THE COLLEGE OF THE BAHAMAS

EXAMINATION

SEMESTER 01-2007

FACULTY OF PURE AND APPLIED SCIENCES

SCHOOL OF SCIENCES AND TECHNOLOGY

X NASSAU
FREEPORT
EXUMA
ELEUTHERA

DATE AND TIME OF EXAMINATION: Friday, April 20, 2007 at 7 pm
DURATION: 2 HOURS

COURSE NUMBER: CHEM 071

COURSE TITLE: COLLEGE PREP CHEMISTRY

STUDENT NAME:

STUDENT NUMBER:

LECTURER'S NAME

INSTRUCTIONS TO CANDIDATES: This paper has 5 pages and 44 questions. Please follow instructions given.

Name: _____

SEMESTER 01-2007
CHEMISTRY 071: COLLEGE PREP CHEMISTRY FINAL

Section A: Multiple Choice

Select the single best alternative in each of the following cases and indicate your answer by marking the appropriate letter on the answer sheet according to the instruction on the sheet. There is one mark for each question in this section.

1) A mixture is:

a) A type of compound.
b) Formed with the production of much heat.
c) Two or more substances physically combined.
d) A type of molecule.

Select the correct term to describe the statements in questions 2-4

A. Homogeneous Mixture	B. Heterogeneous Mixture	C. Physical property	D. Chemical property

2) Ability of butter to melt.

3) Sugar dissolved in water

4) The ability of sodium to react with water.

5) The gases NO_2,CO_2 and SO_2 are all classified as

a) Elements
b) Compound
c) Mixtures
d) Impure substances

6) Air may be described as:

a) A solution of gases
b) A compound
c) A heterogeneous mixtures
d) Elements chemically combined.

Answer question 7-10 using the elements below

Group	1	2	3	4	5	6	7	8
	$_{11}Na$	$_{12}Mg$	$_{13}Al$	$_{14}Si$	$_{15}P$	$_{16}S$	$_{17}Cl$	$_{18}Ar$

7) All of the elements above have:

a) the same number of protons
b) the same number of electron shells
c) the same number of outer shell electrons
d) The same valency.

8) The element "P"

a) is a metal
b) has a valency of three
c) Is more reactive than element Cl.
d) Forms ionic compounds with itself

9) Which pair of elements will form an ionic compound with a one to one ratio of combination?

a) Na and S
b) Mg and S
c) Al and S
d) P and S

10) the element Na

a) has the largest atomic radius in this period
b) is the least reactive elements in this period
c) has a large radius when it becomes an ion
d) Form covalent bonds with itself.

11) An element X has 17 protons and a mass of 35 which statement is **not** correct about this element?

a) It has a valency of one.
b) It has 3 occupied electron shells
c) It is a non metal
d) It forms only covalent compounds when it reacts.

12) Which statement is correct for a single covalent bond?

a) Only one element is involved
b) Two different elements are always involved
c) Two electrons are involved one from each atom in the bond.
d) None of the above is correct.

13) Which is correct for copper(II) oxide?

a) There are two copper atoms in the formula
b) There is one oxygen atom in the formula
c) The valency of the copper is one
d) The ratio of copper to oxygen is two to one

14) Which statement describes an acid?

a) A substance with a pH above 7
b) A substance with lower hydrogen ion than hydroxide ions.
c) A substance that releases hydrogen ions in solution
d) A substance that turns red litmus blue

15) Two atoms have the same number of protons but different amounts of neutrons. Which statement is **not** correct about these atoms?

a) They are atoms of the same element
b) They have different atomic number
c) They have the same amount of electrons
d) They have the same chemical behavior

16) A characteristic of covalent compounds is

a) Strong bonds
b) Ionic bonds
c) Low melting points
d) High boiling points

17) A temperature of 373K can be expressed as

a) 173°C
b) 646°C
c) 100°C
d) -100°C

18) the term oxide is used when

a) oxygen is in free gaseous state
b) oxygen is combined with another metal
c) oxygen is given to hospital patients
d) oxygen is mixed with air

19) The pressure of a gas results from

a) Collision of molecules with each other
b) Collision of electrons with each other
c) Collision of molecules with walls of their container
d) Collision of the nucleus of molecules with electron

20) Which statement is correct about salts?

a) Sodium chloride is the only salt.
b) Salts are formed when acids react with metals.
c) All salts form neutral solutions.
d) All salts are soluble.

Please answer questions (21-40) **True or False**

21) The change in colour of indicators is a chemical change._____

22) Neutralization results in the formation of a salt._____

23) All alkalis are bases but not all bases are alkalis._____

24) Acids are corrosive substances._____

25) A strong base has pH close to 7._____

26) Reactivity increases down group 1._____

27) The most reactive non- metal is found at the bottom of group 7._____

28) The number of electrons in the outer shell helps to determine valency._____

29) A real gas is an imaginary gas._____

30) As pressure increases the volume of a gas increases at constant temperature._____

31) As temperature is increased the pressure of a gas will increase if the volume is constant._____

32) Acid salts have pHs greater than seven._____

33) Brownian motion supports the atomic theory of matter._____

34) Oxidation occurs when electrons are gained by an atom._____

35) An atom that looses electrons goes into a higher oxidation state._____

36) Metals are oxidized when they react._____

37) A spectator ion does not take part in a chemical reaction._____

38) Compounds are pure substances._____

39) Metals are found on the left of the periodic table._____

40) Alloys include physical combinations of elements._____

Section B: Structured questions

Answer all of the following questions

1) Fill in the following table (4Marks)

Symbol of Atom or ion	Name of element	Mass Number	Number of Protons	Number of Neutrons	Number of electrons	Electronic Config'n
$^{36}_{17}Cl^{-1}$				19		
			3	4		2
	aluminium				10	

2)

i. Write the chemical names of each of the following.

a) Na_2SO_4 _____

b) $Fe(OH)_2$ _____

c) HNO_3 _____

d) NH_4Cl _____

ii. Write the formula for the following compounds.

a) Ammonium sulphate _____

b) Sodium hydrogen carbonate _____

c) Copper (I) oxide _____

d) Calcium carbonate _____

iii. Write and balance the following chemical equations.

a) The combustion of copper oxide and propane gas C_3H_8 to form copper metal, carbon monoxide CO and water.

_____ (2Marks)

b) $Pb(NO_3)_{2(s)} \xrightarrow{Heated} PbO_{(s)} + NO_{2(g)} + O_{2(g)}$.

_____ (2Marks)

3) A sample of hydrogen gas occupied a volume 3dm^3 at 10°C and 2 atmosphere pressure .The temperature of the gas was lowered to 5°C and the pressure lowered to 1 atmosphere pressure. What is the new volume of the gas.

a) **List the following:**

Initial Temperature_____ Initial Pressure_____

Initial Volume_____ Final Volume_____ Final

b) Temperature_____($2_{1/2}$ Marks)

c) What law must be applied to calculate the final volume.($_{1/2}$ Marks)

_____

d) Show working and calculate the final volume of the gas.

_____
_____
_____
_____(2Marks)

4) A porcelain boat first weighed empty it's mass was found to be 3.1246g. It was then filled with a certain oxide of iron and re-weighed. Now the mass was 4.3245g. The boat was placed in a combustion tube and heated in a stream of hydrogen. After cooling the mass was found to be 3.9929g.

c) What is the weight of:

iv. iron oxide _____
v. the iron _____
vi. the oxygen _____(3Marks)

d) Calculate the percentage of iron and the percentage of oxygen in the iron –oxide.

_____
_____
_____
_____(3Marks)