

**Notes by-**

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## Pressure and Its Measurement

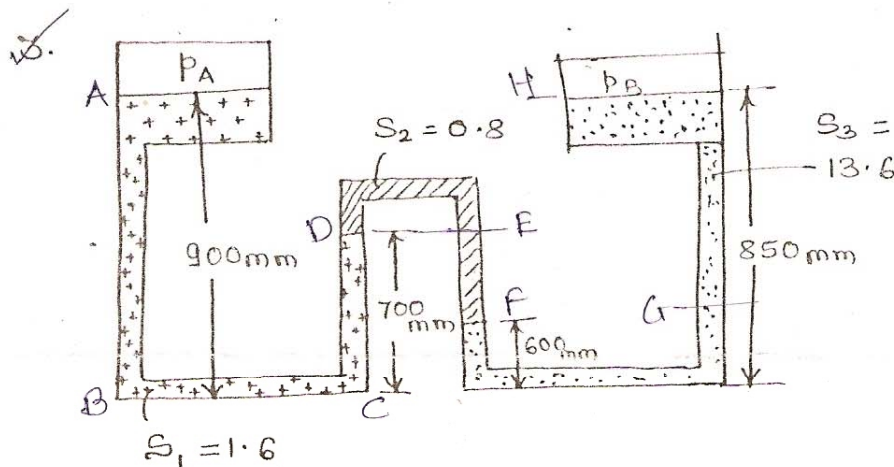
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1. Determine the pressure at the bottom of sea 1.0 km deep if density of sea water is  $1030 \text{ kg/m}^3$ . Express it as gauge and absolute pressure if atmospheric pressure is  $101.30 \text{ kN/m}^2$

$$[P_{\text{gauge}} = 10.104 \text{ kN/m}^2, P_{\text{abs}} = 20.234 \text{ kN/m}^2]$$

2. A tank contains 0.80m of oil of relative density 0.860 below which there is 1.5m of water and 0.20m of mercury. Determine the pressure on the bottom of tank, if relative density of mercury is 13.6.

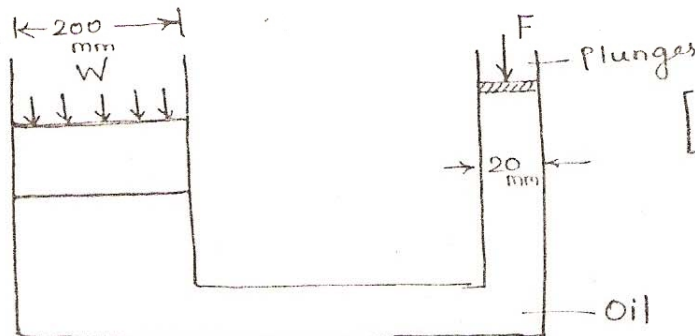
$$[48.04 \text{ kN/m}^2]$$



Determine  $(P_A - P_B)$  in  $\text{kN/m}^2$

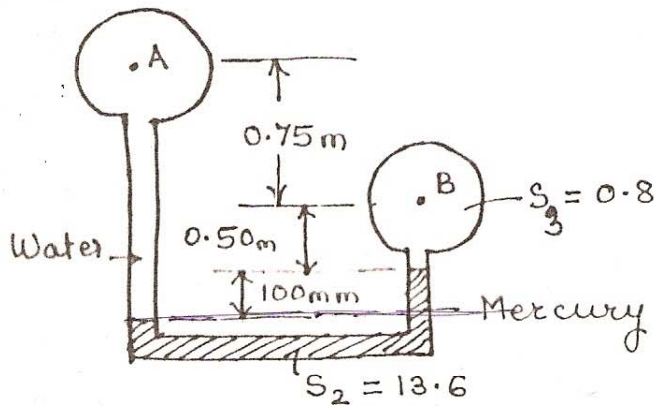
$$[29.43 \text{ kN/m}^2]$$

4. Find the force required to lift a weight of 25.0 kN by means of hydraulic press which has a ram of 200 mm and a plunger of 20 mm diameter. If the plunger has a stroke of 0.30 m and if it makes 20 strokes per minute, determine through what height is the weight lifted per minute. Also find the power required at the plunger.



$$[0.06 \text{ m}; 0.025 \text{ kW}]$$

5. Determine the pressure difference.



$$(P_A - P_B) = 3.82 \text{ kN/m}^2$$

$$4.022 \text{ kN/m}^2$$

6. Express a pressure intensity of 50m of water in all possible units. Take barometer reading as 76cm of mercury.  $[490.5 \text{ kN/m}^2; \dots \dots \dots]$

7. Convert a pressure head of 15m of water to (a) metres of oil of sp. gravity 0.750 (b) metres of mercury of sp. grav 13.6.

$$[20 \text{ m} , 1.103 \text{ m}]$$