University of Bahrain
College of Science
Department of Chemistry
Chemistry 101
1st Hour Exam

Date: 2nd April 2008. **Examiner: Dr. Ahmed Saad, Dr. Harvey Paige, Dr. Sadeq Al-Alawi, Dr. Saleem, Dr. Ahmed Taha, Dr. Awatef Mahdi Dr. Suad Rashdan, Mrs. Reema**

Name:---------- I.D. #---------- Sec.----------

Avogadro's No. = 6.022 x 10^{23}

Q.1 What is the total number of **protons and electrons** in Zr^{+4}.
a) 90 **b)** 45 **c)** 58 **d)** 110 **e)** 76

Q.2 What is the name of **Mn $(ClO_2)_4$**
a) Manganese Chlorate **b)** Manganese (IV) Chlorite
c) Manganese hypochlorite **d)**Manganese (IV) hypochlorate
e) Manganese (IV) perchlorate

Q.3 What is the formula of **dichlorine heptoxide**
a) ClO **b)** Cl_7O_2 **c)** Cl_2O_7 **d)** Cl_2O **e)** Cl_3O_6

Q.4 Which of the following is an alkali metal:
a) Mg **b)** Cl **c)** Ne **d)** Na **d)** Mn

Q.5 The percent composition of O in $FeSO_4.6H_2O$ is
a) 4.2% **b)** 12.3%
c) 21.5% **d)** 35.8% **e)**61.6%

Q.6 An unknown element X react with chlorine to form an ionic compound whose simplest formula is XCl_2. If X ion has 36 electrons identify the element
a) Mg **b)** Mn **c)** Sr **d)** Co **e)** Ca

Q.7 What is the mass of Al in 30.91 g of $Al_2 (SO_4)_3$
a) 4.88 g **b)** 2.44 g **c)** 12.32 g **d)** 1.68 g **e)** 9.76 g

Q.8 What is the number of atoms of S in 4.95 mole of Fe_2S_3
a) 2.98 x 10^{24} atoms **b)** 8.94 x 10^{24} atoms
c) 7.66 x 10^{21} atoms **d)** 1.49 x 10^{24} atoms
e) 5.41 x 10^{25} atoms

Q.9 In balancing the following equation

$$Ca\ O_{(s)} + Na_3P_{(s)} \rightarrow Ca_3P_{2(s)} + Na_2O_{(s)}$$

The sum of all coefficients are

a) 5 **b)** 6 **c)** 7 **d)** 4 **e)** 9

Q.10 4.20g of Cobalt (Co) react with excess of phosphorous (P) according to the equation

$$3Co_{(s)} + 2P_{(s)} \rightarrow Co_3P_{2(s)}$$

What mass of product should be obtained

a) 1.89 g **b)** 5.67 g **c)** 7.88 g **d)** 3.99 g **e)** 17.01 g

Q.11 0.10 mole of Cl_2 react with 1.62 g of Aluminum Al according to the equation

$$4Al_{(s)} + 3Cl_{2(g)} \rightarrow 2Al_2\ Cl_{3(s)}$$

What is the limiting reactant and find what is the number of moles of excess reactant remained at the end of the reaction:

a) Al ; 0.015 mole **b)** Al ; 0.105 mole
c) Cl_2 ; 1.1 mole **d)** Al ; 0.055 mole
e) Both reactants are equally consumed

Q.12 What is the mass, in grams, of one Copper (Cu) atom:

a) 1.055×10^{-22} g **b)** 63.55 g **c)** 1g
d) 1.87×10^{-22} g **e)** 8.63×10^{-23} g

Q.13 Boron, a metalloid named after the Arabic word, Buraq, has two isotopes, Boron–10 (10.013 amu) and Boron–11 (11.009 amu). What is the percentage of Boron-10 ?

a) 19.97 % **b)** 36.42 % **c)** 45.65 % **d)** 25.42 % **e)** 85.92 %

Q.14 The percent composition by mass of a compound is 40.00%, C; 6.67% H; and 53.33% O. What is the simplest formula of the compound?

a) $C_3H_{10}O$ **b)** CH_2O **c)** CH_4O **d)** C_2H_6O **e)** $C_{10}H_{36}O_2$

Q.15 Titanium metal is prepared as follows:

$$TiCl_{4(g)} + 2\ Mg_{(\ell)} \rightarrow Ti_{(s)} + 2MgCl_{2(\ell)}$$

If 3.54 g of $TiCl_4$ are reacted with excess Mg. 0.791 g of Ti were obtained. What is the percent yield of the reaction:

a) 9.83% **b)** 88.5% **c)** 71.0% **d)** 65.0% **e)** 86.64%