TUTORIAL 2

N 1	
Name:	
Instructor:	

1. How many maximum orbital and electrons are permitted in each of the following subshells?

	2s	4d	6 <i>p</i>	Fifth shell	5f
Orbital					
Electron					

2. What neutral atom is presented by each of the following electron configurations:

Configurations	1s ² 2s ² 2p ⁶ 3s ² 3p ²	1 <i>s</i> ² 2 <i>s</i> ² 2 <i>p</i> ¹	1 <i>s</i> ² 2 <i>s</i> ² 2 <i>p</i> ⁶ 3 <i>s</i> ² 3 <i>p</i> ⁶ 4 <i>s</i> ¹
Atom			

- 3. A neutral atom of certain element has 20 electrons.
 - a) Write the electron configuration of the element
 - b) Classify the element
 - c) Draw an orbital diagram and determine whether the atoms these elements are diamagnetic or paramagnetic.

4. If n = 4, what are the possible values of *l* and m/?

5. Write a set of quantum numbers for the third and sixteenth electron of the Sulphur atom.

6. Aluminium, phosphorus and chlorine are different in atomic size as you go across a period from left to right in Periodic Table of the Elements. Which element has the biggest atomic radius? Explain in term of the effective nuclear charge value by showing the calculation for each of the elements.

- 7. Group the species that are *isoelectronic*: Be²⁺, F⁻, Fe²⁺, N³⁻, He, S²⁻, Co³⁺, Ar.
- 8. Which of the following elements are metals, nonmetals or metalloids?

Elements	Character
As	
Xe	
Fe	
Li	
Si	

9. Show the formation of ionic bonds between these following atoms. What are the name and formula of the compound that results?

	Barium and iodine	Aluminum and oxygen
Formation		
Name		
Formula		

10. Show the formation of covalent bonds between these following atoms. What are the name and formula of the compound that results?

	1 carbon and 2 oxygen	1 nitrogen and 3 hydrogen
Formation		
Name		
Formula		

11. Arrange the following sets of atoms in the expected order of increasing electronegativity that is from lowest to highest electronegativity value.

CI, Mg, Si, Al	P, As, N, Sb	As, Se, Br

12. Describe the differences between intramolecular forces and intermolecular forces?

13. Which of the following would you expect to have the higher melting point: Pentane, CH₃CH₂CH₂CH₂CH₂CH₃ or Diethyl ether, (CH₃CH₂)₂O? Give your reason.

14. Illustrate how hydrogen bond can be formed in CH₃OH and H₂O mixture.