

Chem 110, First Exam

Time : 90 min

2011 - 1st term

**Model (C)**

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| Name:  Number:  Section: | Useful information: |

With the best wishes

***General Chemistry Team work***

**Directions:**  for each of the following question, choose the letter that best answers the question and place it on your answer sheet

[1] Which of the following is metal

1. **Sc**
2. Si
3. S
4. Se

[2] Mole (mol) is the SI base unit of

1. mass
2. length
3. **amount of substance**
4. electrical current

[3] The SI prefixes *giga* and *micro* represent, respectively:

1. 10-9 and 10-6
2. 10-9 and 10-3
3. 103 and 10-3
4. **109 and 10-6**

[4] Express 1 × 10-8 cm as nanometers?

1. 1 × 10-19 nm
2. 1 × 10-15 nm
3. **1 × 10-1 nm**
4. 1 × 10-10 nm

[5] Which of the following is ionic compound

1. SCl2
2. SiCl4
3. PCl3
4. **CaCl2**

[6] Calculate the percent of nitrogen in Ca(NO3)2

1. 12.01%
2. **17.10%**
3. 18%
4. 16%

 [7] What is the mass, in grams, of three atoms of Ca?

1. **1.99 × 10-22 g**
2. 40.08 g
3. 1 amu
4. 6.022 × 1023 g

[8 ] What is the number of moles of oxygen atoms in 5 mol of SO2

1. 5
2. 20
3. **10**
4. 4

[9] A piece of nickel (Ni) metal weighing 194.3 g is placed in a graduated cylinder containing 242.0 mL of water. The volume of water now reads 260.5 mL. From these data calculate the density of nickel.

1. **10.5 g/cm3**
2. 1.25 g/cm3
3. 0.746 g/cm3
4. 21.0 g/cm3

[10] What temperature is 113 °C when converted to kelvin?

1. 160 K
2. 239 K
3. 45 K
4. **386 K**

[11] A sample of acid compound contains 40.1 percent of C, 6.6 percentof H, and 53.3 percent of O. The molar mass of this compound is 60 g/mol. What is the molecular formula of the compound?

1. C5H6O
2. C2HO2
3. **C2H4O2**
4. CH2O4

[12] What is the coefficient of H2O when the equation is balanced with the smallest numbers?

\_\_\_ Al4C3 + \_\_\_ H2O → \_\_\_ Al(OH)3 + 3 CH4

1. 3
2. 4
3. 6
4. **12**

[ 13] How many grams of CS2 in 1.55 mol of CS2?

1. 11.82 g
2. 621.20 g
3. **118.02 g**
4. 261 g

[14] Calculate the molarity of 2.00 g of NaOH in 200 ml of solution?

1. 520 M
2. **0.250 M**
3. 5.20 M
4. 0.520 M

[15] The Stock system name for Cr2O3 is

* 1. **chromium(III) oxide.**
  2. dichromium trioxide.
  3. chromium(VI) oxide.
  4. chromium(II) oxide.

[16] There are three isotopes of uranium, differing with respect to

1. number of electrons
2. atomic number
3. number of protons
4. **mass number**

[17] Which of the following prefixes is not correct?

1. Kilo- k 103
2. micro- µ 10-6
3. **nano- n 109**
4. milli- m 10-3

[18] The nucleus of a radon atom () contains:

1. 222 protons and 222 neutrons
2. **86 protons and 136 neutrons**
3. 86 protons and 86 electrons
4. 86 neutrons and 86 electrons

[19] The following species: , , and  all have the same number of:

1. **electrons**
2. neutrons
3. protons
4. Isotopes

[20] Sulfur (16S) element is:

1. a nonmetal
2. found in groups A
3. found in a period 3
4. **all the above**

[21] Name the following ions respectively: Mn2+ , F- , NO2-

1. magnesium(II) , francium , nitrate
2. **manganese(II) , fluoride , nitrite**
3. manganese(II) , fluorine , nitride
4. manganese , fluoride , nitrate

[22] Consider the reaction:

4NH3(g) + 5O2(g) → 4NO(g) + 6H2O(g).

If 150. g of ammonia and 150. g of oxygen gas react, what is the percent yield of nitric oxide (NO)? ( The actual yield of nitric oxide (NO) is 87 g)

1. **77%**
2. 100%
3. 49%
4. 33%

[23] How many moles of LiClO3 are there in 250 ml of a 1.76 M solution?

1. 0.045 mol
2. **0.440 mol**
3. 0.341 mol
4. 0.407 mol

[ 24] What is the mass in grams of Silicon (Si) that can react with 31.5g of Chlorine to produce SiCl4?

Si(*s*) + 2Cl2(*g*) rx SiCl4(*l*)

1. 53.2 g
2. 66.1 g
3. 5.32 g
4. **6.209 g**

[25 ] What volume, in mL, of a 0.250 M solution is required to provide 0.0600 mol of NaOH?

1. **240 mL**
2. 8 mL
3. 0.8 mL
4. 800 mL

[26] A 100 ml sample of 16.5 M HF is diluted to a final volume of 350 ml. What is the molarity of the final solution?

1. 6.3 M
2. 6.0 M
3. 3.2 M
4. **4.7 M**

[27] How many grams of NaOH are required to prepare a 4.0×102 ml solution whose concentration is 0.9 M?

1. **14.4 g**
2. 69 g
3. 0.36 g
4. 0.144 g

[ 28] Determine the number of moles of silver (Ag ) atoms that present in 427.3 g of Ag.

1. 5.432 mol
2. 4.891 mol
3. **3.960 mol**
4. 7.02 × 10-23 mol

[29] At what temperature does the numerical reading on a Celsius thermometer (0C) equal that on a Fahrenheit thermometer (0F)?

1. 0 °C
2. **–40 °C**
3. 100 °C
4. –32 °C

[30] Which of the following is an empirical formula?

1. C12H22O10
2. **H2SO4**
3. Hg2Cl2
4. S8