



PHYSICS

BOOKS - R G PUBLICATION

THERMAL PROPERTIES OF MATTER

Exercise

1. What is the unit of co-efficient of linear expansion.



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2. A metal rod is heated till its length becomes twice of its original length. If coefficient of linear expansion of the material of the rod is α , then what is the change in temperature?



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3. State and explain Pascal's law of transmission of liquid pressure. Explain how this principle is applied in hydraulic lift.



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4. obtain the adiabatic equation $PV^\gamma = \text{constant}$ from the first law of thermodynamics .



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5. Show that $C_P - C_V = R$



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6. Define coefficient of real expansion and coefficient of apparent expansion of liquid. Establish the relation between them.



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7. Define the three processes of transmission of heat. State the factors on which the amount of heat flowing through a conductor in steady state depends. Hence, define coefficient of thermal conductivity.



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8. Define co-efficient of linear, superficial and volume expansions.



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9. Write the relation between α , β and γ .



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10. Define melting point. What is the effect of pressure on melting point.



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11. What is latent heat of fusion?



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12. What is meant by the coefficient of thermal conductivity of a material? state its

unit and dimension.



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13. What is black body and write Stefan's law.



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14. What is meant by thermal capacity?



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15. State Wien's law on radiation.



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16. What is the difference between heat and temperature?



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17. What is apparent expansion of water?



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18. What is Newton's law of cooling? How it can be derived from Stefan's Boltzman law?



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19. Prove that in case of expansion of solid

$$\beta = 2\alpha.$$



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20. What is anomalous expansion of water?

How is it useful in preserving aquatic life?



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21. The length of a cube is $10^\circ C$ is 10 cm. If temperature is increased to $30^\circ C$ what is the change in volume. ($\alpha = 7.2 \times 10^{-5} l^\circ C$).



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22. The volume of a sphere at $30^{\circ}C$ is

1000cm^3

and weight 7.8kg . With the density at

$100^{\circ}C$.



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23. The densities of two substance are $2:3$ and

their specific heats are 0.12 and 0.09

respectively. compare their capacities per unit

volume.





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24. Calculate the amount of radiation of a black body at 400K temperature.

$$(\sigma = 5.67 \times 10^{-8} \text{ wa} / \text{m}^2 / \text{k}^4)$$



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25. How do you explain with the help of graph, the increase in the value of molar conductivity with dilution in case of strong and weak electrolyte?



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26. Write the relation between α , β and γ .



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27. With the help of diagram explain the expansion of liquid.



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28. The specific gravity of two liquid is 0.8 and 0.5. Thermal capacity of one liquid with 3 litter is equal to the thermal capacity of other liquid with 2 litter. Compare the specific heat.



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29. Explain the themal conductivity and what is the unit of thermal conductivity.



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30. Write down the Stefan's law and Stefan Boltzaman law.



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31. The radius of a sphere at $0^{\circ}C$ is 100 cm. when temperature increases the radius becomes 101 cm. Calculate the volume expnassion of the sphere.



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32. The temperature of equal masses of three liquids A, B and C are 12°C , 19°C and 28°C respectively. The temperature, when A and B are mixed is 16°C and when B and C are mixed, it is 23°C . What will be temperature when A and C are mixed.



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33. What is black body and write Stefan's law.



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34. What is the C.G.S and S.I unit fo heat and what is the relation between them.



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