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**Density Exam Questions**

1. The data table below shows the masses and volumes of three objects (A, B, and C).





Which statement about the densities of these three objects is correct?

(1) B is more dense than A.

(2) A is more dense than C.

(3) B and C have equal densities.

(4) A and C have equal densities.

2. The diagram below shows a tall beaker with four different liquids and their densities.

If a ball that has a density of 1.73 g/cm3 is placed in the beaker, where will the ball come to rest?



(1) on top of liquid *A*

(2) between liquids *B* and *C*

(3) between liquids *C* and *D*

(4) on the bottom of the beaker

3. The amount of matter in a substance is known as

(1)density.

(2)volume.

(3)mass.

(4)weight.

4. The diagram below shows milk being poured into a measuring cup.



Which property of the milk can be directly measured using the cup?

(1) mass

(2) density

(3) solubility

(4) volume

5. Which instrument could be used to determine the volume of an irregularly shaped solid?



6. The diagram below shows a rock suspended above an overflow container filled with water up to the overflow spout. A graduated cylinder is positioned next to the container to collect water that comes out of the overflow spout.



Which property of the rock can be directly determined when the rock is placed in the overflow container?

(1) mass

(2) density

(3) volume

(4) hardness

Base your answers to questions 7 and 8 on the information and cross section below and on your knowledge of science.

**Icebergs**

Floating pieces of glacial ice are called icebergs. Huge pieces of glacial ice near a coast may break off and fall into the ocean, as shown in the cross section below. Only about one-tenth of the total iceberg is visible above the surface of the water.



7. Explain why an iceberg floats in the ocean. [1]

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8. Describe *one* change in the environment that would occur if all the glaciers on Earth melted. [1]

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Base your answers to questions 9 and 10 on the diagram below and on your knowledge of science. The diagram shows a glass partially filled with water and ice cubes.



9. Explain why water droplets have formed on the outside of the glass. [1]

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10. What evidence in the diagram indicates that ice has a lower density than water? [1]

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Base your answers to questions 11 and 12 on the information and diagram below.

A student was given samples of four different liquids, *A, B, C,* and *D*. The student poured equal amounts of two different liquid samples into several test tubes. The results are shown in test tubes 1, 2, 3, and 4.



11. What physical property of the liquids causes them to separate into different layers when poured into the test tubes? [1]

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12. When equal amounts of liquids *A, B, C,* and *D* were placed into test tube 5, the liquids separated into four layers. A diagram of test tube 5 appears below. On the blank lines next to each layer, list the final order of the liquids as they would appear in test tube 5. [1]



13. The diagram below shows a rock being placed in a graduated cylinder containing water.



What is the volume of the rock? **Note:** 1 mL = 1 cm3 [1] V= \_\_\_\_\_\_\_\_\_\_\_ **cm3**

14.The diagram below shows a triple-beam balance.



What is the maximum mass, in grams, that could be measured by this balance?

(1) 110

(2) 500

(3) 610

(4) 1510

Base your answers to questions 15 and 16 on the information and diagram below and on your knowledge of science.

A rock hanging from a spring scale is being lowered into a graduated cylinder containing water. Figure *A* shows the reading on the spring scale before the rock is lowered into the water. Figure *B* shows the reading on the spring scale when the rock is in the water. The reading on the spring scale in figure *A* is greater than the reading on the spring scale in figure *B*.



15. Explain why the spring scale shows a greater reading in figure *A* than in figure *B*. [1]

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16. Explain why placing the rock in the water causes the water level to rise. [1]

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17. The beaker shown below contains four liquids of different densities. The blocks shown in the beaker represent four different solid materials. The table below shows the densities of the four solid materials.



Indicate where each of the four solid materials would be located by writing the name of each solid material in the space provided. [2]



18. The diagrams below represent two differently shaped blocks of ice floating in water. Which diagram most accurately shows the blocks of ice as they would actually float in water?



Base your answers to questions 19 and 20 on the cross section below and on your knowledge of science. The cross section compares the densities of different Earth layers.



19. Which Earth layer is most dense?

(1) plastic mantle

(2) stiffer mantle

(3) outer core

(4) inner core

20. Convection currents, which may be the driving force for the movement of lithospheric plates, are mostly found in Earth’s

(1) crust

(2) plastic mantle

(3) outer core

(4) inner core

21. The diagram below represents a cylinder which contains four different liquids, *W*, *X*, *Y*, and *Z*, each with a different density (*D*) as indicated. A piece of solid quartz having a density of 2.7 g/cm3 is placed on the surface of liquid *W*. When the quartz is released, it will pass through

(1) *W*, but not *X*, *Y*, or *Z*

(2) *W* and *X*, but not *Y* or *Z*

(3) *W*, *X*, and *Y*, but not *Z*

(4) *W, X*, *Y*, and *Z*