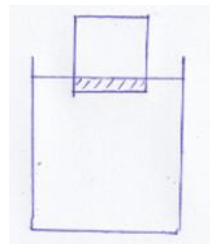
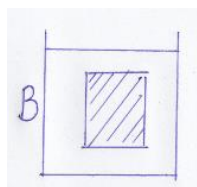
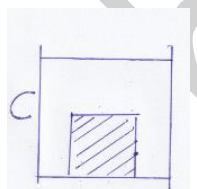


Partially immersed floating objects

- 1) Weight of the objectUpthrust force
- 2) Weight of the object.....weight of fluid displaced
- 3) Volume of object.....volume of fluid displaced
- 4) Density of the object.....density of the fluid

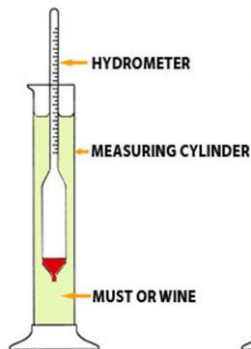
Fully immersed floating objects

- 1) Weight of the objectUpthrust force
- 2) Weight of the object.....weight of fluid displaced
- 3) Volume of object.....volume of fluid displaced
- 4) Density of the object.....density of the fluid

Fully immersed non-floating objects

- 1) Weight of the object.....Upthrust force
- 2) Weight of the object.....weight of fluid displaced
- 3) Volume of object.....volume of fluid displaced
- 4) Density of the object.....density of the fluid

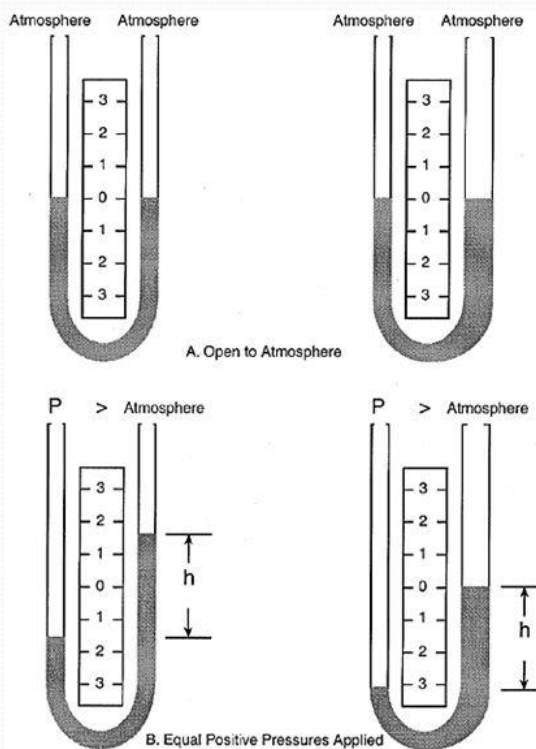
Hydrometer



- 1) Hydrometers are used to measure the of a or a
- 2) Hydrometer functions according to the
- 3) The of the hydrometer is to force and also to the of the displaced by the
- 4) The of the fluid displaced will be to the of the hydrometer which is in the fluid.
- 5) If the of the fluid is high, then volume of fluid has to be displaced. Therefore the hydrometer will immerse
- 6) If the of the fluid is less, then volume of fluid has to be displaced. Therefore the hydrometer will immerse
- 7) The of alcohol is Therefore a hydrometer will immerse
- 8) The of salt water is Therefore a hydrometer will immerse

Variations on the U-Tube Manometer

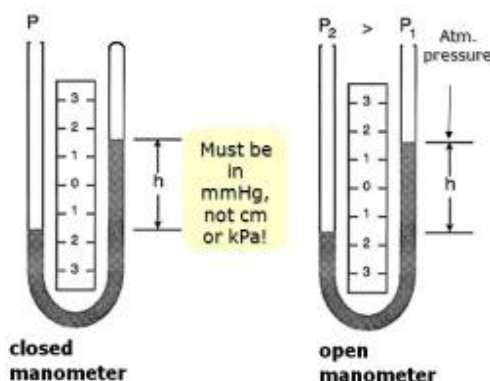
- The pressure reading is always the difference between fluid heights, regardless of the tube sizes.
- With both manometer legs open to the atmosphere, the fluid levels are the same (A).
- With an equal positive pressure applied to one leg of each manometer, the fluid levels differ, but the distance between the fluid heights is the same (B).



Channa



Reading U-tube manometers



- When reading a mercury U-tube manometer, you measure the difference in the heights of the two columns of mercury.

- If the tube is "closed" then the height (h) is the gas pressure in mmHg.

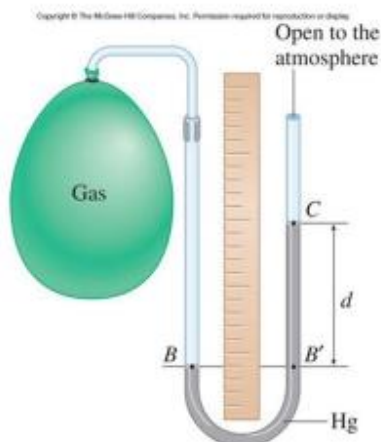
$$P_{(\text{mmHg})} = h_{(\text{mmHg})}$$

- If the tube is "open" and h is positive (the pressure you are measuring is greater than the atmosphere) then you must add atmospheric pressure in mmHg.

$$P_{\text{gas}(\text{mmHg})} = P_{\text{atm}(\text{mmHg})} + h_{(\text{mm})}$$

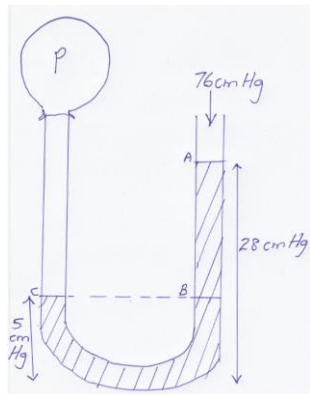
After you finish, you can convert your answer to kPa, or atm. Or whatever.

A container of gas is connected to one end of the U-tube



If there is a pressure difference between the gas and the atmosphere, a force will be exerted on the fluid in the U-tube. This changes the equilibrium position of the fluid in the tube.

Question 20



Find the air pressure P in the balloon.

Pressure at A =
 =

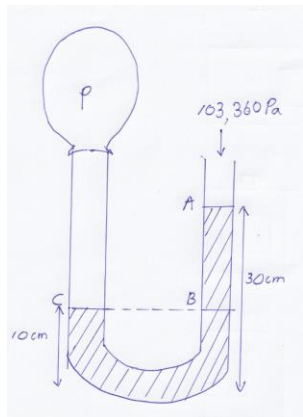
Pressure at B = +
 = +
 = +
 =

Pressure at C = (same level in the same liquid)
 =

Pressure P =
 =

Channa Asela

Question 21



Find the air pressure P in the balloon.
 (Density of water is 1000kgm^{-3} and gravitational acceleration is 10ms^{-2})

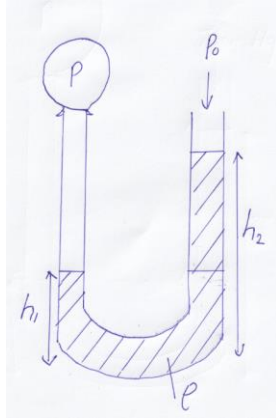
Pressure at A =
 =

Pressure at B = +
 =
 = +
 = +
 =

Pressure at C = (same level in the same liquid)
 =

Pressure P =
 =

Question 22



Find the air pressure P in the balloon.

(Atmospheric pressure is P_0 , density of liquid is ρ and gravitational acceleration is g)

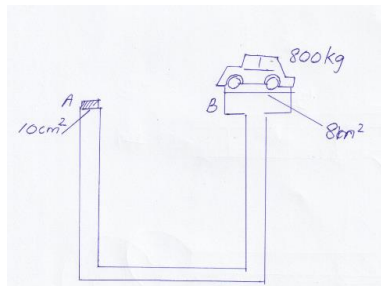
Pressure at A =
=

Pressure at B = +
= +
= +
= +

Pressure at C = (same level in the same liquid)
= +

Pressure P =
= +

Hydraulic Press



..... at A = at B
/..... = /
 / =/.....
 =/..... x (...../.....)

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