**TUTORIAL ON DEFORMATION OF SOLIDS & ELASTIC PROPERTIES OF MATERIALS**

**1.** A metal bar of length 1.0m and uniform cross-sectional area 10-5m2 extends by 1.5mm when a force of 200N is applied. If the elastic limit is not exceeded. Find:

(a) The tensile stress.

(b) The tensile strain.

(c) The Young modulus for the metal.

**2.** A copper wire of length 2.30m and cross-sectional area 8.6 x 10-8m2is stretched by a tension of 17.3N Take the Young modulus for copper to be 1.1 x 1011 Pa.

(a) What is the extension of the wire?

(b) Find the potential energy stored in the wire as a result of doing work on it.

(c) If a force of 173N were used instead, it is likely that the work done by the force will be much greater than 10 times the value given in (b), but the potential energy stored will be less than 10 times that value. Why is this?

**3.** 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:

(a) the stress on the wire,

(b) the resulting strain,

(c) and the value of Young’s modulus for the wire’s material.