PSU Chem 101

Term-241 Midterm

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خاص بالمشتركين فقط

Qustion1: (13.5 points each 0.75) Choose the best answer:

1. An empty container has a mass of 12.333 g After being filled with gas, the mass increased to 12.543 g. Calculate twice the mass of the gas added to the container. (apply the rules of significant figures).
   A) 0.21 g
   B) 0.210 g
   C) 04 g
   D) 0.420 g

2. How would you describe the relation of the following hits in terms of accuracy and precision:
   1) Accurate but not precise
   2) Precise but not accurate
   3) Both accurate and precise
   4) Neither accurate nor accurate,

3. What type of chemical bond is formed by the sharing of electrons between two atoms?
   A) Covalent bond
   B) Ionic bond
   C) Physical bond
   D) All the above4.

4. The heavy components of an atom are:
   A) Protons and electrons
   B) Neutrons and electrons
   C) Protons
   D) protons and neutrons

5. *The formula of ionic compound resulted from the combination of mercury (1) and bromine is?*
   A) Hg_2Br_2.
   B) $HgBr$
   C) $HgBr$
   D) Hg_2Br

6. *Which of the following is an isotope of* ^{32}S*?*
   A) $^{32}S^-$
   B) $^{32}S^{-2}$
   C) ^{31}P
   D) ^{34}S

7. *The name of* $Mg(OH)_2$ *is?*
   A) Magnesium (II) hydroxide
   B) Magnesium hydroxide
   C) Magnesium dihydroxide
   D) Mono magnesium dihydroxide

8. *An unknown element* (X^+) *has the mass number of 226 and contains 87 electrons, determine the number of neutrons?*
   A) 138
   B) 139
   C) 137
   D) 88

9. Which of the following is expected to behave as weak electrolyte?

A) Ethanol (C_2H_5OH)

B) Carbonic acid (H_2CO_3)

C) Barium sulphate ($BaSO_4$)

D) Ammonium sulphate, $(NH_4)_2SO_4$.

10. Which of the following is the correct unit of molarity?

A) mol/L

B) g/L

C) L/mo

D) g/mol

11. Water is widely used as a solvent for a variety of ionic compounds because it is:

A) Polar solvent

B) Nonpolar solvent

C) Pure solvent

D) Ionic solvent

12. You are given the following equation:

$$A + 2B \rightarrow 3C + D = 5$$

If the mass of A = 1g, mass of B = 5 g, and mass of C = 2g, Determine the mass D:

A) 5 g

B) 4 g

C) 6 g

D) 1 g

13. The empirical formula of Cl_2O_5 is

A) $Cl\,O_{2.5}$

B) Cl_4O_{10}

C) Cl_2O_5

D) None of the above

14. The value of 15 m in nanometer (nm) is:

A) $1.5 \times 10^{9} nm$

B) $1.5 \times 10^{-9} nm$

C) $1.5 \times 10^{10} nm$

D) $1.5 \times 10^{-10} nm$

15. A substance has the molar mass of 44 g/mol, which of the following material(s) could represent a possible structure of this substance:

A) CO_2

B) N_2O

C) NO_2

D) A and B

16. Which of the following elements is classified as an alkaline earth metal?

A) C

B) Na

C) Ca

D) Fe

17. What is the common factor between H_2SO_4 and HCI?

A) Both are strong bases

B) Both are weak bases

C) Both are strong acids

D) Both are weak acids

18. To balance a chemical equation, it is allowed to change:

A) The subscripts of the substances

B) The coefficients of the substances

C) Both the subscripts and the coefficients

D) The chemical formulas of the substances

Question 4 : Answer the following questions and provide a detailed solution showing all steps

1) If 873 g of FeI_3 is dissolved in enough water to make 0.6 M, determine the volume of this solution.

2) Iron (III) oxide reacts with carbon to produce Iron and carbon dioxide according to the following BALANCED equation:

$$2Fe_2O_3(s) + 3C(s) \rightarrow 4Fe(s) + 3CO_2(g)$$

A) If 79.9 g of Fe_2O_3 reacted with 14 g of C, indicate the limiting reactant (show the details of your calculations)?

B) Determine the mass of Fe produced from this reaction?

3) Complete and **balance** the following precipitation reaction: (97-136-593-31-2018

$$Li_2SO_4(aq) + AgNO_3(aq) \rightarrow \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots + \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots$$

4) Answer the following questions concerning a 100 g sample of SO_3

A) Determine precent composition by mass of Sulfur (S) in sulfur dioxide SO_3 is?

B) Determine the number of molecules of SO3 in this sample