

J.E.E./A.I.P.M.T. Foundation - XI Physics Worksheet

Time: 30 min Chapter#9: Mechanical Properties of Solids-01 Full Marks: 20

Instructions:

- 1. All questions are compulsory.**
- 2. Please give the explanation for the answer where applicable.**

Q1 - Define stress.

(1 Mark)

Q2 - What is the dimensional formula of young's modulus of elasticity?

(1 Mark)

Q3 - What is the value of young's modulus for a perfectly rigid body?

(1 Mark)

Q4 - Two wires of same material and length are stretched by the same force. Their masses are in the ratio 3:2. Find the ratio of their elongations.

(2 Marks)

Q5 - The young's modulus of the material of a wire is $6 \times 10^{12} \text{N/m}^2$ and there is no transverse strain in it. Find its modulus of rigidity?

(2 Marks)

Q6 - Explain why solids are more elastic than gases?

(2 Marks)

Q7 - A long spring is stretched by 2 cm and its potential energy is V. Find the potential energy of the spring if it is stretched by 10 cm?

(3 Marks)

Q8 - Forces of 105 N each are applied in opposite directions on upper and lower faces of a cube of side 10cm, shifting the upper face parallel to itself by 0.5cm. If the side of the cube were 20cm, what would be the displacement?

(3 Marks)

Q9 - A 14.5 kg mass, fastened to the end of a steel wire of unstretched length 1m, is whirled in a vertical circle with an angular velocity of 2 rev/sec at the bottom of the circle. The cross sectional area of the wire is 0.065cm^2 . Calculate the elongation of the wire when the mass is at the lowest point of its path. $Y_{\text{steel}} = 2 \times 10^{11} \text{N/m}^2$

(5 Marks)