Fluids - problems

1. A 100-kg gold statue is lifted from the bottom of the ocean. Find the tension in the cable ("apparent weight" in water).

2. How much weight can be lifted by a helium balloon with $R = 6\,m$?

3. an iceberg has a mass $M \approx 10^5\,kg$. Find the volume of its submerged part.

4. The cross-sectional area available for blood flow in a vessel with partial blockage is $A_b = 0.1\,mm^2$ and the flow rate dV/dt is $2500\,ml/hour$. In a nearby vessel that is clear, the area is $A_c = 0.5\,mm^2$. What is the blood flow rate, and what is the velocity v_c in m/s in the clear region?

5. Take a rectangular stripe of paper about $2 \times 12\,cm$. Put it right above your chin and blow the air horizontally over it. Assume the speed of moving air is $v \approx 2\,m/s$.

   (a) Find the pressure difference above and below the stripe in Pa.

   (b) the same in atm

   (c) estimate the lift force which acts on the stripe