Name _____ **Unit 5 Practice Test – Bonding**

Date _____

For each statement or question, choose the number of the word or expression that best completes the statement or answers the question.

_____ 1) As a chemical bond forms between two hydrogen atoms in a system, energy is released and the stability of the system

A) decreases B) increases C) remains the same

_____ 2) Which kind of compound generally results when metal atoms chemically combine with metal atoms?

1) hydrogen 2) ionic 3) covalent 4) metallic

_____3) A solid substance was tested in the laboratory. The test results are listed below.

- dissolves in water
- is an electrolyte
- melts at a high temperature

Based on these results, the solid substance could be

A) Cu B) $CuBr_2$ C) C D) $C_6H_{12}O_6$

_____ 4) As a bond between a Magnesium atom and a Bromine atom is formed, electrons are

1) shared to form an ionic bond
2) shared to form a covalent bond
3) transferred to form an ionic bond
4) transferred to form a covalent bond

_____ 5) Which compound contains both ionic and covalent bonds?

1) $CaCO_3$ 2) BCl_3 3) $MgCl_2$ 4) CH_4

_____ 6) A neutral atom with the electron configuration 2-7 would most likely form a bond with an atom having the configuration

1) 2 2) 2-2 3) 2-8-1 4) 2-8-8

_____ 7) Which pair of elements below will form a compound with the greatest ionic character?

A) Pb and F B) Na and O C) Na and Cl D) Cs and S

_____8) Which compound is most polar?

1) H_2O 2) F_2 3) H_2 4) CO_2

_____ 9) A substance that has a melting point of 1074 K conducts electricity when dissolved in water, but does not conduct electricity in the solid phase. The substance is most likely?

1) ionic compound
2) molecular compound
3) metallic element
4) nonmetallic element

_____ 10) What is the total number of electron pairs shared between the two atoms in an N_2 molecule?

1) 1 2) 2 3) 6 4) 4

_____ 11) Which compound would be described as molecular?

1)Na_2S 2)LiOH 3) C_2H_4 4) Ag

_____ 12) Lithium and Chlorine synthesize to form lithium Chloride (LiCl) in the following balanced chemical reaction.

$2Li\ (s) + Cl_2\ (g) \rightarrow 2LiCl\ (s)$

Which statement below describes the changes in energy that take place during this reaction?

1) Energy is absorbed as bonds are formed, only.
2) Energy is released as bonds are broken, only.
3) Energy is absorbed as bonds are broken, and energy is released as bonds are formed.
4) Energy is absorbed as bonds are formed, and energy is released as bonds are broken.

_____ 13) Which type of molecule is NH_3?

1) polar, with a symmetrical distribution of charge
2) nonpolar, with a symmetrical distribution of charge
3) polar, with an asymmetrical distribution of charge
4) nonpolar, with an asymmetrical distribution of charge

____ 14) Select the compound below exhibits the following properties:

- Mobile electrons
- High conductivity
- High melting point

1) NaCl (aq)
2) CH_2OH (l)
3) Cu (s)
4) KF (s)

____ 15) Acetone more readily evaporates into the gaseous form than water, because the

1) IMF are stronger
2) IMF are weaker
3) Covalent bonds are stronger
4) Covalent bonds are weaker

____ 16) Which compound exhibits hydrogen bonding?

1) HF
2) H_2S
3) NaH
4) CH_4

____ 17) Which molecule has polar bonds and is a polar molecule

1) F_2
2) PCl_3
3) NaCl
4) CF_4

____ 18) Which molecule has polar bonds and is a non-polar molecule

1) F_2
2) PCl_3
3) NaCl
4) CF_4

_____ 20) The electrons in a bond between C and O are shared

1) equally, and the resulting bond is polar
2) equally, and the resulting bond is nonpolar
3) unequally, and the resulting bond is polar
4) unequally, and the resulting bond is nonpolar

_____ 21) Which of the following has the highest boiling point?

1) F_2O
2) F_2
3) HF
4) NF_3

Base your answers to questions **22** through **25** on the information below.
For each of the molecules below, do the following:

- Draw the dot diagram
- Determine the bond polarity
- Determine the molecular polarity
- Identify the shape

$CaCl_2$	**PCl_3**	**H_2O**

22) Describe, in terms of valence electrons, how the chemical bonds form in H_2O

23) Determine the total number of electrons in the bonds between an atom of Oxygen and both Hydrogens

24) Explain, in terms of distribution of charge, the molecular polarity of PCl_3

25) Which bond is most polar, P-Cl or H-O? Explain in terms of electronegativity difference.

Physical Properties of CF_4 and NH_3 at Standard Pressure

Compound	Melting Point (°C)	Boiling Point (°C)	Solubility in Water at 20.0°C
CF_4	−183.6	−127.8	insoluble
NH_3	−77.7	−33.3	soluble

26) In the space *in your answer booklet*, draw a Lewis electron-dot diagram for CF_4.

27)Based on the data table above, compare the strength of the intermolecular forces of CF_4 and NH_3

28) What type of IMF does NH_3 exhibit?