**CE 313 Hydraulic Engineering**
**Winter 2013 Test Form 1**

**Instructor:** Arturo Leon **TA:** YunJi Choi

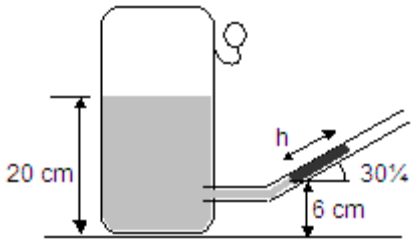
**Quiz 5 -** Chapter 8 Viscous Flow in Pipes (Part 3) **Name:** _____

Answer the following questions to the best of your ability.

1. A 2-in.-diameter orifice place is inserted in a 3-in-diameter pipe. If the water flowrate through the pipe is 0.9cfs, determine the pressure difference indicated by a manometer attached to the flowmeter. Discharge coefficient and the equation for volume flowrate for orifice plate are given in the next page.

    a. 20-lb/in$^2$
    b. 25-lb/in$^2$
    c. 3300-lb/in$^2$
    d. 3600-lb/in$^2$

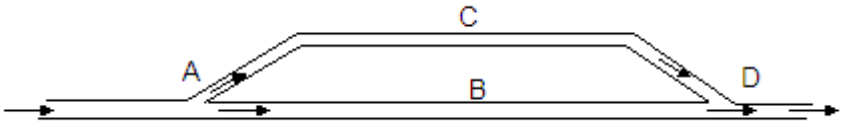
2. An inclined-tube manometer is being used as shown to measure the pressure in a pressurized tank. The tank is partially filled to a depth of 20 cm with a fluid of specific gravity = 0.78. The specific gravity of the manometric gage fluid is 3.5. The gage pressure (kPa) above the fluid in the tank when h = 8 cm is most nearly




    a. 0.3
    b. 0.9
    c. 1.3
    d. 1.8

3. The figure below shows a branched pipe network. The flow rates, diameters, the friction factors, and the lengths of the two branches are as follows:

| | Branch ABD | Branch ACD |
|---|---|---|
| Flow rate | Q | 2Q |
| Diameter | D | D |
| Length | L | L |
| Friction factor | $f_1$ | $f_2$ |




Which of the following is a true conclusion?

a. $f_1=2f_2$
b. $f_1=4f_2$
c. $f_1=f_2$
d. $f_1=f_2/2$

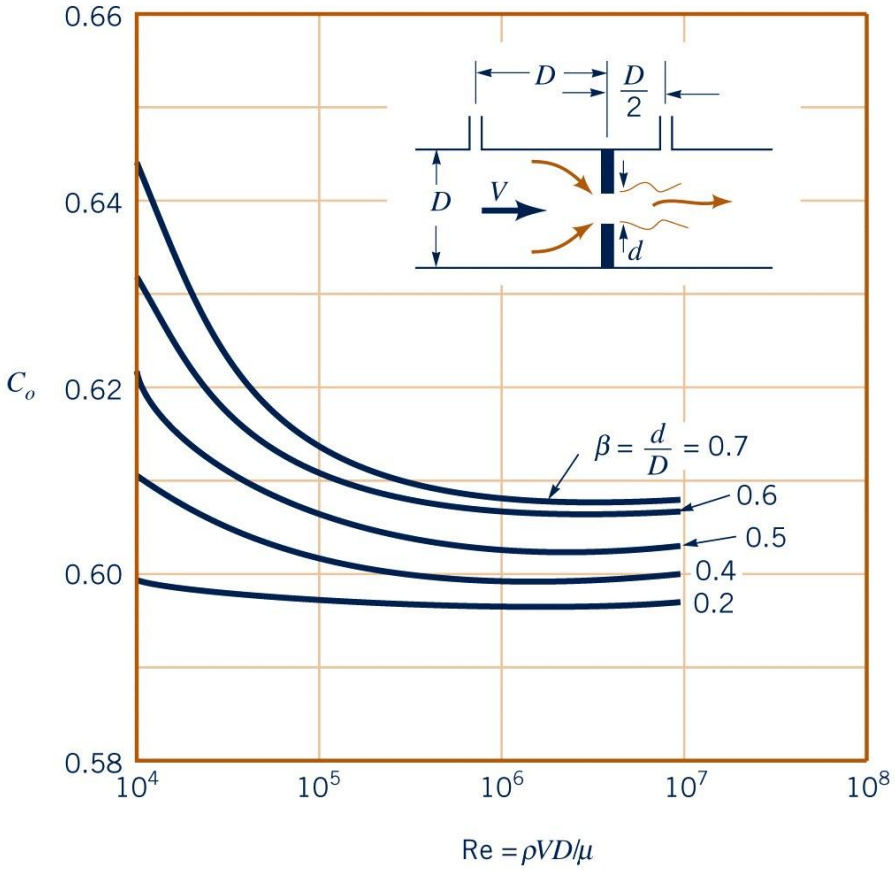



Figure 8.41

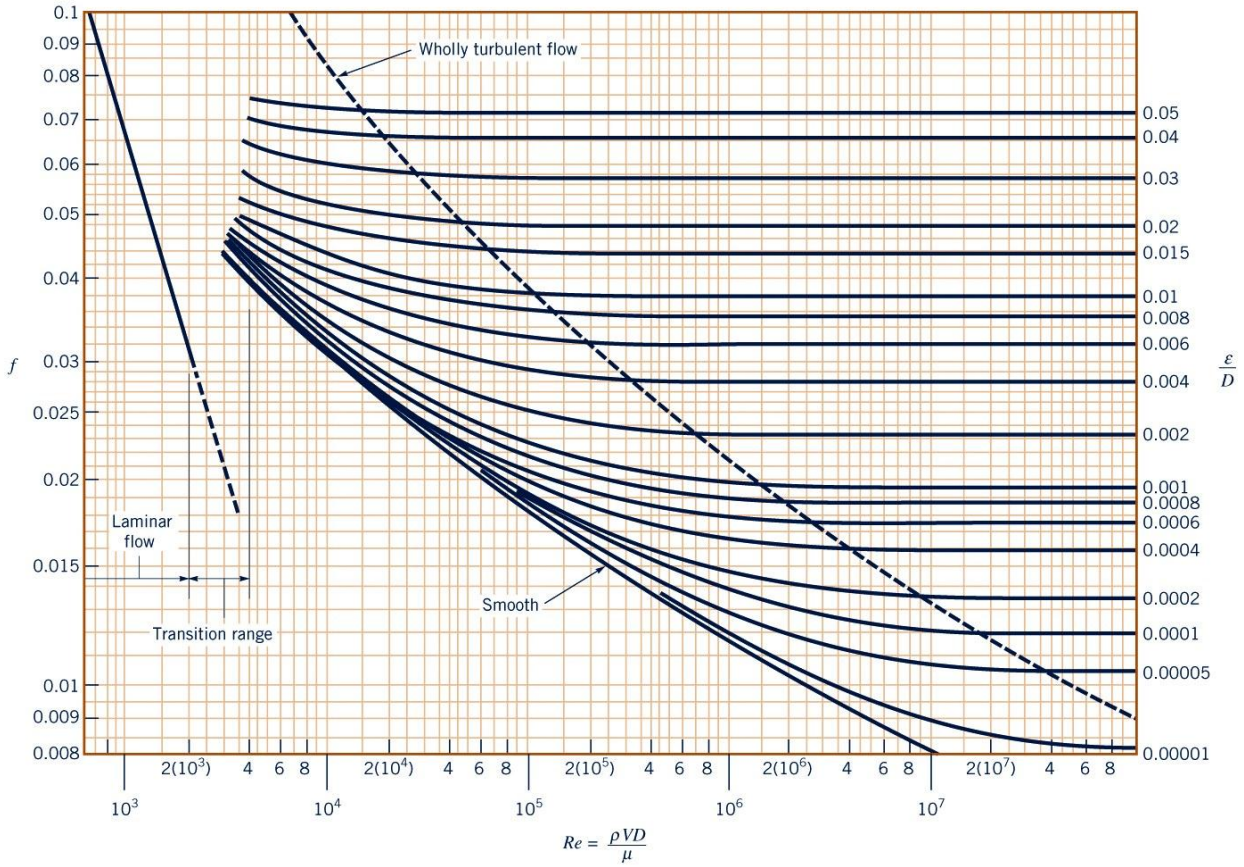



**Figure 8.20**


$$\rho_w = 999\frac{kg}{m^3} \quad or\ 1.94\ \frac{slugs}{ft^3}$$

$$\mu_w = 1.12 \times 10^{-3} N \cdot s/m^2$$

$$h_L = f\frac{l}{D}\frac{V^2}{2g}$$

$$h_L = K_L\frac{V^2}{2g}$$

$$Re = \frac{\rho VD}{\mu}$$

$$Q = C_n Q_{ideal} = C_n A_n \sqrt{\frac{2(p_1 - p_2)}{\rho(1-\beta^4)}}$$

$$\beta = \frac{d}{D}$$