N5 Chemistry
Unit 1: Chemical Changes & Structure
Homework 1.3

1. Which of the following numbers is the same for lithium and sodium?

   A Mass number
   B Atomic number
   C Number of outer electrons
   D Number of occupied energy levels

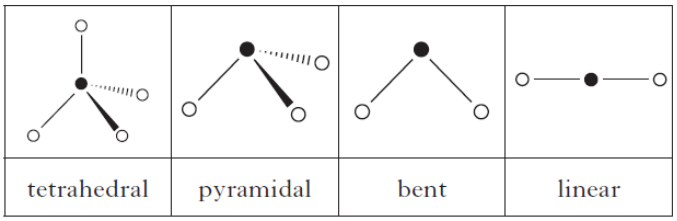
   Answer _____

2. Atoms of an element form ions with a single negative charge and an electron arrangement of 2, 8.
   The element is

   A fluorine
   B lithium
   C sodium
   D neon.

   Answer _____

3. The shapes and names of some molecules are shown below.
   Phosphine has a molecular formula PH_3.
   The shape of a molecule of phosphine is likely to be



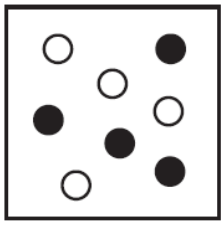
   A tetrahedral
   B pyramidal
   C bent
   D linear.

   Answer _____

4. Which of the following diagrams represents a **compound** made up of **diatomic** molecules?

   Answer _____

5. A



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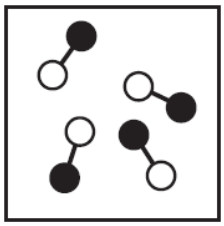

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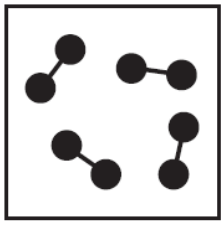

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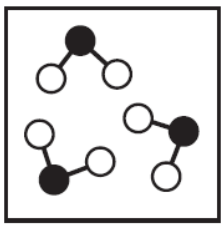


   Which of the following is a covalent substance?

   A Copper oxide
   B Potassium hydroxide
   C Aluminium carbonate
   D Silicon chloride

   Answer _____

6. The electron arrangement of a sulfide ion is the same as that of

   A Helium
   B Neon
   C Argon
   D Krypton.

   Answer _____ 6

7. Covalent substances often exist as molecules where atoms are held together by covalent bonds.

a) What is meant by a covalent bond?

_____ 1

b) Hydrogen gas is made up of diatomic molecules.

i) What is meant by the term diatomic?

_____

_____ 1

ii) Draw a diagram to show how the electrons are arranged in a molecule of hydrogen, H_2.

1

c) Molecules often have a distinct shape.
For each of the following molecules draw a diagram to show the **shape** of the molecule.

i) Methane, CH_4

ii) Nitrogen fluoride, NF_3

iii) Silicon chloride, $SiCl_4$

iv) Hydrogen sulfide, H_2S.

4

8. Atoms contain protons, neutrons and electrons. The nuclide notation of the sodium atom is:

$$^{24}_{11}Na$$

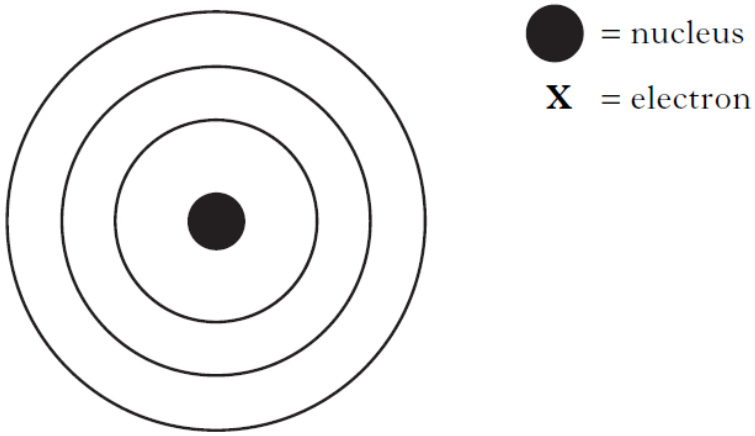
a) Complete the table to show the number of each type of particle in this sodium atom.

Particle	Number
electron	
proton	
neutron	

2

b) Electrons are arranged in energy levels.

i) Complete the diagram to show how the electrons are arranged in a sodium atom. (You may wish to use page 1 of the data booklet to help you.)



1

ii) Explain what holds the negatively charged electrons in place around the nucleus.

_____

_____ 1

c) Sodium atoms will easily form ions.

i) State the electron arrangement for a sodium ion.

_____ 1

ii) State the overall charge of a sodium ion.

_____ 1

9. There are three different types of silicon atom.

Type of atom	Number of protons	Number of neutrons
$^{28}_{14}Si$		
$^{29}_{14}Si$		
$^{30}_{14}Si$		

a) Complete the table to show the number of protons and neutrons in each type of silicon atom. 1

b) What name is used to describe these different types of silicon atom?

_____ 1

c) A natural sample of silicon has an average atomic mass of 28.11.

What is the mass number of the most common type of atom in the sample of silicon?

_____ 1

10. Complete the following table for each ion.

Ion	Number of protons	Number of neutrons	Number of electrons
$^{17}_{8}O^{2-}$	8		10
$^{7}_{3}Li^{+}$	3	4	
	12	13	10
$^{39}_{19}K^{+}$	19		
	15	16	18

6

Total Marks 28