Name_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) Consider a brick that is totally immersed in water. The long edge of the brick is vertical. The pressure on the brick is
   A) greatest on the face with largest area.   B) the same on all surfaces of the brick.
   C) greatest on the sides of the brick.   D) greatest on the bottom of the brick.

2) What of the following is a WRONG statement.
   A) When an ice cube floating in a glass of water melts, the water level remains the same.
   B) An ice cube with a piece of cork frozen into it is floating in a glass of water. When the ice melts, the water level changes.
   C) An ice cube with a steel nut frozen into it is floating in a glass of water. When the ice melts, the water level changes.
   D) When an ice cube floating in a glass of water melts, the water pressure at the bottom of the glass remains the same.

3) What of the following is a WRONG statement.
   A) The equation $vA = $ const is only valid under the conditions of conservation of mass and incompressibility of the fluid.
   B) A steady flow implies that the velocity does not change in time, but might still change along flow lines.
   C) Positioning of the center of buoyancy of a boat above its center of gravity, when the boat is upright, is a necessary condition of stability of the boat.
   D) Variation of hydrostatic pressure with the height/depth is proportional to the density of the fluid

4) What of the following is a WRONG statement.
   A) Curved shape of an airplain wing is not essential for the lift.
   B) Rising of a cork released at the bottom of a lake is different from rising of a Helium baloon in the atmosphere (a Helium baloon stops rising at some height), because the density of air is much smaller that the density of water.
   C) Airplanes take off into the wind to increase the lift force.
   D) For a pump submerged at the bottom of a deep well, it takes more power to pump water to the surface when the well is half–empty than when the well is full.

5) What of the following is a WRONG statement.
   A) Hydrostatic equilibrium implies that the net force everywhere in the fluid is zero.
   B) A stone placed in a vertical cylinder filled with water and rotating around its axis will eventually be found at the bottom near the wall.
   C) Bernoulli's equation originates from the conservation of energy.
   D) A piece of cork placed in a vertical cylinder filled with water and rotating around its axis will eventually be found at the surface near the wall.

6) The air pressure inside of a sealed house is 1.04 atm when a hurricane hits. The hurricane rapidly decreases the external air pressure to 0.83 atm. In what range is the net force (directed outwards) exerted on a square window with a side of 0.8 m in the house?
   A) 1.0×10^4 N – 1.2×10^4 N   B) 4×10^4 N – 6×10^4 N
   C) 1×10^5 N – 2×10^5 N   D) 1.2×10^4 N – 1.4×10^4 N

7) A manual hydraulic lift has a 45–cm–diameter piston supporting the load, and it can go up by a maximal height of 90 cm. The maximal load it can support is 500 kg. Supporting the maximal load requires application of a force of 90 N to the manually driven piston. What is the diameter of the manually driven piston? Assume that there is no friction.

    A) 6 cm   B) 0.8 cm   C) 19 cm   D) 8 cm

8) A venturi is constructed of a pipe with a cross–section area of 98 cm^2 and a throat with a cross–section of 6 cm^2. Water in the pipe has a pressure of 2 atm and it flows with a velocity of 0.7 m/s. What is the pressure in the throat?

    A) 2.0 atm   B) 1.6 atm   C) 1.3 atm   D) 2.4 atm

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) D
2) B
3) C
4) B
5) D
6) D
7) A
8) C