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NEET MECHANICAL PROPERTIES OF SOLIDS — YOUNG'S MODULUS — PYQS

Max. Marks: 28 **Questions:** 7

Section A (MCQ) — 7 questions

Q.1 The maximum elongation of a steel wire of 1 m length if the elastic limit of steel and its Young's modulus, respectively, are 8×10^8 N m^{-2} and 2×10^{11} N m^{-2}, is: [NEET (UG) 2024]

(1) 4 mm (2) 0.4 mm (3) 40 mm (4) 8 mm

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Q.2 A wire of length L, area of cross section A is hanging from a fixed support. The length of the wire changed to L_1 when mass M is suspended from its free end. The expression for Young's modulus is : [NEET (UG) 2020]

(1) $\frac{Mg(L_1 - L)}{AL}$ (2) $\frac{MgL}{AL_1}$

(3) $\frac{MgL}{A(L_1 - L)}$ (4) $\frac{MgL_1}{AL}$

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Q.3 Two wires are made of the same material and have the same volume. The first wire has cross-sectional area A and the second wire has cross-sectional area 3A. If the length of the first wire is increased by Δl on applying a force F, how much force is needed to stretch the second wire by the same amount? [NEET 2018]

(1) 6F (2) F (3) 9F (4) 4F

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Q.4 The Young's modulus of steel is twice that of brass. Two wires of same length and of same area of cross section, one of steel and another of brass are suspended from the same roof. If we want the lower ends of the wires to be at the same level, then the weights added to the steel and brass wires must be in the ratio of [AIPMT 2015]

(1) 4 : 1 (2) 1 : 1 (3) 1 : 2 (4) 2 : 1

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Q.5 Copper of fixed volume V is drawn into wire of length l. When this wire is subjected to a constant force F, the extension produced in the wire is Δl. Which of the following graphs is a straight line ? [AIPMT 2014]

(1) Δl versus $\frac{1}{l}$ (2) Δl versus l^2

(3) Δl versus $\frac{1}{l^2}$ (4) Δl versus l

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Q.6 The following four wires are made of the same material. Which of these will have the largest extension when the same tension is applied? [NEET 2013]

(1) length = 200 cm, diameter = 2 mm
(2) length = 300 cm, diameter = 3 mm
(3) length = 50 cm, diameter = 0.5 mm
(4) length = 100 cm, diameter = 1 mm

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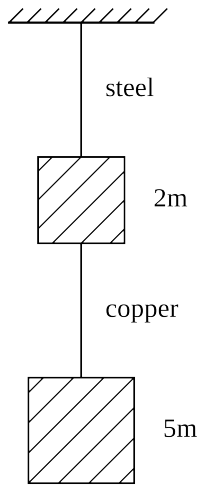
Q.7 If the ratio of diameters, lengths and Young's modulus of steel and copper wires shown in the figure are p, q and s respectively, then the corresponding ratio of increase in their lengths would be [NEET 2013 (Karnataka)]



(1) $\left(\frac{5q}{7sp^2}\right)$ (2) $\left(\frac{7q}{5sp^2}\right)$

(3) $\left(\frac{2q}{5sp}\right)$ (4) $\left(\frac{7q}{5sp}\right)$

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ANSWER KEY

Ques.	1	2	3	4	5	6	7				
Ans.	**1**	**3**	**3**	**4**	**2**	**3**	**2**				