KEY

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 = 38 + (18x3=)54 = 92

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 and sig. fig.to convert 16.32 gallon (gal) into milliliter (mL) (given 1 gal = 3.785 L and 1 L = 1000 mL). (6 pts.)

1) 6.177×10^4 mL

$$16.32 \text{ gal} \times \frac{3.785 \text{ L}}{1 \text{ gal}} \times \frac{1000 \text{ mL}}{1 \text{ L}} = 61771.2 \text{ mL}$$

2) Calculate (with units and sig fig) how many in^3 are in 2.20 cm^3 (1 in = 2.54 cm.)? (8 pts.)

2) $0.134 \ in^3$

or

$1.34 \times 10^{-1} \ in^3$

$$2.20 \text{ cm} \times \frac{1 \ in^3}{(2.54 \text{ cm})^3} = \frac{2.20 \ in^3}{16.387064} = 0.134352237$$

$$0.134$$

3 sig fig $(2.54)^3 = 16.387064$

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

3) _____

(a) Aluminum phosphate: $Al^{3+} PO_4^{3-}$ → $AlPO_4$

(b) Calcium Sulfite: $Ca^{2+} SO_3^{2-}$ → $CaSO_3$

(c) Gallium pentachloride: $GaCl_5$

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

    (a) $Ca(HSO_4)_2$: Calcium Bisulfate / calcium Hydrogen sulfate

    (b) $Al_2(CrO_4)_3$: Aluminum Cromate

    (c) $Co(ClO_4)_2$: cobalt (II) perchlorate

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 is the electron configuration for Ga?   5) _____
    A) $1s^2 2s^2 2p^6 3s^2 3p^5 3d^{10} 4s^2 4p^1$
    B) $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2 4p^6$
    C) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^1$
    D) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 4d^{10} 4p^1$
    E) none of the above

6) How many core electrons are in a chlorine atom?   6) _____
    A) 7
    B) 1
    C) 17
    D) 10
    E) none of the above

7) How many valence electrons are in a chlorine atom?   7) _____
    A) 7
    B) 17
    C) 1
    D) 10
    E) none of the above

8) Chlorine and bromine have very similar chemical properties. This is best explained by the fact that   8) _____
both elements
    A) are gases.
    B) have equal number of protons and electrons.
    C) are in period 3 of the Periodic Table.
    D) have the same number of valence electrons.
    E) none of the above

9) Which state of matter has indefinite shape and is compressible?   9) _____
    A) plasma
    B) liquid
    C) solid
    D) gas
    E) none of the above

10) How would you classify salt water?
    A) pure substance-element
    B) mixture-heterogeneous
    C) mixture-homogeneous
    D) pure substance-compound
    E) none of the above

10) _____

11) An atom containing 7 protons, 8 neutrons, and 7 electrons
    A) is an ion.
    B) cannot exist.
    C) is charge-neutral.
    D) is an oxygen atom.
    E) none of the above

11) _____

12) Which of the following elements has only 12 protons?
    A) O
    B) C
    C) Zn
    D) Mg
    E) none of the above

12) _____

13) The names of the elements whose symbols are Si, P, Mn, and S are respectively,
    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.

13) _____

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

14) _____

15) What is the formula for an ionic compound made of magnesium and sulfur?
    A) MgS_2
    B) MgS $Mg^{2+} \ S^{-2}$
    C) Mg_2S_3
    D) Mg_2S
    E) none of the above

15) _____

16) What is the name of the compound made from lithium and oxygen?
    A) lithium oxide
    B) oxygen lithide
    C) lithium dioxide
    D) lithium(I) oxide
    E) none of the above

16) _____

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17) The correct number of significant figures in the number 0.002320 is: 17) _____
   A) 3
   (B) 4
   C) 7
   D) ambiguous
   E) none of the above

18) Determine the answer to the following equation with correct number of significant figures: 18) _____
   (4.123 × 0.12) + 24.2 = _____
   (A) 24.7
   B) 24.695
   C) 24.70
   D) 25
   E) none of the above

$(0.49476) + (24.2) = 24.69476$

TRUE/FALSE. In scantron fill the circle "A" for a True answer and "B" for False answer (3 pts. each).

19) The charges on electrons and ~~neutrons~~ *protons* cancel each other to give neutral atoms. 19) _B_

20) Isotopes are atoms of the same element that have a different numbers of neutrons. 20) _A_

21) The ionic compound that forms between aluminum and oxygen is AlO. *Al_2O_3* 21) _B_

22) SO_2 is an *covalent* ionic compound. 22) _B_