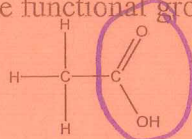


FUNCTIONAL GROUP IDENTIFICATION WORKSHEET

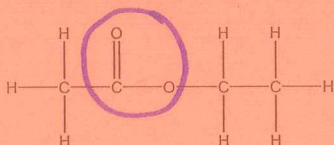
1. Identify the functional groups on the following organic molecules.

a.



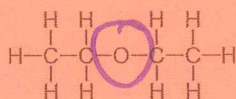
Carboxylic Acid

b.



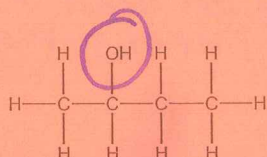
Ester

c.



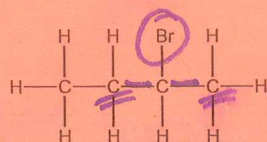
Ether

d.



2° Alcohol

e.



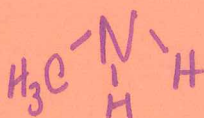
2° Halogenoalkane

2. Draw simple organic molecules that contain the following functional groups.

f. Cycloalkane



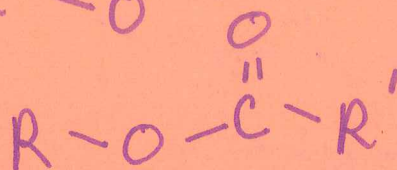
g. Amine



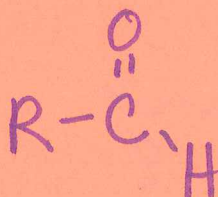
h. Ether



i. Ester

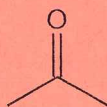


j. Aldehyde



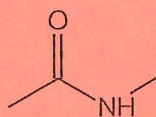
3. Identify the functional group in each of the following molecules.

a.



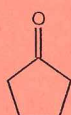
Ketone

b.



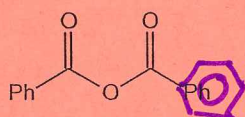
Amide

c.



Ketone

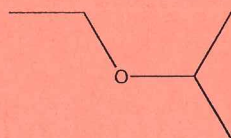
d.



anhydride (you don't need to know this one.)

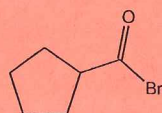
Ph = phenyl group

e.



ether

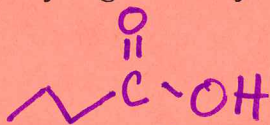
f.



Ketone (less important halogenoalkane)

4. Draw simple molecules that contain the following functional groups. Draw as skeleton structures, as shown above – do not draw carbons, but only lines to represent bonds between them. Do not draw hydrogens if they are attached to a carbon atom.

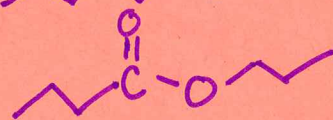
a. Carboxylic Acid



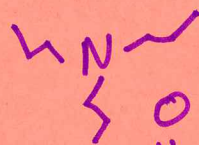
b. Halide



c. Ester



d. Amine



e. Ketone



f. Aldehyde



Organic Molecules and Functional Groups

Name: _____

Date: _____

1. Which compound is a member of the alkene series of hydrocarbons?

- A. benzene **B. propene**
 C. toluene D. butadiene

2. The IUPAC name of an aldehyde has the ending

- A. -ol **B. -al** C. -oate D. -oic

3. A hydrocarbon molecule containing one triple covalent bond is classified as an

- A. alkene B. alkane
C. alkyne D. alkadiene

4. Which is the general formula for an aldehyde?

- A.** $\begin{array}{c} \text{O} \\ \parallel \\ \text{R}-\text{C}-\text{H} \end{array}$ B. R—OH
 C. $\begin{array}{c} \text{O} \\ \parallel \\ \text{R}-\text{C}-\text{O}-\text{H} \end{array}$ D. $\begin{array}{c} \text{O} \\ \parallel \\ \text{R}_1-\text{C}-\text{R}_2 \end{array}$

5. Which is the structural formula for propanone (acetone)?

- A. $\begin{array}{ccccc} & \text{H} & \text{H} & \text{H} & \\ & | & | & | & \\ \text{H} & -\text{C} & -\text{C} & -\text{C} & -\text{H} \\ & | & | & | & \\ & \text{H} & \text{OH} & \text{H} & \end{array}$ **B.** $\begin{array}{ccccc} & \text{H} & & \text{H} & \\ & | & & | & \\ \text{H} & -\text{C} & -\text{C} & -\text{C} & -\text{H} \\ & | & || & | & \\ & \text{H} & \text{O} & \text{H} & \end{array}$
 C. $\begin{array}{ccccc} & \text{H} & \text{H} & \text{H} & \\ & | & | & | & \\ \text{H} & -\text{C} & -\text{C} & -\text{C} & =\text{O} \\ & | & | & & \\ & \text{H} & \text{H} & & \end{array}$ D. $\begin{array}{ccccc} & \text{H} & \text{H} & \text{H} & \\ & | & | & | & \\ \text{H} & -\text{C} & -\text{C} & -\text{C} & -\text{H} \\ & | & | & | & \\ & \text{OH} & \text{OH} & \text{OH} & \end{array}$

6. Which functional group is found in all organic acids?

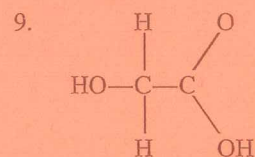
- A. $\begin{array}{c} \text{H} \\ | \\ -\text{C}-\text{H} \\ | \\ \text{H} \end{array}$ B. $\begin{array}{c} \text{H} \\ | \\ -\text{C}-\text{OH} \\ | \\ \text{H} \end{array}$
 C. $\begin{array}{c} \text{H} \\ | \\ -\text{C}=\text{O} \end{array}$ **D.** $\begin{array}{c} \text{O} \\ // \\ -\text{C} \\ \backslash \\ \text{OH} \end{array}$

7. All organic compounds must contain the element

- A. hydrogen B. nitrogen
C. carbon D. oxygen

8. Which formula represents an organic acid?

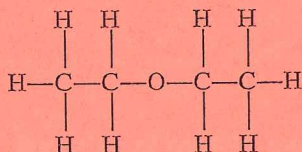
- A.** CH₃COOH B. CH₃CHO
 C. CH₃COCH₃ D. CH₃OH



How many different functional groups are there in a molecule with the structural formula shown?



- A. 1 **B. 2** C. 3 D. 4

10.



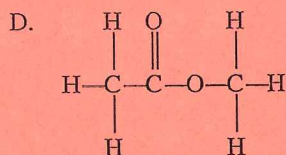
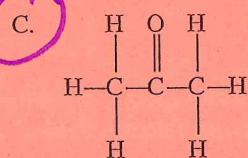
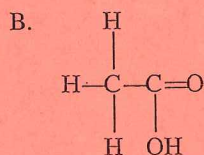
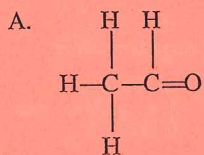
Which type of compound is represented by the structural formula shown?

- A. a ketone B. an aldehyde
 C. an ester **D. an ether**

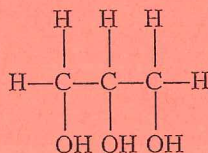
11. The structure  or  may be used to represent

- A. benzene** B. methane
 C. acetylene D. cyclopropane

12. Which structural formula represents a ketone?



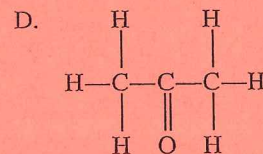
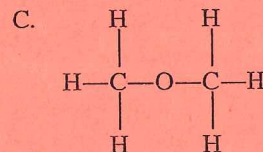
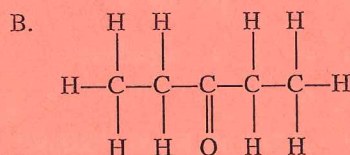
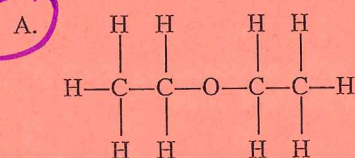
13.



Which type of compound is represented by the structural formula shown?

- A. an alcohol** B. an acid
 C. an ester D. a hydrocarbon

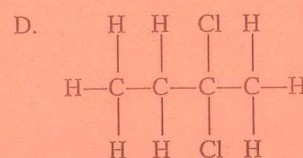
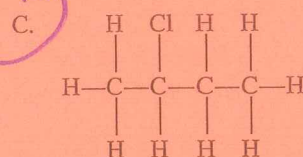
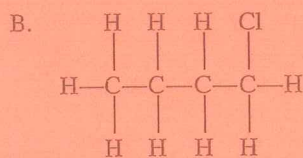
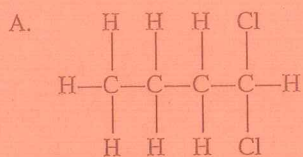
14. Which is the structural formula for diethyl ether?



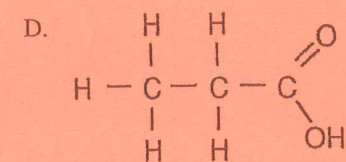
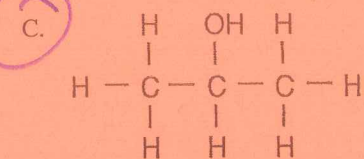
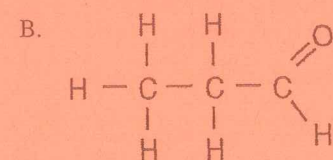
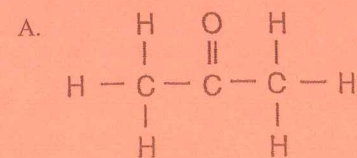
15. Which formula represents a ketone?

- A. CH₃COCH₃** B. C₂H₅COOCH₃
 C. C₂H₅COOH D. CH₃CHO

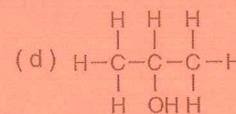
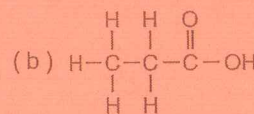
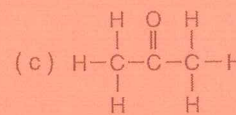
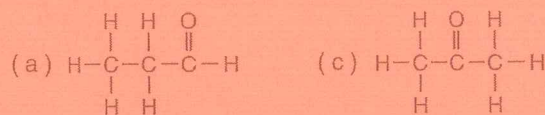
16. Which is the structural formula for 2-chlorobutane?



17. Which structural formula represents an isomer of 1-propanol?



18. Given the formulas of four organic compounds:



Which pair below contains an alcohol and an acid?

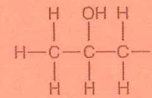
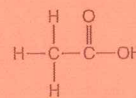
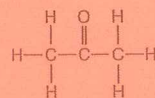
A. *a* and *b*

B. *a* and *c*

C. *b* and *d*

D. *c* and *d*

19. Given the three organic structural formulas shown below:



Which organic-compound classes are represented by these structural formulas, as shown from left to right?

A. ester, organic acid, ketone

B. ester, aldehyde, organic acid

C. ketone, aldehyde, alcohol

D. ketone, organic acid, alcohol

20. Which is the correct structural formula for 1,2-ethandiol?

