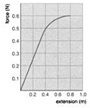
**PROBLEMS ON DEFORMATION OF SOLIDS**

Where necessary take g = 10 ms-2, π = 3.14

1. A wire 2.5 m long with a cross-sectional area of 6 mm2 stretches by 1.27 mm when a mass of 45 kg is suspended from it. Find the stress on the wire, the resulting strain, and the value of Young’s modulus for the wire’s material.
2. A spiral spring with elastic constant of 400 Nm-1 was stretched by 2 cm, calculate the energy stored in it.
3. A force of 40 N applied at the end of a wire of length 4 m and diameter 2.00 mm produces an extension of 0.24 mm. Calculate the (a) stress on the wire; (b) strain on the wire; (c) Young’s modulus of the material.
4. A load of 24 N attached to a spring of natural length 14 cm extends it to 15.2 cm. What is the work done by the load? (Ans: 0.144J)
5. A spiral spring has a natural length of 12.0 cm and extends to 14.0 cm when a 50 g mass is attached.
6. What is the new length when a mass of 100 g is attached?
7. What mass is attached when the new length is 12.4 cm?
8. State the assumption made in your calculations. (Ans: 16 cm, 10 g)
9. The extension of a string was 2.0 cm was when a tension of 4 N acts on it.
10. Find the new extension when a tension of 6 N is on the string.
11. What tension will produce an extension of 5.0 cm (Ans: 3cm, 10N)
12. The figure shows the stress-strain graph for a material under tension. What is the energy stored for a piece of this material with an extension of 0.8 m and of thickness 2 mm?
13. A piece of steel wire of length 2.0 m and cross-sectional area 3 x 10-4 m2 has a 40 kg weight attached to it. How far does it extend? (Young modulus of steel = 2.0 x 1011 Pa)