Name: _____ Date: _____ Period: _____

Unit 2: Smells Exam Review

1. Describe the smell that molecules would have if their name ended with the following:
    a. –ine

    b. –ate

    c. –one

    d. –ic acid

    e. –ane

    f. -ol

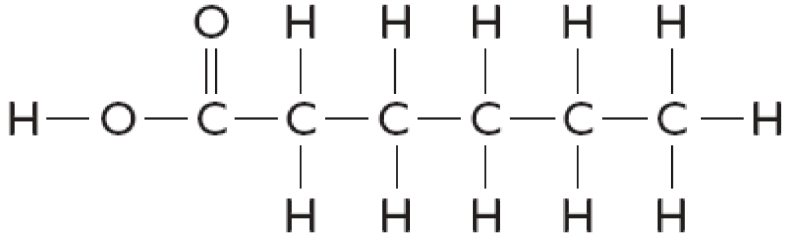
2. Explain the HONC 1234 Rule. How does it help you draw structural formulas?

3. Draw the Lewis Dot diagram for PBr_3. How many lone pairs does PBr_3 have?

4. a) How many covalent bonds will Silicon, Si form? Why?

    b) How many covalent bonds will Phosphorus, P form? Why?

Use the Molecule to Answer Questions 5 & 6:



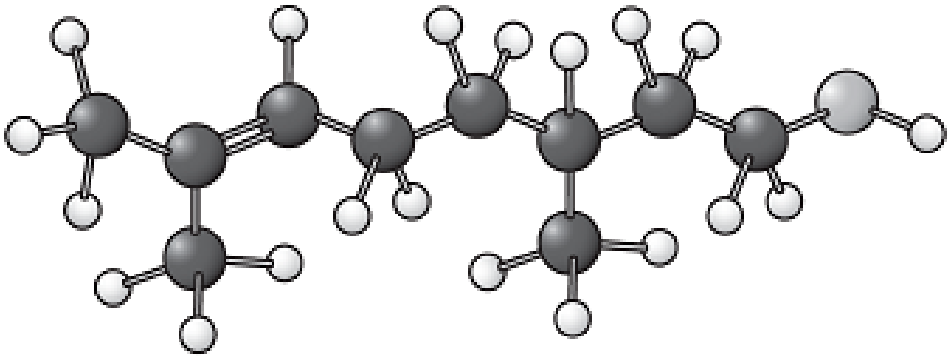
5. What is the functional group of the molecule shown in the structural formula above? Name and circle it.

6. Which is the name for the molecule shown in the structural formula above?
   a. diethylamine
   b. ethyl butyrate
   c. diethylthiol
   d. hexanoic acid
   e. methanol

7. How many total electrons are shared by the 2 oxygen atoms in an O_2 molecule? Show the lewis dot structure for this molecule as evidence.

8. Describe the smell(s) a molecule has if it contains the following functional groups.
   a. Amine
   b. Ester
   c. Ketone
   d. Carboxyl
   e. Alkane
   f. Hydroxyl

9. Examine the ball-and-stick model for citronellol.



a. What is the molecular formula for the molecule?

b. Draw the Lewis dot formula for the molecule.

c. Draw the structural formula for the molecule.

d. What functional group is in the molecule? Name and circle it.

e. Predict the smell of the molecule.

10. Draw the Lewis Dot Structure and Structural formula for the molecules below. Then using your molecular shape chart from lesson 11, predict the shape of each molecule.

a. CF_2Cl_2

b. SF_2

c. NH_3

11. What is the relationship between the electron domain theory and the shape of a molecule?

12. What phase or state of matter must molecules be in for our noses to detect them?

13. Describe how our noses detect molecules according to the receptor site theory.

Circle the word in parentheses ( ) that correctly completes each sentence.

14. Molecules that are NOT attracted to a charged object are (polar, nonpolar).

15. Molecules that carry partial charges are (polar, nonpolar).

16. Molecules that are strongly attracted to one another are (polar, nonpolar).

17. Molecules that tend to dissolve easily in water are (polar, nonpolar).

18. Molecules that are attracted to a charged wand are (polar, nonpolar).

19. Molecules that do not form a drop on wax paper are (polar, nonpolar).

20. A type of bond in which electrons are transferred from one atom to another is (polar covalent, nonpolar covalent, ionic).

21. A type of bond in which electrons are shared unequally between two atoms is (polar covalent, nonpolar covalent, ionic).

22. A type of bond in which electrons are shared equally between two atoms is (polar covalent, nonpolar covalent, ionic).

23. Two atoms with the same electronegativity are (polar, nonpolar).

24. A difference in electronegativity of 0.35 would indicate a/an (polar, nonpolar, ionic) bond.

25. A difference in electronegativity of 1.25 would indicate a/an (polar, nonpolar, ionic) bond.

26. A difference in electronegativity of 0.75 would indicate a/an (polar, nonpolar, ionic) bond.

27. A difference in electronegativity of 3.30 would indicate a/an (polar, nonpolar, ionic) bond.

28. Molecules that smell are usually (polar, nonpolar).

29. Molecules that smell are usually (small, large).

30. If two dipoles cancel one another out, the molecule is (polar, nonpolar).

31. Circle the element with the greatest electronegativity.

a. N or F

b. Cl or P

c. Ca or As

d. O or S

e. Cl or I

f. Na or K

32. For the molecule $\mathbf{PF_3}$:

a. Draw the structural formula showing partial positive and partial negative charges.

b. Draw the Lewis Dot structure.

c. Is this molecule polar? Explain your reasoning.

d. Will this molecule have a smell? Explain your reasoning.

33. Water is a small polar molecule. Why doesn't it have a smell?

34. Place a partial positive or partial negative charge on each atom in the following pairs.

a. H-O b. H-C c. H-N

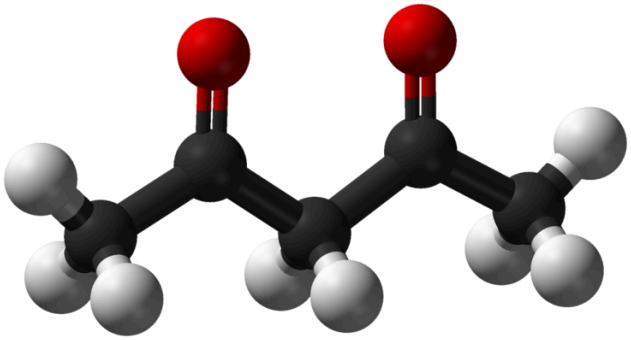
35. Complete the chart.

Functional Group	Structure	Name ending	Possible Smell(s)
Carboxyl			
Amine			
Ester			
Alcohol			stringy- frying pan- ball-shaped-
Ketone			stringy- frying pan- ball-shaped-

36. What is the general rule of solubility?

37. What two conditions must be met to have a polar molecule?

38. Consider this model.



a. What is its molecular formula?

b. Draw the structural formula.

c. Draw the Lewis dot structure.

d. What is the functional group of this molecule?

e. What can you predict about the name and smell of this compound?

f. What is the shape on each of the numbered carbons?