PHYSICS

BOOKS - VGS PUBLICATION-BRILLIANT

THERMAL PROPERTIES OF MATTER

Problems

1. What is the temperature for which the readings on Kelvin Fahrenheit scales are same?

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2. Find the icrease in temperature of aluminium rod if it $s \leq n > his \rightarrow be \in creasedby1\%$. (alpha f or $alu\mu nium =$ 25xx10^(-6)//^(@)C)`

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3. How much steam at $100^\circ C$ is to be passed into water of mass 100g at $20^\circ c$ to raise its temperature by $5^\circ C$? (Latent heat of steam is 540 cal /g and specific heat of water is $1cal/g^\circ C$)

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4. 2 kg of air is heated at constant volume. The temperature of air is increased from 293 K to 313K. If the specific heat of air at constant volume is $0.718k.\ j/kgK$, find the amount of heat absorbed in kj and kcal ($J = 4.2KJ/Kcal$)

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5. A clock , with a brass pendulum, keeps correct time at $20^\circ C$, but loses 8.212 s per day , when the temperature rises to $30^\circ C$. Calculate the coefficient of linear expansion of brass.

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6. A body cools from $60^\circ C$ to$40^\circ C$ in 7 minutes . What will be its temperature after next 7 minutes if the temperature of its surrounding is $10^\circ C$?

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7. If the maximum intensity of radiation for a black is found at $2.65\mu m$, What is the temperature of the radiating body ? (Wein$scons\tan t$=2.9 xx 10^(-3) mK`)

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Very Short Answer Questions

1. Distinguish between heat and temperature.

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2. What is triple point of water? Mention the values of temperature and pressure at triple point of water

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3. What are the lower and upper fixing points in Celsius and Fabrcnheit scales?

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4. Do the value of coeffcicnts of expansion differ, when the temperatures are measured on Centigrade scale or on Fahrenheit scale?

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5. Can a substance contact on heating ? Given an example.

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6. Why gaps are left between rails on a railway track?

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7. Why do liquids have on linear and areal expansions?

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8. What is latent heat of fusion?

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9. What is latent heat of vapourisation?

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10. Why are utensils coated black? Why is the bottom of the utensils made of copper?

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11. What is triple point of water? Mention the values of temperature and pressure at triple point of water

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12. State Boyle`s law and Charles law.

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13. State Wein`s displacement law

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14. Ventilators are provided in rooms just below the roof . Why?

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15. Does a body radiate heat at 0 K ? Does it radiate heat at $0^\circ C$?

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16. State the different modes of transmission of heat. What of these modes require medium?

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17. Define coefficient of thermal conductivity and temperature gradient.

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18. Define emissive power and emissivity.

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19. Can a substance contact on heating ? Given an example.

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20. What is greenhouse effect? Explain global warming.

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21. Defined absorptive power of a body .What is the absorptive power of a perfect black body?

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22. State Newton`s law of cooling.

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23. State the conditions under which Newton`s law of cooling is applicable.

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24. The roofs of buildings are often painted white during summer. Why?

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25. What is thermal expansion?

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26. Why is it easier to perform the skating on the snow?

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Short Answer Questions

1. Example Celsius and fahrenheit scales of temperature.Obtain the relation between celsius and

fahrenheit scales of temperature celsius (Centigrade)scale of temperature.

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2. Two identical rectangular strips one of copper and the other of steel, are riveted toghter to form a compound bar. What will happen on heating ?

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3. Pendulum clocks generally go fast in winter and slow in summer.Why ?

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4. In what way is the anomalous behaviour of water advantageous to aquatic animals ?

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5. Explaion conduction, convection and radiation with examples.

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Long Answer Questions

1. Example thermal conductivity and coeifficient of the thermal conductivity. A copper bar of the thermal conductivity 401 W (mk) has one end at $104^{\circ}C$. The length of the bar is 0.10 m and the cross-sectional area is $1.0 \times 10^{-6} m^{-2}$. What is the rate of heat conduction along the bar ?

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2. State the explain Newton $slowofc\infty l \in g. Statetheconditionsunderwhich Ne \rightarrow n$ s law of cooling is applicable . A body cools down from $60^{\circ}C$ to $50^{\circ}C$. in 5 minutes and to $40^{\circ}C$ in another 8 minutes . Find the temperature of the surroundings .

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