

JEE MAIN MECHANICAL PROPERTIES OF SOLIDS — BULK MODULUS AND COMPRESSIBILITY — PYQS

Max. Marks: 16
Questions: 4

Section A (MCQ) — 2 questions

- Q.1** The increase in the pressure required to decrease the volume (ΔV) of water is $6.3 \times 10^7 \text{ N/m}^2$. The percentage decrease in the volume is _____.
(Bulk modulus of water = $2.1 \times 10^9 \text{ N/m}^2$)

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

- (1) 2 % (2) 3 % (3) 6 % (4) 4 %

Scan or tap for the
full solution



- Q.2** The fractional compression $\left(\frac{\Delta V}{V}\right)$ of water at the depth of 2.5 km below the sea level is _____.
Given, the Bulk modulus of water = $2 \times 10^9 \text{ N m}^{-2}$, density of water = 10^3 kg m^{-3} , acceleration due to gravity $g = 10 \text{ m s}^{-2}$.

[JEE Main 2025 (Online) 29th January Morning Shift]

- (1) 1.0 (2) 1.25 (3) 1.75 (4) 1.5

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Section B (Numerical) — 2 questions

- Q.3** A sample of a liquid is kept at 1 atm. It is compressed to 5 atm which leads to a change of volume of 0.8 cm^3 . If the bulk modulus of the liquid is 2 GPa, the initial volume of the liquid was _____ litre.
(Take 1 atm = 10^5 Pa)

[JEE Main 2025 (Online) 8th April Evening Shift]

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- Q.4** The volume contraction of a solid copper cube of edge length 10 cm, when subjected to a hydraulic pressure of $7 \times 10^6 \text{ Pa}$, would be _____ mm^3 .
(Given bulk modulus of copper = $1.4 \times 10^{11} \text{ N m}^{-2}$)

[JEE Main 2025 (Online) 28th January Evening Shift]

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ANSWER KEY

Section A (MCQ) — 2 questions

Ques.	1	2									
Ans.	2	2									

Section B (Numerical) — 2 questions

Ques.	3	4									
Ans.	4	50									