

## Homework 3

### MECHANICAL PROPERTIES OF METALS

1. List three factors that should be considered in designing laboratory tests to assess the mechanical characteristics of materials for service use.
2. Distinguish between elastic and plastic deformations, both by definition, and in terms of behavior on a stress-strain plot. Show it schematically!
3. State what is occurring on an atomic level as a material is elastically deformed.
4. Cite typical value ranges of modulus of elasticity and Poisson's ratio for metallic materials.
5. Explain why engineering stress decreases with increasing engineering strain past the tensile strength point.
6. Define *hardness* in a one- or two-sentence statement.
7. Cite three reasons why hardness tests are performed more frequently than any other mechanical test on metals.
8. Cite five factors that can lead to scatter in measured data.

And the following exercises:

6.22-6.24, 6.36-6.37, 6.40-43 & 6.47