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# JEE MAIN MECHANICAL PROPERTIES OF SOLIDS — ELASTIC POTENTIAL ENERGY — PYQS

**Max. Marks:** 8 **Questions:** 2

## Section B (Numerical) — 2 questions

**Q.1** A copper wire of length 3 m is stretched by 3 mm by applying an external force. The volume of the wire is $600 \times 10^{-6}$ m$^3$. The elastic potential energy stored in the wire in stretched condition would be _____ J.
(Given Young modulus of copper = $1.1 \times 10^{11}$ N/m$^2$) [JEE Main 2026 (Online) 5th April Evening Shift]

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**Q.2** A steel wire of length 2 m and Young's modulus $2.0 \times 10^{11}$ N m$^{-2}$ is stretched by a force. If Poisson's ratio and transverse strain for the wire are 0.2 and $10^{-3}$ respectively, then the elastic potential energy density of the wire is _____ $\times 10^5$ (in SI units).
[JEE Main 2025 (Online) 2nd April Morning Shift]

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## ANSWER KEY

| Ques. | 1 | 2 | | | | | | | | | |
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| Ans. | 33 | 25 | | | | | | | | | |