



Manage your time!!!

First Question

1-1. Explain the following terms:

(5 pts)

- Hydrostatic
- Cavitation
- surface tension
- Capillary effect
- Pascal's Law

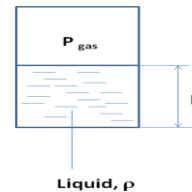
1-2. Answer the following short questions:

(5 pts)

- a) If 5.6 m^3 of oil weighs 46 800 N, determine the **mass density** and the **relative density**?
- b) A fluid has absolute viscosity μ of 0.048 Pa s. If at point A, 75 mm from the wall the velocity is measured as 1.125 m/s, calculate the **intensity of shear stress** at point B 50 mm from the wall in N/m^2 . Assume a linear (straight line) velocity distribution from the wall.
- c) Determine the **absolute pressure in Pa** at a depth of 6 m below the free surface of a tank of water when a barometer reads 760 mm mercury (relative density 13.57)
- d) Determine the **pressure in bar** at a depth of 10 m in oil of relative density 0.750.
- e) Express the pressure **head** of 15 m of water in meters of oil of relative density 0.75

1-3) Express the static pressure of liquid mathematically as Function of the temperature and the head?

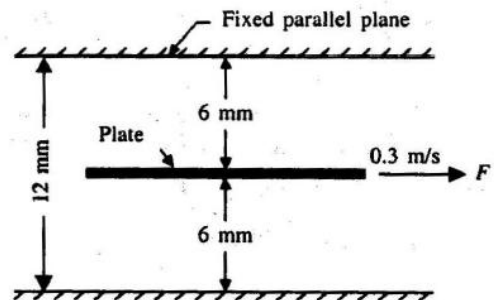
(1 pt)



1-4) Calculate the Drag force **F** of the plate by given:

- Area of thin plate 0.25 m^2
- Velocity of plate $u = 0.3 \text{ m/s}$
- Viscosity of oil 0.972 Ns/m^2

(1 pt)



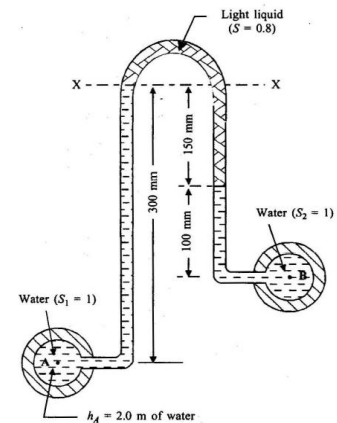


Second Question

a) An inverted differential manometer having an oil of specific gravity 0.8 connected to two different pipes carrying water under pressure. Determine the pressure in the pipe B?

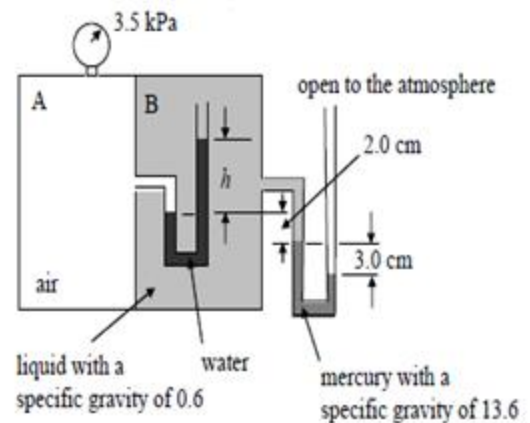
The pressure in pipe A is 2.0 meter of water.

(3 pts)



b) Compartments A and B of the tank shown in the figure below are closed and filled with air and a liquid with a specific gravity equal to 0.8. If the atmospheric pressure is 100kPa and the gage reads 3.5kPa (absolute), determine the manometer reading h .

(5 pts)



End