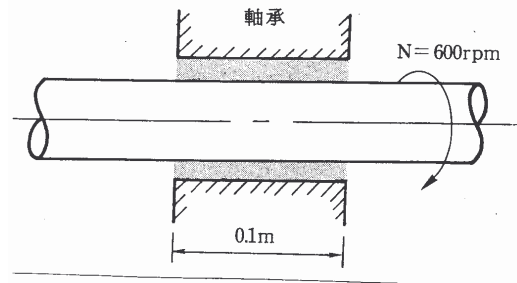
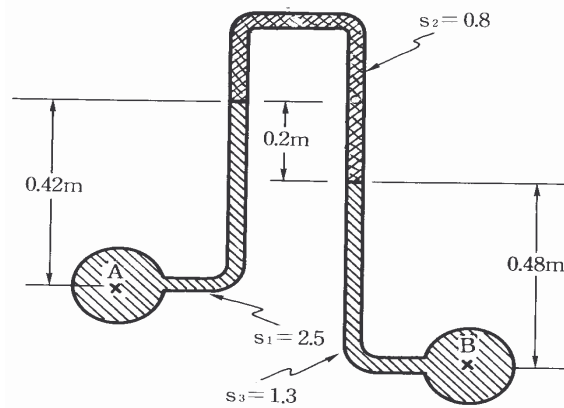


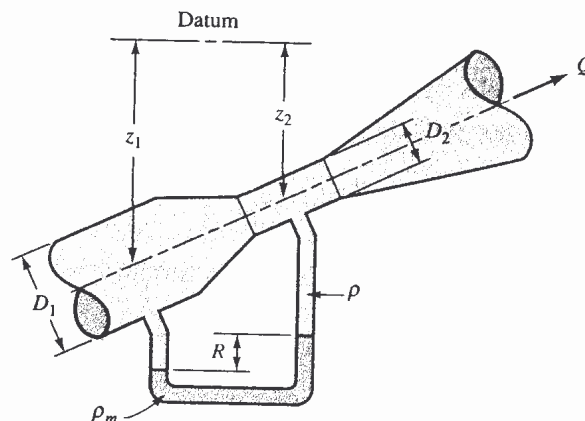
1. 一直徑為 0.3 m 之圓柱軸在軸承內旋轉，軸承與軸間之油膜厚度為 0.2mm，黏性為 $0.5\text{N}\cdot\text{s}/\text{m}^2$ 。如圖所示，若圓柱軸以 600rpm 之轉速運動，試求軸承因黏性所造成之摩擦損失功率。(20%)



2. 如圖所示之差壓計，試求 P_A 與 P_B 之壓力差。(20%)



3. The thrust due to any one of the family of geometrically similar airplane propellers is to be determined experimentally from a wind-tunnel test on a model. The thrust F_T depends upon speed of rotation ω , speed of advance V_0 , diameter D , air viscosity μ , density ρ , and speed of sound c . Please select ρ , ω , and D as repeating variables. Use dimensional analysis to find suitable parameters for plotting test results. (20%)
4. For the venturimeter and manometer installation shown in Figure derive an expression relating the volume rate of flow with the manometer reading. (20%)



5. Determine the forces coming onto the reducing elbow shown in Figure from the steady flow of water inside the elbow. The average values of the flow characteristics at the inlet and the outlet are known, as is the geometry of the reducing elbow. (20%)

