

- 5 (a) Explain what is meant by *plastic deformation*.

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- (b) A copper wire of uniform cross-sectional area $1.54 \times 10^{-6} \text{ m}^2$ and length 1.75 m has a breaking stress of $2.20 \times 10^8 \text{ Pa}$. The Young modulus of copper is $1.20 \times 10^{11} \text{ Pa}$.

- (i) Calculate the breaking force of the wire.

breaking force = N [2]

- (ii) A stress of $9.0 \times 10^7 \text{ Pa}$ is applied to the wire. Calculate the extension.

extension = m [2]

- (c) Explain why it is not appropriate to use the Young modulus to determine the extension when the breaking force is applied.

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..... [1]