UNIT 1 TEST: MATTER

True/False
Indicate whether the sentence or statement is true or false.

___ 1. Burning wood is a chemical change.
___ 2. Gases are more compressible than liquids or solids.
___ 3. Water is an element.
___ 4. Solids take the shape of their container, but maintain constant volume.

Multiple Choice
Identify the letter of the choice that best completes the statement or answers the question.

___ 5. Which beaker illustrated below best represents a**homogeneous** mixture?
   a. [Image]
   b. [Image]
   c. [Image]
   d. [Image]

___ 6. Matter includes all of the following EXCEPT
   a. air.                     b. light.
   c. smoke.                  d. water vapor.

___ 7. Which of the following is NOT a sign that a chemical reaction has taken place?
   a. Formation of a solid     b. Color change
   c. Formation of a gas       d. Melting

___ 8. The unit cm³ measures
   a. length.                  b. mass.
   c. volume.                  d. density.
9. A student makes a list of some observable properties of a substance.

**Students' List of Properties**
1) silver in color
2) shiny
3) conducts electricity
4) forms a compound with sulfur

Which of the student’s listed properties is a chemical property of the substance?
- a. 1
- b. 2
- c. 3
- d. 4

10. If a substance can’t be broken down physically but it CAN be broken down chemically, it is classified as a ____________.
- a. element
- b. heterogeneous mixture
- c. compound
- d. homogeneous mixture

11. The first diagram represents four molecules of a substance before any change has occurred. Which diagram best represents the same substance after a **physical** change has occurred?

![Diagrams](Before change: A B C D)

- a. A
- b. B
- c. C
- d. D

12. A sample of water taken from a local lake (where floating particles are present) would be best described as a _____________________.
- a. homogeneous mixture.
- b. heterogeneous mixture.
- c. pure substance.
- d. compound.

13. Which of the following is NOT a pure substance?
- a. ![Image A](pure substance)
- b. ![Image B](heterogeneous mixture)
- c. ![Image C](compound)
- d. ![Image D](single molecule)
14. The following chemical equation shows that HCl acid can be broken down into its individual components through chemical means.

\[ 2\text{HCl} \rightarrow \text{H}_2 + \text{Cl}_2 \]

HCl is classified as-

- a. element
- b. solution

15. The mass of matter per unit volume is

- a. mass.
- b. weight.
- c. inertia.
- d. density.

16. Four watch glasses, labeled 1, 2, 3, and 4, each held a few crystals of four different white solid substances. Equal numbers of drops of a dilute acid were added to each of the dishes. Nothing else was done to the containers. The results are listed in the given table.

<table>
<thead>
<tr>
<th>Watch Glass</th>
<th>Results after acid was added</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No change</td>
</tr>
<tr>
<td>2</td>
<td>Bubbles released</td>
</tr>
<tr>
<td>3</td>
<td>Substance dissolved</td>
</tr>
<tr>
<td>4</td>
<td>Container became warmer</td>
</tr>
</tbody>
</table>

Which of these MOST likely reflects a physical change?

- a. 1
- b. 2
- c. 3
- d. 4

17. Which description of the states of matter is accurate?

- a. Only gases have an indefinite shape.
- b. Liquids have a definite volume and a definite shape.
- c. Gases have an indefinite shape and a definite volume.
- d. Solids have a definite shape and a definite volume.

18. Which statement describes a chemical property?

- a. Its crystals are a metallic gray.
- b. It dissolves in alcohol.
- c. It boils at 273K.
- d. It reacts with carbon to form a gas.

Short Answer

19. A block of aluminum occupies a volume of 15.0 mL and weighs 40.5 g. What is its density?
20. What is the mass of the ethyl alcohol that exactly fills a 200.0 mL container? The density of ethyl alcohol is 0.789 g/mL.

21. Draw a representation of the particles in a solid, liquid and a gas.

solid  liquid  gas

22. Matter can have a **definite** or **indefinite** shape and volume depending upon the state of matter. A liquid has __________ shape and __________ volume.

23. Choose one of the following physical or chemical changes and circle it. Say whether it is a physical or chemical change and then explain why.

   a. Baking a cake
   b. Melting a popsicle
   c. A nail rusting
   d. Water condensing on a cold glass

   Physical or Chemical change: ________________________________________
   Why? _____________________________________________________________

24. What is one question you thought would be on this test but wasn’t? ______________________

   ________________________________________________________________

   How would you have answered that question? ______________________

   ________________________________________________________________

EXTRA CREDIT: Draw a particle diagram of a pure element and a homogeneous mixture:

pure substance  homogeneous mixture