SNC 2DI Exam Review: Chemistry Unit

1. Understand the meaning of the following terms. Be able to recognize their definitions:

Protons	Atomic number	Anion
Chemical Family or Group	Valence electrons	Cation
Ionic compound	Law of Conservation of Mass	Synthesis reaction
Double displacement reaction	Atomic Mass	Neutralization reaction
Neutrons	Stable Octet	Non-metal
Chemical Period	Reactants	Chemical formula
Covalent bond	Acid and its pH range Isotopes	Decomposition reaction
Precipitate	Ion	Metalloid
Electrons	Products	Ionic bond
Group Number	Base and its pH range	Single displacement reaction
Covalent Compound	Metal	

2. Compare the sub-atomic particles:

a) protons are found in the _____, have a charge of _____ and a mass of _____

b) neutrons are found in the _____, have a charge of _____ and a mass of _____

c) electrons are found in the _____, have a charge of ___ and a mass of _____

3. What do the following terms tell us about an atom?

a) atomic number: _____

b) mass number: _____

c) Group number: _____

d) neutral atom: _____

4. Complete the chart for the following atoms and ions:

Element Name	**Symbol**	**Atomic Number**	**Atomic Mass**	**# of protons**	**# of neutrons**	**# of electrons**	**Charge on Ion**
Phosphorus							
		25					
				12			
	F						
		18					
Scandium							
	Fe						
			12				
				75			

5. Complete the following chart:

	calcium	bromine	cesium	magnesium	argon	iodine
Period						
Group #						
# of valence e^-						
Group name						

6. Complete the following chart, assuming that hydrogen is a non-metal.

Chemical Formula	**Ionic or Covalent Compound?**	**Number of each type of element or ion present**
$C_2H_2F_4$		
NO_2		
$Ba(NO_3)_2$		
$C_6H_{12}O_6$		
K_2CO_3		
PBr_3		
$Sn_3(PO_4)_4$		

7. Use electron dot diagrams to show the formation of the ionic compound between the following pairs of atoms. Start with the neutral atoms, show the movement of electrons and the ions that form. Include the chemical formula of the final compound.

a) barium and oxygen **b) lithium and phosphorus**

8. Use electron dot diagrams to show the formation of the following covalent compounds. Show the bonded electron pairs as "sticks" and include all unshared electron pair.

a) PF_3 **b) CO_2**

9. Complete the following chart to compare the properties of ionic and covalent compounds:

Property	**Ionic**	**Covalent**
Made from what type of elements		
Are electrons transferred or shared?		
State at room conditions		
Melting point		
Usually has an odour?		
Dissolves in water?		
Conducts electricity when in water?		

10. Name the following ionic compounds (remember to use Roman Numerals where necessary):

Ca_3P_2

Na_2CO_3

Fe_2O_3

$PbCl_4$

BaS

$Mg(NO_3)_2$

$Co_2(SO_4)_3$

$CrBr_3$

$(NH_4)_2SO_4$

$Al(OH)_3$

$NiPO_4$

MnF_2

11. Write the chemical formulas for the following ionic compounds:

iron (II) sulfide

zinc carbonate

tin (IV) nitride

manganese (II) bromide

cobalt (III) nitrate

nickel (III) hydroxide

lead (IV) oxide

ammonium phosphate

potassium sulfate

silver iodide

aluminum phosphide

mercury (II) carbide

12. Use the prefix system to name the following covalent (molecular) compounds:

CS_2

SF_6

P_2O_3

PI_3

NH_3

CCl_4

SO

Cl_2O_5

13. Write the chemical formulas for the following covalent compounds:

dihydrogen monoxide

bromine pentafluoride

dicarbon tetrabromide

nitrogen triiodide

sulfur dioxide

dinitrogen tetroxide

diphosphorus pentoxide

xenon hexafluoride

14. How do you recognize each type of reaction?

a) synthesis has only one _____

b) decomposition has only one _____

c) in _____ displacement, one element takes the place another element in a compound

d) in _____ displacement, the ions from both compounds “change partners”

15. Balance the following chemical reactions. Classify each reaction as a synthesis, decomposition, single displacement or double displacement reaction.

Type of Reaction

a) ___ Cu + ___ O_2 → ___ Cu_2O _____

b) ___ XeF_6 + ___ H_2O → ___ XeO_3 + ___ HF _____

c) ___ Al + ___ HCl → ___ H_2 + ___ $AlCl_3$ _____

d) ___ PCl_3 + ___ H_2S → ___ P_2S_3 + ___ HCl _____

e) ___ PH_3 → ___ H_2 + ___ P _____

f) ___ Cu + ___ S_8 → ___ Cu_2S _____

g) ___ SnO → ___ Sn + ___ O_2 _____

h) ___ $Cu(NO_3)_2$ + ___ Fe → ___ $Fe(NO_3)_3$ + ___ Cu _____

16. Write the Law of Conservation of Mass. How is it related to balancing chemical equations?

17. Compare the properties of acids and bases:

Property	**Acids**	**Bases**
pH range		
Conducts electricity?		
Taste		
Colour with litmus paper		
Colour in phenolphthalein		
Colour in bromothymol blue		

18. Write the general equation that occurs when you mix an acid and base together. What is this called?

19. Refer to the information in the chart to the right.

a) the strongest acid is _____

b) the strongest base is _____

c) the weakest acid is _____

d) the weakest base is _____

e) a neutral substance is _____

f) which is stronger: hair remover or soap? _____

by how much? _____

g) which is stronger, apple juice or folic acid? _____

by how much? _____

Substance	**pH**
Red wine	3.8
Hair remover	11
Apple juice	3.0
Soap	8.0
Distilled water	7.0
Folic acid	5.0
Liquid bleach	12.4