Fluid Statics (Hydrostatic):-

Fluid:-
↳ The substance which can flow from one point to another point is called fluid. Example ⇒ Liquid & gas.

Hydrostatics (Fluid statics):-
↳ The study of fluid at rest is called hydrostatics.

Density:-
↳ Mass per unit volume is called density. It's unit is kgm^{-3}.

Relative density (Specific gravity):-
↳ Relative density of a substance is the ratio of its density to the density of water at 4°C.

i.e. Relative density (or Specific gravity) $(S_r) = \frac{\rho}{\rho_w}$

Where,

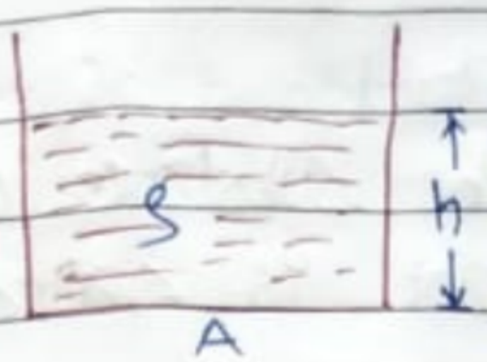
ρ = density of substance

ρ_w = density of water = 1 gm/cm³ = 1000 kg/m³

Pressure:-
↳ Force per unit area is called pressure. It's unit is N/m^2 or pascal(Pa)

In fluid pressure (P) = hdg.

Derivation of pressure in liquid :-



Let us consider a liquid of density 's' contained in a vessel of cross-sectional area 'A' up to height 'h' as shown in figure.

Now;

Total mass of liquid ⇒

(m) = Volume(V) × density (s)

= Area(A) × height(h) × density(s)

$= Ahs$

Weight of liquid is given by;

$W = mg$

$= Ahsg$

So, the normal force on the bottom of the vessel is;

$F = W$

$= Ahsg.$

Finally,

The pressure exerted by liquid at the bottom of vessel is given by;

$$P = \frac{F}{A}$$

$$= \frac{Ahsg}{A}$$

$$\Rightarrow \boxed{P = hsg}$$

This is required relation for pressure due to liquid and this relation shows that pressure due to Liquid is directly proportional to

i) density of liquid.
ii) height of liquid in vessel.
iii) Acceleration due to gravity at that place.