J.E.E./A.I.P.M.T. Foundation - XI Physics Worksheet
Time: 30 min Chapter#9: Mechanical Properties of Solids-02 Full Marks: 20

Instructions:
1. All questions are compulsory.
2. Please give the explanation for the answer where applicable.

Q1 - Why young's modulus and shear modulus are relevant only for solids?

(1 Mark)

Q2 - What is the value of modulus of rigidity for a liquid?

(1 Mark)

Q3 - A wire 3 m in length suspended vertically stretches by 1 mm when mass of 40 kg is attached to the lower end. What is the potential energy gained by the wire?

(1 Mark)

Q4 - The breaking stress of aluminium is $8.1 \times 10^{7} Nm^{-2}$. Find the greatest length of aluminium wire that can hang vertically without breaking. Density of aluminium is $2.7 \times 10^{3} kgm^{-3}$.

(2 Marks)

Q5 - Two wires A and B of the same material have radii in the ratio 2:1 and lengths in the ratio 4:1. Find the ratio of the normal forces required to produce the same change in the lengths of the two wires?

(2 Marks)

Q6 - A rod elongates by l when a body of mass m is suspended from it. Find the work done in the process?

(2 Marks)

Q7 - A copper and a steel wire of same length and cross section are attached end to end. The compound wire is hung from a rigid support and a load is suspended from the free end. If Y of steel is (20/9) times of copper then find the ratio of increase in length of steel wire to copper wire?

(3 Marks)

Q8 - Compute the fractional change in volume of a glass slab, when subjected to a hydraulic pressure of 1 atm. It is given bulk modulus of glass = $37 \times 10^{9} Nm^{-2}$

(3 Marks)

Q9 - One end of a wire 2m long and diameter 2mm is fixed in the ceiling. A naughty boy of mass 10kg jumps to catch the free end and stays there. Find the change in the length of the wire. $Y = 2 \times 10^{11} N/m^{2}$

(5 Marks)