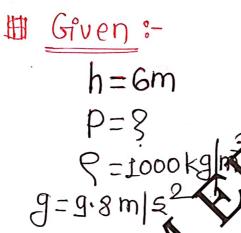
MECHANICAL PROPERTIES OF FLUIDS

Type - 01

1. A swimmer is swimming in a swimming pool at 6m below the surface of the water. Calculate the pressure on the swimmer due to water above.

(Density of water = 1000 kg/m, g=9.8 m/s)



solution:

$$P = 1000 \times 6 \times 9.8$$

 $P = 10^{3} \times 6 \times 9.8$
 $P = 58.8 \times 10^{3}$
 $P = 5.88 \times 10^{4} \text{ N/m}^{2}$

calculation

MECHANICAL PROPERTIES OF FLUIDS

2. In a hydraulic lift, the input piston had surface area 30cm and the output piston has surface area of 1500 cm. If a force of 25N is applied to the input piston, calculate weight on output piston.

Given:

$$A_1 = 30 \text{ cm}^2$$
 $A_1 = 30 \text{ cm}^2$
 $A_2 = 1500 \text{ cm$

MECHANICAL PROPERTIES OF FLUIDS

3. In a hydraulic lift, the input piston had surface area 20 cm. The output piston has surface area of 1000 cm. If a force of 50N is applied to the input piston, it raises the output piston by 2m. Calculate weight of support on output piston and its work done.

Given:-
$$A1 = 20 \text{ cm}^{2}$$

$$A1 = 20 \times 10^{-4} \text{ m}^{2}$$

$$A2 = 1000 \text{ cm}^{2}$$

$$A2 = 1000 \times 10^{-4} \text{ m}^{2}$$

$$F_{1} = 50 \text{ N}$$

$$h = 2 \text{ m}$$

$$\frac{F_2}{1000 \times 10^{-4}} = \frac{50}{20 \times 10^{-4}}$$

$$F_2 \times 20 \times 10^{-4} = 50 \times 1000 \times 10^{-4}$$

$$F_2 = \frac{50 \times 1000 \times 10^{-4}}{20 \times 10^{-4}}$$

$$F_2 = \frac{5000}{20 \times 10^{-4}}$$

$$F_2 = 5000$$
 $F_2 = 2500$ N

(2) klork done = $force \times displacement$ $U \cdot D \cdot = F_2 \times h$ $U \cdot D \cdot = 2500 \times 2$ $U \cdot D \cdot = 5000 \text{ N-m}$

W.D. = 5000J

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