PHYSICS

BOOKS - CHETAN PHYSICS (TAMIL ENGLISH)

HEAT

Fill In The Blanks

1. Temperature is a degree of.....of a substance.

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2. The melting point of ice is.....$^{\circ}C$

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3. During transformation of liquid phase to solid phase, the latent heat is.....

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4. The quantity of heat absorbed by liquid at constant temperature to convert into gas is..... .

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5. When substance is converted from liquid to solid state, the heat energy is..... .

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6. Melting of ice due to applied pressure, getting converted back into ice after the pressure is removed is called ..... .

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7. A body of length 1m having cross sectional area $0.80m^2$ has heat flow through it at the rate of $8000\ J/\sec.$ Then find the temperature difference if $K = 200Jm^{-1}K^{-1}$

A. 20°C

B. 40°C

C. 50°C

D. 100°C

Answer: C

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8. The temperature at which the air gets saturated with water vapour is called ..... temperature.

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9. Absolute humidity is measured in ..... .

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10. The presence of water vapour in the atmosphere is called. .....

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11. The amount of water vapour in air is determined in terms of its ..... .

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12. List down the thermal conductivity of some substances.

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13. If the relative humidity is more than 60%, then then the air is ..... .

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14. If the relative humidity is ..... 60%, then the air is dry.

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15. In SI system, heat is measured in ..... .

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16. In CGS, heat is measured in ....

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17. 1 calorie =..... joule.

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18. SI unit of specific heat capacity is..... .

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19. The amount of heat energy required to increase the object temperature by $1^{\circ}C$ is called _____ .

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20. CGS unit of specific heat capacity is..... .

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21. If objects of equal masses are given equal heat, their final temperature will be different, this is due to difference in their..... .

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22. Write down the thermal conductivity of substances listed below:

1.Concrete,

2.Water,

3.Glass wool,

4.Air,

5.Helium,

6.Hydrogen,

7.Oxygen.

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23. In which case the thermal conductivity increases from left to right.

A. Al, Cu, Ag

B. Ag, Cu, Al

C. Cu, Ag, Al

D. Al, Ag, Cu

Answer: a

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Complete The Analogy

1. Boiling point of water : $100^{\circ}C$ :: Melting point of ice:

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2. Latent heat of fusion of ice : 80 cal/g :: Steam :.....

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3. CGS unit of heat : calorie :: CGS unit of heat capacity:

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4. Specific heat of Water : $1cal/g^{\circ}C$:: Kerosene : .....

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5. Dry air : less than 60% Relative humidity :: Humind air. .....

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Answer In One Sentence

1. 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 heat through them will be

A. 1:1

B. 2:1

C. 1:4

D. 1:8

Answer: d

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2. What is Latent heat of fusion ?

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3. Define boiling point of liquid.

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4. What is meant by latent heat of vaporization

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5. What are the different ways of heat transfer?

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6. Is the concept of latent heat applicable during transformation of gaseous phase to

liquid phase and from liquid phase to solid phase?

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7. Where does the latent heat go during these transformation?

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8. The length of the two rods made up of the same metal and having the same area of cross-

section are 0.6 m and 0.8 m respectively. The temperature between the ends of first rod is 90 C and 60° C and that for the other rod is 150°C and 110° C. For which rod the rate of conduction will be greater ?

A. First

B. Second

C. Same for both

D. None of the above

Answer: c

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9. Mention the variation of colour of a substance on heating ?

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10. What is dew point temperature?

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11. What is absolute humidity?

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12. What is relative humidity?

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13. What is the formula for percentage of relative humidity ?

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14. What is kilocalorie?

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15. What is calorie?

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16. Distinguish between Absolute humidity and Relative humidity.

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

A. High specific heat and low conductivity

B. High specific heat and high conductivity

C. Low specific heat and low conductivity

D. Low specific heat and high conductivity

Answer: d

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18. The ratio of thermal conductivity of two rods of different material is 5:4. The two rods of same area of cross-section and same thermal resistance will have the lengths in the ratio

A. 4:5

B. 9:1

C. 1:9

D. 5:4

Answer: d

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19. The thermal conductivity of a material in CGS system is 0.4. In steady state, the rate of flow of heat 10 cal/sec-cm, then the thermal gradient will be

A. $10^{o}C/$ cm

B. $12^{o}C/$ cm

C. $25^{o}C/$ cm

D. $20^{o}C/$ cm

Answer: c

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20. Two rectangular blocks A and B of different metals have same length and same area of cross-section. They are kept in such a way that their cross-sectional area touch each other. The temperature at one end of A is $100^{o}C$ and that of B at the other end is $0^{o}C$. If the ratio of their thermal conductivity is 1 : 3, then under

steady state, the temperature of the junction in contact will be

A. 25°C

B. 50°C

C. 75°C

D. 100°C

Answer: a

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Match The Columns

1. Match the column

Column A	Column B
(1) Mass	(a) m/s
(2) Weight	(b) m/s^2
(3) Acceleration	(c) kg
(4) Velocity	(d) N

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2. 

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3. Match the column

Column A	Column B
(1) Mass	(a) m/s
(2) Weight	(b) m/s^2
(3) Acceleration	(c) kg
(4) Velocity	(d) N

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State Whether Following Statement Are True Or False If False Rectify The Statement

1. True or False :

Different substances have different melting

points.

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2. True or False :

Different substances have same specific heat capacities.

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3. Two vessels of different materials are similar in size in every respect. The same quantity of

ice filled in them gets melted in 20 minutes and 30 minutes. The ratio of their thermal conductivities will be

A. 1.5

B. 1

C. 2/3

D. 4

Answer: a

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4. If the ratio of coefficient of thermal conductivity of silver and copper is 10:9, then the ratio of the lengths upto which wax will melt in Ingen Hausz experiment will be

A. $6:10$

B. $\sqrt{10}:3$

C. $100:81$

D. $81:100$

Answer: b

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5. True or False:

Presence of moisture in air is called humidity.

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6. The thickness of a metallic plate is 0.4 cm. The temperature between its two surfaces is 20° C. The quantity of heat flowing per second is 50 calories from $5cm^2$ area. In CGS system, the coefficient of thermal conductivity will be

A. 0.4

B. 0.6

C. 0.2

D. 0.5

Answer: c

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7. True or False :

Water vapour content of air is measured by relative humidity.

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8. True or False :

Absolute humidity is measured in g/m^3

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9. The dimensions of thermal resistance are

A. $\left[M^{-1}L^{-2}T^{3}K\right]$

B. $\left[ML^{2}T^{-2}K^{-1}\right]$

C. $\left[ML^2T^{-3}K\right]$

D. $\left[ML^2T^{-2}K^{-2}\right]$

Answer: a

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10. A slab consists of two parallel layers of copper and brass of the same thickness and having thermal conductivities in the ratio of 1:4. If the free face of brass is at 100°C and

that of copper at 0°C, the temperature of interface is

A. 80°C

B. 20°C

C. 60°C

D. 40°C

Answer: a

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11. True or False:

S.I. unit of heat is joule.

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12. True or False:

In CGS system, heat is measured in joules.

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13. True or False:

1 J = 4.18 cal.

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14. True or False:

Specific heat is denoted by letter 'h'.

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15. True or False:

Specific heat capacity is measured in SI system in $J/kg^{\circ}C$.

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16. True or False:

In CGS, specific heat capacity can be measured in calorie.

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17. True or False:

Thermometer is used to measure specific heat capacity.

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18. True or False:

The specific heat capacity of water is $1.0 cal / g^{\circ} C$

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Choose And Write The Correct Option

1. The specific heat capacity of ___ is maximum.

A. Mercury

B. Copper

C. Water

D. Iron

Answer: C

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2. A piece of glass is heated to a high temperature and then allowed to cool. If it cracks, a probable reason for this is the following property of glass

A. Low thermal conductivity

B. High thermal conductivity

C. High specific heat

D. High melting point

Answer: a

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3. The temperature gradient in a rod of 0.5 m long is 80° C/m. IF the temperature of hotter end of the rod is 30°C, then the temperature of the cooler end is

A. 40°C

B. -10°C

C. 10°C

D. 0°C

Answer: b

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4. A body of length 1m having cross sectional area $0.75m^2$ has heat flow through it at the rate of 6000 Joule $/$ sec. Then find the temperature difference if $K = 200Jm^{-1}K^{-1}$

A. 20°C

B. 40°C

C. 80°C

D. 100°C

Answer: B

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5. Two rods of same length and material transfer a given amount of heat in 12 seconds, 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: b

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6. The specific heat capacity is measured in C.G.S. system in ___ .

A. cal

B. kcal

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

D. joule $/kg^{\circ}C$

Answer: C

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7. If the radius and length of a copper rod are both doubled, the rate of flow of heat along the rod increases

A. 4 times

B. 2 times

C. 8 times

D. 16 times

Answer: b

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8. Two identical plates of different metals are joined to form a single plate whose thickness is double the thickness of each plate. If the

coefficients of conductivity of each plate are 2 and 3 respectively, then the conductivity of composite plate will be

A. decreases

B. increases

C. remains the same

D. fluctuates

Answer: A

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9. The specific heat capacity of water is ____ $cal/g^{\circ}C$

A. 10

B. 1

C. 1.5

D. 0.5

Answer: B

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10. When water boils and is converted into steam, then _____ .

A. heat is taken in and temperature remains constant.

B. heat is taken in and temperatures rises.

C. heat is given out and temperatures Jowers.

D. heat is given out and temperature remains constant.

Answer: D

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11. 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 X_c, $X_m$and X_g, then

A. $X_c = X_m = X_g$

B. $X_c > X_m > X_g$

C. $X_c < X_m < X_g$

D. $X_m < X_c < X_g$

Answer: C

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12. 

With reference to the above diagram, which of the following relation is incorrect?

A. $C_{\text{iron}} > C_{\text{copper}}$

B. $C_{\text{copper}} > C_{\text{lead}}$

C. $C_{\text{Iron}} > C_{\text{lead}}$

D. $C_{\text{lead}} > C_{\text{copper}}$

Answer: D

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13. Which of the following is a correct relation?

A. 4.18 calories= 1 joule

B. 1 calories = 4.18 joule

C. 10^7 calories = 1 joule

D. 1 calories = 10^7 joule

Answer: B

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14. In the experiment of Hope's apparatus, the point of intersection of the two curves in the graph corresponds to the _____ .

A. melting point of ice

B. freezing point of water

C. temperature at which the density of water is minimum

D. temperature at which the density of water is maximum

Answer: D

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15. The ends of two rods of different materials with their thermal conductivities, radii of cross sections and lengths all in the ratio 1 : 2 are maintained at the same temperature difference, if the rate of flow of heat in the larger rod is 4 cal/ sec, the rate of flow of heat in the shorter rod will be

A. $1\ cal\ /\ \sec$

B. $2\ cal\ /\ \sec$

C. $8\ cal\ /\ \sec$

D. $16\ cal\ /\ \sec$

Answer: A

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16. Heat needed to raise the temperature of 1 kg of water from $14.5^\circ C$ to 15.5° C is _____ .

A. 4186 J

B. 103 J

C. 1 cal

D. 4180 cal

Answer: A

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17. If two metallic plates of equal thickness and thermal conductivities K_1 and K_2 are put together face to face and a common plate is constructed, then the equivalent thermal conductivity of this plate will be

A. $\frac{K_1K_2}{K_1+K_2}$

B. $\frac{2K_1K_2}{K_1+K_2}$

C. $\frac{\left(K_1^2+K_2^2\right)^{\frac{3}{2}}}{K_1K_2}$

D. $\frac{\left(K_1^2+K_2^2\right)^{\frac{3}{2}}}{2K_1K_2}$

Answer: B

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18. Heat absorbed when 1 g of ice melts at $0^\circ C$ to form lg of water at the same temperature is ___ cal

A. 80

B. 800

C. 540

D. 54

Answer: A

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19. The unit of reaction rate constant depends upon the

A. Order

B. Molecularity

C. Progress

D. None of these

Answer: A

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Solve The Following

1. Types: A

$Q = mc\Delta$ (Heat energy during change in temperature)

Q = mL (Heat energy during change of state)

Note : Specific heat capacity (c) $= 1cal/g^\circ C = 1\ kcal/kg^\circ C$

ΔT = Higher temperature - Lower temperature

.

How much heat energy is necessary to raise the temperature of 5kg of water form 20° C to 100°C.

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2. How much energy needs to be supplied to 150g of water at $100^{\circ} C$ to convert it to steam at $100^{\circ} C$. $(L_{vap} = 540 cal / g)$.

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3. Equal heat is given to two objects A and B of mass 1g. Temperature of A increases by $3^{\circ} C$ and B by $5^{\circ} C$. Which object has more specific heat and by what factor ?

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Numericals For Practice

1. How much heat is required to raise the temperature of 500 g of mercury from $20^{\circ}C$ to $100^{\circ}C$. (Sp. heat cap. of Hg is $0.033 kcal/kg^{\circ}C$).

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2. The initial temperature of 40 g copper ball is $24^{\circ}C$. When 200 cal heat is supplied, the temperature rises to $74^{\circ}C$. Find the specific heat capacity of copper?

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3. Calculate the heat gained by 50 g of ice at $0^{\circ}C$ to change into water of the same temperature. (Latent heat of fusion of ice is 80 cal/g)

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4. Calculate the amount of heat absorbed by 100 g of ice to change into water of $30^\circ C$. (Specific heat capacity of water is $1 cal / g^\circ C$)

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5. Liquid ammonia is used in ice factory for making ice from water. If water at $20^\circ C$ is to be converted into 2 kg ice at $0^\circ C$, how many

grams of ammonia is to be evaporated? (Given: The latent heat of vaporization of ammonia= 341 cal/g)

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6. A thermally insulated pot has 150 g ice at temperature $0^{\circ}C$. How much steam of $100^{\circ}C$ has to be mixed to it, so that water of temperature $50^{\circ}C$ will be obtained ?

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7. If 80 g steam of temperature $97^{\circ}C$ is released on an ice slab of temperature $0^{\circ}C$,how much ice will melt ? How much energy will be transferred to the ice when the steam will be transformed to water?

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8. Type: C

Calorimeter

Heat lost by = Heat gained + Heat gained

hot object = by calorimeter + by liquid

$Q = Q_1 + Q_2$

$Q = mc\Delta T$

Q = mL

Note :

$C_{Copper} = 0.1cal/g^\circ C = \ = 0.1kcal/kg^\circ C$

Final temperature becomes equal to 'T' for all substances

A copper sphere of of 100g mass in heated to raise its temperature to $100^\circ C$ and is released in water of mass 195g and temperature $20^\circ C$ in a copper calorimeter . If the mass of calorimeter is 50g what will be the maximum temperature of water ?

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9. A calorimeter has mass 100g and specific heat $0.1 kcal/kg^\circ C$. It contains 250 g of liquid at $30^\circ C$ having specific heat of $0.4 kcal/kg^\circ C$. If we drop a piece of ice of mass 10 g at $0^\circ C$, what will be the temperature of the mixture ?

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10. A solid of mass 250 g at $90^\circ C$ is dropped in a calorimeter containing 100 g of water at $15^\circ C$. The resulting temperature of mixture becomes $40^\circ C$. The mass of calorimeter is 100 g and its specific heat capacity is 0.1 $cal/g^\circ C$. Find the specific heat capacity of the solid.

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11. A copper sphere of mass 500 g is heated to $100^\circ C$ and then introduced into a copper

calorimeter containing 100 g of water at $20^{\circ} C$. Find the maximum temperature of the mixture, if the mass of calorimeter is 100g and specific heat capacity is $0.1 cal / g^{\circ} C$.

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Define Write The Laws

1. What is Latent heat of fusion ?

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2. What is Latent heat of fusion ?

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3. Calculate the amount of heat radiated per second by a body of surface area $12cm^2$ kept in thermal equilibrium in a room at temperature $20^\circ C$. The emissivity of the surface $= 0.80$ and $\sigma = 6.0 \times 10^{-8} Wm^{-2} K^{-4}$

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4. What is meant by latent heat of vaporization

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5. What is meant by latent heat of vaporization

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6. How much energy is radiated per minute from the filament of an incandescent lamp at $3000K$, if the surface area is $10^{-4}m^2$ and it's emissivity is 0.4 ?

Stefan's constant $\sigma = 5.67 \times 10^{-8}Wm^{-2}K^{-4}$

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7. The operating temperature of a tungsten filament in an incandescent lamp is $2000K$ and it's emissivity is 0.3. Find the surface area

of the filament of a 25 watt lamp. Stefan's constant $\sigma = 5.67 \times 10^{-8} Wm^{-2} K^{-4}$

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8. Two spheres of different materials one with double the radius and one-fourth wall thickness of the other, are filled with ice. If the time taken for complete melting ice in the large radius one is 25 minutes and that for smaller one is 16 minutes, the ratio of thermal

conductivities of the materials of larger sphere to the smaller sphere is

A. 4:5

B. 5:4

C. 25:8

D. 8:25

Answer: d

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9. The ratio of the diameters of two metallic rods of the same material is 2 : 1 and their lengths are in the ratio 1 : 4. If the temperature difference between their ends are equal, the rate of flow of heat in them will be in the ratio

A. 2:1

B. 4:1

C. 8:1

D. 16:1

Answer: d

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

A. 30°C

B. 40°C

C. 50°C

D. 60°C

Answer: B

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11. Two identical rods of copper and iron are coated with wax uniformly. When one end of each is kept at temperature of boiling water,

the length upto which wax melts are 8.4cm and 4.2cm respectively. If thermal conductivity of copper is 0.92, then thermal conductivity of iron is

A. 0.23

B. 0.46

C. 0.115

D. 0.69

Answer: B

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

A. Mud is superconductor of heat

B. Mud is good conductor of heat

C. Mud is bad conductor of heat

D. None of these

Answer: C

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13. The temperature of hot and cold end of a 20cm long rod in thermal steady state are at 100^{o} C and 20^{o}C respectively. Temperature at the centre of the rod is

A. 50^{o}C

B. 60^{o}C

C. 40^{o}C

D. 30^{o}C

Answer: B

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14. A heat flux of 4000 J/s is to be passed through a copper rod of length 10 cm and area of cross-section $100cm^2$. The thermal conductivity of copper is 400 W/m/ °C. The two ends of this rod must be kept at a temperature difference of

A. 1°C

B. 10°C

C. 100°C

D. 1000°C

Answer: C

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15. One end of a metal rod of length 1.0 m and area of cross section $100cm^2$ is maintained at 100° C. If the other end of the rod is maintained at 0°C, the quantity of heat transmitted through the rod per minute is

(Coefficient of thermal conductivity of material of rod =100 W/m-K)

A. $3 \times 10^3 J$

B. $6 \times 10^3 J$

C. $9 \times 10^3 J$

D. $12 \times 10^3 J$

Answer: B

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Write Short Notes

1. Define latent heat capacity . Give its unit

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2. The coefficient of thermal conductivity of copper is nine times that of steel. One end of copper is maintained at 100°C and the other end of steel is maintained at 0°C. If the corresponding lengths of the copper and iron are 18cm and 6cm respectively, What will be

the temperature at the junction of copper and steel ?

A. 75°C

B. 67°C

C. 33°C

D. 25°C

Answer: A

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

A. 1 : 3

B. 4 : 3

C. 8 : 9

D. 3 : 2

Answer: C

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4. A slab consists of two parallel layers of two different materials of same thickness having thermal conductivities K_1 and K_2. The equivalent conductivity of the combination is

A. $K_1 + K_2$

B. $\frac{K_1 + K_2}{2}$

C. $\frac{2K_1K_2}{K_1 + K_2}$

D. $\frac{K_1 + K_2}{2K_1K_2}$

Answer: B

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5. There are two identical vessels filled with equal amounts of ice. The vessels are of different metals., If the ice melts in the two vessels in 20 and 35 minutes respectively, the

ratio of the coefficients of thermal conductivity of the two metals is

A. 4:7

B. 7:4

C. 16:49

D. 49:16

Answer: B

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Distinguish Between

1. What is the difference between heat and temperature?

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2. The heat is flowing through a rod of length 50 cm and area of cross-section $5cm^2$. Its ends are respectively at 25^oC and 125^oC. The coefficient of thermal conductivity of the material of the rod is 0.092 kcal / $m \times s \times {}^oC$. The temperature gradient in the rod is

A. $2^{\circ}C / cm$

B. $2^{\circ}C / m$

C. $20^{\circ}C / m$

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

Answer: A

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3. In the Ingen Hauz's experiment the wax melts up to lengths 10 and 25 cm on two identical rods of different materials. The ratio

of thermal conductivities of the two materials is

A. 1 : 6.25

B. 6.25 : 1

C. $1 : \sqrt{2.5}$

D. 1 : 2.5

Answer: A

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Give Scientific Reasons

1. Temperature of water at the surface of lake is – 20°C. Then temperature of water just below the lower surface of ice layer is

A. -4°C

B. 4°C

C. 0°C

D. -20°C

Answer: C

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2. Two rods of same length and cross section are joined along the length. Thermal conductivities of first and second rod are K_1 and K_2. The temperature of the free ends of the first and second rods are maintained at θ_1 and θ_2 respectively. The temperature of the common junction is

A. $\frac{\theta_1 + \theta_2}{2}$

B. $\frac{K_1 K_2}{K_1 + K_2}(\theta_1 + \theta_2)$

C. $\frac{K_1\theta_1 + K_2\theta_2}{K_1 + K_2}$

D. $\frac{K_2\theta_1 + K_1\theta_2}{K_1 + K_2}$

Answer: C

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3. Why is a white trail observed at the back of a flying plane in dear sky?

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4. How will you explain following statements with the help of the anomalous behaviour of water?

In regions with cold climate, the aquatic plants and animals can survive even when the atmospheric temperature goes below $0^{\circ} C$.

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5. How will you explain following statements with the help of the anomalous behaviour of

water?

In cold regions in winter the pipes for water supply break and even rocks crack.

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6. In cold regions, the winter rocks cracks due to anomalous expansion of water .

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Explain The Following Meaning Of Statement

1. Role of Latent heat in the change of state of a substances.

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2. On what basis and how will you determine wether air is saturated with vapour or not?

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3. How can you relate the formation of water droplets on the outer surface of a bottle taken out of refrigerator with formation of dew.

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4. Specific heat capacity

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5. Principle of heat exchange:

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6. How is specific heat measured ? Or Explain mixing method for measurement of specific heat.

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7. What is meant by latent heat ? How will the state of matter transform if latent heat is give off ?

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8. What is meant by specific heat capacity ? How will prove experimentally that different substance have different speific heat capacities?

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9. Which principal is used to measure the specific heat capacity of a substance ?

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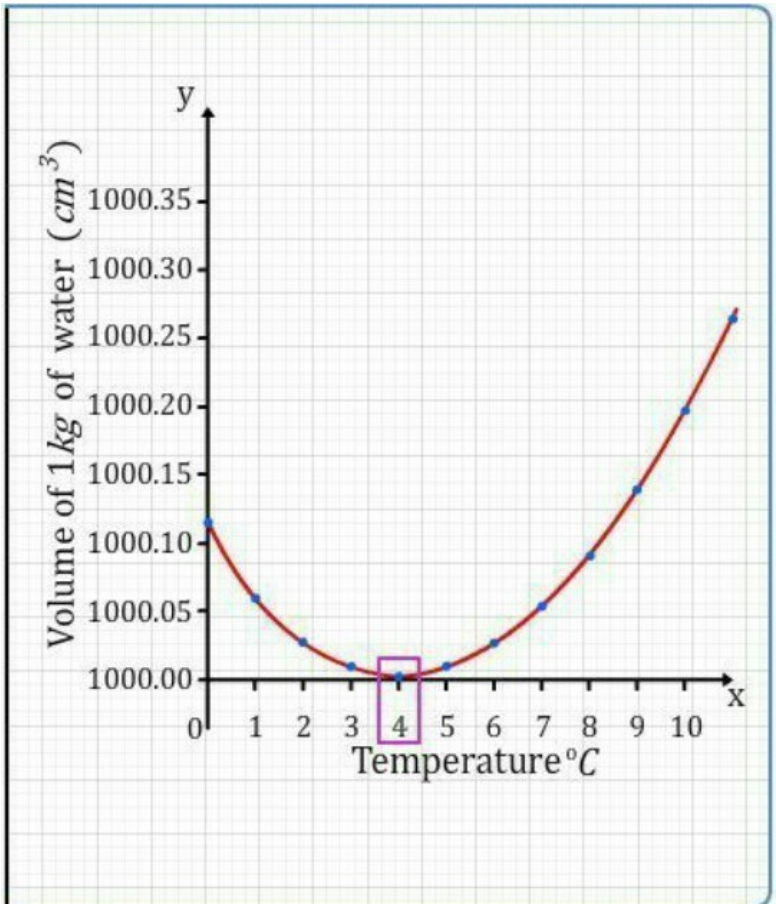
10. Explain the given graph :

Observe the graph below . Temperature of water is raised from $0^\circ C$, observe the change in volume at different temperatures and

explain the behavior of water .



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11. Explain the following graph:

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Open Ended Question

1. While deciding the unit for heat , which temperature interval is chosen ? Why ?

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2. In the below experiment the wire moves throught the ice slab. However the ice slab does not break.

Why ?

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3. Is there any relationship of latent heat with the regelation ?

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Darw A Neat And Labelled Diagram

1. Hope' s apparatus.

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2. Specific heat capacity

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3. Graph of time against temperature for Hope's Apparatus.

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4. Survival of aquatic life .

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Figure Application Based Questions

1. Answer the following based on the graph given

What is the state of the substance in the regions DE of the garph ?

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2. Answer the following based on the graph given

What is the heat energy absorbed in the region EF called ?

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3. Define: Latent heat of Vaporization .

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4. Answer the following question based on the diagram given below.

What is the heat energy absorbed from A to B called ?

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5. Answer the following question based on the diagram given below.

What is the heat energy absorbed form C to D called ?

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6. Answer the following based on the diagram given below .

When the temperature of water decreases from $4^{\circ} C$ to $2^{\circ} C$ will the level of water rise or fall in the cylinder ?

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7. Answer the following based on the diagram given below .

which of the two thermometers , T_1 or T_2 will show at temperature of $0^\circ C$ first ?

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8. Answer the following based on the diagram given below .

Pipe lines crack in winter

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9. Answer the followoing based on the diagram given below .

Which behavior of water in shown in the graph ?

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10. At what temperature is the volume of water minimum ?

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11. Answer the followoing based on the diagram given below .

On coolding form $0^{\circ}C$ to $4^{\circ}C$,what is the effect on (a) volume (b) Density of water

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12. Answer the following based on the diagram given below .

Above expriment is meant to understand which phenomenon of heat ?

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13. Answer the following based on the diagram given below .

Define the phenomenom in minimum words.

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14. Answer the following based on the diagram given below .

What is the effect of the increase in pressure on the melting point of ice ?

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15. In the below experiment the wire moves throught the ice slab. However the ice slab does not break.

Why ?

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16. Answer the following based on the diagram given below .

Will latent heat affect the process ?

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17. What is the boiling point of a pure substance ?

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18. The graph given in daigram represents a cooling curve for a substance being cooled form its vapour to soild phase by releasing heat at a constant rate of $100 Js^{-1}$

What happens in the region DE ?

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19. What is the melting point of the substance ?

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Paragraph Based Question

1. Read the following paragraph carefully and answer the following question .

If the heat is exchanged between a hot and

cold object, the temperature of the cold object goes on increasing due to gain of energy and the temperature of the hot object goes on decreasing due to loss of energy .

The change in temperature continues till the temperatures of both the the object attain the same value . In the process, the cold object gains heat energy and the hot objet lose heat energy . If the system of both the object is isolated from the environment by keeping it inside a heat resistance box (meaning that the energy exchange takes place between the two object only), then no energy can flow from

inside the box or come into the box.

Heat is transferred from where to where ?

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2. Read the following paragraph carefully and answer the following question .

If the heat is exchanged between a hot and cold object,the temperature of the cold object goes on increasing due to gain of energy and the temperature of the hot object goes on decreasing due to loss of energy .

The change in temperature continues till the tempertaures of both the object attain the same value . In the process, the cold object gains heat energy and the hot object lose heat energy . If the system of both the object is isolated form the environment by keeping it inside a heat resistance box (meaning that the energy exchange takes place between the two object only), then no energy can flow from inside the box or come into the box.

Which principle do we learn about from this process ?

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3. Read the following paragraph carefully and answer the following question .

If the heat is exchanged between a hot and cold object, the temperature of the cold object goes on increasing due to gain of energy and the temperature of the hot object goes on decreasing due to loss of energy .

The change in temperature continues till the temperatures of both the the object attain the same value . In the process, the cold object gains heat energy and the hot object lose heat

energy . If the system of both the object is isolated from the environment by keeping it inside a heat resistance box (meaning that the energy exchange takes place between the two object only), then no energy can flow from inside the box or come into the box.

How will you state the principle briefly ?

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4. Read the following paragraph carefully and answer the following question .

If the heat is exchanged between a hot and cold object, the temperature of the cold object goes on increasing due to gain of energy and the temperature of the hot object goes on decreasing due to loss of energy .

The change in temperature continues till the temperatures of both the the object attain the same value . In the process, the cold object gains heat energy and the hot objet losec heat energy . If the system of both the object is isolated from the environment by keeping it inside a heat resistance box (meaning that the energy exchange takes place between the

two object only), then no energy can flow form inside the box or come into the box.

Which property of the substance measured using principle of heat exchange?.

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Assignment 5 Answer The Following

1. What is Specific latent heat of fusion?

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2. Name the apparatus used to experiment anomlous behavior of water.

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3. Principle of heat exchange:

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Assignment 5 Choose And Write The Correct Option

1. The specific heat capacity of ___ is maximum.

A. Mrecury

B. Copper

C. Water

D. Iron

Answer:

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2. Aquatic plants and anmials can survive in cold region because of ..... .

A. Humidity

B. Dew point

C. Heat capacity

D. Anomalous behaviour of water

Answer:

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Assignment 5 Answer The Following Any 2

1. In cold regions in winter , rocks crack due to anomalous expansion of water .

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2. What is the difference between heat and temperature?

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3. Equal heat is given to two object A and B of mass 1g. Temperature of A increases by $3^{\circ}C$ and B by $5^{\circ}C$. Which object has more specific heat ?and by what factor ?

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Assignment 5 Answer The Following Any 2

1. A calorimeter has mass 100g and specific heat $0.1kcal/kg^{\circ}C$. It contains 250 g of liquid at $30^{\circ}C$ having specific heat of

$0.4 kcal/kg^\circ C$. If we drop a piece of ice of mass 10 g at $0^\circ C$, what will be the temperature of the mixture ?

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2. If 80 g steam of temperature $97^\circ C$ is released on an ice slab of temperature $0^\circ C$,how much ice will melt ? How much energy will be transferred to the ice when the steam will be transformed to water?

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Assignment 5 Answer The Following Any 1

1. Define: Latent heat of Vaporization .

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2. Complete the following table:

Place	Altitude from the Earth's surface (km)	g (m/s^2)
(i) Surface of Earth	0	.....
(ii) Mount Everest	8.8	.....
(iii) Altitude attained by Man-made balloon	36.6	.....
(iv) Orbit of space shuttle	400	.....
(v) Communication satellite	35700	.....

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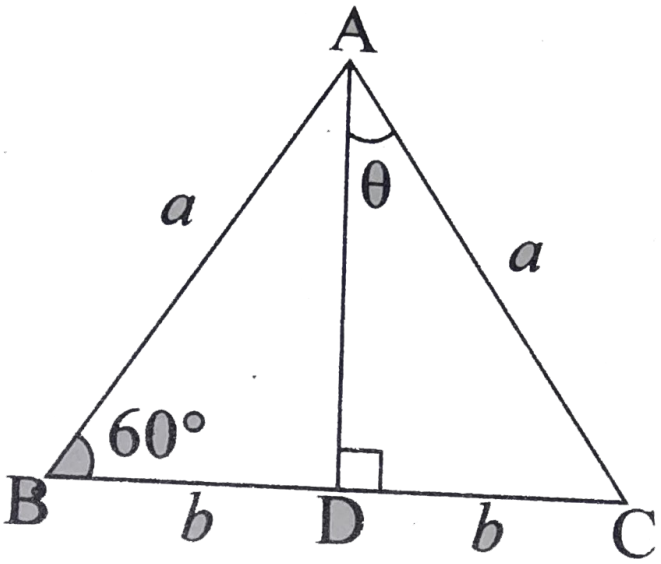
3. In the given diagram θ is .....



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