Chemistry 111-2012 NAME: _____
Vining; 9/24/2012 Exam #1 Exam Version 24
Q 1-20 = 4 points; Q 21-22 10 points each

Record answers both here and on Answer Sheet.
Hand in only the Answer Sheet.

Molar masses: $Cr_2(CO_3)_3$ = 284.01 g/mol $MgCO_3$ = 84.31 g/mol CaO = 56.08 g/mol

Fe_2O_3 = 159.69 g/mol $C_3H_8O_2$ = 76.09 g/mol Cr_2O_3 = 151.99 g/mol

Avogadro's number = 6.022×10^{23}

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1. You make some tea using a tea bag. Some tea dissolves, but some of the little leaves leak out and are floating around in the liquid. The result is a:

a) pure compound b) pure element

c) homogeneous mixture d) heterogeneous mixture

2. The atomic number of Si is:

a) 28 b) 14 c) 42 d) 58 e) none of these

3. The mass number of the only stable isotope of manganese, Mn is:

a) 25 b) 30 c) 55 d) 110 e) none of these

4. The species $^{36}S^{2-}$ has:

a) 35 protons, 35 neutrons, and 35 electrons.

b) 16 protons, 17 neutrons, and 17 electrons.

c) 16 protons, 20 neutrons, and 18 electrons.

d) 18 protons, 18 neutrons, and 16 electrons.

e) 20 protons, 16 neutrons, and 18 electrons.

5. An atom becomes a cation by: *v24*

a) gaining protons b) losing protons

c) gaining electrons d) losing electrons

6. Which ionic compound listed below does *not* have a correct formula?

a) K_2O b) $Al(NO_3)_3$ c) $Ba(OH)_2$

d) $MgSO_4$ e) $SrPO_4$

7. The elements C and Si are in the same periodic _____ and the elements O and N are in the same periodic _____ .

a) group, family b) period, group c) group, period d) period, block

8. The element iridium has two staple isotopes:

^{191}Ir Mass = 190.96 amu
^{193}Ir Mass = 192.96 amu

Which isotope is more abundant?

a) Ir-191 b) Ir-193 c) they are equal d) can't be answered

9. The relationship between O_2 and O_3 is that they are…

a) isotopes b) enantiomers c) allotropes d) elementopes e) no relationship

10. The molar mass of $Ca(NO_3)_2$ is

a) 102.1 g/mol b) 134.3 g/mol c) 164.1 g/mol d) 172.6 g/mol

11. What kind of compound will be formed between the elements Mg and Br? *v24*

a) ionic b) molecular covalent c) extended covalent d) alloy

12. How many F **atoms** are there in a 68.9-g sample of F_2?

a) 68.9 b) 137.8 c) 1.09×10^{24} d) 2.18×10^{24} e) 4.37×10^{24}

13. What is the percent mass of carbon (to two significant figures) in $C_3H_8O_2$?

a) 12% b) 23% c) 27% d) 47% e) none of these

14. A compound has the empirical formula CH_2O and a molar mass of 120.10 g/mol. What is the molecular formula?

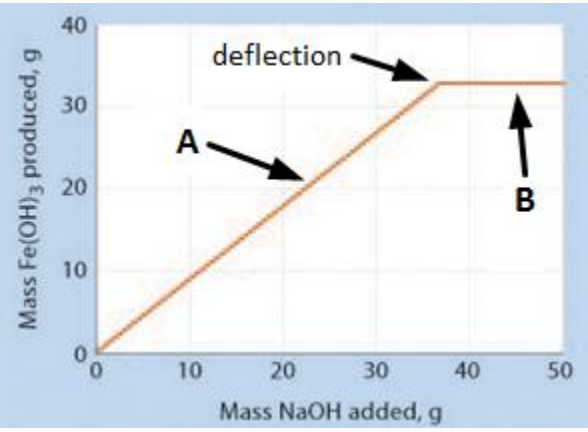
a) PCl_2F b) $C_3H_6O_3$ c) $C_4H_8O_4$ d) CH_2O e) none of these

15. Consider the reaction, $P_4 + 6\ Cl_2 \rightarrow 4\ PCl_3$

If 3.5 mol of P_4 react, how many moles of PCl_3 can be formed?

a) 4 b) 3.5 c) 14 d) 6 e) 11

16. An experiment is performed where NaOH is slowly added to 50.0 g $FeCl_3$. The reaction that occurs produces $Fe(OH)_3$. The plot below shows the mass of $Fe(OH)_3$ produced as a function of the mass of NaOH added. **Choose two correct statements. Circle both on the answer sheet.**



a) at point A, $FeCl_3$ is the limiting reactant

b) at point A, NaOH is the limiting reactant

c) adding more $FeCl_3$ will move the deflection point to the right

d) adding more NaOH will move the deflection point to the right