Alexandria Higher Institute of Engineering & Technology (AIET)			
Department of: Industrial		Second Year	2nd Year
ME251	Fluid Mechanics		Midterm-of-Semester-1 Exam, Nov., 24, 2015
Examiners:	Dr. Rola Afify and committee		Time: 1.5 hour

Answer the following questions:

Question one (6 marks)

A) 1. Discuss the relation between Viscosity and Temperature for a certain fluid.
2. Define Kinematic viscosity and Vapor pressure of liquids.

B) Choose the correct answer:
1. The absolute viscosity of a fluid is primarily a function of:
(a) Density, (b) Temperature, (c) Pressure, (d) Velocity, (e) Surface tension

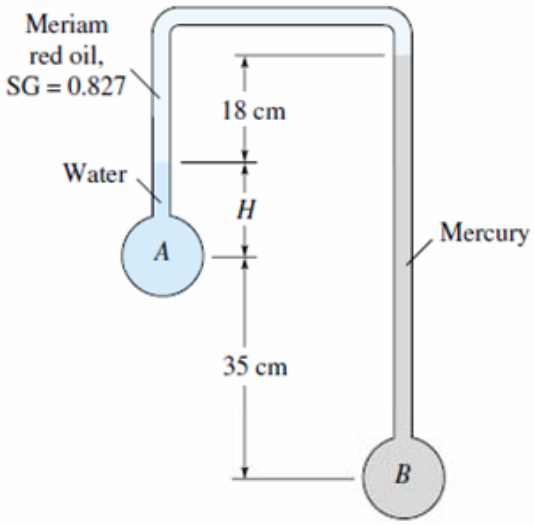
2. Two parallel plates, one moving at 4 m/s and the other fixed, are separated by a 5-mm-thick layer of oil of specific gravity 0.80 and kinematic viscosity 1.25 $*10^{-4}$ m^2/s. What is the average shear stress in the oil?
(a) 80 Pa, (b) 100 Pa, (c) 125 Pa, (d) 160 Pa, (e) 200 Pa

Question two (6 marks)

A) Show using neat sketch of the following:
i) The relation between Absolute, Atmospheric, and guage pressure.
ii) Pressure Intensifier.

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

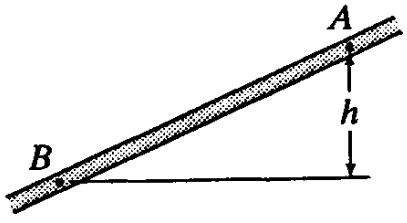
C) For the inverted manometer shown figure, all fluids are at 20°C. If $P_B - P_A = 97$ kPa, what must the height H be in cm?



Question Three (8 marks)

A) Differentiate between:-
I. steady and unsteady flow.
II. Lamina, transient, and turbulent flow.

B) If h = 10.5 m, as shown in figure, and the pressure at A and B are 170 and 275 kPa respectively. Assume the liquid has a specific gravity of 0.85. Find:-
I. The head loss in meters of liquid.
II. The direction of flow.



Good Luck 1/1

Dr. Rola Afify