College of Engineering & Technology

Department: Mechanical Engineering Marks: 20
Lecturer: Dr. Rola Afify   Time: 8:30 – 10:10
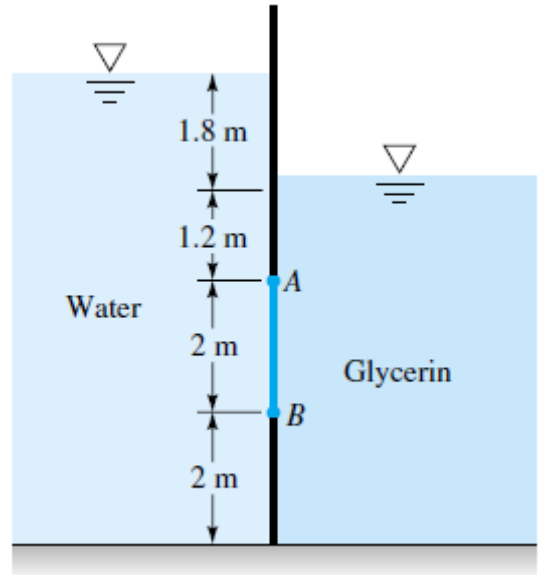Course Code: ME362   Date: 22/4/2015

Name: R. N.:

Answer the following questions:
Question one (10 marks)
A) Find the net hydrostatic force per unit width on the rectangular gate AB hinged at A and its line of action. Take the density of Glycerin to be 1260 kg/m³.

B) The uniform body A has width b into the paper and is in static equilibrium when pivoted about hinge O. What is the specific gravity of this body if:
(a) h = 0 and (b) h = R?
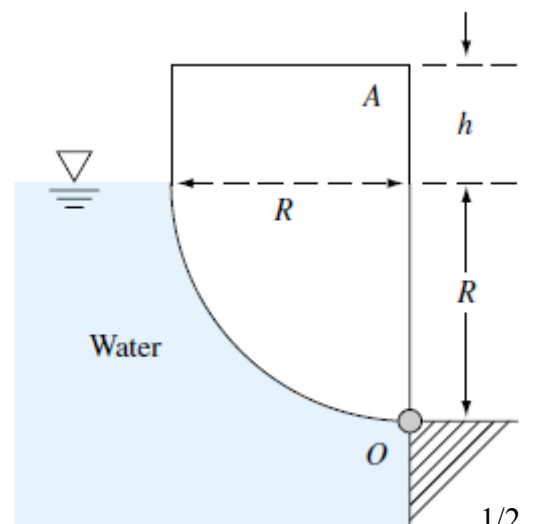
<u>Question two (10 marks)</u>

A) Compare between Ideal flow and Real flow.

B) A pipe 4 cm diameter is connected in series to a pipe 8-cm diameter. For a discharge of 6 lit/s, of a liquid of sp. gr. 0.9, the pressure before & after the sudden enlargement was 2 bar & 2.04 bar. Calculate the head lost in the enlargement.

C) A horizontal venturi-meter is used to measure the discharge in 100-mm water pipe line. The venturi throat is 60-mm diameter and it's discharge coefficient C_d = 0.96. Calculate the water discharge and the energy loss in the convergent part when a U-tube manometer containing carbon-tetra-chloride (sp.gr = 1.64) is connected between the venturi inlet and throat sections reads 80 cm.

Dr. Rola Afify