

1. (30pts) Please define the following terms :
- (a) Poisson's ratio,
  - (b) bulk modulus,
  - (c) factor of safety,
  - (d) generalized Hook's law for multiaxial loading,
  - (e) stress concentration factor,
  - (f) anisotropic material,
  - (g) proportional limit,
  - (h) idealized elasto-plastic material,
  - (i) strain rosette,
  - (j) strain-energy density.

2. (40pts) A steel rod 0.127 in. in diameter, with a gage length of 4 in., is subjected to a gradually increasing tensile load. The load versus deformation obtained from the test is given in the following table. Construct the stress-strain diagram and determine the following: (a) the modulus of elasticity, (b) the 0.2% yield stress, (c) the ultimate stress, (d) the fracture stress, (e) the percent elongation and, (f) the modulus of resilience.

Load, F,(lb)	Deformation, $\delta$ , (in.)
250	0.0025
500	0.0050
750	0.0075
850	0.0095
950	0.0115
1050	0.0171
1100	0.0212
1150	0.0305
1200	0.0356
1150	0.0410
1100	0.0461 (fracture)

3. (30pts) Determine the maximum deflection and draw the bending-moment diagram for the beam and loading shown.

