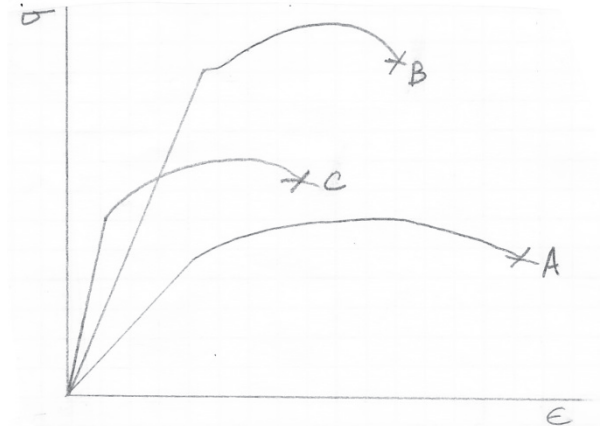


**This is the non-multiple choice version of online Quiz 2. The questions in D2L will be the same but each sub-question will be multiple choice in the online format. It is recommended that you complete problems in the standard given-find-solution method for your reference.**

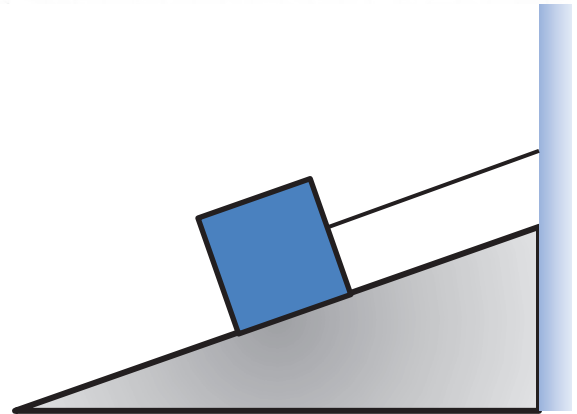
Use the image shown at right to answer the following:

1. Which of the materials has the highest yield strength?
2. Which of the materials has the highest ultimate strength?
3. Which of the materials is the stiffest?
4. Which of the materials is the most ductile?



A block of 35.7 slugs is supported on a frictionless inclined plane by a steel rod ( $\sigma_y = 36.0$  ksi) that is parallel to the incline of the plane. The plane is inclined at an angle of  $25^\circ$ . The acceleration due to gravity is  $32.2$  ft/s<sup>2</sup>. Determine the following:

- #5) What is the tension in the steel rod?  
 #6) For a factor of safety against yield of 1.80, what is the minimum required diameter for the rod?



A 50.0 m long, 100 mm diameter rod has a 1.12 MN axial load applied. If the modulus of elasticity of the rod is 200 GPa.

- #7) What is the change in length of the rod assuming it stays in the linear elastic range of the material?  
 #8) What is the axial stress in the rod?

- #9) What type of stress caused the following failure (dotted lines indicate where the failure occurred)?

