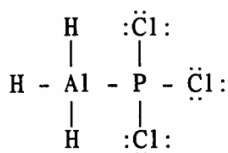


*This practice test is a general guideline to help you study. It is NOT a definitive list. There are potentially things on here that will not show up on the test, and there are potentially things not on this list that will show up on the test. Material that appeared in Warm Ups, Notes, Homework, Classwork, Labs, Study Materials, etc are all have the potential to appear on the test. **Please time yourself! This practice test should take a maximum of 85 minutes to ensure you are going fast enough to finish the actual Test in class!***

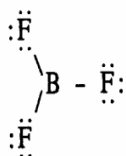
- When the following equation is balanced, what is the sum of the coefficients?
 $\text{Al}_2(\text{SO}_4)_3 + \text{Ca}(\text{OH})_2 \rightarrow \text{Al}(\text{OH})_3 + \text{CaSO}_4$
 - 4
 - 9
 - 8
 - 3
 - 10
- In the Lewis structure for SF_6 , the central sulfur atom shares _____ electrons.
 - 4
 - 8
 - 10
 - 12
 - none of the above, because SF_6 is an ionic compound
- In the balanced molecular equation for the neutralization of sodium hydroxide with sulfuric acid, the products are:
 - $\text{NaSO}_4 + \text{H}_2\text{O}$
 - $\text{NaSO}_3 + 2\text{H}_2\text{O}$
 - $2\text{NaSO}_4 + \text{H}_2\text{O}$
 - $\text{Na}_2\text{S} + 2\text{H}_2\text{O}$
 - $\text{Na}_2\text{SO}_4 + 2\text{H}_2\text{O}$
- Roundup, an herbicide manufactured by Monsanto, has the formula $\text{C}_3\text{H}_8\text{NO}_5\text{P}$. How many moles of molecules are there in a 349.7-g sample of Roundup?
 - 0.4835
 - 2.532
 - 2.068
 - 19.43
 - none of these
- How many of the following molecules possess dipole moments? BH_3 , CH_4 , PCl_5 , H_2O , HF , H_2
 - 1
 - 2
 - 3
 - 4
 - 5
- In the Lewis structure for elemental nitrogen there is (are)
 - a single bond between the nitrogens.
 - a double bond between the nitrogens.
 - a triple bond between the nitrogens.
 - three unpaired electrons.
 - none of the above.
- What type of reaction is below $2\text{HCl} \rightarrow \text{H}_2 + \text{Cl}_2$
 - synthesis
 - Decomposition
 - Single Replacement
 - Double Replacement
 - Combustion
- Balanced chemical equations imply which of the following?
 - Numbers of molecules are conserved in chemical change.
 - Numbers of atoms are conserved in chemical change.
 - Volume is conserved in chemical change.
 - a and b
 - b and c
- When phosphorus and chlorine atoms combine to form a molecule of PCl_3 , 6 electrons will be
 - Shared equally
 - shared unequally
 - Gained
 - Lost
 - evenly distributed
- Atoms with very similar electronegativity values are expected to form
 - no bonds.
 - covalent bonds.
 - triple bonds.
 - ionic bonds.
 - none of these
- Which of the following contains only one unshared pair of e-?
 - NH_3
 - H_2O
 - CH_4
 - NaCl
 - BeF_3
- A reaction occurs between sodium carbonate and hydrochloric acid producing sodium chloride, carbon dioxide, and water. The correct set of coefficients, respectively, for the balanced reaction is:
 - 3 6 6 3 4
 - 8 6 5 10 5
 - 5 10 10 5 5
 - 1 2 2 1 1
 - none of these
- What is the correct chemical formula for cupric oxide?
 - Cu_2O_3
 - Cu_3O
 - CuO_3
 - Cu_3O_2
 - CuO

14. Which of the following molecules contains a central atom with sp^2 hybridization?

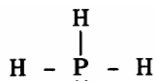
A)



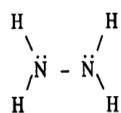
B)



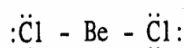
C)



D)



E)



15. Which of the following molecules is non-polar overall?

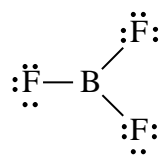
- A) SF_4
- B) SF_2
- C) CCl_4
- D) H_2S
- E) OCl_2

16. The hybridization of the central atom in XeF_5^+ is:

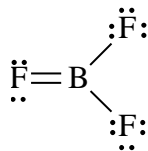
- A) sp
- B) sp^2
- C) sp^3
- D) dsp^3
- E) sp^3d^2

17. Which of the following Lewis structures best describes BF_3 ?

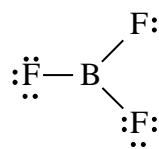
A)



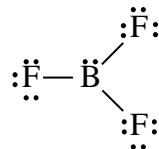
B)



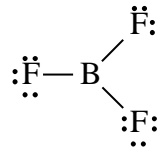
C)



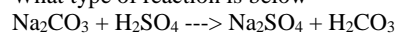
D)



E)



18. What type of reaction is below



- A) synthesis
- B) Decomposition
- C) Single Replacement
- D) Double Replacement
- E) Combustion

Use the following to answer question 19:

Using the following electronegativity values

C	2.5	Cl	3.2
H	2.2	N	3.0
		O	3.4

Then select from the following group the molecule that fits the given statement:

- a) CH_3CHO
- b) CO_2
- c) CH_3Cl
- d) C_2H_6
- e) none

19. This molecule shows the smallest number of lone pairs in its Lewis structure.

- A) CH_3CHO
- B) CO_2
- C) CH_3Cl
- D) C_2H_6
- E) none

20. Which of the following has a dipole moment?
- CO_2
 - CO^{2-}
 - NH_4^+
 - PF_3
 - two of them do
21. For which compound does 0.256 mole weigh 12.8 g?
- $\text{C}_2\text{H}_4\text{O}$
 - CO_2
 - CH_3Cl
 - C_2H_6
 - none of these
22. What type of reaction is below $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$
- synthesis
 - Decomposition
 - Single Replacement
 - Double Replacement
 - Combustion
23. What is the molar mass of ethanol ($\text{C}_2\text{H}_5\text{OH}$)?
- 45.06
 - 42.04
 - 46.07
 - 34.06
 - 62.07
24. What is the coefficient for water when the following equation is balanced?
- $$\text{As}(\text{OH})_3(\text{s}) + \text{H}_2\text{SO}_4(\text{aq}) \rightarrow \text{As}_2(\text{SO}_4)_3(\text{aq}) + \text{H}_2\text{O}(\text{l})$$
- 1
 - 2
 - 4
 - 6
 - 12
25. Which of the following molecules has no dipole moment?
- CO_2
 - NH_3
 - H_2O
 - all
 - none
26. How many grams are in a 6.980-mol sample of sodium hydroxide?
- 40.00 g
 - 279.2 g
 - 167.5 g
 - 5.730 g
 - 0.1745 g
- Use the following to answer question 27:
- Aqueous solutions of barium chloride and silver nitrate are mixed to form solid silver chloride and aqueous barium nitrate.
27. The balanced molecular equation contains which one of the following terms?
- $\text{AgCl}(\text{s})$
 - $2\text{AgCl}(\text{s})$
 - $2\text{Ba}(\text{NO}_3)_2$
 - BaNO_3
 - $3\text{AgCl}(\text{s})$

28. What is the coefficient for oxygen when the following equation is balanced?
- $$\text{NH}_3(\text{g}) + \text{O}_2(\text{g}) \rightarrow \text{NO}_2(\text{g}) + \text{H}_2\text{O}(\text{g})$$
- 3
 - 6
 - 7
 - 12
 - 14
29. In the reaction between magnesium and sulfur, the magnesium atoms
- become anions.
 - become cations.
 - become part of polyatomic ions.
 - share electrons with sulfur.
30. Based on electronegativity differences, which of the following is most likely to be ionic?
- BaF_2
 - Cl_2
 - NH_3
 - NO_3
 - CH_4
31. Which of the following cannot exceed the octet rule?
- N
 - S
 - P
 - I
 - All of the atoms (a-d) can exceed the octet rule.
32. The electron pair in a C-F bond could be considered
- closer to C because carbon has a larger radius and thus exerts greater control over the shared electron pair.
 - closer to F because fluorine has a higher electronegativity than carbon.
 - closer to C because carbon has a lower electronegativity than fluorine.
 - an inadequate model since the bond is ionic.
 - centrally located directly between the C and F.
33. Choose the compound with the most ionic bond.
- LiCl
 - KF
 - NaCl
 - LiF
 - KCl
34. Phosphoric acid can be prepared by reaction of sulfuric acid with "phosphate rock" according to the equation:
- $$\text{Ca}_3(\text{PO}_4)_2 + 3\text{H}_2\text{SO}_4 \rightarrow 3\text{CaSO}_4 + 2\text{H}_3\text{PO}_4$$
- What is the molar mass of $\text{Ca}_3(\text{PO}_4)_2$?
- 310.18 g / mol
 - 87.05 g / mol
 - 278.18 g / mol
 - 215.21 g / mol
 - 166.02 g / mol
35. Which contains the highest % by mass of hydrogen?
- HCl
 - H_2O
 - H_2SO_4
 - H_2S
 - HF

36. What type of reaction is below
 $\text{C}_2\text{H}_5\text{OH} + 3\text{O}_2 \rightarrow 2\text{CO}_2 + 3\text{H}_2\text{O}$
 A) synthesis
 B) Decompositon
 C) Single Replacement
 D) Double Replacement
 E) Combustion
37. What type of reaction is below
 $2\text{Al} + 3\text{Pb}(\text{NO}_3)_2 \rightarrow 3\text{Pb} + 2\text{Al}(\text{NO}_3)_3$
 A) synthesis
 B) Decompositon
 C) Single Replacement
 D) Double Replacement
 E) Combustion
38. The ability to conduct electricity in the solid state is a characteristic of metallic bonding. This characteristic is *best* explained by the presence of
 A) mobile protons
 B) high electronegativities
 C) mobile electrons
 D) high ionization energies
 E) immobile protons
39. What is the sum of the coefficients of the following equation when it is balanced using smallest whole number integers?
 $\text{NaNH}_2 + \text{NaNO}_3 \rightarrow \text{NaN}_3 + \text{NaOH} + \text{NH}_3$
 A) 5
 B) 6
 C) 7
 D) 8
 E) 9
40. In balancing an equation, we change the _____ to make the number of atoms on each side of the equation balance.
 A) formulas of compounds in the reactants
 B) coefficients of compounds
 C) formulas of compounds in the products
 D) subscripts of compounds
 E) none of these

Use the following to answer questions 41-46:

Select the correct molecular structure for the given species from the choices below:

41. BeF_3^-
 A) a) pyramidal
 B) b) none of these
 C) c) octahedral
 D) d) trigonal planar
 E) e) bent
42. IF_4^-
 A) pyramidal
 B) tetrahedral
 C) square planar
 D) octahedral
 E) none of these

43. XeF_4
 A) pyramidal
 B) tetrahedral
 C) square planar
 D) octahedral
 E) none of these
44. NI_3
 A) pyramidal
 B) tetrahedral
 C) square planar
 D) octahedral
 E) none of these
45. BeCl_2
 A) linear
 B) trigonal planar
 C) tetrahedral
 D) bent
 E) none of these
46. SiH_4
 A) pyramidal
 B) tetrahedral
 C) square planar
 D) octahedral
 E) none of these
47. Which of the following groups contains no ionic compounds?
 A) HCN , NO_2 , $\text{Ca}(\text{NO}_3)_2$
 B) PCl_5 , LiBr , $\text{Zn}(\text{OH})_2$
 C) KOH , CCl_4 , SF_4
 D) NaH , CaF_2 , NaNH_2
 E) CH_2O , H_2S , NH_3
48. Which of the following are *true* concerning ionic bonding?
 A) Ionic bonding occurs between a metal, which has a high affinity for electrons, and a nonmetal, which loses electrons relatively easy.
 B) CaCl_2 forms because Ca^{2+} is always a more stable species than the calcium atom alone.
 C) Compounds with ionic bonds tend to have low melting points.
 D) The electronegativity difference between the bonding atoms of ionic compounds is small since the electrons are not shared but rather held together by electrostatic forces.
 E) All of the above statements are false.
49. Give (in order) the correct coefficients to balance the following:
 $\text{H}_2\text{SnCl}_6 + \text{H}_2\text{S} \rightarrow \text{SnS}_2 + \text{HCl}$
 A) 1, 2, 1, 6
 B) 1, 2, 2, 2
 C) 1, 1, 1, 6
 D) 6, 2, 1, 1
 E) 2, 4, 2, 6
50. When electrons in a molecule are not found between a pair of atoms but move throughout the molecule, this is called
 A) ionic bonding.
 B) covalent bonding.
 C) polar covalent bonding.
 D) delocalization of the electrons.
 E) a dipole moment.

51. The forces of attraction that hold a diamond together are called
- electrovalent
 - ionic
 - network covalent
 - London dispersion
 - hydrogen
52. Atoms having greatly differing electronegativities are expected to form:
- no bonds
 - polar covalent bonds
 - nonpolar covalent bonds
 - ionic bonds
 - covalent bonds
53. Which of the following bonds would be the most polar without being considered ionic?
- Mg-O
 - C-O
 - O-O
 - Si-O
 - N-O
54. How many atoms of hydrogen are present in 4.11 g of water?
- 1.37×10^{23}
 - 1.23×10^{24}
 - 4.95×10^{24}
 - 2.75×10^{23}
 - 0.456
55. Which atoms are *most* likely to form covalent bonds?
- non-metal atoms that share protons
 - non-metal atoms that share electrons
 - metal atoms that share protons
 - metal atoms that share electrons
 - metal and non-metals atoms sharing electrons
56. Which of the following bonds is least polar?
- C—O
 - H—C
 - S—Cl
 - Br—Br
 - They are all nonpolar.
57. An element with an electronegativity of 0.9 bonds with an element with an electronegativity of 3.1. Which of the following phrases *best* describes the bond between these elements?
- mostly covalent in character and formed between a metal and a non-metal
 - Mostly covalent in character and formed between two non-metals
 - Mostly ionic in character and formed between a metal and a non-metal
 - Mostly ionic in character and formed between two non-metals
 - Mostly metallic in character and formed between two metals
58. Determine the coefficient for O₂ when the following equation is balanced in standard form (smallest whole number integers)
- $$\text{C}_4\text{H}_{10}(\text{g}) + \text{O}_2(\text{g}) \rightarrow \text{CO}_2(\text{g}) + \text{H}_2\text{O}(\text{g})$$
- 4
 - 8
 - 10
 - 13
 - 20

Answer Key

1. B
2. D
3. E
4. C
5. B
6. C
7. B
8. B
9. B
10. B
11. A
12. D
13. E
14. B
15. C
16. E
17. A
18. D

19. D
20. E
21. C
22. A
23. C
24. D
25. A
26. B
27. B
28. C
29. B
30. A
31. E
32. B
33. B
34. A
35. B
36. E
37. C
38. C
39. E

40. B
41. D
42. C
43. C
44. A
45. A
46. B
47. E
48. E
49. A
50. D
51. C
52. D
53. D
54. D
55. B
56. D
57. C
58. D

****Has not been checked! Please tell me if you see typos!!!****