MC, Chem2, Sum 18, Test1 $36-0=36$ $\frac{72}{108}$ $\frac{108}{108}$ Name

Please read all the questions VERY carefully before answering. On scantron start from the same bubble number as the question number for your multtiple choice question. Write neatly. If I cannot read your answer, you will not receive any point. Use the attached periodic table and constant chart. No outside paper is allowed. Total points = 36 + (24x3=)72 = 108

SHORT ANSWER. In all calculations, write the set up equation first, then put the raw data with units. Then do your calculations. Points will be deducted if your answer is not clearly written.

1) Show calculations with units to convert 16.32 pounds (lb) into grams (g) (given 1 kg = 2.205 lb and 1 kg = 1000g). (6 pts.)   1) ___7401 g___

$$\frac{16.32\ lb}{1} \times \frac{1 kg}{2.205\ lb} \times \frac{1000 g}{1 kg}$$
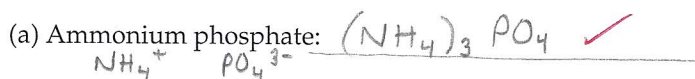
$$= 7,401.3605\ g$$

$$= \boxed{7401\ g} \checkmark$$

2) Chlorine has two isotopes: Cl- 35 wih natural abundance 75.77% and mass of 34.97 amu and another one Cl- 37 with natural abundance 24.23% and mass 36.97 amu. Calculate the atomic mass of chlorine with correct unit (6 pts.).   2) ___35.45 amu___

Atomic mass = (fraction of isotope #1 × mass of isotope #1) + fraction of isotope #2 × mass #2)

$$= (.7577 \times 34.97\ amu) + (.2423 \times 36.97\ amu)$$

$$= 26.496769\ amu + 8.957831$$

$$= 35.4546\ amu$$

$$= \boxed{35.45\ amu} \checkmark$$

3) Write the formula for (4ts. each; Total 12 pts.):   3) _____

(a) Ammonium phosphate: $(NH_4)_3 PO_4$ $\checkmark$
     NH_4^+ PO_4^{3-}

(b) Cadmium Sulfite: $Cd SO_3$ $\checkmark$
     Cd^{2+} SO_3^{2-}

(c) Lead (IV) hydrogen carbonate: $Pb(HCO_3)_4$ $\checkmark$
     Pb^{4+} HCO_3^-

4) Write the names for the following compounds(4ts. each; Total 12 pts.):   4) _____

(a) $Co^{2+}(HSO_4^-)_2$: cobalt (II) hydrogen sulfate $\checkmark$

(b) $Al_2^{3+}(CrO_4^{2-})_3$: aluminium chromate $\checkmark$

(c) P_2O_5: diphosphorus pentaoxide $\checkmark$

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MULTIPLE CHOICE. On scantron start from the same bubble number as the multiple choice question number. Choose the one alternative that best completes the statement or answers the question (3 pts. each).

5) What color of visible light has the longest wavelength? *lowest energy*

A) green   B) blue   C) red   D) violet   E) yellow

5) ___C___

6) The n = 1 shell contains ___0___ p orbitals. All the other shells contain ___3___ p orbitals.

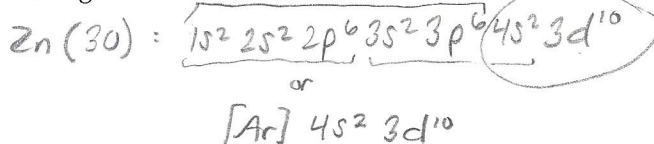A) 6, 2   B) 3, 6   C) 3, 3   D) 0, 6   E) 0, 3

6) ___E___

7) The 3p subshell in the ground state of atomic xenon contains _____ electrons. $1s^2$

A) 2   B) 6   C) 8   D) 10   E) 36

7) ___B___

$Xe(54) \rightarrow 1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6$

8) The ground state electron configuration for Zn is _____.

A) $[Ar]3s^2 3d^{10}$
B) $[Kr]4s^2 3d^{10}$
C) $[Ar]4s^2 3d^{10}$
D) $[Ar]4s^1 3d^{10}$
E) $[Kr]3s^2 3d^{10}$

$Zn(30) = 1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10}$

or

$[Ar]\ 4s^2 3d^{10}$

8) ___C___

9) The elements in the _____ period of the periodic table have a core- electron configuration that is the same as the electron configuration of neon.

A) first   B) second   C) third   D) fourth   E) fifth
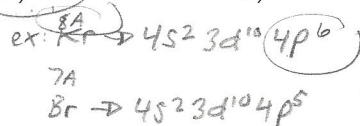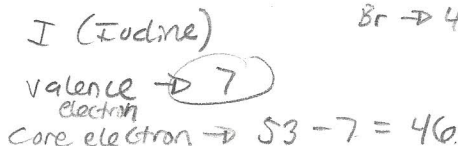
?

9) ___C___

10) Elements in group _____ have a np^6 electron configuration in the outer shell.

A) 5A   B) 6A   C) 4A   D) 8A   E) 7A

$ex: Kr \rightarrow 4s^2 3d^{10} 4p^6$ 8A
7A

10) ___D___

11) How many valence electrons are in a iodine atom?

A) 7
B) 17
C) 1
D) 10
E) none of the above

I (Iodine)

valence $\rightarrow$ 7 electron

Core electron $\rightarrow$ 53 - 7 = 46

$Br \rightarrow 4s^2 3d^{10} 4p^5$

11) ___A___

12) Which state of matter has indefinite shape and is compressible?

A) plasma
B) liquid
C) solid
D) gas
E) none of the above

12) ___D___

13) How would you classify tea?

A) pure substance- element
B) mixture- heterogeneous
C) mixture- homogeneous
D) pure substance- compound
E) none of the above

13) ___C___

14) Which of the following elements has an atomic number of 4?   14) __C__
   A) He
   B) H
   C) Be
   D) C
   E) none of the above

15) What is the atomic symbol for silver?   15) __A__
   A) Ag
   B) Au
   C) Si
   D) S
   E) none of the above

Silicon

16) The names of the elements whose symbols are Si, P, Mn, and S are respectively,   16) __E__
   A) silicon, phosphorus, magnesium, and sulfur.
   B) silicon, potassium, magnesium, and sulfur.
   C) silicon, potassium, magnesium, and sodium.
   D) silver, phosphorus, magnesium, and sulfur.
   E) silicon, phosphorus, manganese, and sulfur.

17) Nonmetals are located where on the periodic table?   17) __D__
   A) left side
   B) middle
   C) zig- zag diagonal line
   D) right side
   E) none of the above

18) What is the formula for an ionic compound made of magnesium and sulfur?   18) __B__
   A) MgS_2
   B) MgS
   C) Mg_2S_3
   D) Mg_2S
   E) none of the above

Mg^{2+} $S^{2-} \rightarrow MgS$

19) How many protons and neutrons are in Cl- 37?   19) __D__
   A) 37 protons, 17 neutrons
   B) 17 protons, 37 neutrons
   C) 20 protons, 17 neutrons
   D) 17 protons, 20 neutrons
   E) none of the above

Cl
protons $\rightarrow$ 17
neutrons $\rightarrow$ 37 - 17 = 20

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20) A specific isotope of an element is known to have 15 protons and 16 neutrons. Which symbol would properly represent this isotope?   20) __C__

A) $^{16}_{15}X$

B) $^{31}_{16}S$

C) $^{31}_{15}P$

D) $^{15}_{31}Ga$

E) none of the above

(handwritten: $^{31}_{15}$ P, N)
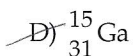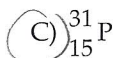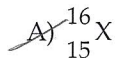
TRUE/FALSE. In scantron fill the circle "A" for a True answer and "B" for False answer (3 pts. each).

21) The decimal number 0.0000010 expressed in scientific notation is 1.0×10^6.   21) __B__

(handwritten: X)

22) The number 0.010100 has <u>five</u> significant figures.   22) __A__

23) When the number 65.59 is rounded to contain 2 significant figures, it becomes 66.0.   23) __B__

(handwritten: 6.6×10^1)

? 24) The gold foil experiment proved that large regions of the atoms consisted of empty space.   24) __A__

25) The charges on electrons and <u>neutrons</u> cancel each other to give neutral atoms.   25) __B__

(handwritten: protons)

26) Isotopes are atoms of the same element that have a different numbers of neutrons.   26) __A__

27) The ionic compound that forms between aluminum and oxygen is AlO.   27) __B__

(handwritten: Al^{3+} O^{2-} $\rightarrow Al_2O_3$)

28) SO_2 is an ionic compound.   28) __B__

(handwritten: covalent)

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