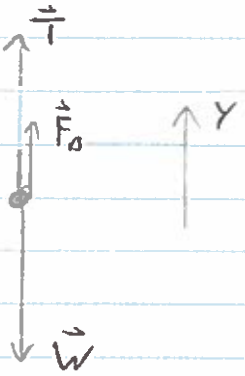
Ex 12.5

a/ FBD: (Immersed)



Object is in static equilibrium: NI:

$$\sum F_y = 0 = T + F_B - W$$

$$T = W - F_B \qquad W = mg$$

$$F_B = \rho_{sw} g V_{sw} = \rho_{sw}$$

$$V_{st} = \frac{m}{\rho_{gold}} = ?$$

$$\therefore \quad T = mg - \rho_{sw} g \frac{m}{\rho_{gold}} = mg\left(1 - \frac{\rho_{sw}}{\rho_{gold}}\right)$$

$$T = (15.0\,kg)(9.8\,ms^{-2})\left(1 - \frac{1.03\times10^{3}\,kg\,m^{-3}}{19.3\times10^{3}\,kg\,m^{-3}}\right.$$

$$T = 139\,N$$

What happens if cable snaps? $\downarrow ma = \downarrow W - F_B \uparrow$

Sinks