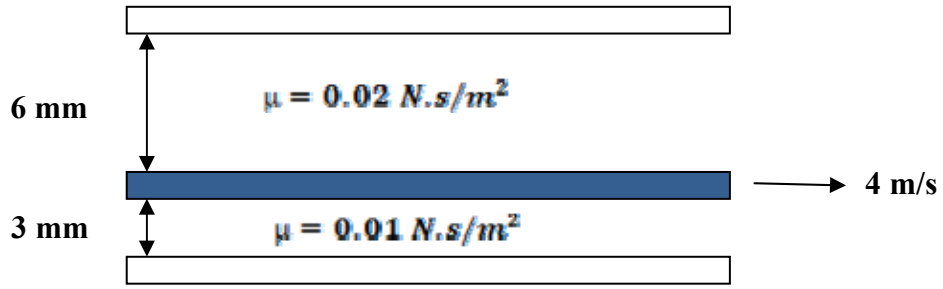
	Alexandria Higher Institute of Engineering & Technology (AIET)		
	Mechatronic Department		Third Year
	EME312	Fluid Mechanics	Midterm, April, 28, 2014
	Examiners:	Dr. Rola Afify and Committee	Time: 1.5 hours

Answer the following questions:

Question one (6 marks)

A) Compare between:
1. Density and Specific weight of a fluid.
2. Newtonian and Non-Newtonian fluids.
3. Relation between viscosity and temperature for: Liquids and gases.

B) A large movable plate is located between two large fixed plates, as shown in figure. The viscosities of the two fluids contained between the plates are indicated. Determine the magnitude of the shearing stresses that act on the fixed walls when the moving plate has a velocity of 4 m/s. Assume the velocity distribution between the plates is linear.

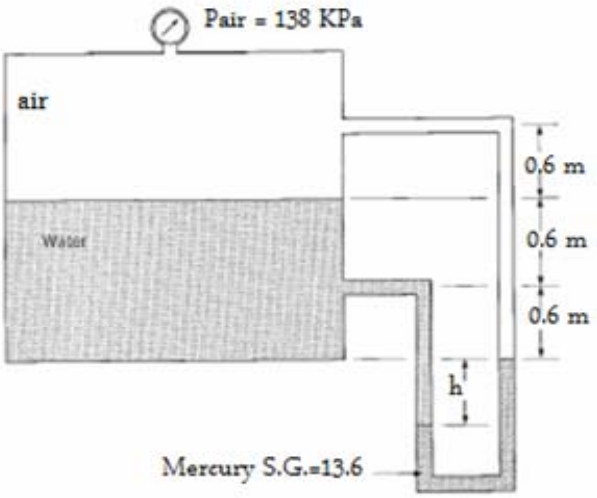


Question two (7 marks)

A) State the relation between absolute, guage and atmospheric pressure.

B) Prove that the pressure changes in the vertical direction.

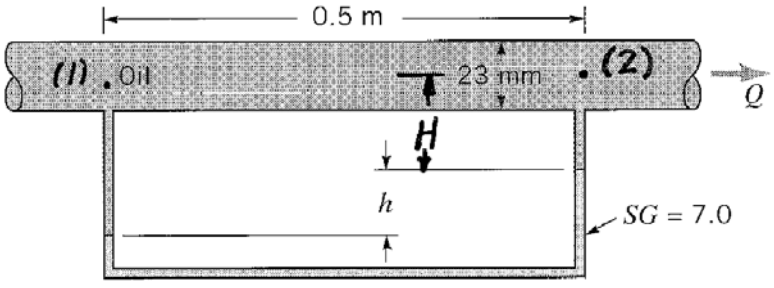
C) A U-tube mercury manometer is connected to a closed pressurized tank, as shown in figure. If the air pressure is 138 KPa, determine the differential reading, h. The specific weight of the air is negligible.



Question three (7 marks)

A) Compare between:
1- Streamline and Stream tube.
2- Uniform and Non-uniform flows.

B) Oil (specific weight = 8900 N/m^3) flows through a horizontal 23 mm diameter tube, as shown in figure. A differential tube manometer is used to measure the pressure drop along the tube. Determine head loss in the pipe if the value for h equals 20 cm.



Good Luck 1/1

Dr. Rola Afify