Fluid Dynamics

➢ Density

$$Density = \frac{mass}{volume}$$

➢ Relative density

$$Relative\ density = \frac{Density\ of\ liquid}{Density\ of\ water}$$

➢ Pressure

$$Pressure = \frac{Force}{Area}$$

• Pressure exerted by a liquid on a tank

$$P = h\rho g$$

➢ Shape of the container will not be cared.

➢ Pressure is not a vector.

• <u>**Pascal's law**</u>

➢ A pressure change at any point in a confined incompressible fluid is transmitted throughout the fluid such that the same change occurs everywhere.

$$F_1 A_2 = F_2 A_1$$

• <u>**Archimedes principle**</u>

• When an object is fully or partially immersed in a still homogeneous, incompressible fluid, the upward thrust force on it; is equal to the weight of the volume of fluid displaced by it.

$$U = v\rho g$$

• <u>**Principle of flotation**</u>

➢ If an object is partially or completely immersed in a still, incompressible fluid and, the upward thrust on the object is equal to the weight of the object.

$$U = mg$$

$mg = v\rho g$

$m = v\rho$

- ## **Continuum flow equation**

$A_1 V_{1\ =} A_2 V_2$

- ## **Bernoulli's theorem**

> If a fluid is incompressible and streamlined…

P(Pressure) **+ ½ρv^2**(K.E) **+ ρgh**(P.E) = k(constant)