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JEE MAIN MECHANICAL PROPERTIES OF SOLIDS — SHEAR MODULUS (MODULUS OF RIGIDITY) — PYQS

Max. Marks: 12 **Questions:** 3

Section A (MCQ) — 1 question

Q.1 A cylindrical rod of length 1 m and radius 4 cm is mounted vertically. It is subjected to a shear force of 10^5 N at the top. Considering infinitesimally small displacement in the upper edge, the angular displacement θ of the rod axis from its original position would be : (shear modulus, G = 10^{10} N/m^2)

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

(1) 1/160π (2) 1/2π (3) 1/4π (4) 1/40π

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Section B (Numerical) — 2 questions

Q.2 A cube has side length 5 cm and modulus of rigidity 10^5 N/m^2. The displacement produced by a force of 10 N in the upper face of cube is _____ mm.

[JEE Main 2026 (Online) 5th April Morning Shift]

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Q.3 Two slabs with square cross section of different materials (1, 2) with equal sides (l) and thickness d_1 and d_2 such that $d_2 = 2d_1$ and $l > d_2$. Considering lower edges of these slabs are fixed to the floor, we apply equal shearing force on the narrow faces. The angle of deformation is $\theta_2 = 2\theta_1$. If the shear modulus of material 1 is 4×10^9 N/m^2, then shear modulus of material 2 is $x \times 10^9$ N/m^2, where value of x is _____.

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

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ANSWER KEY

Section A (MCQ) — 1 question

Ques.	1										
Ans.	**1**										

Section B (Numerical) — 2 questions

Ques.	2	3									
Ans.	**2**	**1**									