1. (30pts) Please define the following terms :
   (a) Poisson's ratio,
   (b) true strain,
   (c) bulk modulus,
   (d) volumetrical strain,
   (e) stress concentration factor,
   (f) shear flow,
   (g) anisotropic material,
   (h) Saint-Venant's principle,
   (i) proportional limit,
   (j) idealized elasto-plastic material,
   (k) plastic section modulus,
   (l) shear center,
   (m) Tresca's yield criterion,
   (n) strain rosette,
   (o) strain-energy density.

2. (20pts) 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) modulus of resilience, and (e) modulus of toughness by approximate means.

Load, F, (lb)	Deformation, δ, (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. (25pts) The compressive-air tank AB has an outside diameter of 462 mm and a uniform wall thickness of 6 mm. Knowing that the gage pressure inside the vessel is 120 kPa, determine the maximum normal stress and the maximum in-plane shearing stress at (a) point K, (b) point L.
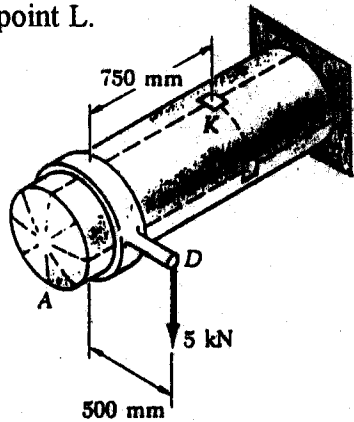
4. (25pts) Determine the maximum deflection and draw the bending-moment diagram for the beam and loading shown.