Question#18738

2 kg bras black is attached to a string and submerged under water. Find the buoyant force and the tension in the rope. (density of bras=8700 kg/m^3

Solution:

According to Archimedes' principle:

$F_{buoyant} = \rho g V$, were ρ − dencity of water, V − value of an object, $g = 9.8 \ m/s^2$

Such as: $m = \rho_{bras} V$, $V = \dfrac{m}{\rho_{bras}}$

$$\boldsymbol{F_{buoyant}} = \dfrac{\rho g m}{\rho_{bras}} = \dfrac{1000*9.8*2}{8700} = \boldsymbol{2.25 \ N}$$

The tension in the rope is:

$F = mg − F_{buoyant}$

$$\boldsymbol{F = 2*9.8 − 2.25 = 17.35 \ N}$$

Answer: the buoyant force- 2.25 N, the tension on the rope- 17.35 N.