

Quiz

1. What is heat capacity? What is specific heat?
2. Briefly explain the mechanism of heat conduction in solids?
3. What is phonon?
4. Why do metals have good thermal conductivity?
5. Why are ceramics poor conductors of heat?
6. What is the origin of thermal expansion in solids?
7. Why thermal expansion of ceramics is much lower compared to metals?
8. What kind of stresses will be developed if the ends of a solid are constrained while (i) heating (ii) while cooling?
9. Is it possible to have zero or negative thermal expansion?
10. What causes thermal shock?
11. What is thermal shock resistance? How can it be improved?
12. A brass rod is to be used with its ends held rigid. What is the maximum temperature the rod can be heated to from room temp without the compressive stress in it exceeding 172 MPa. Elastic modulus of brass $E = 100 \text{ GPa}$ and $\alpha_l = 20 \times 10^{-6}$
13. A 0.35 m long brass rod is heated from 15 to 85 °C with its ends held rigid. Find out the magnitude and type of stress developed if it was free of stress at 15 °C. Elastic modulus of brass is 100 GPa and α of brass is $20 \times 10^{-6}/^\circ\text{C}$