

Thermal Properties of Matter

NEET previous year questions · Physics

2 questions from the official papers: Re-NEET 2026 (1), NEET 2020 (1). Each is followed by its answer and a worked solution written by BrainIt. Generated on 23 October 2026.



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1. Re-NEET 2026 · Q24

The temperature of a metallic sphere of radius R is increased by a small amount ΔT . If the linear coefficient of thermal expansion of the metal is α , the approximate increase in the volume of the sphere is:

- (1) $2\pi R^3 \alpha \Delta T$ (2) $3\pi R^3 \alpha \Delta T$
(3) $4\pi R^3 \alpha \Delta T$ (4) $6\pi R^3 \alpha \Delta T$

Answer (3)

Sol. For small expansions the coefficient of volume expansion is $\gamma = 3\alpha$. Hence $\Delta V = V\gamma\Delta T = \frac{4}{3}\pi R^3 \times 3\alpha \times \Delta T = 4\pi R^3 \alpha \Delta T$. Equivalently, differentiating $V = \frac{4}{3}\pi R^3$ gives $\Delta V = 4\pi R^2 \Delta R$ with $\Delta R = R\alpha\Delta T$. NCERT Class 11, Thermal Properties of Matter.

2. NEET 2020 · Q155

The quantities of heat required to raise the temperature of two solid copper spheres of radii r_1 and r_2 ($r_1 = 1.5r_2$) through 1 K are in the ratio

- (1) $9/4$ (2) $3/2$ (3) $5/3$ (4) $27/8$

Answer (4)

Sol. The heat required to raise the temperature of a sphere is proportional to its volume, which is proportional to the cube of its radius. Given $r_1 = 1.5r_2$, the ratio of volumes is $\left(\frac{r_1}{r_2}\right)^3 = \left(\frac{1.5r_2}{r_2}\right)^3 = 1.5^3 = \frac{27}{8}$.

Therefore, the ratio of the quantities of heat required is $\frac{27}{8}$. Chapter: Thermal Properties of Matter.

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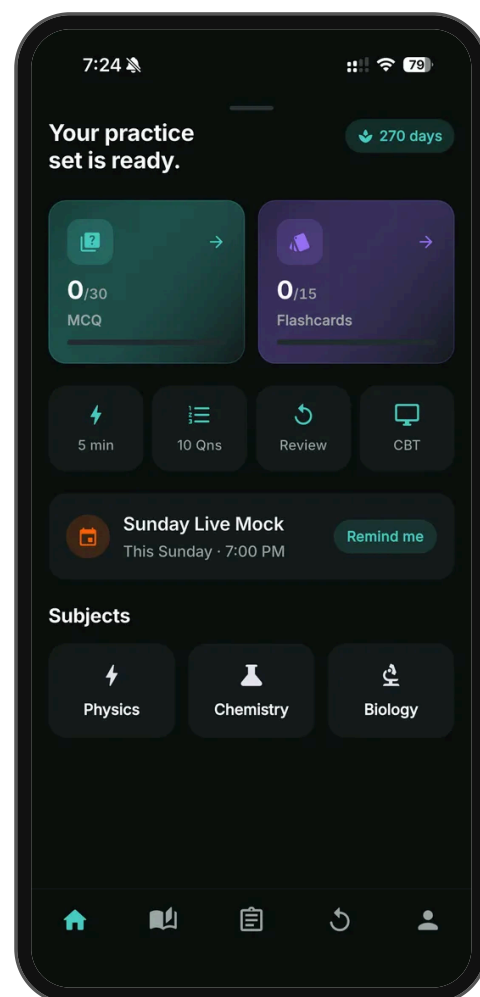
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