Period Table Worksheet 1

1. While doing a research project, you noted the following information about five elements.

Element A :
- is a solid;
- conducts electricity;
- has 2 electrons in its outermost shell;
- has a low density.

metal

Element B :
- is not malleable
- does not conduct electricity;
- has 7 electrons in its outermost shell;
- is light green in colour.

non-metal

Element C :
- has all its outer orbits full
- does not form compounds with other elements;
- is in a gaseous state;
- has a very low boiling point.

non-metal

Element D :
- is a poor conductor of heat;
- is very hard;
- in non-ductile and non-malleable;
- conducts electricity.

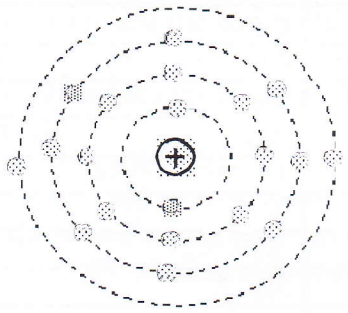
metalloid

Element E :
- is ductile and malleable;
- is a solid;
- is a good conductor of heat and electricity;
- has a high melting point.

metal

Classify the elements above as metals, non-metals or metalloids.

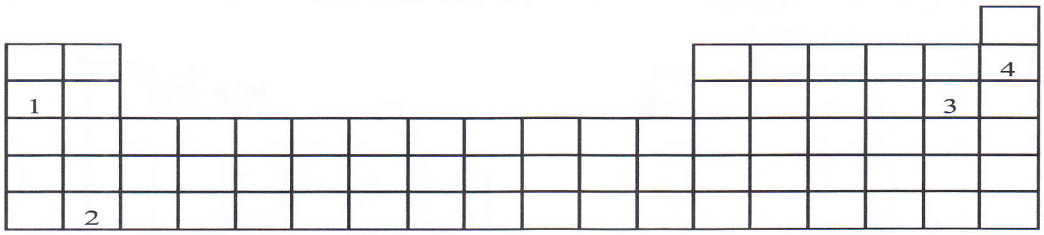
2. The Bohr-Rutherford atomic model of an element is shown below.



What are, respectively, the Group and the Period of the Periodic Table to which the element belongs?

A) IIA and 4 B) II A and 3 C) IV A and 2 D) IV A and 3

3. Which of the elements in the table below possess the properties of **shininess, electrical conductivity and malleability**?



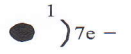
A) 1 and 2 B) 1 and 4 C) 2 and 3 D) 3 and 4

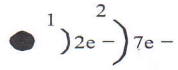
4. In a laboratory, a scientist noted the following facts about an element:
   1. It is a solid.
   2. It is a poor conductor of heat and electricity
   3. The nucleus of the atom of this element contains less than 18 protons.
   4. The outermost electron shell contains 5 electrons.

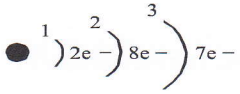
   What is this element?

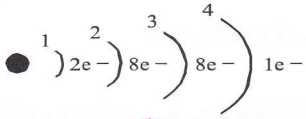
Phosphorus

5. Which of the following atomic models represent elements from the halogen family?

1. 

2. 

3. 

4. 

A) 1 and 2 B) 3 and 4 C) 2 and 3 D) 1 and 4

6. After a forest fire, we collected the ashes that were left on the ground. An analysis of these ashes enabled us to determine their composition. The table below lists the different elements that were found.

NAME OF ELEMENT	CHEMICAL SYMBOL
Calcium	Ca
Chloride	Cl
Iron	Fe
Magnesium	Mg
Phosphorus	P
Potassium	K
Silicon	Si
Sodium	Na
Sulphur	S

a) Choose two elements that are found in the same period in the periodic table of the elements. Explain your choice by using scientific concepts.

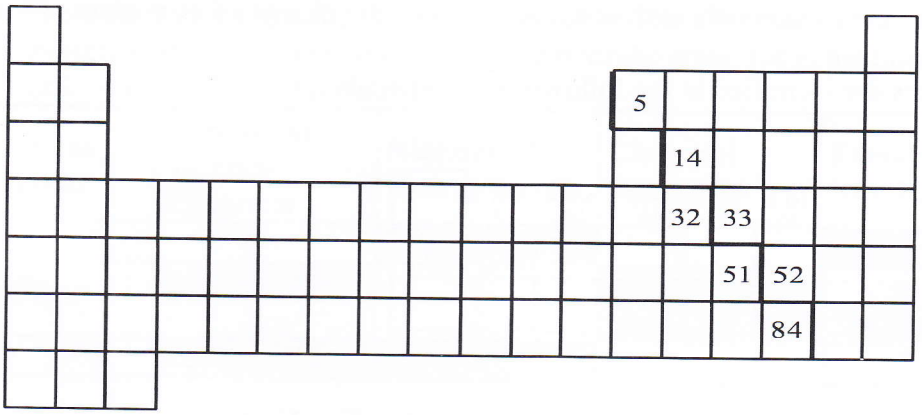
Ca + K
Na + Mg } same # of orbits

b) Choose two elements that are found in the same group in the periodic table of the elements. Explain why these elements have the same chemical reactivity using the Rutherford-Bohr model.

Mg + Ca - group 2

7. Complete the following sentence by choosing the correct response. Fluorine, chlorine, bromine and iodine belong to the halogen family; they are all used for.
A) Lightning B) Disinfecting C) Communication D) Heating

8. Below is a partial representation of the Periodic Table



Using the table above, which of the following statements best describes the location of metals, non-metals and metalloids?

A) The non-metals are situated in the seven boxes identified. The metals occupy the region to the right of these boxes and the metalloids the region to the left.
B) The metals are situated in the seven boxes identified. The metalloids occupy the region to the right of these boxes and the non- metals the region to the left
C) The metalloids are situated in the seven boxes identified. The non-metals occupy the region to the right of these boxes and the metals the region to the left.
D) The metalloids are situated in the seven boxes identified. The metals occupy the region to the right of these boxes and the non-metals the region to the left.

9. Listed below are the characteristics of an element from the periodic table.
   - It is a nonmetal.
   - Its outermost energy level has seven electrons.
   - It is used to purify and disinfect water.

   To which group in the periodic table does this element belong?
A) Alkali metals B) Alkaline earth metals C) Halogens D) Inert gas

10. The organization of the Periodic Table can be explained in terms of electron arrangements. Which of these explanations is correct?
A) An element that immediately precedes a noble gas always has its last electron in a new energy level. This means that the element is in a new Period.

B) An element that immediately follows a noble gas always has its last electron in a new energy level. This means that the element is in a new Period

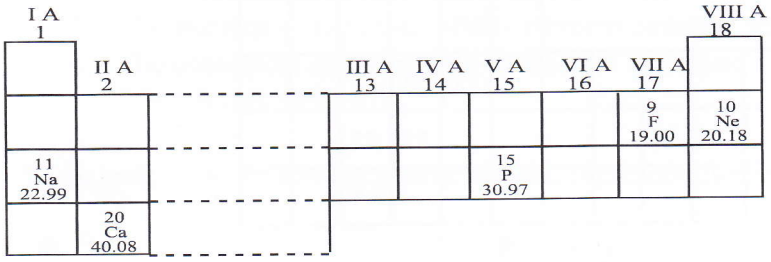
C) An element that immediately follows a noble gas always has its last electron in the same energy level as the preceding noble gas. This means that the element is in a new Period

D) An element that immediately follows a noble gas always has its last electron in a new energy level. This means that the element is in the same Period.

11. Give the name of each element described below.

1. The element has electrons in two energy levels (shells) and the outer level is full. Ne
2. The element has electrons in three energy levels (shells) and it has two valence electrons. Mg
3. The element has an atomic number of 14. Si
4. The element reacts vigorously with water and the electric charge of its nucleus is +19. K

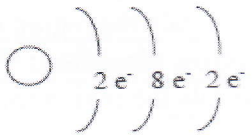
12. Five elements are identified in the following periodic table.



Match each of the five elements with one of the characteristics listed below

1. Its third energy level contains 5 valence electrons. P
2. It is a gas that does not react with metals or nonmetals. Ne
3. It is an element whose chemical reactions are similar to those of potassium. Na
4. It is one of the most corrosive gases. F
5. It is an alkaline earth metal that is a component of bones and teeth. Ca

13. The following diagram shows the Rutherford-Bohr model of an atom.



Using the periodic table answer the following questions:

a) To what group does this element belong? 2

b) To what period does this element belong? 3

14. The following table gives some information about four elements (E_1, E_2, E_3 and E_4).

Element	Protons	Electrons	
E_1	19		K
E_2		18	Ar
E_3	12		Mg
E_4		9	F

Which of these elements is an alkaline earth metal?

E3

A) Element E_1 B) Element E_2 C) Element E_3 D) Element E_4

15. The chemical symbols of four elements are given in the table below. Fill the table.

ELEMENT	NUMBER OF VALENCE ELECTRONS	CHEMICAL FAMILY NAME
Br	7	Halogens
Ca	2	Alkaline Earth
Na	1	Alkali
Ne	8	Noble Gas

16. The table below gives the chemical symbols of four elements and provides space to indicate certain characteristics: Using the periodic table, fill in the blank boxes in the table. (Do not fill in the shaded areas)

Element Symbol	**Number of Valence Electrons**	**Number of Energy Levels**	**Chemical Reactivity**	**Family Number**
Li	1		4	
C		2		4
Cl	7	3		
Ne			none	8

17. The table below provides certain information about the symbol, the electron configuration, the name of the chemical family and the period number of four elements in the periodic table.

Symbol	Electron configuration	**Name of the chemical family**	**Period number**
Mg	•)2e⁻)8e⁻)2e⁻	Alkaline Earth	
Li	•)2e⁻)1e⁻	Alkali metals	2
B	•)2e⁻)3e⁻		2
He	•)2e⁻	Noble gas	

Using the above information and the periodic table, fill in the empty boxes in the table

18. The following are statements about certain elements in the periodic table. Which statement is true?
A) Nitrogen (N) is a noble gas located in period 5.
B) Bromine (Br) is a halogen located in period 4. ✓
C) Hydrogen (H) is an alkali metal located in period 1
D) Magnesium (Mg) is an alkaline earth metal located in period 2.

19. Two elements X and Y have the following properties.

Element X	**Element Y**
Metallic lustre Two valence electrons Located in the 4th period	Without metallic lustre Three valence electrons Conducts electricity

Ca

b

Which symbols from the periodic table correspond to elements X and Y?

A) K and B B) K and C C) Ca and C D) Ca and B

20. The table below shows eight elements from the periodic table.

												B	C	N			
												Al	Si	P			
														Sb	Te		

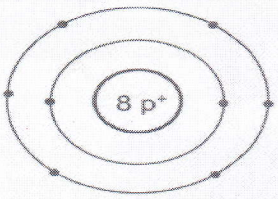
Which of the following groups of elements consists of metalloids only?

A) Al, N, Sb and Te C) B, N, P and Te

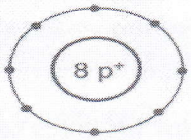
B) Al, C, P and Si D) B, Sb, Si and Te

21. Which of the following diagrams correctly represents the oxygen (O) atom according to the Rutherford-Bohr model?

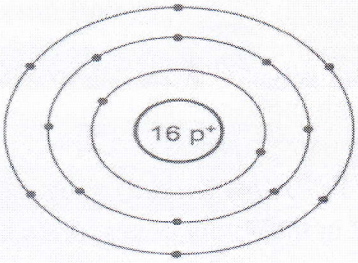
A)



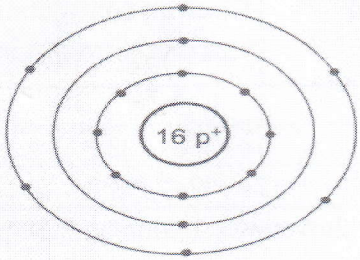
B)



C)



D)



22. The properties of four elements are listed below.

Element	Property
A	This family's elements all have two valence electrons. Alkaline Earth Metals
B	This family's element's orbits are all full. Noble Gas
C	This family's elements are used as antiseptics and disinfectants. Halogens
D	This family's metals are all highly reactive. Alkali Metals

To which chemical group does each of these elements belong? **Give full name.**