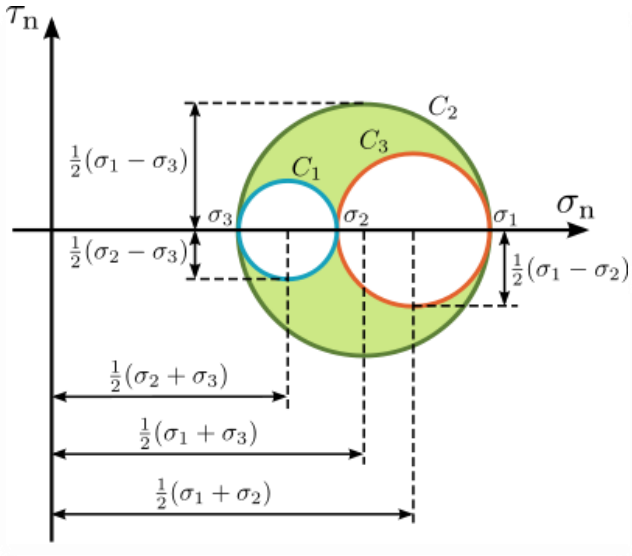
Assignment-1

Fundamentals of Materials Processes

1. On the basis of working temperature, metal forming is classified as hot working, cold working and
   - **a. Warm working**
   - b. Cryo working
   - c. Ultra high temp working
   - d. Sub zero working
2. Which of the following is not a classification of metal forming based on direction of the force:
   - a. Compression
   - b. Tension
   - **c. Drawing**
   - d. Shearing
3. In a general deformation condition' for a body in equilibrium, how many independent elements are present in the stress tensor
   - a. 4
   - **b. 6**
   - c. 8
   - d. 9
4. How many principal stresses would exist in a 3 dimensional stress state?
   - a. 1
   - b. 2
   - **c. 3**
   - d. 4



Answer questions 5-6 based on the picture given above

5. Maximum shear stress that exists on the element is given by
    a. σ1
    b. σ1-σ3
    c. σ1-σ2
    d. ½(σ1-σ3)
6. In a 2-D pure shear state, which of the following will be true:
    a. σ2= σ1
    b. σ3= - σ1
    c. σ3=0
    d. σ1=0
7. Hydrostatic stress produces
    a. Only elastic volume changes and not plastic deformation
    b. Only plastic deformation and not elastic volume changes
    c. Only permanent deformation and not volume changes
    d. Only volume changes and no plastic deformation
8. Which of the following is NOT true regarding yielding
    a. Volume remains constant
    b. Addition of a constant value to all the normal stresses does not change the yielding state
    c. Absolute magnitude of the shear stresses does not change the yielding state
    d. Absolute magnitude of normal stresses does not change the yielding state
9. Yielding under Tresca criterion occurs when one of the following stresses reaches a critical value 'C'
    a. σ1
    b. σ1-σ3
    c. σ2-σ3
    d. σ1-σ2
10. In Von-Mises criterion, which of the following is true (where the terms have usual meaning)
    a. Y=√3 K
    b. Y=2K
    c. Y=(√3/2)K
    d. Y=K