1. Complete the following :
   430 K = ……..C = …….F = ……..R
   70 C = ……..K = …….F = ……..R
   290 F = ……..C = …….K = ……..R
   90 R = ……..C = …….F = ……K

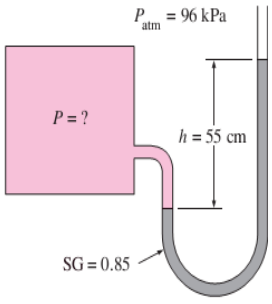
2. A vacuum gage connected to a chamber reads 5.8 psi at a location where the atmospheric pressure is 14.5 psi. Determine the absolute pressure in the chamber.
3. A vessel of cylindrical shape is 50 cm in diameter and 75 cm high. It contains 4 kg of a gas. The pressure measured with manometer indicates 620 mm of Hg above atmosphere when barometer reads 760 mm of Hg. Determine:
   (i)The absolute pressure of the gas in the vessel in bar.
   (ii)Specific volume and density of the gas.

4. A cylindrical vessel of 60 cm diameter and 80 cm height contains 3.2 kg of a gas. The pressure measured with manometer indicates 60 cm of Hg above atmosphere when barometer reads 760 mm of Hg. ***Find*** :
   (i) The absolute pressure of the gas in the vessel in bar,
   (ii) Specific volume and density of gas.

5. An oil of specific gravity 0.8 is contained in a tube to a depth of 80 cm. ***Determine*** the gauge pressure at this depth in kN/m^2.

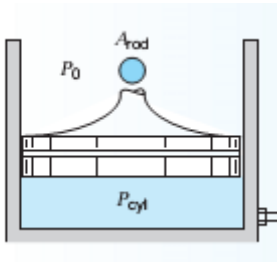
6. The pressure of gas in a pipe line is measured with a mercury manometer having one limb open to the atmosphere. If the difference in the height of mercury in the two limbs is 562 mm, ***calculate*** the gas pressure. The barometer reads 761 mm Hg, the acceleration due to gravity is 9.79 m/s^2, and the density of mercury is 13640 kg/m^3.

7. A manometer is used to measure the pressure in a tank. The fluid used has a specific gravity of 0.85, and the manometer column height is 55 cm, as shown in Fig. 1 If the local atmospheric pressure is 96 kPa, determine the absolute pressure within the tank.



8. Gas from a bottle of compressed helium is used to inflate an inelastic flexible balloon, originally folded completely flat to a volume of 0.5 m^3. If the barometer reads 760 mm Hg, ***what*** is the amount of work done upon the atmosphere by the balloon?

9. 14.5 liters of gas at 172 MN/m^2 is expanded at constant pressure until its volume becomes 130.5 liters. **Determine** the work done by the gas.
10. A manometer is used to measure the air pressure in a tank. The fluid used has a specific gravity of 1.25, and the differential height between the two arms of the manometer is 28 in. If the local atmospheric pressure is 12.7 psia, deter-mine the absolute pressure in the tank for the cases of the manometer arm with the (a) higher and (b) lower fluid level being attached to the tank.
11. A gas having a volume of 0.05 m^3 and pressure of 6.9 bar expands reversibly in a cylinder behind a piston according to law **pv $^{1.2}$ = constant** until the volume is 0.08 m^3**.** ***Calculate*** the work done by the gas. Also sketch the process on a p-v diagram.
12. The hydraulic piston/cylinder system shown in Fig. has a cylinder diameter of D=0.1 m with a piston and rod mass of 25 kg. The rod has a diameter of 0.01 m with an outside atmospheric pressure of 101 kPa. The inside hydraulic fluid pressure is 250 kPa. How large a force can the rod push within the upward direction?



13. A cylinder contains 1 kg of a certain fluid at an initial pressure of 20 bar. The fluid is allowed to expand reversibly behind a piston according to a law pV^2= constant until the volume is doubled. The fluid is then cooled reversibly at constant pressure until the piston regains its original position ; heat is then supplied reversibly with the piston firmly locked in position until the pressure rises to the original value of 20 bar. Calculate the net work done by the fluid, for an initial volume of 0.05 m^3?
14. 1 kg of a fluid is compressed reversibly according to a law pv=0.25 where p is in bar and v is in m^3/kg. The final volume is 1/4 of the initial volume. Calculate the work done on the fluid and sketch the process on a p-v diagram?
15. A certain fluid at 10 bar is contained in a cylinder behind a piston, the initial volume being 0.05 m^3. Calculate the work done by the fluid when it expands reversibly, (a) At constant pressure to final volume of 0.2 m^3;(b) According to linear law to final volume of 0.2 m^3 and a final pressure of 2 bar ; (c) According to a law pV= constant to a final volume of 0.1 m^3; (d) According to law pV^3= constant to a final volume of 0.06 m^3. Sketch all processes on p-Vdiagram.