Exam2

Multiple Choice
Identify the letter of the choice that best completes the statement or answers the question.

____ 1. Which of these is the correct Lewis dot structure for chlorine?

a. 

b. 

c. 

d. 

e. 

____ 2. How many moles nitrogen atoms are in 12 moles of NH_4NO_3?
a. 6 mole
b. 12 moles
c. 14 moles
d. 24 moles
e. 28 moles

____ 3. Which of these contains polar bonds but is a nonpolar molecule?

I. NCl_3
II. H_2
III. CO_2
IV. BF_3

a. I only
b. I and III
c. III and IV
d. III only
e. I, III and IV

____ 4. The elements of group VIIA will all form ions. These ions will be _____ and willall have a charge of _____.
a. cations, 2+
b. anions, 2-
c. cations, 3+
d. anions, 1-
e. cations, 1+

____ 5. Determine the number of atoms in a copper strip that has a mass of 35.0 grams.
a. 3.33×10^{25} atoms
b. 2.11×10^{25} atoms
c. 2.71×10^{20} atoms
d. 3.32×10^{23} atoms

e. 0.551 atoms

____ 6. Ethylene glycol is the primary component in antifreeze. How many grams ofethylene glycol, $C_2H_4(OH)_2$ are in 394 mL of a 9.087 M solution of antifreeze? (molar mass $C_2H_4(OH)_2$ = 62 g/mol)
a. 222 g
b. 43.7 g
c. 3.58 g
d. 2.69 g
e. 0.157 g

____ 7. Calculate the number of oxygen atoms in 45.0 g of $Co_2(SO_4)_3$ (molar mass =405.8 g/mole).
a. 8.01×10^{23} atoms
b. 2.67×10^{23} atoms
c. 12.0 atoms
d. 6.68×10^{22} atoms
e. 1.07×10^{24} atoms

____ 8. Which of these is the correct name for Li_2SO_4?
a. lithium sulfide
b. dilithium sulfide
c. dilithium sulfate
d. lithium sulfate
e. dilithium tetrasulfide

____ 9. Rubidium consists of two naturally occurring isotopes rubidium-85 and rubidium-87. Rubidium-85 (^{85}Rb) has an isotopic mass of 84.9117 amu and a 72.15% abundance. Rubidium-87(^{87}Rb) has a 27.85% abundance. The atomic weight of rubidium is 85.4768 amu. Determine the isotopic mass of ^{87}Rb?
a. 86.72371 amu
b. 86.8013 amu
c. 86.8220 amu
d. 86.8621 amu
e. 86.9085 amu

____ 10. Nicotine has the chemical formula $C_{10}H_{14}N_2$. What is the molecular weight ofnicotine?
a. 26 amu
b. 81 amu
c. 138 amu
d. 162 amu
e. 366 amu

____ 11. Which of these molecules will have a trigonal planar electron geometry and a bentmolecular geometry?
a. PCl_3
b. H_2O
c. C_2H_2
d. CH_3Cl
e. SO_2

____ 12. How many lone pairs of electrons are around the central atom in PCl_3?
a. 0
b. 1
c. 2
d. 3
e. 20

____ 13. Which of these substances is **not** polar?
a. H_2O
b. SO_2

c. HF
d. CCl_4
e. CH_3F

____ 14. Which of these theories is utilized in the prediction of molecular shapes?
a. Dalton's Theory
b. VSEPR Theory
c. Bohr's Atomic Theory
d. Lewis Bonding Theory
e. Einstein's Theory of Relativity

____ 15. The $[NO_2]^-$ molecule has _____ double bonds, _____ single bond(s), and _____ lone (nonbonding) pair(s) of electrons and _____ resonance forms.
a. 2, 0, 8, 2
b. 1, 1, 8, 3
c. 1, 1, 6, 2
d. 0, 2, 10, 0
e. 2, 0, 12, 2

____ 16. Which of these is the correct name for N_2O_3?
a. nitrogen trioxide
b. trinitrogen dioxide
c. dinitrogen trioxide
d. nitrogen dioxygenide
e. dinitrogenide dioxygenide

____ 17. How many grams of nitrogen dioxide are required to produce 260 grams of nitrogenmonoxide?

$3NO_2 + H_2O \rightarrow 2HNO_3 + NO$

a. 8.67 grams
b. 56.52 grams
c. 132 grams
d. 399 grams
e. 1196 grams

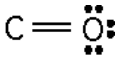
____ 18. Which scientist is responsible for the organization of the modern Periodic Table?
a. Bohr
b. Galileo
c. Dalton
d. Avogadro
e. Mendeleev

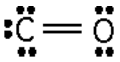
____ 19. Which of these is the correct **SUM** of the coefficients when the equation isbalanced?

__ $CaCl_2(aq)$ + __ $K_2CO_3(aq) \rightarrow$ __ $KCl(aq)$ + __ $CaCO_3(s)$

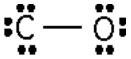
a. 2
b. 4
c. 5
d. 8
e. 10

____ 20. Which of these is the correct Lewis dot structure for carbon monoxide?
a. 

b. 

c. 

d. 

e. 

____ 21. Liquids which vaporize easily and have high vapor pressures are known as _____.
a. volatile liquids
b. nonvolatile liquids
c. explosive liquids
d. cohesive liquids
e. adhesive liquids

____ 22. Calculate the number of moles in a 233 gram sample of barium.
a. 0.589 moles
b. 1.70 moles
c. 3.20×10^{4}
d. 6.022×10^{23} moles
e. 1.02×10^{24} moles

____ 23. The point at which a liquid is converted to a gas is known as the _____.
a. boiling point
b. melting point
c. sublimation point
d. deposition point
e. freezing point

____ 24. Which of these substances makes up the largest fraction of water on the planet?
a. rain clouds
b. oceans
c. ground water
d. lakes
e. ice caps

____ 25. What is the total number of electrons which can occupy the first and second principal energy levels (n=1, n=2)?
a. 2
b. 6
c. 8
d. 10
e. 18

____ 26. Which of these elements has the **highest** electronegativity?
a. Ca
b. N
c. Se
d. P
e. O

____ 27. The dominant intermolecular attractive force between CH_3Cl molecules is
a. dipole forces.
b. dispersion forces.
c. hydrogen bonding.

d. London forces.
e. volatile forces.

____ 28. Why is the equation incorrect?

$Mg_3 + N_2 \rightarrow Mg_3N_2$

a. The equation is not balanced.
b. The coefficient of N_2 is incorrect.
c. The valence of the nitride ion is incorrect.
d. Some of the subscripts are incorrectly used.
e. The valance of the magnesium ion is incorrect.

____ 29. How many moles of potassium cyanide are in a 113.5 gram sample of KCN?
a. 3.487 moles
b. 2.903 moles
c. 1.743 moles
d. 0.872 moles
e. 0.0173 moles

____ 30. Barium fluoride is often used in glass manufacturing. Which of these is the correctformula and bonding type for barium fluoride?
a. BaF, ionic
b. BaF, covalent
c. BaF_2, ionic
d. BaF_2, covalent
e. Ba_2F, ionic

____ 31. Which of these is a polar molecule with tetrahedral electron geometry and bentmolecular geometry?
a. CO
b. H_2O
c. O_3
d. PCl_3
e. SO_3

____ 32. What is the coefficient in front of HF when the equation is balanced?

__ B_2O_3 + __ HF → __ BF_3 + __ H_2O

a. 1
b. 2
c. 3
d. 5
e. 6

____ 33. How many moles of oxygen gas are needed to react with 9 moles of acetylene, C_2H_2?

$2C_2H_2 + 5O_2(g) \rightarrow 4CO_2 + 2H_2O$

a. 0.4 moles
b. 4.5 moles
c. 9 moles
d. 18 moles
e. 22.5 moles

____ 34. Ionic bonds are formed when electrons are _____.

a. transferred
b. split
c. shared
d. destroyed
e. heated

____ 35. Barium fluoride is often used in glass manufacturing. Which of these is the correctformula and bonding type for barium fluoride?
a. BaF, ionic
b. BaF, covalent
c. BaF_2, ionic
d. BaF_2, covalent
e. Ba_2F, ionic

____ 36. Which of these is a nonmetal?
a. Mg
b. Br
c. Cu
d. Ge
e. Li

____ 37. Which of these is the correct representation for the ion with Z=27, A=60, and C=2^+ ?
a. $^{60}_{27}Co^{2+}$
b. $^{60}_{27}Nd^{2+}$
c. $^{60}_{27}Fr^{2+}$
d. $^{87}_{27}Co^{2+}$
e. $^{33}_{27}Co^{2+}$

____ 38. Which of these theories is utilized in the prediction of molecular polarity?
a. Dalton's Theory
b. VSEPR Theory
c. Electronegativity
d. Einstein's Relativity Theory
e. Both B and C

____ 39. What is the concentration in molarity when 3.00 grams of K_3PO_4 isdissolved in 350 mL of H_2O? (molar mass of K_3PO_4 = 212.3 g/mol)
a. 0.0404 M
b. 0.0565 M
c. 0.121 M
d. 0.161 M
e. 0.323 M

____ 40. Which of these molecules contains a triple bond?
a. NH_3
b. OCl_2
c. C_2H_2
d. H_2O

e. MgO

____ 41. Which of these substances contains hydrogen bonds?
a. HBr
b. CH_3F
c. CH_3OH
d. CH_3OCH_3
e. SiH_4

____ 42. Which of these is the correct molecular geometry of CCl_4?
a. linear
b. trigonal planar
c. tetrahedral
d. pyramidal
e. bent

____ 43. Attractions between molecules which hold liquids together are known as _____.
a. density
b. adhesive forces
c. cohesive forces
d. pressure
e. attractive forces

____ 44. Which of these is not a method for measuring the concentration of a solution?
a. percent by mass
b. percent by volume
c. pressure per volume
d. parts per million
e. molarity

Exam2
Answer Section

MULTIPLE CHOICE

1. C
2. D
3. C
4. D
5. D
6. A
7. A
8. D
9. E
10. D
11. E
12. B
13. D
14. B
15. C
16. C
17. E
18. E
19. C
20. D
21. A
22. B
23. A
24. B
25. D
26. E
27. A
28. D
29. C
30. C
31. B
32. E
33. E
34. A
35. C
36. B
37. A
38. E
39. A
40. C
41. C

42. C
43. C
44. C