



Class 11 Physics | Mechanical Properties Of Solids

MCQ WORKSHEET • 15 questions • Choose one correct option • Suggested time: 25 minutes

1. A wire of cross-section $2 \times 10^{-6} \text{ m}^2$ carries 20 N tension. Stress is:

- A. 10^8 Pa B. $4 \times 10^{-5} \text{ Pa}$ C. 10^6 Pa D. 10^7 Pa

2. A 2 m wire extends by 1 mm. Strain is:

- A. 2×10^3 B. 2×10^{-3} C. 5×10^{-3} D. 5×10^{-4}

3. Young's modulus is the ratio of:

- A. Strain to stress
B. Force to length
C. Longitudinal stress to longitudinal strain
D. Pressure to volume

4. SI unit of Young's modulus is:

- A. N B. Pa C. m D. J

5. Within the proportional limit, Hooke's law states:

- A. Stress is inversely proportional to strain
B. Stress equals force
C. Strain is always zero
D. Stress is proportional to strain

6. For equal stress, a material with greater Young's modulus has:

- A. Greater strain B. Equal strain always
C. Zero stress D. Smaller strain

7. A wire's length doubles at fixed material, area and load. Extension becomes:

- A. Four times B. Twice C. Half D. Unchanged

8. A wire's radius doubles at fixed length, load and material. Extension becomes:

- A. Half B. One-fourth C. Twice D. Four times

9. A wire stores elastic energy under gradually applied force F and extension x . Energy is:

- A. $2Fx$ B. $Fx/2$ C. Fx D. F/x

10. Bulk modulus measures resistance to:

- A. Only shape change at constant volume
B. Volume change
C. Temperature change
D. Electric current

11. A material's bulk modulus is $2 \times 10^9 \text{ Pa}$. Pressure 10^6 Pa causes fractional volume decrease:

- A. 2×10^3 B. 5×10^{-3} C. 2×10^{-3} D. 5×10^{-4}

12. Shear modulus relates tangential stress to:

- A. Volume strain B. Longitudinal force
C. Temperature D. Shear strain

13. For a given small longitudinal strain, elastic energy per unit volume is:

- A. $2Y(\text{strain})^2$ B. $Y/(\text{strain})^2$
C. $Y(\text{strain})^2/2$ D. $Y(\text{strain})$

14. Steel is more elastic than rubber in the modulus sense because steel has:

- A. Larger breaking strain
B. Smaller restoring force at equal strain
C. Larger Young's modulus
D. Lower density

15. Two identical wires in parallel share the same total load. Extension compared with one wire is:

- A. Twice B. Four times C. Half D. Unchanged

ANSWER KEY — check after completing all 15 questions

1.D 2.D 3.C 4.B 5.D 6.D 7.B 8.B 9.B 10.B 11.D 12.D 13.C 14.C 15.C