

**Florida International University**  
**CWR 3201 Fluid Mechanics, Fall 2018**  
**Instructor:** Arturo S. Leon, Ph.D., P.E., D.WRE  
**TA:** Thao Do, CEE Undergraduate

**Mid-term # 1**

**Student Name:** \_\_\_\_\_

**Date:** 09/26/2018

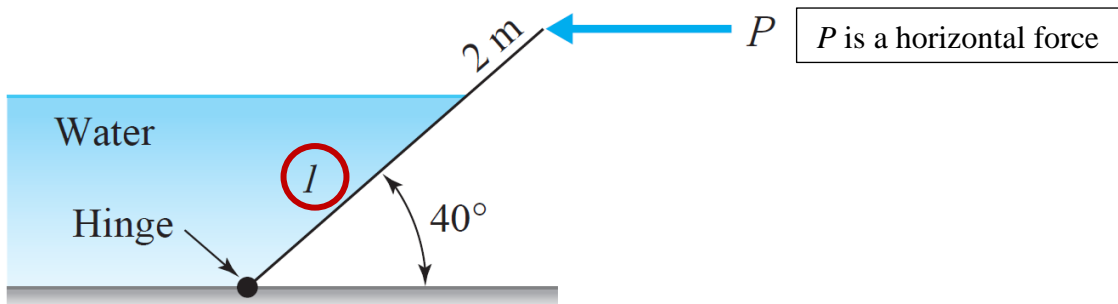
✓ You will have 1h 15 minutes to complete the exam. The exam is closed book and closed notes.

Only one page (front and back) with handwritten equations are allowed (no photocopies or artificially reduced text will be allowed).

1. **(20 points)** An object is constructed of a material lighter than water. It weighs 50 N in air and a force of 10 N is required to hold it under water. What is its density, specific weight, and specific gravity?

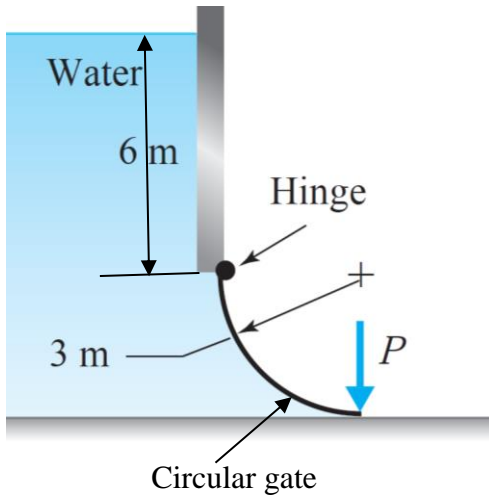


2. (20 points). Find the force  $P$  needed to hold the 3-m-wide rectangular gate as shown below if  $l = 5$  m





3. (30 points) What force  $P$  is needed to hold the 10-m-wide gate shown in the figure below closed?





4. (30 points) The tank shown in the figure shown below is accelerated to the right at  $10 \text{ m/s}^2$ . If the tank is 4 meters wide, find the force acting on the wall AB.

