

Name: _____

Key

ID # _____

1- A cube of wood of side = 10 cm has a density of 700 kg/m^3 . As shown in the figure, the cube is held in equilibrium under water by a string tied to the BOTTOM of a container. Find the tension in the string.

$$F_{\text{net}} = ma \rightarrow 0$$

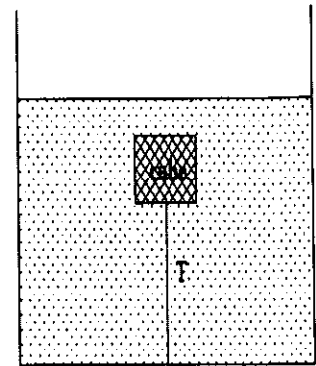
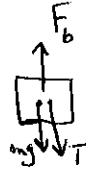
$$F_b - m_o g - T = 0$$

$$\Rightarrow T = F_b - m_o g = m_f^{\text{dis}} g - m_o g$$

$$= \rho_f V_o g - \rho_o V_o g$$

$$= (1000)(1 \times 10^{-3})(9.8) - 700(1 \times 10^{-3})(9.8)$$

$$= 2.94 \text{ N}$$



container

$$V_o = (0.1)^3 = 1 \times 10^{-3} \text{ m}^3$$

2- An Aluminum block (density 2.7 g/cm^3) has a weight W in air and has a weight W_{app} in water (density = 1 g/cm^3) when completely submerged. If $(W - W_{\text{app}})$ is equal to 196 N , What is the volume of the block?

$$W_{\text{app}} = W - F_b$$

$$F_b = W - W_{\text{app}} = 196 \text{ N} = \rho_f V_o g$$

$$V_o = \frac{196 \text{ N}}{(1000 \frac{\text{kg}}{\text{m}^3})(9.8 \frac{\text{m}}{\text{s}^2})} = 0.02 \text{ m}^3$$