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NEET MECHANICAL PROPERTIES OF SOLIDS — PYQS

Max. Marks: 52 **Questions:** 13

Section A (MCQ) — 13 questions

Q.1 Match **List-I** with **List-II** : [NEET (UG) 2026]

List-I		List-II	
A.	Young's Modulus	I.	$\frac{\Delta d}{\Delta L}\left(\frac{L}{d}\right)$
B.	Compressibility	II.	$\frac{FL}{A(\Delta L)}$
C.	Bulk Modulus	III.	$-\frac{1}{\Delta P}\left(\frac{\Delta V}{V}\right)$
D.	Poisson's Ratio	IV.	$-P\left(\frac{V}{\Delta V}\right)$

(1) A-III, B-II, C-I, D-IV
(2) A-II, B-III, C-IV, D-I
(3) A-I, B-IV, C-III, D-II
(4) A-IV, B-I, C-II, D-III

Solution

Q.2 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

Scan or tap for the full solution

Q.3 Let a wire be suspended from the ceiling (rigid support) and stretched by a weight W attached at its free end. The longitudinal stress at any point of cross-sectional area A of the wire is : [NEET (UG) 2023]

(1) W/A (2) W/2A (3) Zero (4) 2W/A

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Q.4 **Assertion (A):** The stretching of a spring is determined by the shear modulus of the material of the spring.
Reason (R): A coil spring of copper has more tensile strength than a steel spring of same dimensions.

In the light of the above statements, choose the most appropriate answer from the options given below: [NEET (UG) 2022]

(1) Both (A) and (R) are true and (R) is the correct explanation of (A)
(2) Both (A) and (R) are true and (R) is not the correct explanation of (A)
(3) (A) is true but (R) is false
(4) (A) is false but (R) is true

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Q.5 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.6 When a block of mass M is suspended by a long wire of length L, the length of the wire becomes (L + l). The elastic potential energy stored in the extended wire is : [NEET (UG) 2019]

(1) Mgl (2) MgL (3) $\frac{1}{2}$ Mgl (4) $\frac{1}{2}$ MgL

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Q.7 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.8 The bulk modulus of a spherical object is 'B'. If it is subjected to uniform pressure 'P', the fractional decrease in radius is [NEET 2017]

(1) $\frac{B}{3P}$ (2) $\frac{3P}{B}$ (3) $\frac{P}{3B}$ (4) $\frac{P}{B}$

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Q.9 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.10 The approximate depth of an ocean is 2700 m. The compressibility of water is 45.4×10^{-11} Pa^{-1} and density of water is 10^3 kg/m^3. What fractional compression of water will be obtained at the bottom of the ocean? [AIPMT 2015 (Cancelled)]

(1) 1.2×10^{-2} (2) 1.4×10^{-2}

(3) 0.8×10^{-2} (4) 1.0×10^{-2}

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Q.11 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.12 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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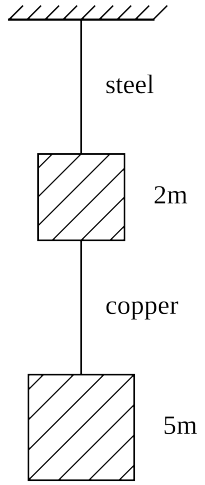
Q.13 If the ratio of diameters, lengths and Young's modulus of steel and copper wires shown in the figure are p, q and s respectively, then the corresponding ratio of increase in their lengths would be [NEET 2013 (Karnataka)]



(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	8	9	10	11
Ans.	**2**	**1**	**1**	**3**	**3**	**3**	**3**	**3**	**4**	**1**	**2**
Ques.	12	13									
Ans.	**3**	**2**									

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