1. A sodium ion contains ____ electrons, ____ protons, and ____ neutrons.
   A 10; 11; 12
   B 11; 11; 12
   C 11; 12; 12
   D 11; 10; 12

2. Which one of following ionic compounds does not have a correct chemical formula?
   A NH₄OH
   B Na₃PO₄
   C CaCl₂
   D NaCO₃

3. When oxygen gains electrons, ____.
   A the ion has a 2+ charge
   B the ion has a 2- charge
   C it also gains protons
   D all of the above

4. All of the following elements form ions with a charge of 2+ or 2- EXCEPT ____.
   A sulfur
   B magnesium
   C calcium
   D oxygen
   E potassium

5. In an ionic compound, the sum of the negative charges equals the sum of the positive charges.
   A True
   B False

6. A covalent compound when dissolved in water will easily conduct an electric current.
   A True
   B False

7. The chloride ion is a polyatomic ion.
   A True
   B False

8. A polyatomic ion is...
   A an ion of more than one atom.
   B an ion of more than two atoms.
   C a positively or negatively charged atom.
   D an energy absorbed during a chemical reaction.

9. An ionic compound is...
   A always composed of polyatomic ions.
   B an ion of one atom.
   C a compound composed of positive and negative ions.
10. The octet rule (rule of eight)...
- A results in a negatively charged ion, formed when an electron is gained by an atom.
- B explains the ion of one atom.
- C states that when atoms combine to form compounds, they lose, gain, or share electrons to obtain an electron configuration with a complete outer energy level.
- D shows the number of ions of opposite charge that surround an ion in a crystal.

11. Which one of the following compounds contains a covalent bond?
- A NaCl
- B Li₂O
- C H₂O
- D KBr

12. What kind of chemical bond will form when elements of the IA group react with elements of the VIIA group?
- A metallic bond
- B hydrogen bond
- C ionic bond
- D covalent bond

13. Which of the following are shared in the formation of an ionic bond?
- A protons
- B neutrons
- C electrons
- D none of the above

14. For the following, give the symbol and charge of each ion, then write the formula for the compound formed by them (Example: calcium & iodide Ca²⁺ I⁻ → CaI₂).

<table>
<thead>
<tr>
<th>Positive and negative ions</th>
<th>Symbols &amp; charges</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. potassium &amp; acetate</td>
<td>K⁺ &amp; C₂H₃O₂⁻</td>
<td>KC₂H₃O₂</td>
</tr>
<tr>
<td>b. ammonium &amp; hydroxide</td>
<td>NH₄⁺ &amp; OH⁻</td>
<td>NH₄OH</td>
</tr>
<tr>
<td>c. calcium &amp; phosphate</td>
<td>Ca²⁺ &amp; PO₄³⁻</td>
<td>Ca₃(PO₄)₂</td>
</tr>
<tr>
<td>d. silver &amp; sulfate</td>
<td>Ag⁺ &amp; SO₄²⁻</td>
<td>Ag₂SO₄</td>
</tr>
<tr>
<td>e. aluminum &amp; carbonate</td>
<td>Al³⁺ &amp; CO₃²⁻</td>
<td>Al₂(CO₃)₃</td>
</tr>
<tr>
<td>f. lead &amp; nitrate</td>
<td>Pb²⁺ &amp; NO₃⁻</td>
<td>Pb(NO₃)₂</td>
</tr>
<tr>
<td>g. ammonium &amp; phosphate</td>
<td>NH₃⁺ &amp; PO₄³⁻</td>
<td>(NH₄)₂PO₄</td>
</tr>
</tbody>
</table>