Name: _____CM Box: _____

Circle your section:

Sanders – 01   Sanders – 02   Lui – 03

ES 202
Fluid & Thermal Systems

Examination II
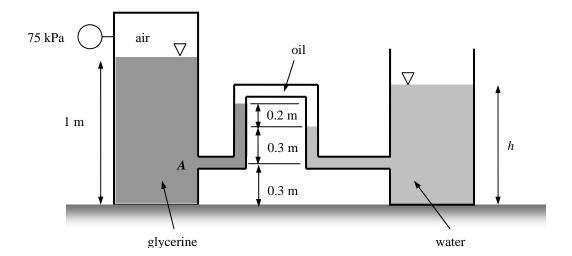April 26, 2005

Problem	Score
1	/ 30
2	/ 70
Total	/ 100

Show your work clearly for credit
One page of equation sheet allowed
Laptops allowed

Problem 1 (30 points)
An inverted U-tube manometer containing oil (S.G. = 0.8) is located between two reservoirs as shown in the following figure. The reservoir on the left, which contains glycerine (S.G. = 1.26), is closed and pressurized with air. The pressure gage attached to the tank indicates that the air pressure in the tank is 75 kPa gage. The reservoir on the right contains water (density = 1000 kg/m3) and is open to the atmosphere. Assume atmospheric pressure is measured to be 100 kPa, and there is no fluid flowing between the two reservoirs.
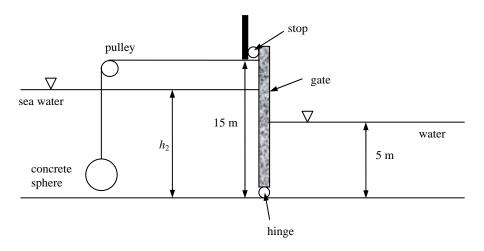
a) Determine the pressure at Point A, in kPa.
b) Determine the depth of the water, h, in the right reservoir.

Problem 2 (70 points)

Refer to the following figure. Assume the width of the gate (dimension into the paper) is 5 m and the diameter of the concrete sphere is 3 m. Determine the value of h_2 so that the gate will open. Substance properties are:

$$\rho_{sea\ water} = 1030\frac{kg}{m^3}, \quad \rho_{concrete} = 2300\frac{kg}{m^3}, \quad \rho_{water} = 1000\frac{kg}{m^3}$$

Hint: Work out the problem in symbolic form. Substitute numbers at the end.