

PYQSide

JEE MAIN MECHANICAL PROPERTIES OF SOLIDS — YOUNG'S MODULUS — PYQS

Max. Marks: 36

Questions: 9

Section A (MCQ)

- Q.1** The two wires A and B of equal cross-section but of different materials are joined together. The ratio of Young's modulus of wire A and wire B is 20/11. When the joined wire is kept under certain tension the elongations in the wires A and B are equal. If the length of wire A is 2.2 m, then the length of wire B is _____ m.

[JEE Main 2026 (Online) 6th April Morning Shift]

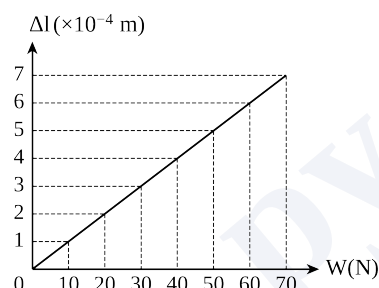
- (1) 1.1 (2) 2.22 (3) 1.21 (4) 4.44

Scan or tap for the
full solution



- Q.2** Figure represents the extension (Δl) of a wire of length 1 meter, suspended from the ceiling of the room at one end with a load W connected to the other end. If the cross-sectional area of the wire is 10^{-5} m^2 then the Young's modulus of the wire is _____ N/m^2 .

[JEE Main 2026 (Online) 6th April Evening Shift]



- (1) 1.0×10^{11} (2) 2.0×10^{10}
(3) 1.0×10^{10} (4) 2.0×10^{11}

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- Q.3** The Young's modulus of steel wire of radius r and length L is Y . If the radius r and length L of the wire are doubled then the value of Y

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

- (1) increases by two times
(2) reduces by half
(3) remains unchanged
(4) becomes one fourth

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- Q.4** A string A of length 0.314 m and Young's modulus $2 \times 10^{10} \text{ N/m}^2$ is connected to another string B of length and Young's modulus both twice of those of A. This series combination of strings is then suspended from a rigid support and its free end is fixed to a load of mass 0.8 kg. The net change in length of the combination is _____ mm. (radius of both the strings is 0.2 mm and acceleration due to gravity = 10 m/s^2) (Mass of both strings is to be neglected as compared to the mass of load)

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

- (1) 3 (2) 2 (3) 1.9 (4) 1

Scan or tap for the
full solution



- Q.5** A metal string A is suspended from a rigid support and its free end is attached to a block of mass M . Second block having mass $2M$ is suspended at the bottom of the first block using a string B. The area of cross sections of strings A and B are same. The ratio of lengths of strings of A to B is 2 and the ratio of their Young's moduli (Y_A/Y_B) is 0.5. The ratio of elongations in A to B is _____.

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

- (1) 1 (2) 4 (3) 8 (4) 6

Scan or tap for the
full solution



- Q.6** Two wires A and B made of different materials of lengths 6.0 cm and 5.4 cm, respectively and area of cross sections $3.0 \times 10^{-5} \text{ m}^2$ and $4.5 \times 10^{-5} \text{ m}^2$, respectively are stretched by the same magnitude under a given load. The ratio of the Young's modulus of A to that of B is $x:3$. The value of x is _____ [JEE Main 2026 (Online) 28th January Morning Shift]

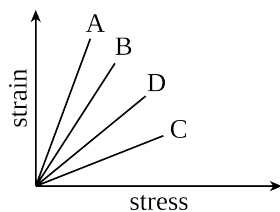
- (1) 2 (2) 1 (3) 4 (4) 5

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full solution



- Q.7** The strain-stress plot for materials A, B, C and D is shown in the figure. Which material has the largest Young's modulus ?

[JEE Main 2026 (Online) 23rd January Morning Shift]



- (1) B (2) A (3) D (4) C

Scan or tap for the
full solution



- Q.8** A 3 m long wire of radius 3 mm shows an extension of 0.1 mm when loaded vertically by a mass of 50 kg in an experiment to determine Young's modulus. The value of Young's modulus of the wire as per this experiment is $P \times 10^{11} \text{ N m}^{-2}$, where the value of P is: (Take $g = 3\pi \text{ m/s}^2$)

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

- (1) 2.5 (2) 25 (3) 10 (4) 5

Scan or tap for the
full solution



- Q.9** Two wires A and B are made of same material having ratio of lengths $\frac{L_A}{L_B} = \frac{1}{3}$ and their diameters ratio $\frac{d_A}{d_B} = 2$. If both the wires are stretched using same force, what would be the ratio of their respective elongations?

[JEE Main 2025 (Online) 7th April Morning Shift]

- (1) 3:4 (2) 1:12 (3) 1:3 (4) 1:6

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ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9		
Ans.	3	3	3	2	4	4	4	4	2		