CE 3305 Engineering Fluid Mechanics
Exercise Set 5
Summer 2018 – GERMANY

Purpose : Pressure variation in layered fluids of different densities. Manometry used to determine density of unknown fluid.
Assessment Criteria : Completion, plausible answers, use of **R** for calculations.

Exercises :

1. (Problem 3.16 pg 96) Figure 1 is a schematic of a closed tank with Bourdon-tube gages tapped into it.

   a) What is the specific gravity of the oil?

   b) What is the pressure reading on gage C?

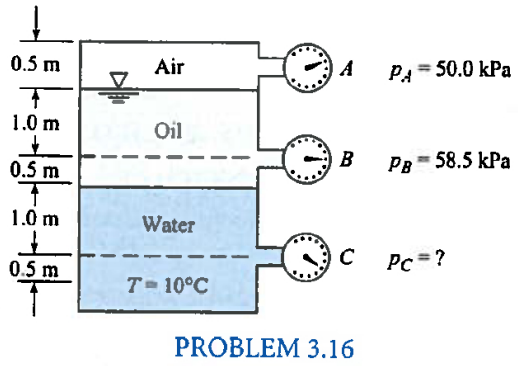

Figure 1: Closed tank with three phase system (Air, Oil, Water)

2. (Problem 3.54 pg 101) A device for measuring the specific weight of a liquid consists of a YouTube manometer as depicted in Figure 2. The manometer tube has an internal diameter of 0.5 cm and originally has water in it. Exactly 2 cm^3 of unknown liquid is poured into one leg of the manometer, and a displacement of 5 cm is measured between the free surfaces as shown. What is the specific weight of the unknown liquid?

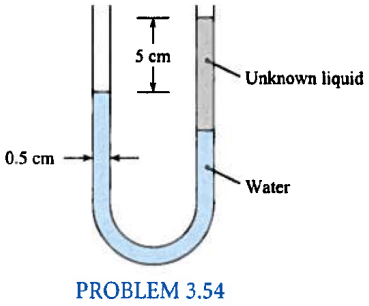

Figure 2: U-Tube manometer for measuring specific weight