An $1 \times 1 \times 1$ meter cube of light foam ($\rho_f = 20\,\mathrm{kg/m^3}$) is initially suspended in air ($\rho_a = 1.2\,\mathrm{kg/m^3}$) from a force scale. The cube is then gradually lowered into a large tank of water ($\rho_w = 1000\,\mathrm{kg/m^3}$). The acceleration of gravity is $g = 9.8\,\mathrm{m/s^2}$.

What does the force scale read when ...

a) The cube is entirely in the air?

b) The cube is fully submerged in the water?

c) If the cube is dropped and left floating on the water, what will be the distance between the cube bottom and the water surface?