1. Explain the following terms: (25%)
   A. Shear Modulus
   B. Yield strength
   C. Moment of Inertia
   D. Strain energy
   E. Buckling

2. What is the difference between normal strain and shear strain? (15%)

3. Design an experiment to measure the Poisson's ratio of a material? (10%)

4. An element in plane stress is shown in Fig. 1. Determine (a) the principal stress and principal plane, (b) the stresses on an element rotate through an angle of 45° and (c) the maximum shear stresses. (25%)

5. A loaded femur (大腿骨) is simplified as a 2D structure shown in Fig. 2. Compute the stress distribution on section BB. (Assume the necessary parameters by yourself.) (25%)

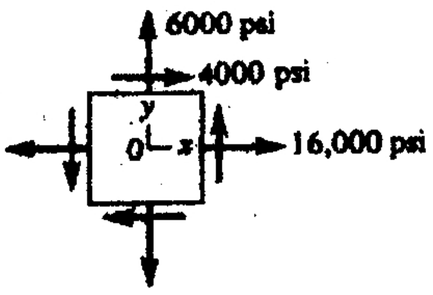

Fig. 1

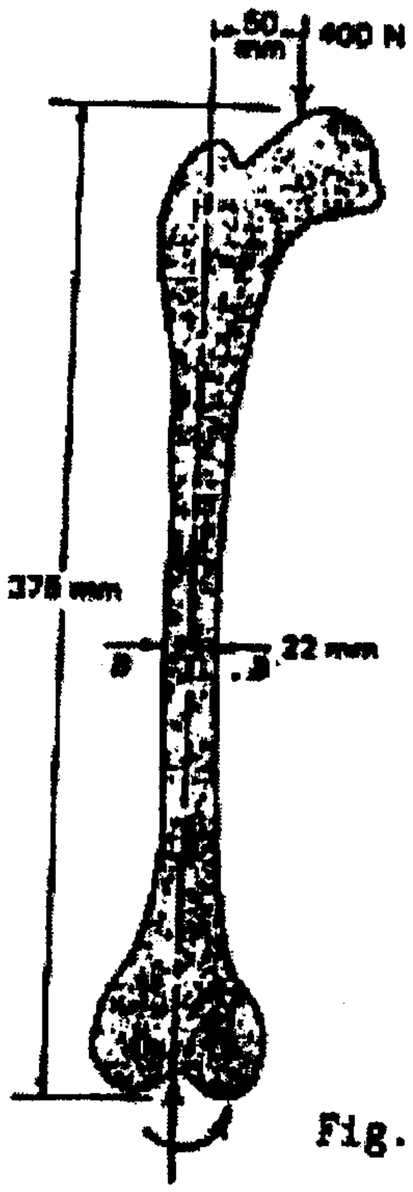

Fig. 2