22 Which statement about elastic and plastic deformation is correct?

A Elastic deformation and plastic deformation are proportional to the applied force.

B Elastic deformation and plastic deformation cause no change in volume.

C Elastic deformation causes heating of the material but plastic deformation does not.

D Elastic deformation is reversible but plastic deformation is not.

23 What is meant by the *ultimate tensile stress* of a ductile metal?

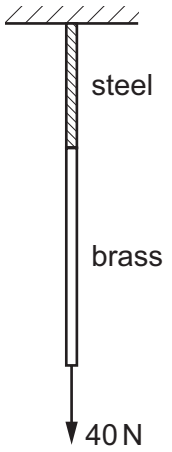
A It is the maximum stress at which the material deforms elastically.

B It is the maximum stress at which the material obeys Hooke's law.

C It is the maximum stress that the material can support without breaking.

D It is the Young modulus multiplied by the maximum possible strain of a material.

24 A 0.80 m length of steel wire and a 1.4 m length of brass wire are joined together. The combined wires are suspended from a fixed support and a force of 40 N is applied, as shown.



The Young modulus of steel is 2.0×10^{11} Pa.

The Young modulus of brass is 1.0×10^{11} Pa.

Each wire has a cross-sectional area of 2.4×10^{-6} m^2.

The wires extend without reaching their elastic limits.

What is the total extension? Ignore the weights of the wires.

A 1.7×10^{-4} m **B** 3.0×10^{-4} m **C** 3.9×10^{-4} m **D** 9.0×10^{-4} m