Chem 1110

Midterm 1

100 points

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Name_____

Instructions:

This is a closed book, closed notebook test. You may not discuss this exam with anyone, either during or after the exam, until it has been graded and returned to you in class. You may not use any outside materials - including Periodic Tables - on this exam, <u>except</u> a single 3" x 5" index card and an English-foreign language dictionary if necessary. You may use a calculator to help you compute the correct answer but may not retrieve or view any reference materials that may be stored in your calculator.

Each question is worth 4 points. All questions are of equal value. Select the best single answer of those available.

1. A chemist is given an unknown gas sample. Which observation describes a chemical property of the sample?

A. When a lit match is inserted in a container of the gas, the match goes out.
B. The gas has a sharp, stinging odor.
C. It is colorless.
D. It's density is greater than that of air.
E. It weighs 11.2 grams.

2. Which of the following causes a chemical change?

A. Winding an alarm clock
B. Turning on a flashlight
C. Slicing a tomato
D. Digging a hole in the ground
E. Pumping gasoline

3. Barium sulfate is a white, crystalline solid that metls at 1580°C and that decomposes at 1600°C. At a temperature of 500°C a sample of barium sulfate will be a

A. Colorless liquid
B. Yellow liquid
C. White crystalline solid
D. White cloud of vapor
E. Its physical state can not be determined from the information provided

4. Which of the following is a pure substance?

A. Root beer
B. Bleach
C. Eggs
D. Gasoline
E. Neon

5. Which of the following observations demonstrates that a sample of solid material is a compound?

A. Crushing the sample does not affect its other properties
B. Heating the substance causes no visible color change
C. Heating the substance causes it to melt, then eventually to boil
D. It cannot be broken down into simpler substances by physical means
E. It cannot be broken down into simple substances by chemical means

6. A reddish powder is heated gently in a loosely covered container. While heating the powder, a silvery metal appears in the container, and if a glowing (smoldering) wooden splinter is carefully placed within the container it bursts into flame. The original substance is a (an) _____ and the substances produced by the heating are probably _____.

A. Element, compounds
B. Compound, elements
C. Compound, mixtures
D. Mixture, elements
E. Mixture, compounds

7. Which of the following chemical symbols represents a metallic element?

A. Ar
B. Br
C. Ca
D. Kr
E. P

8. Which of the following represents the largest unit?

A. Deciliter
B. Dekaliter
C. Kiloliter
D. Megaliter
E. Milliliter

9. Which value is closest to the mass of a 2 pound box of laundry detergent? (Note: 1.000 lb = 453.6 g)

A. 1 kg
B. 200 g
C. 2.0×10^{-4} cg
D. 9×10^{9} mg
E. 4.5×10^{3} ng

10. The amount of matter in an object is its

A. Density
B. Specific gravity
C. Volume
D. Weight
E. Mass

11. Which of the following numbers contains at least four significant figures?

A. 230,110
B. 23,011.0
C. 0.23010
D. 0.0230100
E. 0.002301

12. In scientific notation the number 0.0046 is expressed as

A. 46×10^{-3}
B. 4.6×10^{-3}
C. 4.6×10^{-2}
D. 4.6×10^{-1}
E. 46×10^{-1}

13. An adult weighing 145 pounds takes a 200. mg quinine tablet. The dosage in µg of drug per kg of body weight is

A. 1.38×10^{6}
B. 1.60×10^{3}
C. 3.04×10^{3}
D. 4.41×10^{5}
E. 15.2

14. What is the Farenheit temperature if it is -10.0°C?

A. 263°F
B. 26°F
C. 14°F
D. -6°F
E. -18°F

15. A nugget of pure gold weighs 2.20 kg. If the density of pure gold is 19 g/cm3, what is the volume of the nugget?

A. 0.116 cm^3
B. 8.60 cm^3
C. 11.6 cm^3
D. 116 cm^3
E. 8600 cm^3

16. Calculate the density of the organic solvent cyclohexane is a 50.0 g sample has a volume of 64.3 mL.

A. 114.3 g/mL
B. 14.3 g/mL
C. 1.29 g/mL
D. 0.778 g/mL
E. 0.322 g/mL

17. Where is most of the mass of an atom concentrated?

A. Nucleus
B. Protons
C. Neutrons
D. Electrons
E. Orbitals

18. How many neutrons does an atom of ^{46}Ti have?

A. 22
B. 24
C. 46
D. 68
E. None of the above answers is correct

19. An isotope with 15 protons and 17 neutrons will have which of the following symbols?

A. $^{32}_{17}Cl$
B. $^{17}_{15}Cl$
C. $^{17}_{15}P$
D. $^{32}_{15}P$
E. $^{32}_{17}P$

20. An imaginary element Xq consists of two isotopes having masses of 100.0 amu (20.0%) and 102.0 amu (80.0%). The atomic weight of Xq would be

A. 100.2 amu
B. 100.4 amu
C. 101.0 amu
D. 101.6 amu
E. None of the above answers is correct

21. Which of the following elements is most likely to have chemical properties similar to those of bromine?

A. S
B. Se
C. Kr
D. Te
E. I

22. Which group contains only d-block elements?

A. Ni, Pd, Pt
B. Si, Ge, As
C. Ce, Pr, Nd
D. Kr, Xe, Rn
E. Po, Fr, Ac

23. How many electrons can occupy the shell with a principle quantum number of 4?

A. 18
B. 32
C. 50
D. 4
E. 16

24. What is the electron configuration of S?

A. $1s^2 2s^2 2p^2$
B. $1s^2 2s^2 2p^6 3s^2 3p^2$
C. $1s^2 2s^2 2p^6 3s^2 3p^4$
D. $1s^2 2s^2 2p^6 3s^2 3p^6$
E. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 4d^1$

25. The number of valence electrons in an element with the electron configuration $1s^2 2s^2 2p^6 3s^2 3p^4$ is

A. 2
B. 4
C. 6
D. 8
E. 16

Answers Chem 1110 MT1

1. A
2. B
3. C
4. E
5. D
6. B
7. C
8. D
9. A
10. E
11. E
12. B
13. C
14. C
15. D
16. D
17. A
18. B
19. D
20. D
21. E
22. A
23. B
24. C
25. C