

## PART A: MULTIPLE CHOICE (10 MARKS)

Choose the best response in each case and place your answer in the appropriate space on your answer sheet.

1. "When water is heated, it bubbles and a vapour is seen to rise from it." This statement is best described as:  
(a) a quantitative observation  
(b) a qualitative observation  
(c) a hypothesis
2. A solid element looks silvery and shiny when its surface has been freshly sanded and polished. It will stretch without breaking if enough pulling force is applied. This element is most likely classed as a:  
(a) metal  
(b) nonmetal  
(c) noble gas
3. Which line gives the correct number of neutrons, protons, and electrons in an atom of aluminum <sup>27</sup>/<sub>13</sub>Al?  
(a) 13, 13, 14  
(b) 13, 14, 13  
(c) 14, 13, 13
4. How many electrons are in the 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> shell for an atom with a total of 15 electrons?  
(a) 2,5,8  
(b) 5,8,2  
(c) 2,8,5
5. An atom becomes an ion with a charge of 2+ when it:  
(a) gains 2 electrons  
(b) loses 2 electrons  
(c) neither (a) or (b)
6. In a chemical reaction, a metallic element usually:  
(a) loses electrons  
(b) gains electrons  
(c) neither (a) or (b)
7. Ionic bonds are generally formed between:  
(a) two metals.  
(b) a metal and a nonmetal.  
(c) two nonmetals.
8. Which of the following compounds is held together by covalent bonds?  
(a) NaCl  
(b) CaBr<sub>2</sub>  
(c) NH<sub>3</sub>
9. Which of the following is used to organize the modern periodic table?  
(a) atomic number  
(b) atomic mass  
(c) combining capacity
10. Which of the following elements form the majority of the periodic table?  
(a) metals  
(b) nonmetals  
(c) metalloids

## PART B: MATCH (5 MARKS)

Match the definition from the 1<sup>st</sup> column to the best term in the 2<sup>nd</sup> column and place the matching letter in the appropriate space on your answer sheet.

- |  |                       |
|--|-----------------------|
| 1. A compound formed by the sharing of electrons.                                      | A) electron           |
| 2. Indicates the number of electrons an atom gains or loses to form an ionic compound. | B) ion                |
| 3. Subatomic particle that has a relative mass of 1 and a charge of +1.                | C) ionic compound     |
| 4. An atom that has lost or gained electrons.  | D) ionic charge       |
| 5. Subatomic particle that has a relative mass of 1 and a charge of 0.                 | E) molecular compound |
|  | F) neutron            |
|  | G) periodic table     |
|  | H) polyatomic ion     |
|  | I) proton             |
|  | J) valence electrons  |

## PART A: MULTIPLE CHOICE (10 MARKS)

1	2	3	4	5	6	7	8	9	10
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## PART B: MATCH (5 MARKS)

1	2	3	4	5
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## PART C: SHORT ANSWER (30 MARKS)

Answer the following questions in the space provided below. If more space is needed, use the back of this sheet

- {1} 1a) What is the symbol of the noble gas \_\_\_\_\_ that has the closest atomic # to the element chlorine?
- {1} 1b) How many e's must chlorine lose or gain to have an electron arrangement like the noble gas above? \_\_\_\_\_
- {2} 1c) What charge (# and sign) of ion will result? \_\_\_\_\_
- {1} 2a) What is the symbol of the noble gas \_\_\_\_\_ that has the closest atomic # to the element aluminum?
- {1} 2b) How many e's must aluminum lose or gain to have an electron arrangement like the noble gas above? \_\_\_\_\_
- {2} 2c) What charge (# and sign) of ion will result? \_\_\_\_\_

3. Lithium and oxygen react to form an ionic compound.

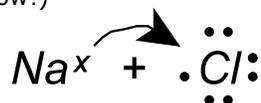
- {2} (a) Indicate the ionic charges on the ions.



- {2} (b) What is the chemical formula and name of the compound formed.

\_\_\_\_\_

- {2} (c) Sketch Lewis dot diagrams to show how the ionic compound from (b) above forms by transferring electrons. More than one atom of each element may be necessary. (See the example for sodium chloride below!)



4. Nitrogen and hydrogen react to form a molecular compound.

- {2} (a) Indicate the ionic charges on the ions.



- {2} (b) What is the chemical formula and name of the compound formed.

\_\_\_\_\_

- {2} (c) Sketch Lewis dot diagrams to show how the molecular compound from (b) above forms by sharing electrons. More than one atom of each element may be necessary. (See the example for hydrochloric acid below!)



- {12} 5. Give the compound name or formula as required.

- |                                    |                                |
|------------------------------------|--------------------------------|
| (a) $\text{K}_2\text{S}$ _____     | (g) sodium oxide _____         |
| (b) $\text{Ag}_2\text{O}$ _____    | (h) beryllium chloride _____   |
| (c) $\text{CaSO}_4$ _____          | (i) calcium bicarbonate _____  |
| (d) $\text{Na}_2\text{CO}_3$ _____ | (j) silver nitrate _____       |
| (e) $\text{SO}_2$ _____            | (k) carbon dioxide _____       |
| (f) $\text{NBr}_3$ _____           | (l) silicon tetrabromide _____ |