

PRACTICE EXAM #4

PAGE 1 of 3

Chem20, Elementary Chemistry

1.) For each of the following compounds, draw the correct Lewis structure and indicate the expected electronic **AND** molecular geometries. Indicate whether the molecule is **polar** or **nonpolar**. Be sure to include **ALL** possible resonance structures where applicable. (30 pts)

Element	O	H	C	N	B
eN	3.5	2.1	2.5	3.0	2.0

a.) O₃

ELECTRONIC _____

MOLECULAR _____

b.) HCN (the carbon is central)

ELECTRONIC _____

MOLECULAR _____

c.) BH₃

ELECTRONIC _____

MOLECULAR _____

2.) A sample of $\text{NH}_3(\text{g})$ in a 452 mL container has a pressure of 605 torr. A closed valve connects it to a 623 mL container that contains a sample of $\text{CH}_4(\text{g})$ at a pressure of 598 torr. When the valve is opened, the two gases are allowed to mix and travel freely between **both** containers. Assume the valve adds no volume. (23 pts)

a.) What is the new partial pressure of $\text{NH}_3(\text{g})$ after the valve is opened?

b.) What is the new partial pressure of $\text{CH}_4(\text{g})$ after the valve is opened?

c.) What is the total pressure of the mixture of $\text{NH}_3(\text{g})$ and $\text{CH}_4(\text{g})$?

3.) Complete the following statements. (12 pts)

- a.) Kinetic Molecular Theory assumes that gas particles have no _____, meaning that they take up no space and behave as points.
- b.) The Duet Rule for Lewis dot structures applies to two elements: _____ and _____, whose valence shell is the $n = 1$ level.
- c.) A(n) _____ bond forms between two atoms that have a difference in electronegativity between 0.0 – 0.4.

