# PHYSICS

# BOOKS - PEARSON IIT JEE FOUNDATION

# HEAT

## Example

**1.** Calculate the amount of heat energy required to increase the temperature of 250 g

of water from $27^{\circ}C$ to $67^{\circ}C$ (Specific heat capacity of water is 1 cal $g^{-1\circ}C^{-1}$)

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**2.** Find the amount of heat energy produced by 150 g of a fuel of calorific value 8000 $calg^{-1}$

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## Very Short Answer Type Question

**1.** Fill in the blanks

The capacity to do work is called____.

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**2.** Fill in the blanks

If heat energy is given to a substance and its temperature remains constant then the substance undergoes a change in_____.

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**3.** Fill in the blanks

The temperature at which a liquid convert to gaseous state is called _____ of a liquid.

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**4.** Fill in the blanks

_____is the SI unit of heat

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**5.** Fill in the blanks

The transfer of heat which takes place due to the vibration of particles is _____.

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**6.** Fill in the blanks

A black body absorbs _____ heat energy than a white body

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**7.** Fill in the blanks

Substance through which heat travels easily and quickly are said to be _____of heat.

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**8.** Fill in the blanks

The process of changing a substance from gaseous state to liquid state is called_____.

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**9.** Fill in the blanks

Heat energy produced by 150 g of a fuel of calorific value 8000 car $g^{-1}$ is_____.

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**10.** Fill in the blanks

When hot water is poured in ordinary glass vessel it breaks because of _____.

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**11.** For each of the equation four choices have been provided. select the correct alternative when two bodies are in thermal contact the direction of flow of heat is determining by its

A. density

B. temperature

C. heat capacity

D. mass

**Answer: b**

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**12.** For each of the equation four choices have been provided. select the correct alternative

The constant temperature at which a solid substance change in to liquid state is called

A. melting point of the substance

B. boiling point of the substance

C. saturation temperature

D. evaporation temperature

**Answer: a**

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**13.** For each of the equation four choices have been provided .select the correct alternative SI unit of specific heat capacity is _____.

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

B. $Jkg^{-1^{\circ}}C^{-1}$

C. $jkg^{-1^{\circ}}K^{-1}$

D. All the above

**Answer: c**

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**14.** For each of the equation four choices have been provided. select the correct alternative Temperature is measured in_____.

A. degree celsius

B. kelvin

C. degree fahrenheit

D. All the above

**Answer: d**

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**15.** For each of the equation four choices have been provided. select the correct alternative

Normal temperature of the human body is _____.

A. 87K

B. 273 K

C. $37^{\circ} C$

D. $82^\circ F$

**Answer: c**

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**16.** For each of the equation four choices have been provided. select the correct alternative Clinical thermometer is calibrated in _____.

A. Celsius scale

B. Fahrenheit scale

C. Absoulte scale

D. Both a and b

**Answer: c**

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**17.** For each of the equation four choices have been provided. select the correct alternative

Cooling in a motor car is done by

A. conduction

B. convection

C. radiation

D. all the above

**Answer: b**

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**18.** For each of the equation four choices have been provided. select the correct alternative

The mode of transfer of heat in the absence of a medium is called _____.

A. convection

B. conduction

C. radiation

D. all the above

**Answer: c**

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**19.** For each of the equation four choices have been provided. select the correct alternative

In solids generally the heat is transferred by

A. conduction

B. convection

C. radiation

D. all the above

**Answer: a**

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**20.** For each of the equation four choices have been provided .select the correct alternative From the folloiwng choose the coorect option

that represent the order of the thermal expansion in solids (S) liquid (L) and gases (G) for an equal rise in temperature

A. $L > S > G$

B. $S > L > G$

C. $G > S > L$

D. $G > L > S$

**Answer: d**

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**21.** For each of the equation four choices have been provided. select the correct alternative

On heating a substance which of the following physical quantities changes?

A. density

B. mass

C. volume

D. both and c

**Answer: d**

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**22.** Choose the correct statement in winter

(a) a set of double window is a better insulator

(b) window constructed of a single double thickness glass is a good insultor

A. only a

B. only b

C. both a and b

D. cannot be compared

**Answer: a**

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**23.** For each of the equation four choices have been provided. select the correct alternative Arrange the following substance in the increasing order of their thermal conductivity copper iron glass

A. glass, iron, copper

B. copper , iron , glass

C. iron, glass, copper

D. iron, copper ,glass

**Answer: a**

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**24.** For each of the equation four choices have been provided .select the correct alternative

A thermometer workd on the principal of

A. linear expansion of solid

B. cubical expansion of solid

C. uniform expansion of volume of liquid or gas with temperature

D. both b and c

**Answer: c**

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**25.** For each of the equation four choices have been provided .select the correct alternative Choose the correct statement:

(a) when heat energy is given to ice at $0^{\circ}C$ th

peotential energy of the molecules of ice increases

(b) heat added to ice at $0^{\circ}C$ does not increase the kinetic energy and hence thereis no rise of temperature

A. only a

B. only b

C. both a and b

D. none of these

**Answer: c**

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**26.** For each of the equation four choices have been provided .select the correct alternative

Choose the correct statement:

(a) boiling of a given substacne takes place at all temperature

(b) evaporation of a substance takes place at a constant temperature

(c ) boiling takes place at every part of the liquid

(d) evaporation takes place only on the surface of liquid

A. both a and c

B. b,c and d

C. both c and d

D. all the above

**Answer: c**

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**27.** For each of the equation four choices have been provided .select the correct alternative

Choose the correct statement:

(a) solids undego linear arial and cubical expansions

(b) liquid and gases undergo cubical expansion

A. only a

B. only b

C. both a and b

D. none of these

**Answer: c**

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**28.** For each of the equation four choices have been provided .select the correct alternative Bimetallic strip works on the principal of _____

A. undequal expansion of solids

B. unequal contraction of solids

C. equal expansion of solids

D. Both a and b

**Answer: d**

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**29.** For each of the equation four choices have been provided. select the correct alternative Which of the following statement is/are wrong?

A. normally solids expands on melting

B. normally a liquid contract on freezing

C. there is no effect on volume during cooling or heating a gas

D. all the above

**Answer: c**

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**30.** For each of the equation four choices have been provided. select the correct alternative

In case of an incense stick or an agarbatti the smoke at the lighted end of stick moves in upward direction it is because

A. the cool air below the lighted end moves to take the place of hot air above the lighted end

B. the air at the hot ends is more dense

C. it is natural for the smoke to move up

D. the smoke is repelled by the gravity of earth

**Answer: a**

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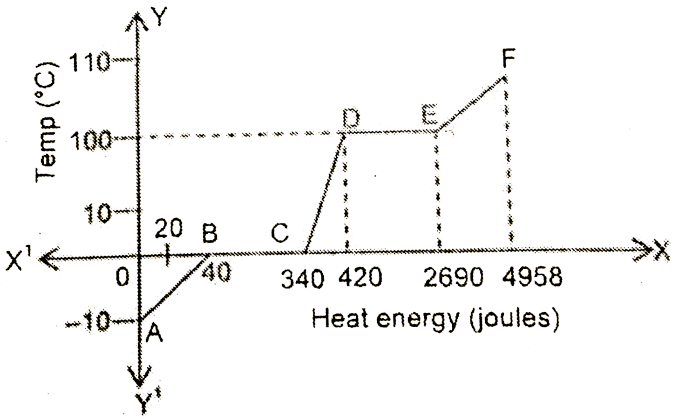
**31.** The heating curve of a particular substance in solid state is as shows in the figure.Choose the correct alternative




If mass of the substance is 20 g then the heat energy required to melt 1 g the substacne is _____J.

A. 300

B. 15

C. 113,50

D. 2270

**Answer: b**

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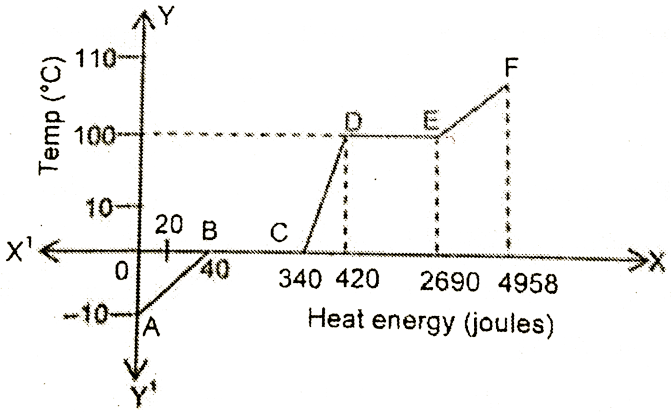
**32.** The heating curve of a particular substance in solid state is as shows in the figure.Choose the correct alternative



The change of state in the graph is represented by _____part.

A. ab

B. bc

C. de

D. both b and c

**Answer: d**

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**33.** Arrange the following steps in a sequential order to explain the formation of conventional currents through ventilation.

(a) the cold air enters into the room through windows from high pressure to low pressure region

(b) hot air in the room is less denser and it raises up

(c ) the rooms are provided with ventilators at the top

(d) hot air passes out through the ventilators it creates low pressure region in the room

A. cadb

B. cdab

C. badc

D. cbda

**Answer: d**

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**34.** Arrange the following steps in sequential order to constructor a celsius thermometer.

(a) lower fixing point is marked by placing the

bulb of the thermometer in pure melting ice

(b) a thin capillary tube covered with a thick glass stem and a providing a funnel is taken

(c ) the distance between upper fixing point and lower fixing point is divided in to 100 equal parts and calibrated

(d) upper fixing point is marked by placing the bulb of the thermometer in boiling water

(e ) while pouring the mercury in the tube palce the mercury bulb in hot water bath to remove air bubbles

A. befadc

B. beadcf

C. befcad

D. befcad

**Answer: a**

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**35.** Match the entries given in column A with the appropriate ones in colum B.

| Column A | | | Column B |
|---|---|---|---|
| A. | Specific heat capacity | ( ) a. | Maximum |
| B. | Density of water at 4°C | ( ) b. | cal $g^{-1}$ |
| C. | Calorific value | ( ) c. | Minimum |
| D. | Heat capacity | ( ) d. | Boling point of water |
| E. | Volume of water at 4°C | ( ) e. | cal $g^{-1}°C^{-1}$ |
| F. | Upper fixing point | ( ) f. | cal$°C^{-1}$ |

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**36.** Match the entries given in column A with the appropriate ones in colum B.

| Column A | | | Column B |
|---|---|---|---|
| A. | Thermometric liquid | ( ) a. | Double walled |
| B. | Rotating paper pinwheel | ( ) b. | Solid state to gaseous state directly |
| C. | Evaporation | ( ) c. | Common salt and ice |
| D. | Thermos flask | ( ) d. | Convectional currents |
| E. | Freezing mixture | ( ) e. | Mercury |
| F. | Sublimation | ( ) f. | Liquid to gas, below its boiling point |

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**37.** Match the entries given in column A with the appropriate ones in colum B.

| Column A | | | Column B |
|---|---|---|---|
| A. | Heat | ( ) a. | Medium is necessary |
| B. | Thermometer | ( ) b. | Aluminium |
| C. | Conduction | ( ) c. | Used to find specific heat |
| D. | Insulator | ( ) d. | Energy |
| E. | Calorimeter | ( ) e. | Device to measure temperature |
| F. | Calorie | ( ) f. | Summer |
| G. | Conductor | ( ) g. | Unit of heat |
| H. | Dark coloured clothes | ( ) h. | Glass |
| I. | Light coloured clothes | ( ) i. | Winter |

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**38.** Answer the following question

What is heat?

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**39.** Answer the following question

Why boiling water is not used to sterilize a clinical thermometer?

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**40.** What is maximum - minimum thermometer ?

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## Short Answer Type Question

**1.** Describe about clinical thermometer

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## Level 1

**1.** Heat energy is invisible

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**2.** For a substacne to undergo a change of state heat must be either given to it or taken away from it

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**3.** The heat required to raise the temperature of 1 kg of water by $1^{\circ} C$ is called one calorie

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**4.** The heat absorbed by a substance decreases with increases in temperature

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**5.** State True or False The temperature of boiling water can be measured by a clinical thermometer

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**6.** Heat lost by radiation depends upon whether the outer surface of body is black or polised

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**7.** on heating iron expands more than copper

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**8.** To transmit heat from one object to another by conduction the two object should be in contact


**9.** Black substance absorbs and lose heat radiations faster

**10.** No medium is required for transfer of heat by the process of convection

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**11.** Water is a_____ conductor of heat

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**12.** If temperature of a substance increases the average kinetic energy of molecus of the

substance _____.

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**13.** Faster mode of transmisson of heat is _____.

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**14.** Calorific value of _____ fuels is high

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**15.** The substances which do not allow heat to travel through them easily are said to be _____ of heat

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**16.** Change in temperature of a body is $57^{\circ} C$ . The equivalent change in temperature in kelvin scale is _____.

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**17.** During sublimation the solid substance which is converting to geseous state is called _____.

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**18.** Heat capacity of 250 g of water is _____.

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**19.** 100 g of ice at $0^{\circ} C$ is mixed with 0.25 kg of water at $0^{\circ} C$ The net transfer of heat is _____

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**20.** Condensation point of a substance is numerically equal to _____.

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**21.** The physical state of a substance can be changed by

A. decreasing its temperature

B. removing heat energy from the substane

C. giving heat energy to the substacne

D. both b and c

**Answer: d**

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**22.** By heating_____of substance can be changed

A. size

B. temperature

C. state

D. all the above

**Answer: d**

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**23.** Heat flow from one body to another body stops when both bodies attain equal____.

A. temperature

B. heat energy

C. mass

D. volume

**Answer: a**

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**24.** An iron ball at $40^\circ C$ is dropped in a mug containing oil at $40^\circ C$ Then

A. heat flows from iron ball to oil

B. heat flows from between oil to iorn ball

C. heat does not flow between lil and iron

D. temperature of oil increases and temperatue of iron ball decreases

**Answer: c**

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**25.** In the steam enging emost of the heat energy is converted in to _____.

A. electrical energy

B. light energy

C. sound energy

D. mechanical energy

**Answer: d**

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**26.** The range of temperature that can be measured by using a clinical thermometer is

A. $35^\circ C$ to $43^\circ C$

B. $35^\circ F$ to $43^\circ F$

C. 35 K to 43 K

D. all the above

**Answer: a**

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**27.** Which of the following is true in case of mode of transmission of heat?

A. convenction is possible only in case of liquid and gases

B. radiation is the fasters mode of heat transfer

C. conduction is possible only in case of solids

D. all the above

**Answer: d**

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**28.** Sea breeze and land breeze are formed due to

A. conduction

B. convenction

C. radiation

D. all the above

**Answer: b**

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**29.** Woolen clothes keep us warm during winter because ____

A. wool is a poor conductor of heat

B. wool is a good conductor of heat

C. air trapped in between the fibres prevents the heat flow

D. both a and c

**Answer: d**

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**30.** In a thermos flask the loss of heat energy due to the following methods is minimized

A. conduction

B. convection

C. radiation

D. all the above

**Answer: d**

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**31.** Heat energy brings about_____.

A. chemical changes in matter

B. changes in dimension

C. changes in temperature

D. all the above

**Answer: d**

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**32.** Choose the correct statement

(a) Two thin woolen blankets keep ou body warmer than a single equally thick woolen blanket

(b) Mud houses with thatcvhed roofs keep warm in summer and cool in winter as compared to concrete housed

A. only a

B. only b

C. both a and b

D. none of these

**Answer: a**

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**33.** Which of the following is a poor conductor of heat ?

A. vacuum

B. water

C. air

D. all the above

**Answer: d**

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**34.** Which of the following statement is/true?

A. celsius $.^{\circ} C$ is the CGS unit of temperature

B. $30^{\circ} C$ =303 K

C. when heat energy from one body to another the change in temperature of bodies need not be equal

D. all the above

**Answer: d**

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**35.** Choose the correct statement:

(a) During boiling a liquid change in to gaseous state at constant temperaute with absorption of heat energy

(b) During solidification a liquid changes in to solid state at constant temperature with release of heat energy

A. only a

B. only b

C. both a and b

D. none of these

**Answer: c**

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**36.** Fog is formed on the bathroom mirror when one takes a hot shower but does not during cold shower because

A. evaporatiion of water is more at higher temperature

B. formation of fog on the mirror does not depent on amount of vapour

C. formation of fog on mirror is not concerned with temperature of water

D. both a and b

**Answer: a**

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**37.** Which of the following statement is (are) true in case of changes of state?

A. every substance on absorbing heat undergoes change in stte form solid to liquid and liquid to gas at any temperature

B. all substacne do not undergo change in state form solid to liquid and liquid to gas on absorbing heat at nay temperture

C. during change of state there is no change in temperature

D. both b and c

**Answer: d**

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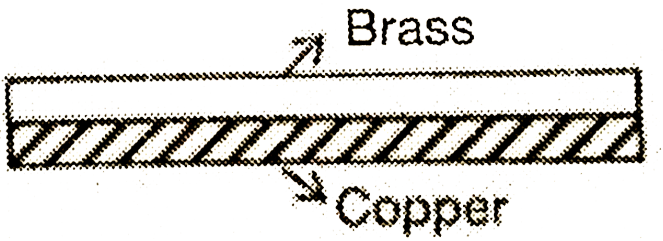
**38.** A bimetallic strip made up of copper and brass as shown below. Which among the following statements is/true about the bimetallic strip? (Expansion of brass is more

than expansion copper?




A. if this bimetallic strip is heated brass takes outer edge of the bend and copper takes the inner edge of the bend

B. if this bimetallic strip is cooled brass takes inner edge of the bedn and copper takes the outer edge of the bend

C. heating and cooling do not affect the bimetiallic strip

D. both a and b

**Answer: d**

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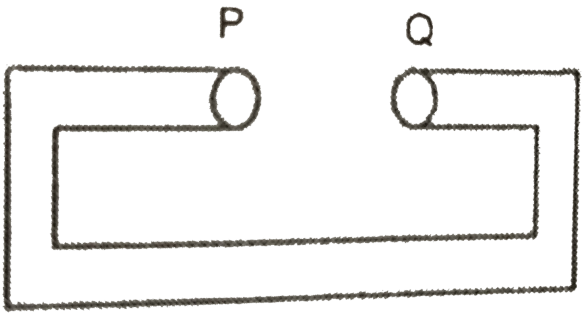
**39.** A metallic rod is bent in the form of ractangle as shown in the given figure and heated .Then the gap between the ends P and

Q _____




A. increases

B. decreases

C. remains same

D. connot be determined

**Answer: a**

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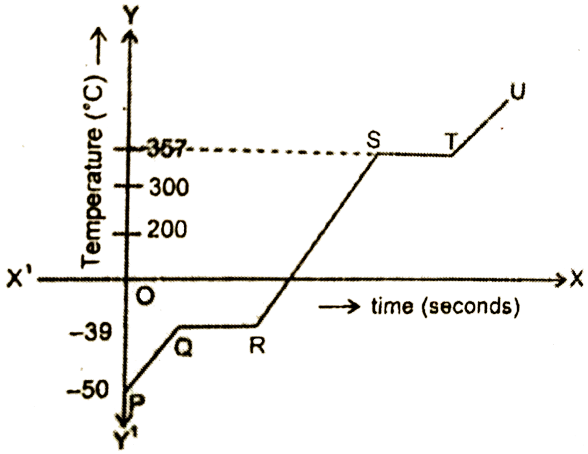
**40.** The heating cuve of particular substance in solid state is as shown in the figure : Choose the correct aternativ e




The boiling point of the substance is _____$C^\circ$

A. $-39$

B. 300

C. 357

D. cannot be determined

**Answer: c**

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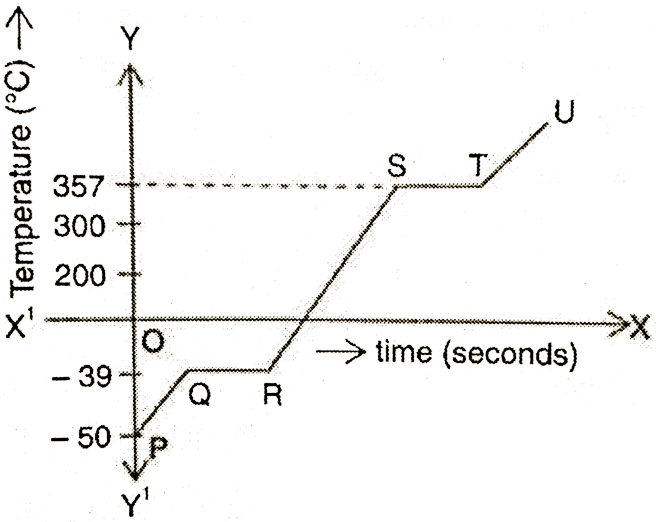
**41.** The heating curve of a paritcular substance in solid state is as shown in the figure .choose the correct alternative




The porition QR of the graph indicates

A. no change in heat energy

B. change in temprture

C. change of state

D. both b and c

**Answer: c**

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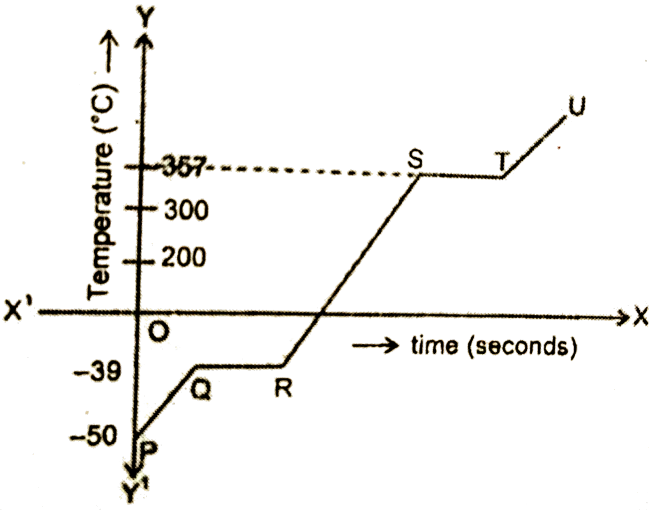
**42.** RS part of the graph indicates _____ state of substance




A. solid

B. liquid

C. gaseous

D. cannot be determined

**Answer: b**

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**43.** Arrange the following steps in sequential order ot show that the conduciton of heat is different in different conductors

(a) take two identical rods one is copper and the other is iron

(b) The ends of the two rods are heated with the same spirit lamp

(c ) fix some nails on the rods with the help of wax at equal distances

(d) The nails near to the flame first from the copper rod and then from the iron rod.

A. acdb

B. abcd

C. acbd

D. adbc

**Answer: c**

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**44.** If 'm' g of fuel is completely burned and that heat energy is supplied to 'M' g of water to raise its temperature by $\Delta t^{\circ} C$ then arrange the following steps in a sequences to calculate the calorific value of the fuel

(a) Determine the heat energy absorbed by water

(b) Determine the calorific value by dividing heat energy produced with mass of the fuel

(c ) Note down the amss of water specific heat

capacity and change in temperature of water

(d) Heat energy absorbed by water is equal to heat given by the guel after complete combustion

A. acbd

B. adcb

C. cadb

D. cdba

**Answer: c**

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**45.** Match the entries given in column A with the appropritate ones in column B

| Column A | | | Column B | |
|---|---|---|---|---|
| A. | Thermometric liquid | ( ) | a. | –240°C |
| B. | Lower fixing point | ( ) | b. | Anomalous behaviour of water |
| C. | Survival of aquatic life | ( ) | c. | 310 K |
| D. | Maximum temperature on the moon | ( ) | d. | Low vapour pressure |
| E. | Minimum temperature on the planet Mercury | ( ) | e. | Freezing point of water |
| F. | Normal human body temperature | ( ) | f. | 110°C |

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**46.** Match columns

| | Column A | | Column B |
|---|---|---|---|
| A. | 50 g of a fuel produces 25 kcal of energy. Its calorific value in cal $g^{-1}$ is | ( ) | a. 373 |
| B. | 400 cal of heat is supplied to 50 g of water to raise its temperature by 8°C. Heat capacity in cal $°C^{-1}$ | ( ) | b. Slow process |
| C. | Boiling | ( ) | c. 500 |
| D. | Heat energy supplied to 150 g of copper to raise its temperature by 12°C in cal is. (take $s_{copper}$ = 0.9 cal $g^{-1}°C^{-1}$) | ( ) | d. Quick process |
| E. | Evaporation | ( ) | e. 1620 |
| F. | Boiling point of water in Kelvin scale | ( ) | f. 50 |

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**47.** Match columns

| | Column A | | | Column B |
|---|---|---|---|---|
| A. | High specific heat capacity of water | ( ) | a. | Bimetallic strip |
| B. | Human body temperature | ( ) | b. | Six's maximum and minimum thermometer |
| C. | Boiling point of mercury | ( ) | c. | 357°C |
| D. | Thermal switches | ( ) | d. | 273 K |
| E. | Maximum and minimum temperature of a day | ( ) | e. | Clinical thermomter |
| F. | Freezing point of water | ( ) | f. | Coolant |

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Level 2

**1.** For each of the question four choice have been porvided select the correct alternative

Choose the correcty statement

A. specific heat capacity of a body in all its states is constant

B. specific heat capacity of a body is different in different states

C. specific heat capacity is a characteristic property of a material and it is different for different material

D. both b and c

**Answer: d**

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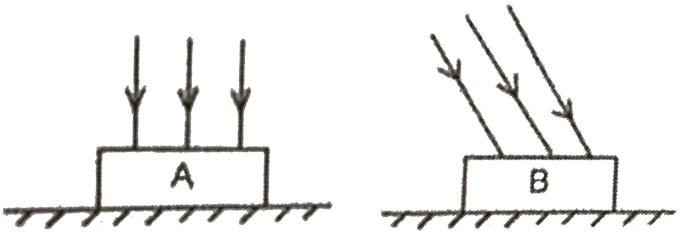
**2.** The sun's rays are falling on two identical ice blocks as shown in the figure Then




A. block a starts melting first

B. block b starts melting first

C. both starts melting at the same time

D. cannot be campared

**Answer: a**

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**3.** During the day time mid day is hotter than early morining or late evening it is

A. due to the sun's rays fall normally on the surface of earth during mid day

B. due to sun's rays that fall obliquely during the early morininng or late eveniing

C. not concerned with how the light rays fall

D. both a and b

**Answer: d**

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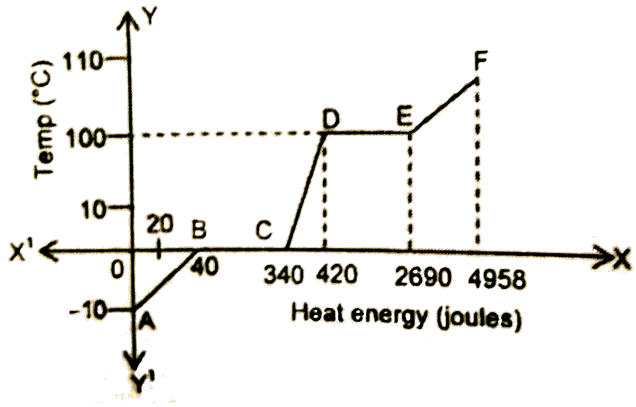
**4.** The heating curve of a particular substance in solid state is a shown in the figure .choose the correct alternative




The amount of heat energy absorbed by the substacne to change completely from liquid at its boiling point to gaseous state is _____J

A. 46185

B. 2270

C. 4538

D. 4958

**Answer: b**

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**5.** Why does the airblown from a fan produce a cooling effect?

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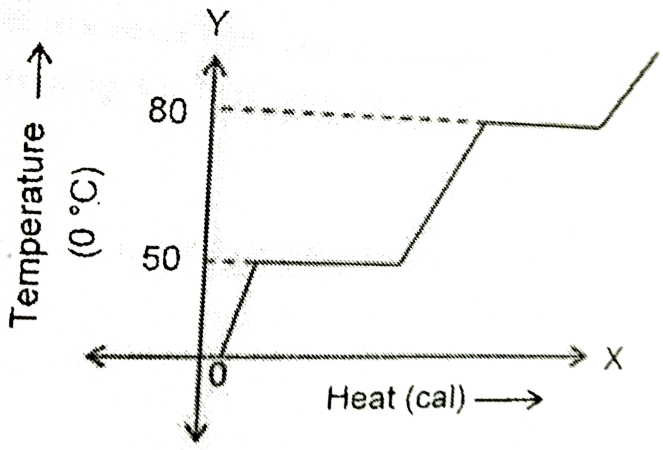
**6.** A graph is drawn by taking the rise in temperature on Y axis and heat supplied on x axis .Find out the melting point and boiling point of heat substance

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**7.** A physiscs student performed an experiment by taking a beaker with 1 l of water oat $30^{\circ}C$ and dropping an iron sphere with temperature $90^{\circ}C$ in it . After sometime student tmeasure their equailibrium temperature as $48^{\circ}C$ .If the density of iron sphere is 7870 kg $m^{-3}$ then find the volume of the iron sphere specifice heat of iron is 0.110 jcal $g^{-1\circ}C^{-1}$

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**8.** A sceince student in a science fair demonstrated the existence of water and ice in a same container at $0^\circ C$ and water and steam in a same closed container at $100^\circ C$ explain how is it possible to have two different states of matter at the same temperature

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**9.** Ramu took four indentical iron balls of temperature $36^\circ C, 10^\circ C, 20^\circ C$ and $32^\circ C$ .He kept them in physical (thermal) contact

with one another .After some time he measured the equilibrium temperautre attained by these four balls .What is the value of the equilibrium temperature?

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**10.** You have been given with a cup of coffee which is too hot to drink .Which among the following is the best method to cool it? Why?

(i) Placing it in a beaker containing water

(2) Placing it on the surface of wood

(3) Placing it on the surface of an iron block

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**11.** Rajesh took two identical glasses containing the same amount of hot milk at the same temperature He kept one glass undisturbed .While the other one he continously stirred using a spoon .Then among them milk in which glass cools faster ? Why?

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**12.** A physics student took a number full of dry ice with a thermometer placed in ti .He strted supplying heat energy at constant rate by placing it on a heating device .The student observed no change in the thermometer reading even after 90 % of ice melted explain what happened to the heat energy supplied

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**13.** Water at $10^{\circ} C$ is in liquid form but iron at $10^{\circ} C$ is in solid form what is the reason ?

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**14.** Ram took equal masses of cooking oil and water repecitvely in two differernt identical beakers and placed them on identical heat engines and supplied same amount of heat to them .with the help o fthermometer he noted

their temperautes which one of them would be hotter why?

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**15.** Akbar observed that the things placed inside the refrigerator become cold. He wanted to know how does the ehat flow from the inside of the refrigerator to the ouside of the refrigerator .Explain

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**16.** If a uniform metal plate with a hole in it heated then explain how the size of the hole gets effected?

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**17.** Raju was trying very hard to unscrew the metal cap of a bottle then he heated the cap slightly and was able to unscrew it easily explain

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**18.** Why does a black smith heat the iron block before hammering it to change its shape?

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**19.** If we touch a piece of steel and wood on a winter day we feel that the steel is colder than wood .if we touch the steel and the wood on summer day we feel that steel is hotter than wood why?

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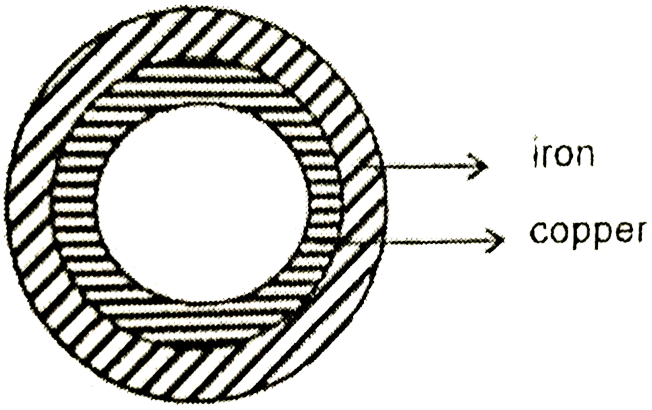
Level 3

**1.** Is it possible to raise the temperature of water by heating it in a container made up of paper ? [Temperature required to burn the paper is more than $100^{\circ} C$]

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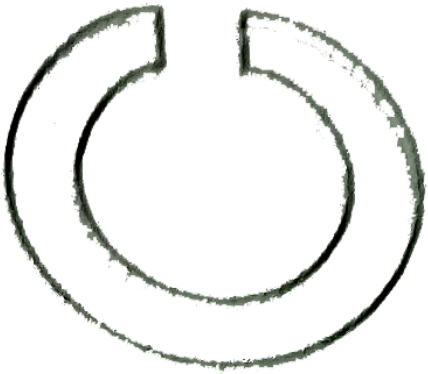
**2.** A small ring having small gap is shown in figure on heating what will happen to size of gap.



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**3.** Explain why a clinical thermometer is exclusively used to measure the human body temperature and a laboratory thermometer is used to measure the temperatures of different substances but not to measure the human body temperature .

Watch Video Solution

**4.** Two beaker A and B contain water at different temperatures .When 1 liter of water from beaker A is mixed with 2 litre of water

from beaker B the equilibrium temperature is $16^{\circ}C$ and when 2 litre of water from beaker A then the equilibrium temperature is $14^{\circ}C$ .Determine the tempreature of water in the beaker A and B

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**5.** Two beaker contain hot water of the same temperature one beaker is placed in anotehr beaker containing cold water and the other breaker in fornt of a rotating fan .It is

observed that the beaker placed infront fan cools faster .explain the reason

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**6.** A test tube is filled with some water .A small piece of wax is fixed at the bottom of the test tube and small piece of wax is made to float on the water what happens to the wax at the top and bottom of the test tube if the test tube is heated at the top middle and bottom?

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**7.** Why is hot water more effective than cold water in extinguishing fire ?

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## Test 1

**1.** Arrange the following steps in a sequential order to demonstrate the thermal expansion of solids

(a) heat th eball with a spirit lamp for some

time

(b) place the ball on the ring it just slips through the ring

(c ) Place the ball on the ring the ball does not pass through the ring

(d) take a ball and ring such that the internal diameter of the ring and the external diameter of the bal are equal .

A. dbac

B. dabc

C. dacb

D. dcab

**Answer: a**

 Watch Video Solution

**2.** 0.5 g of benzoic acid was subjected to combustion in a bomb calorimeter at $15^{\circ}C$ when the temperature of the calorimeter system (including water) was found to rise by $0.55^{\circ}C$. Calculate the heat of combustion of benzoic acid (i) at constant volume and (ii) at

constant pressure. the thermal capacity of the calorimeter including water was found to be 23.85 kJ.

Watch Video Solution

**3.** Match the following

| Column A | | Column B | |
|---|---|---|---|
| (A) | Heat is absorbed | (a) | Gravesand's ring and ball experiment |
| (B) | Anomalous expansion of water | (b) | Solid to liquid |
| (C) | Heat is released | (c) | Hope's apparatus |
| (D) | Thermal expansion of solids | (d) | Gas to liquid |

A. $a \rightarrow b, B \rightarrow a, C \rightarrow d, D \rightarrow c$

B. $A \rightarrow d, B \rightarrow c, C \rightarrow d, D \rightarrow a$

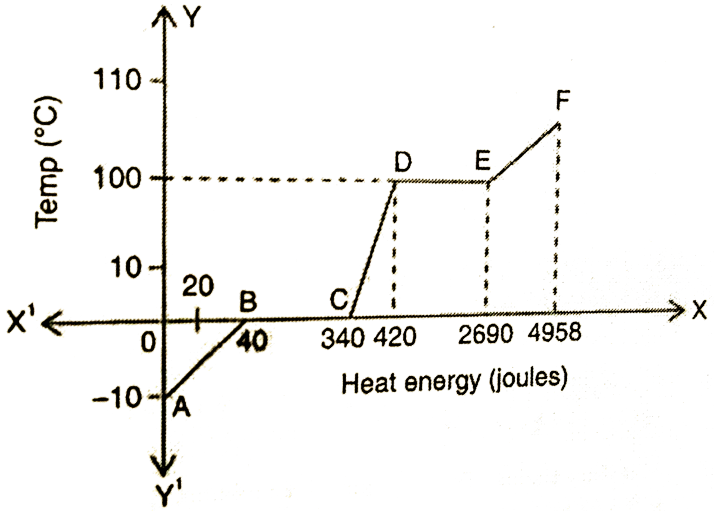
C. $A \rightarrow d, B \rightarrow a, C \rightarrow b, D \rightarrow c$

D. $A \rightarrow b, B \rightarrow c, C \rightarrow d, D \rightarrow a$

**Answer: d**

Watch Video Solution

**4.** The heating curve of a particular substance in solid state is as shown in the figure .choose the correct alternative




The change of state in the graph is represented by _____part.

A. ab

B. bc

C. de

D. both b and c

**Answer: d**

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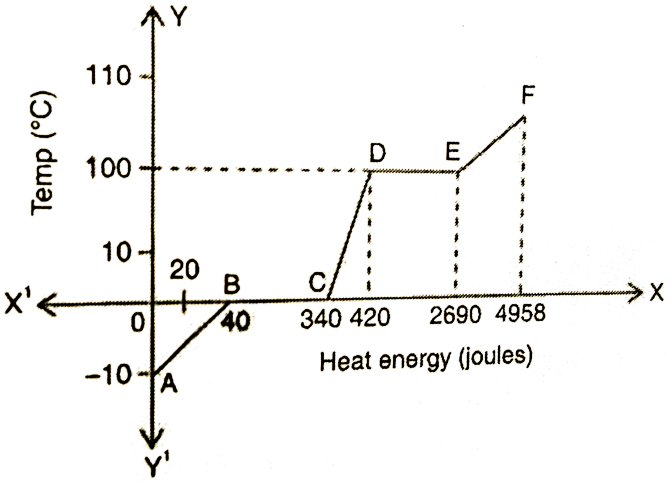
**5.** The amount of heat energy absorbed by the substance to change completely form liquid at its boiling point to gaseous state is _____J



A. 4618

B. 2270

C. 4538

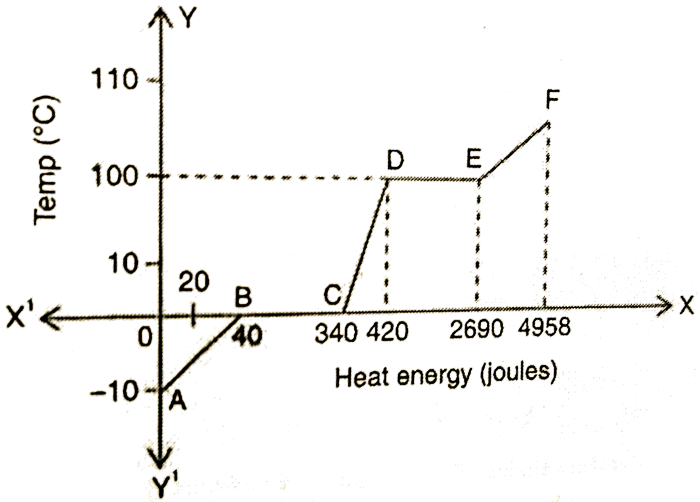
D. 4958

**Answer: b**

 Watch Video Solution

**6.** If mass of the substacne is 20 g then the heat energy required to melt 1 g of the

substacne is _____J




A. 300

B. 15

C. 113.5

D. 2270

**Answer: b**

Watch Video Solution

**7.** Assertion (A) Radiation is the fatest mode of transmissin of heat

Reason (R ) : Conduction and convection require a medium for transmission of heat where as heat radiations can travel through vaccum .

A. both a and r are correct and r is the correct explanation of a

B. both a and r are correct but ra is not the correct explanation of a

C. a is correct and r is incorrect

D. both a and r are incorrect

**Answer: b**

Watch Video Solution

**8.** Assertion (A): Clinical thermometer cannot be used to meaure the temperature of melting ice

Reason (R ): The range of clinical thermometer is from $35^{\circ}C$ to $43^{\circ}C$

A. both a and r are correct and r is the correct explanation of a

B. both a and r are correct but ra is not the correct explanation of a

C. a is correct and r is incorrect

D. both a and r are incorrect

**Answer: a**

Watch Video Solution

**9.** Choose the correct statements

A. both a and c

B. b,c and d

C. both c and d

D. all the above

**Answer: c**

View Text Solution

**10.** Choose the correct statement in winter

(a) a set of double window is a better insulator

(b) window constructed of a single double thickness glass is a good insultor

A. only a

B. onlyb

C. both a and b

D. cannot be compared

**Answer: a**

Watch Video Solution

**11.** on heating substance of the following physical quantities change(s)?

A. density

B. mass

C. volume

D. both a and c

**Answer: d**

Watch Video Solution

**12.** Bimetallic strip worked on the principal of _____

A. unequal expansion of solids

B. unequal contraction of solids

C. equal expansion of solids

D. both a and b

**Answer: d**

Watch Video Solution

**13.** For each of the equation four choices have been provided .select the correct alternative

SI unit of specific heat capacity is _____.

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

B. $calg^{-1\circ}C^{-1}$

C. $Jkg^{-1}k^{-1}$

D. all the above

**Answer: c**

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**14.** A thermometer worked on the principle of

A. linear expansion of solid

B. cubical expansion of solid

C. uniform expansion of volume of liquid or gas with temperature

D. both a and c

**Answer:**

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**15.** In case of an incense stick or an agrbati the smoke at the lighted end of stick moves in upward direction it is because

A. the cool air below the lighted end moves to take the place of hot air above the lighted end

B. the air at the hot ends is more dense

C. it is natural for the smoke to move up

D. the smoke is repelled by the gravity of earth

**Answer: a**

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## Test 2

**1.** Arrange the following steps in a sequential order to demonstrate the expansion of gases

(a) Heat the test tube and observe the position of coloured drop in the narrow galss tube

(b) Take a drop of coloured liquid in to

naroorw galss tube

(c ) Take an empty test tube fit its mouth wiht one holed cork stopper

(d) Fit the narrow glass tube through the cork os that the level of the coloured drop is just above the cork

(e ) The ari in the tube expands and pushes the colured drop in the narrow tube upwards

A. bcade

B. cbdae

C. badce

D. cadeb

**Answer: b**

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**2.** If Q cal of heat energy is supplied to 'm' kg of substacne its temeprature changes from $t_1C$ ot $t_2C$ Arrange the following steps in a sequential order to calculate speciific heat capacity of the substacne in SI system

(a) Note down the mass of the substance as

'm' kg heat energy as Q cal and the temperrures as $t_1C$ and $t_2C$

(b) Write the formula for the amount of heat energy lost or gained by a body as $Q = mstrian \geq <$

(c ) Convert the heat energy and temperature into si system

(d) substitute the values in the formula and calculate the specific heat capacity of the substacne

(e ) Find the change in temperature of the substacne

A. acedb

B. cdaeb

C. acebd

D. ceabd

**Answer: c**

 Watch Video Solution

## 3. Match the following

| Column A | | Column B | |
|---|---|---|---|
| (P) | Condensation | (p) | Thermal expansion |
| (Q) | Small gap is left while laying the rail tracks | (q) | Melting point of the substance |
| (R) | Freezing point of a substance | (r) | Produces low temperature |
| (S) | Mixture of common salt and ice | (s) | Heat is released |

A. $P \rightarrow q, Q \rightarrow s, R \rightarrow p, S \rightarrow r$

B. $P \rightarrow q, Q \rightarrow p, R \rightarrow s, S \rightarrow r$

C. $P \rightarrow s, Q \rightarrow p, R \rightarrow q, S \rightarrow r$

D. $P \rightarrow s, Q \rightarrow p, R \rightarrow r, S \rightarrow q,$

**Answer: c**

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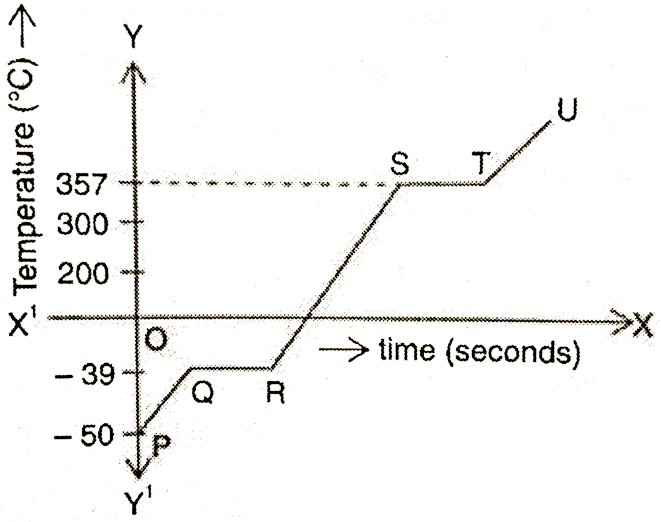
**4.** The heating curve of a paritcular substance in solid state is as shown in the figure .choose the correct alternative




The porition QR of the graph indicates

A. no change in heat energy

B. change in temprture

C. change of state

D. both b and c

**Answer: c**

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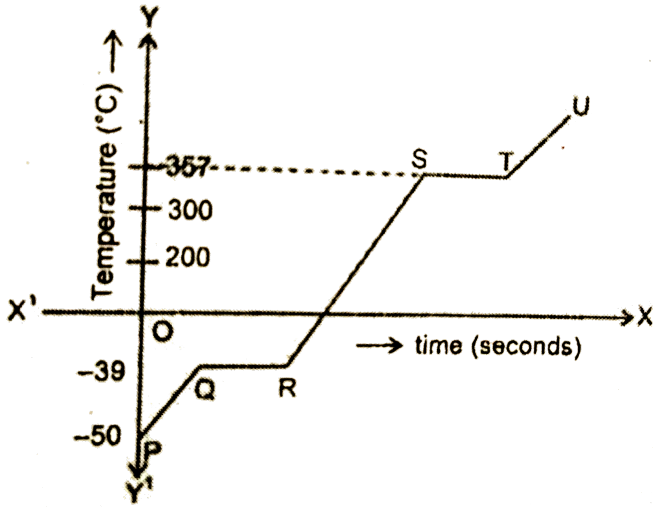
**5.** RS part of the graph indicates _____ state of substance




A. solid

B. liquid

C. gaseous

D. cannot be determined

**Answer: b**

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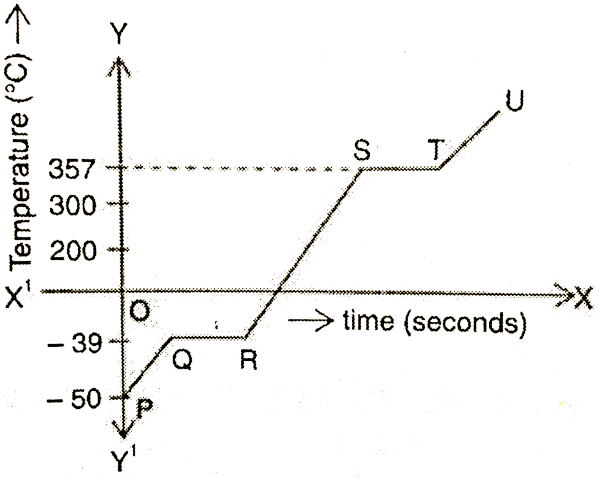
**6.** The boiling point of the substacne is _____C




A. $-39$

B. 300

C. 357

D. cannot be determined

**Answer: c**

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**7.** Assertion (A): The volume of a given mass of water is more at $0^\circ C$ when compared to water at $4^\circ C$

Reason (R ): Water expands when its temperature is incresed form $0^\circ C \rightarrow 4^\circ C$

A. both a and r are true and r is the corret expantion of a

B. both a and r are true but r is not the correct explanation of a

C. a is true but r is false

D. both a and r are false

**Answer: c**

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**8.** Assertion (A): Black coloured clothes are preferred over white colored clothes in winter

Reason (R ): Black is good absorber of radiation

A. both a and r are ture and r is the correct explanation of a

B. both a and r are true but r is not the correct explanation of a

C. a is true but r is false

D. both a and r are false

**Answer: d**

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**9.** Fog is formed on the bathroom mirror when one takes a hot shower but does not during cold shower because

A. evaporation of water is more at higher temperture

B. formation of fog o the mirror does not depend on amount of vapour

C. formation of fog on mirror is not concerned wioth temperature of water

D. both a and b

**Answer: a**

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**10.** Choose the correct statement

(a) Two thin woolen blankets keep ou body warmer than a single equally thick woolen blanket

(b) Mud houses with thatcvhed roofs keep warm in summer and cool in winter as compared to concrete housed

A. only a

B. only b

C. both a and b

D. none of these

**Answer: a**

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**11.** Heat energy brings about_____.

A. chemical changes in matter

B. change in dimensions

C. change in temperature

D. all the above

**Answer: d**

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**12.** Choose the correct statement

A. specific heat capacity of a body in all its states is constant

B. specific heat capacity of a body is different in different states

C. specific heat capacity is a characteristic property of a material and it is different for different material

D. both a and c

**Answer: d**

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**13.** Which of the following statement is //are ture?

A. celsius .$^{\circ}$ $C$ is the unit of temperature

B. $30^{\circ}C = 303k$

C. when heat energy flows from one body to another the change in temperaure of trhe bodies need not be equal

D. all the above

**Answer: d**

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**14.** Which of the following is true in case of mode of transmission of heat?

A. convection is possible only in case of liquid and gases

B. radiation is the fasters mode of heat transfer

C. conduction is possible only in case of solids

D. all the above

**Answer: d**

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