

Watch Video Solution

7. On what factors does the radiating power of a hot body depend ?

Watch Video Solution

8. Why do pendulum clocks made of ordinary metal go slow in summer ?

Watch Video Solution

9. Define apparent and real expansion of a liquid and derive a relation between them.

Watch Video Solution

10. Metals are good conductors of heat because .

Watch Video Solution

11. Distinguish between heat and temperature.

Watch Video Solution

Essay Answer Type Questions

1. Differentiate between evaporation and boiling.

Watch Video Solution

2. Explain what is meant by the coefficients of linear (α), superficial (β) and cubical expansion (γ) of a solid. Given their units, find the relationship between them.

Watch Video Solution

3. The length of s steel rod exceeds that of a brass rod by 5 cm. If the difference in their lengths remains same at all temperature, then the length of brass rod will be: (α for iron and brass are $12 \times 10^{-6}/^{\circ} C$ and $18 \times 10^{-6}/^{\circ} C$, respectively)

Watch Video Solution

4. What are the basic differences between , conduction, convection and radiation?

Watch Video Solution

5. Bomb calorimeter

Watch Video Solution

6. Discuss properties of heat radiations.

Watch Video Solution

7. Discuss some important applications of bad conductors.

Watch Video Solution

8. Which principle is involved in the experiment to determine the specific heat of a liquid by the method of mixture ?

Watch Video Solution

Concept Application Level 1

1. Heat engines convert mechinical enrgy into heat energy.

A. True

B. False

C.

D.

Answer: False

Watch Video Solution

2. As pressure increases, the melting point of ice decreases.

A. True

B. False

C.

D.

Answer: True

Watch Video Solution

3. Temperature determines the direction of flow of heat energy.

A. True

B. False

C.

D.

Answer: True

Watch Video Solution

4. Conduction process can be explained on the basis of both atomic model and kinetic model.

Watch Video Solution

5. Liquids have two types of volumetric expansion.

A. True

B. False

C.

D.

Answer: True

Watch Video Solution

6. Gas thermometers are more sensitive than liquid thermometers.

A. True

B. False

C.

D.

Answer: True

Watch Video Solution

7. Water has high specific heat capacity.

A. True

B. False

C.

D.

Answer: True

Watch Video Solution

8. Specific heat capacity of water is ____ J $kg^{-1}K^{-1}$.

Watch Video Solution

9. At constant volume, the pressure of a given mass of a gas is directly proportional to its _____

Watch Video Solution

10. 500 joule of heat energy is supplied to a heat engine and 100 J of heat energy is dissipated due to friction and as sound energy, then the efficiency of the heat engine is ____

Watch Video Solution

11. A temperature of $50^{\circ}C$ on Celsius thermometer corresponds to ____ on Fahrenheit thermometer.

Watch Video Solution

12. The relative humidity is expressed as _____

Watch Video Solution

13. The quantity of heat produced when a unit mass of a substance is completely burnt is called its _____

Watch Video Solution

14. A pendulum clock becomes

Watch Video Solution

15. Match the entries in column A with the appropriate ones in column B.

Column A		Column B
A. Mechanical equivalent of heat	( ) a.	$[M^1 L^0 T^0]$
B. Water equivalent	( ) b.	$\frac{W}{H}$
C. Rate of evaporation	( ) c.	measurement of calorific values
D. Expansion of gases	( ) d.	area of the free surface of the liquid that is exposed to air.
E. At constant volume $P \propto T$	( ) e.	only volumetric
F. Bomb calorimeter	( ) f.	hidden energy
G. Latent heat	( ) g.	Charles law
H. Specific heat capacity	( ) h.	carburetor
I. Infrared rays	( ) i.	heat
J. Petrol engine	( ) j.	cal $g^{-1}{}^0C^{-1}$

View Text Solution

16. When heat energy is incident on a body, then

A. it is reflected

B. it is absorbed

C. it is transmitted through it

D. All the above

Answer: D

Watch Video Solution

17. The ratio of the quantity of heat absorbed by the surface of a body to the quantity of heat falling on it in one second is called

A. reflecting power of the body

B. radiating power of the body

C. transmitting power of the body

D. absorbing power of the body

Answer: D

View Text Solution

18. Among the following ____ represents the smallest temperature change

A. 1 K

B. $1^{\circ}C$

C. $1^{\circ}F$

D. Both 1 and 2

Answer: A::C

Watch Video Solution

19. A sample of air containing certain amount of water vapour is saturated at a particular

temperatures. If the temperature of the sample is raised further, then

A. the sample becomes supersaturate

B. the sample remains saturated

C. the sample becomes moist air

D. the sample becomes unsaturated

Answer: D

View Text Solution

20. Temperature of a body is the measure of

A. sum total of kinetic and potential energy of the molecules of the given body.

B. amount of heat energy present inside the given body.

C. mechanical vibrations of the body.

D. only average kinetic energy of the molecules present inside the body.

Answer: D

Watch Video Solution

21. 100 g of water at $60^\circ C$ is added to 180 g of water at $95^\circ C$. The resultant temperature of the mixutre is _____.

A. $80^\circ C$

B. $82.5^\circ C$

C. $85^\circ C$

D. $77.5^\circ C$

Answer: B

Watch Video Solution

22. In a thermos flask, heat loss by conduction and convection can be avoided by

A. providing vecuum between the two walls of the flask.

B. filling the space between the two walls of the flask with cork which is a bad conductor of heat.

C. providing a shining glass.

D. All the above

Answer: A

Watch Video Solution

23. When ice water is heated, its density

A. decreases

B. increases

C. first increases, then decreases

D. first decreases, then increases

Answer: C

Watch Video Solution

24. Certain amount of gas enclosed in an air tight piston vessel is acted upon by one atompheric pressure. The volume of the gas at $30^\circ C$ is $90cm^3$ and when the temperature is raised to $40^\circ C$, the volume becomes $95cm^3$. Then the volume coefficient of expansion of the given gas is ____

A. $0.0005K^{-1}$

B. $0.05K^{-1}$

C. $0.05K^{-1}$

D. $0.005K^{-1}$

Answer: D

Watch Video Solution

25. The unit for volume coefficient of expansion is

A. $^{\circ}C^{-1}$

B. K^{-1}

C. $^{\circ}F^{-1}$

D. All the above

Answer: D

Watch Video Solution

26. The water equivalent of a body, whose mass is 'm' g and specific heat is 's' cal $g^{-1}{}^{\circ}C^{-1}$ in gram is given by ____

A. (m+s)g

B. $\left(\frac{m}{s}\right)g$

C. $\left(\frac{s}{m}\right)g$

D. $(ms)g$

Answer: D

Watch Video Solution

27. The amount of heat energy required to heat 1 kg of ice from $-10^{\circ}C$ to $10^{\circ}C$ is (Given: specific heat of ice

$= 2.095 kJ kg^{-1} \circ C^{-1}$, specific heat of water $= 4.2 J g^{-1} \circ C^{-1}$ specific latent heat of fusion of ice $= 336 J g^{-1}$

A. 398.95 kJ

B. 387.75 kJ

C. 337.75 kJ

D. 357.75 kJ

Answer: A

Watch Video Solution

28. Efficiency of heat engine is defined as the

A. product of the work done by the heat engine and amount of heat supplied to it.

B. ratio of the amount of heat supplied to it and work done by the heat engine.

C. ratio of the work done by the heat engine and amount of heat supplied to it.

D. ratio of amount of heat supplied to it and amount of heat dissipated

Answer: C

Watch Video Solution

29. Two bodies A and B are said to be in thermal equilibrium with each other if they have same

A. mass

B. heat energy

C. temperature

D. specific heat capacities

Answer: C

Watch Video Solution

30. The Quill's tube with its open end upwards is fixed in slanting position making `45^(@)' with the vertical line. If the atmospheric pressure be equal to 'H' and the length of the

mercury pallet in the Quill's tube 'h', then the pressure of air enclosed in the tube is equal to _____

A. H+h

B. H-h

C. $H + \frac{h}{\sqrt{2}}$

D. $H - \frac{h}{\sqrt{2}}$

Answer: C

Watch Video Solution

31. The principle used in the construction of air (gas) thermometer is

A. variation of volume with temperature at constant pressure.

B. variation of volume with temperature at constant heat energy.

C. variation of pressure with temperature at constant volume

D. variation of pressure with temperature at constant heat energy

Answer: A

 Watch Video Solution

32. The quantity of heat required to raise the temperature fo a unit mass of a substance through one degree celsius called ____

A. latent heat

B. mechanical equivalent of heat

C. specific heat capacity

D. specific latent heat

Answer: C

Watch Video Solution

33. Heat capacity of a body is

A. dependent on its shape.

B. dependent on its mass.

C. dependent on its temperature.

D. None of these.

Answer: B

Watch Video Solution

34. The melting of ice by application of pressure and its resolidification on releasing the pressure is known as _____.

A. melting point

B. boiling point

C. regelation

D. super incumbent pressure

Answer: C

Watch Video Solution

35. The boiling point of liquid depneds on

A. its nature.

B. super incumbent pressure.

C. its purity

D. All the above

Answer: D

Watch Video Solution

36. Among the following statements, find the wrong one.

A. The presence of any impurities (dissolved) raises the boiling point of the solution.

B. The boiling point of a solution is always lesser than that of the pure solvent.

C. The boiling point of an aqueous solution of common salt is always greater than

$100^\circ C$ at normal atmospheric pressure.

D. Both (1) and (3) are ture

Answer: B

Watch Video Solution

37. 10 g of a fuel is combusted in the internal chamber of a bomb calorimeter because of which the temperature of 250 g of the water present in external chamber increases from $25^\circ C$ to $75^\circ C$. Write the following steps in

a sequential order to find the value of calorific value of the fuel. (Assume that the heat produced by the combustion of fuel is completely absobed by the water).

(a) Equate $m_F S = m_u S_w(\Delta t)$ and find the value of S.

(b) Note the value of mass of fuel (m_F) and water (m_w) in bomb calorimeter from the given data.

(c) Consider the change in the temperature (Δt) of the water to find the heat absorbed by water using, $Q = m_u S_w(\Delta t)$.

(d) Let 'S' be the calorific value of the fuel and

heat produced by the combustion of the fuel is given by $Q = m_f S$.

A. abcd

B. bcad

C. bcda

D. cbad

Answer: C

Watch Video Solution

38. Arrange the following steps in a sequential order to prove the convection in gases.

(A) Place a lighted candle below chimnery B and hold a lighted incense stick over chimnery A.

(B) The smoke given out by incense stick is sucked in through chimney A and comes out through B.

(C) Take a rectangular wooden box and fix with two glass chimneys A and B on the top.

(D) The lighted candle heats the air and reduces air pressure near the chimney B. The

cold, heavy air washes in through chimney A, sweeping the smoke given out by incense stick.

(E) On absorbing heat, the hot air molecules move away from the source of heat and molecules of cold air move towards the source of heat, froming convection currents.

A. ABEDC

B. CABDE

C. EDCBA

D. ABCDE

Answer: B

Watch Video Solution

39. Find the worng one among the following statements.

A. By maintaining higher pressure, the boiling point of water is raised to around $120^{\circ} C$, inside the cooker.

B. If the pressure inside the cooker exceeds a limit, the excess steam comes out by pushing the weight valve upwards.

C. If pressure inside cooker exceeds the safety limit, safety valve opens and relieves the excess pressure

D. Pressure cooker is a device for enhancing the cooking power of water.

Answer: C

 Watch Video Solution

40. Write the following steps of an activity in sequence to show that water is a bad conductor of heat.

(A) Clamp the test tube in slanting position and heat the test tube near its mouth with Bunsen burner.

(B) This shows that heat is not conducted through water and water is a bad conductor of heat.

(C) Take a hard glass tube containing cold water filled up to $3/4$ of its length and drop

small pieces of ice, wrapped in copper wire gauge

(D) It is observed that water near the mouth of the test tube starts boiling but the ice does not melt.

A. ABCD

B. DCBA

C. ADCB

D. CADB

Answer: D

Watch Video Solution

Concept Application Level 2

1. Two metallic tins made of copper and steel are stuck together with the copper tin inside the steel tin. Explain a method to seprate the tins.

Watch Video Solution

2. As an air bubble rises from the bottom of a large water storage tank to free surface of water, the radius of the air bubble increases from 6 mm to 10 mm. The temperature of the water at the surface is $42^\circ C$ and its bottom is $27^\circ C$. Find the depth of the water tank. (Take density of water $= 1gcm^{-3}$, $g = 10ms^{-2}$, 1 atmospheric pressure = 760 mm of Hg, density of mercury $= 13.6gcm^{-3}$

Watch Video Solution

3. The ratio of densities of two metallic spheres X and Y is 1:2. The ratio of their radii is 2:1. If the ratio of heat supplied to them is 2:3, then calculate the ratio of specific heat capacity of X and Y if they experience an equal rise in temperature.

Watch Video Solution

4. A vessel contains ice and is in thermal equilibrium at $-10^{\circ}C$ and is supplied heat energy at the rate of 20 cal s^{-1} for 450

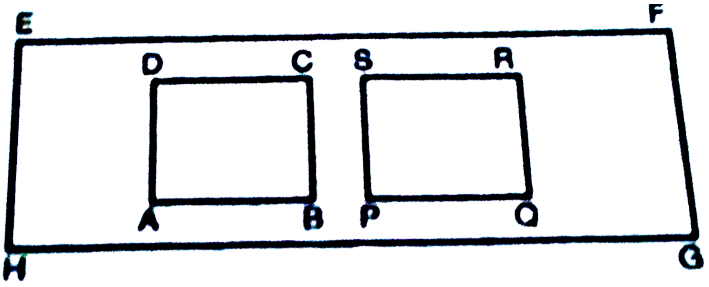
seconds. If the mass of ice is 0.1 kg and due to supply of heat energy, the whole ice just melts find the water equivalent of the vessel. (Take specific heat of ice $= 0.5 cal g^{-1} \circ C^{-1}$ and specific heat of the vessel is $= 0.1 cal g^{-1} \circ C^{-1}$. Latent heat of fussion = $80 cal g^{-1}$ and assume that no heat is transferred to the surroundings)

Watch Video Solution

5. From a rectangular sheet EFGH of metal, two small square shaped pieces, as shown in the figure, are removed. The remaining metal sheet is then heated. What happens to the area of the empty squares ABCD and PQRS? Also explain, what happens to

(i) the distance between the points C and D and

(ii) the distance between point C and S.



View Text Solution

6. Two copper spheres of equal mass, one solid and the other hollow, are heated through an equal rise in temperature. What is the ratio of the time taken to heat them if the ratio of the rate at which heat is upplied to the solid sphere to hollow sphere is 1:2 ?

View Text Solution

7. A faulty mercury thermometer has a stem of uniform cross section marked in mm. If this reads 83 mm instead of 80 mm at LEP and 229 mm instead of 220 mm at UFP, find the difference in the length of the mercury thread in both the faulty and correct thermometers at $250^{\circ}C$. (Take LFP $= 0^{\circ}C$ and UFP $= 100^{\circ}C$)

View Text Solution

8. Find the water equivalent of paraffin oil if 100 kg of paraffin oil absorbs $4180 \times 10^3 J$ to raise its temperature from 300 K to 320 K. (Take specific heat of water as $4.18 Jg^{1\circ} C^{-1}$)

View Text Solution

9. Why does the temperature of the surroundings start falling when the ice of frozen lake starts melting?

View Text Solution

10. Why do the fish plates of railway tracks have oval shaped holes ?

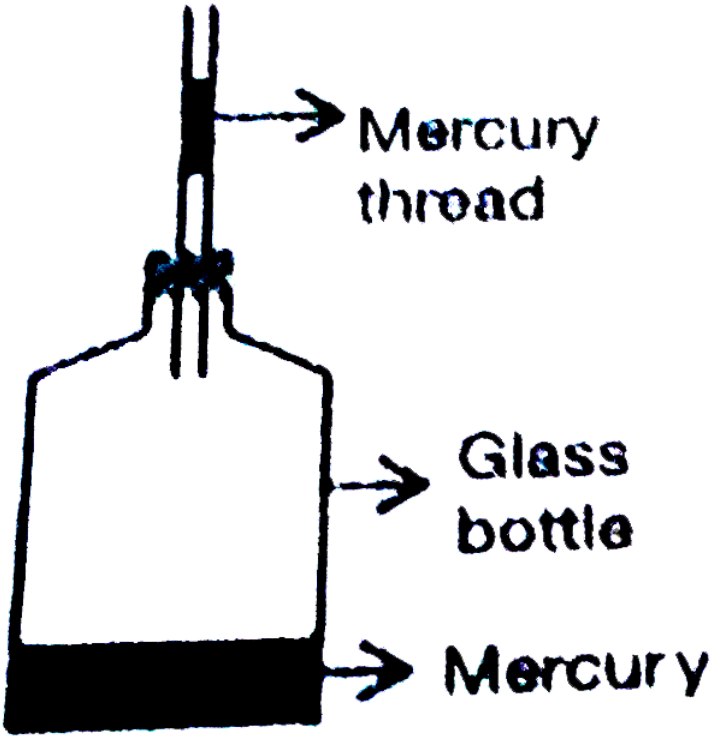
View Text Solution

11. It is possible to heat (boil) fluids by convection process in weightlessness condition ?

View Text Solution

12. A constant volume air thermometer is as shown in the figure below. Explain why the bottle is partly filled with mercury. Find the ratio fo volume of mercury present in the bottle to the volume of the bottle if the volume coefficients of mercury and glass are $1.8 \times 10^{-4} K^{-1}$ and $6 \times 10^{-5} K^{-1}$,

respectively.



View Text Solution

13. Two copper cylinders 'A' and 'B' having their radii in the ratio 1:2 and lengths in the ratio 2:1 are supplied equal amount of heat. Find the ratio of therise in their temperature.

View Text Solution

14. A copper calorimeter of mass 100 g contains 200 g of ice at $-10^{\circ}C$. The thermal energy is upplied to the calorimeter and its contents at the rate of 50 calories per second.

What is temperature of the calorimeter and its contents after ten minutes.

(Given, the specific heat of ice $= 0.5 cal g^{-1} {}^{\circ} C^{-1}$, the specific heat of copper $= 0.1 cal g^{-1} {}^{\circ} C^{-1}$, and latent heat of fusion of ice $= 80 cal g^{-1}$

View Text Solution

15. $0 \cdot 1$ kg of a substance is taken as sample and combusted on sample holder of a bomb calorimeter. The temperature of 1 kg of ice

present in external chamber has risen from $0^{\circ}C$ to $50^{\circ}C$. What is the calorific value of the given sample?

(Given that specific heat capacity of water = $42Jkg^{-1}K^{-1}$) Specific latent heat of fusion of ice $= 336000Jkg^{-1}$

View Text Solution

16. A metallic ball of mass 100 g and specific heat capacity 2 J $kg^{-1}K^{-1}$ was dropped from a height of 6 m on to a perfectly non-

conducting surface. If 80% of its kinetic energy is converted into heat on striking the surface, find the change in temperature of the ball. (Take g=1000 cm s^{-2}).

Watch Video Solution

17. A Centigrde and Fahrenheit thermometer of same lengths (20 cm) are taken. Find the ratio fo the lengths of mercury threads in the given temperature scales, respectively, if temperature rises from $0^{\circ}C$ to $4^{\circ}C$. Take

LFP and UFP for both the thermometers as freezing point and boiling point of water, respectively.

Watch Video Solution

18. Two rods of equal length and of the same material but having different diameters, are heated through and equal rise in temperature. Of the two, thin and thick rods, which will experience a greater extension? Explain.

Watch Video Solution

19. When 50 ml of a liquid is heated through $20^{\circ}C$, its apparent expansion is 0.5 ml. If the coefficient of linear expansion of the container is $9 \times 10^{-6} K^{-1}$, find the coefficient of real expansion of the liquid.

Watch Video Solution

20. What is the amount of heat 1 kg of ice from $-5^{\circ}C$ to $5^{\circ}C$ (Given, specific heat of ice $= 2.095 Kjkg^{1^{\circ}}C^{-1}$, specific heat of water

$= 4.2 Jg^{-1}{}^{\circ}C^{-1}$, specifc latent heat of fusion of ice $= 336 Jg^{-1}$)

Watch Video Solution

Concept Application Level 3

1. A closed calorimeter of negligible water equivalent contains 1 kg of ice at $0^{\circ}C$, the 1 kg of steam at $100^{\circ}C$ is pumped into it. Find the ratio of mass of steam to water remaining in the calorimeter after attaining equilibrium

temperature. Take the efficiency of the calorimeter as 90%. Find the amount of heat lost to surroundings.

Watch Video Solution

2. A hollow metallic sphere is heated. Explain in the type of change produced in its

(a) internal radius (b) external radius

(c) volume (d) mass

(e) density

Watch Video Solution

3. A metallic solid body of weight $'W_1'$ is immersed in a liquid, whose temperature is $t_1^\circ C$. The apparent wight of the body in the given liquid is $'W_2'$. Then the temperature of that liquid is changed to $t_2^\circ C$, the apparent wight of the body is $'W_3'$. If the density of this liquid at $t_1^\circ C$ and $t_2^\circ C$ was d_1 and d_2 , respectively, then find the volume coefficient of the solid body in terms of W_1, W_2, W_3, d_1, d_2 and $t_1^\circ C$ and $t_2^\circ C$.

Watch Video Solution

4. A thermally insulated can (like thermal flask) containing a liquid is shaken vigorously. Will there be any change in the amount of heat energy present in it. If there is a change, discuss how it can be noticed.

Watch Video Solution

5. As the altitude from the surface of the Earth increases, the atmospheric temperature falls. Explain.

View Text Solution

6. Ravi read that a biscuit packet gives 450 k cal of energy per 100 g. Now, he wanted to find the calorific value of some other substance. He took 0.1 kg of that substance as a sample and combusted it on a sample holder of a bomb calorimeter. Because of this, the temperature of 1 kg of ice present in the external chamber rose from $0^{\circ}C$ to $50^{\circ}C$. What is the calorific value of the given sample ? It is given

that the specific heat capacity of water $= 4200J = 336000Jkg^{-1}$.

Watch Video Solution

7. Bose took 100 kg of paraffin oil and supplied 4180×10^3J of heat energy to it. Because of this, the temperature of the oil was found to increase from 300 K to x. With this data, Bose found the value of x. Find his answer. [Assume that there is no loss of energy to the surroundings and take the specific heat of

water as $4.18 Jg^{-1} {}^{\circ} C^{-1}$(and water equivalent of 100 kg paraffin oil = 50 kg)].

Watch Video Solution

8. Neelkamal took 200 g of water and wanted to boil it from $25^{\circ} C$. He took a gas burner that supplies 250 calories in one second, to heat the water. If the thermal efficiency of the burner is 80% , then how much time will be take to boil water ?

Watch Video Solution

9. A Quill's tube of one metre is taken. A certain amount of ideal gas is trapped in it by a 20 cm length of Hg column. When the tube is held vertical with open end upwards, the length of the gas column is 50 cm. Find the pressure and length of the trapped gas, when the Quill's tube is kept in slanting position making 45° with the vertical open and upwards. (Take atmospheric pressure as 76 cm of Hg and $\sqrt{2} = 1.414$).

Watch Video Solution

10. Calculate the amount of energy wasted on combustion of 2 kg of diesel in a diesel engine of efficiency 40% The calorific value of diesel is $44,800 kJ/kg$.

Watch Video Solution

Others

1. Convert $75^\circ C$ into Kelvin and Fahrenheit scale.

Watch Video Solution

2. Convert $-40^\circ F$ into Celsius and Kelvin scale

Watch Video Solution

3. The mercury thread of a thermometer rises by $4/5$ parts between two standard points on Celsius scale, when it is placed in warm water. Calculate the temperature of water in Fahrenheit scale.

Watch Video Solution

4. A faulty thermometer has its upper and lower fixed points marked as $104^\circ C$ and $-4^\circ C$, respectively. What is the

correct temperature if the above thermometer reads $32^\circ C$?

Watch Video Solution

5. The length of a brass rod is 1.5 m. Its coefficient of linear expansion is $19 \times 10^{-6} K^{-1}$ Find the increase in length of the rod if it is heated through $20^\circ C$.

A. $3.6 \times 10^{-6} m$

B. $5.7 \times 10^{-6} m$

C. $5.7 \times 10^{-4} m$

D. $3.6 \times 10^{-4} m$

Answer: C

Watch Video Solution

6. The area of a rectangular copper sheet is $0.30^{\circ} m^2$. If the sheet is heated through $10^{\circ} C$, its area increases by $1.02 \times 10^{-4} m^2$. Calculate the coefficient of areal expansion of copper.

Watch Video Solution

7. The volume of a gas at $27^{\circ}C$ is 1 litre. At what temperature, will its volume be 1.5 litres if the pressure remains constant ?

Watch Video Solution

8. The volume of a gas at STP is 273 ml. What will its volume be at a pressure of 38 cm of mercury column a and a temperature of $-23^{\circ}C$?

Watch Video Solution

9. Find the heat energy required to convert 10 g ice at $0^{\circ}C$ to steam at $100^{\circ}C$. Specific latent heat of melting and vapourization are 336 KJ kg^{-1} and 2260 KJ kg^{-1}, respectively, and specific heat of water is 4200 J $kg^{-1}K^{-1}$.

Watch Video Solution

10. At $30^{\circ}C$, the actual amount of water vapour present in 1 m^3 of air is 15 g, whereas 30 g of water vapour is required to saturate air at the same temperature. Find the relative humidity.

Watch Video Solution

11. Find the work done by a petrol engine on combustion of 1 kg petrol. The efficiency of the

engine is 30% and calorific value of petrol is 47 MJ kg^{-1}.

Watch Video Solution