Answer on Question #50118 – Physics - Mechanics | Kinematics | Dynamics

Properties of Materials

A sample material is pulled by a certain force so that an elastic elongation is recorded. What is the ratio of deformation between loaded and unloaded conditions known as?

1. spring constant

- 2. Young modulus
- 3. stress
- 4. strain

Solution:

#1

spring constant: $k = \frac{F}{\Delta x}$ - Hooke's Law – stress is directly proportional to strain #2 Young modulus: $E = \frac{\sigma}{\varepsilon}$ - the ratio of tensile stress by extensional strain #3 Stress: $Stress = \frac{F}{A}$ – internal force per unit area associated with a strain #4 Strain: $Strain = \frac{\Delta L}{L}$ - the ratio of extension to original length (unloaded condition)

Thus, correct answer is 4.

Answer: 4. Strain

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