

JEE MAIN THERMAL PROPERTIES OF MATTER — THERMAL EXPANSION — PYQS

Max. Marks: 16
Questions: 4

Section A (MCQ) — 4 questions

- Q.1** The temperature of a metal strip having coefficient of linear expansion α is increased from T_1 to T_2 resulting in increase of its length by ΔL_1 . The temperature is further increased from T_2 to T_3 such that the increase in its length is ΔL_2 . Given $T_3 + T_1 = 2T_2$ and $T_2 - T_1 = \Delta T$, the value of ΔL_2 is _____.

[JEE Main 2026 (Online) 4th April Evening Shift]

- (1) $\Delta L_1[1 + 2\alpha^2(\Delta T)^2]$ (2) $\Delta L_1[1 + \alpha^2(\Delta T)^2]$
 (3) $\Delta L_1[1 + 2\alpha\Delta T]$ (4) $\Delta L_1[1 + \alpha\Delta T]$

Scan or tap for the full solution



- Q.2** A brass wire of length 2 m and radius 1 mm at 27°C is held taut between two rigid supports. Initially it was cooled to a temperature of -43°C creating a tension T in the wire. The temperature to which the wire has to be cooled in order to increase the tension in it to $1.4T$, is _____ $^\circ\text{C}$.

[JEE Main 2026 (Online) 24th January Morning Shift]

- (1) -71 (2) -80 (3) -65 (4) -86

Scan or tap for the full solution



- Q.3** An aluminium and a steel rod having same lengths and cross-sections are joined to make total length of 120 cm at 30°C . The coefficients of linear expansion of aluminium and steel are $24 \times 10^{-6}/^\circ\text{C}$ and $1.2 \times 10^{-5}/^\circ\text{C}$, respectively. The length of this composite rod when its temperature is raised to 100°C , is _____ cm.

[JEE Main 2026 (Online) 21st January Morning Shift]

- (1) 120.20 (2) 120.06 (3) 120.15 (4) 120.03

Scan or tap for the full solution



- Q.4** Consider a rectangular sheet of solid material of length $l = 9$ cm and width $d = 4$ cm. The coefficient of linear expansion is $\alpha = 3.1 \times 10^{-5} \text{ K}^{-1}$ at room temperature and one atmospheric pressure. The mass of sheet $m = 0.1$ kg and the specific heat capacity $C_v = 900 \text{ J kg}^{-1} \text{ K}^{-1}$. If the amount of heat supplied to the material is $8.1 \times 10^2 \text{ J}$ then change in area of the rectangular sheet is :

[JEE Main 2025 (Online) 4th April Evening Shift]

- (1) $2.0 \times 10^{-6} \text{ m}^2$ (2) $6.0 \times 10^{-7} \text{ m}^2$
 (3) $3.0 \times 10^{-7} \text{ m}^2$ (4) $4.0 \times 10^{-7} \text{ m}^2$

Scan or tap for the full solution



ANSWER KEY

Ques.	1	2	3	4										
Ans.	4	1	3	1										