Chem3/Exam3
FS/95

Name_____ StdntNo_____

Remember to put all final answers on the answer sheet.

1. Which of the following does not have a dipole moment?

a. HCl
b. CO
c. NCl3
d. BCl3
e. all have a dipole moment

2. Which compound should be the most ionic?

a. LiF
b. NaF
c. KF
d. RbF
e. LiI

3. Which compound should be most covalent?

a. OF2
b. SO2
c. SF6
d. AsCl3
e. Br2

4. Which ions are isoelectronic?

a. Li+, Na+, K+
b. F-, Cl-, Br-
c. F-, Na+, Mg+2
d. a and b
e. all of the above

5. On formation of a positive ion, the size of a metal atom would be predicted to:

a. always increase
b. always decrease
c. remain the same
d. depends on the metal
e. metals don't form positive ions

6. For the compound PCl3, the bond angles would be approximately

a. 90
b. 109
c. 120
d. 90 and 120
e. 180

7. The shape of the CO3-2 ion is

a. trigonal planar
b. pyramidal
c. linear
d. bent
e. tee shaped

8. In going from a single to a triple bond between atoms, the trend in the bond length and bond strength are

a. increase/increase
b. increase/decrease
c. decrease/increase
d. decrease/decrease
e. depends on element

9. Which compounds or ions exhibit resonance?

a. O2
b. H2S
c. NO2-
d. HCl
e. two of the above

10. Which compounds cannot be described adequately using Lewis structures?

a. SO2
b. NO2
c. CO2
d. SiO2
e. none of the above

11. Calculate the molar heat of formation of NH3(g) from the reaction:

N2(g) + 3H2(g) <==> 2NH3(g)

Given the following bond energies:

N-N(triple) = 941 kJ
H-H = 432 kJ
N-H = 391 kJ

a. +109 kJ
b. -109 kJ
c. +54.5 kJ
d. -54.5 kJ
e. none is correct

12. What is the formal charge on S in the compound H2S?

a. 0
b. +1
c. -1
d. +2
e. -2

13. How many lone pairs are present on S in the compound H2S?

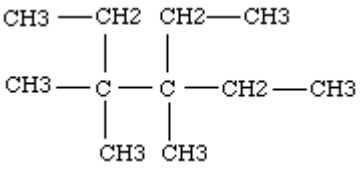
a. 0
b. 1
c. 2
d. 3
e. 4

Questions 14-21 dealt with radioactivity and have been deleted

22. What technique would best identify the type of branching present in the carbon chain of a new organic compound?

a. IR-infrared spectroscopy
b. C,H,N,O-combustion analysis
c. NMR-nuclear magnetic resonance
d. Melting or boiling point
e. UV-ultraviolet spectroscopy

23. The most reasonable name for the following alkane is:



a. 2,3-diethyl-2-methylbutane
b. 2,3-diethyl-2,3-dimethylpentane
c. 3,4-diethyl-3,4-dimethylpentane
d. 4-ethyl-3,3,4-trimethylhexane
e. 3-ethyl-3,4,4-trimethylhexane

24. Aromatic compounds are identified by the presence of:

a. double bonds
b. functional groups
c. unsaturated rings
d. triple bonds
e. isomerism

25. The characteristic that distinguishes polymers from other types of organic molecules is:

a. the presence of functional groups
b. the presence of double bonds
c. vulcanization
d. free radicals
e. long, chainlike structure