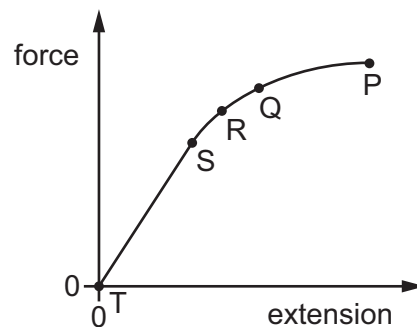


- 20 A steel wire has a length of 300 cm and a cross-sectional area of  $0.50 \text{ mm}^2$ . The Young modulus of steel is  $2.0 \times 10^{11} \text{ Pa}$ .

One end of the wire is attached to a fixed point. A load of 10 N is hung from the other end. The wire obeys Hooke's law.

What is the extension of the wire?

- A  $3.0 \times 10^{-7} \text{ m}$   
B  $3.0 \times 10^{-5} \text{ m}$   
C  $3.0 \times 10^{-4} \text{ m}$   
D  $3.0 \times 10^{-2} \text{ m}$
- 21 The extension of a copper wire is measured for different forces applied to the wire. A graph is plotted to show the variation of the force on the wire against extension. The maximum force is applied at point P.



Which statement **must** be correct?

- A Point R is the limit of proportionality.  
B The elastic potential energy of the wire at point S is given by the area under the graph between points T and S.  
C There is no plastic deformation between points Q and P.  
D The wire obeys Hooke's law up to a point between R and Q.