

SMS-204: Integrative marine sciences, physics

Quiz Lab 1.

1. If I know the volume and the mass of an object I can obtain its density by:
 - a. Density= volume + mass
 - b. Density= mass / volume
 - c. Density= volume / mass
 - d. Density= volume \times mass

2. The no-slip condition results in:
 - a. All of the following
 - b. Wind over land is faster 10m above ground than 1cm above ground.
 - c. Currents in the ocean are faster 1m above bottom than 1mm above bottom.
 - d. A coffee in a cup will eventually come to rest after vigorous mixing.

3. To obtain the volume of a solid object of complicated shape:
 - a. Find the smallest sphere that can contain the object and measure its volume.
 - b. Put it in a graduated cylinder and read the mark near the top of the object.
 - c. Put it in a graduated cylinder with enough fluid in it to cover the object.
Read the combined volume of fluid and object and subtract the volume of the fluid when the object is removed.
 - d. Measure the object's density with a caliper and divide its mass by its density.

4. The difference between precision and accuracy:
 - a. There is none. They are basically the same.
 - b. Accuracy tells us when something happened. Precision tells where it happened.
 - c. Accuracy is the degree of reproducibility while precision is the degree of veracity (truth).
 - d. Accuracy is the degree of veracity (truth) while precision is the degree of reproducibility.

5. A consequence of the no-slip condition is that if we rotated a tank with some fluid in it on a turn-table eventually:
 - a. The fluid in the container will be at rest relative to the lab.
 - b. The fluid in the container will be at rest relative to the walls of the tank.
 - c. The fluid will spill off the sides of the container.
 - d. The fluid will spin faster and then slower relative to the lab.

- 6. An object floats in water because:**
- a. It is lighter than water.**
 - b. Its mass is less than that of water.**
 - c. It has a smaller volume than water.**
 - d. It is less dense than water.**
- 7. The fluid in contact with a falling beads**
- a. Stretches.**
 - b. Moves at the same speed as the bead.**
 - c. Moves to the back of the falling bead.**
 - d. Does not move.**
- 8. We record uncertainties of all measured physical quantities because:**
- a. It gives us a sense of certainty.**
 - b. No physical quantity can be obtained exactly.**
 - c. It looks professional.**
 - d. All of the above.**
- 9. Biologists should care about physical attributes in the ocean because:**
- a. They determine organismic DNA length.**
 - b. They determine organismic social structures.**
 - c. They determine the conditions in which the organisms need to function and survive.**
 - d. All of the above.**
- 10. The continuum hypothesis for fluids means that:**
- a. Rather than describing the dynamics of each molecule in a fluid, the fluid can be described as a deformable material with bulk properties that are constant on much larger scales than that of molecules.**
 - b. The flow field does not have abrupt changes, that is, acceleration and other flow transitions are smooth.**
 - c. Fluids continue to flow long after we stop the forces acting on it.**
 - d. Fluids have memory of past events. We can learn about past events by looking at the fluids in their present condition.**
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