# HW05 - Organic Fundamentals

These questions will get you started on some organic chemistry.

**1** 4 points

The inline formula for an ingredient in certain types of nail polish remover is $CH_3CO_2CH_2CH_3$. What type of compound (classification) is this?

- an ether
- an ester
- an aldehyde
- a ketone
- a carboxylic acid

**2** 4 points

What is the name of $C_6H_{14}$?

- hexane
- propane
- heptane
- hexene
- pentane

**3** 4 points

Which of the following has the greatest molar mass?

- heptane
- pentane
- propane
- butane
- hexane
- nonane
- octane

**4** 4 points

Which of the following has the greatest molar mass?

- propane
- butene
- pentene
- butane
- methane
- pentane

**5** 4 points

What is the carbon chain product of the elimination reaction beginning with the reactant shown below?

Hint: the eliminated product is HBr. What is left?

- HC≡CH
- CHBr=CHBr
- $H_2C$–$CH_2$
- $CH_2Br$–$CH_2Br$

**6** 4 points

What best describes the functional group on this molecule?

- primary alcohol
- amine
- secondary alcohol
- ether
- carboxylic acid

**7** 4 points

What is the functional group on this molecule?

- ketone
- amine
- alcohol
- aldehyde

**8** 4 points

What is the functional group on this molecule?

- aldehyde
- ketone
- ether
- alcohol

**9** 4 points

Look at this big molecule. What is the functional group on the top right?

- primary amine
- ketone
- secondary amine
- aldehyde
- carboxylic acid

**10** 4 points

You are asked to identify the ketone on a large organic molecule. What characteristics are you looking for?

- a carbon-carbon double bond
- an oxygen double bonded to a non-terminal carbon
- an oxygen bonded to carbon and hydrogen
- a carbon with a double bond to oxygen and a single bond to an alcohol group
- an oxygen double bonded to a terminal carbon

**11** 4 points

Which of the following is a carboxylic acid functional group?

- R-CHO
- R-COOH
- R-OH
- R-CO
- R-$NH_2$

**12** 4 points

The following two choices both have the formula, $C_2H_6O$. Which is dimethyl ether?

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- 

**13** 4 points

This is the condensed structural formula for acetaminophen, the active ingredient in the over-the-counter medication Tylenol.

What is the molecular formula of acetaminophen?

- $C_8H_9NO$
- $C_8H_{11}NO_2$
- $C_8H_9NO_2$
- $C_8H_9NO_3$

**14** 4 points

The following structure is the carbon skeleton for a structural isomer of octane with most of the hydrogen and carbon atoms omitted.



What is the molecular formula of this structure?

- $C_8H_{18}$
- $C_8H_{16}$
- $C_8H_{14}$
- $C_8H_8$

**15** 4 points

Consider the following structure:



How many single bonds and double bonds (respectively) are represented by this condensed formula?
Note: the group on the far right can also be read as a phenyl group, similar to what you would see in benzene:



- 12, 14
- 15, 14
- 11, 7
- 12, 4
- 15, 4

**16** 4 points

Consider the structural formula of phenol.



The active ingredient in some oral anesthetics used in sore throat sprays. What is the molar mass of phenol?

- 89 g/mol
- 50 g/mol
- 17 g/mol
- 94 g/mol

**17** 4 points

What are three functional groups in the following molecule?



- indole
- aldehyde
- carbonyl
- alcohol
- ether
- secondary amine
- primary amine

**18** 4 points

The following addition reaction will proceed when bromine forms two radicals via homolytic cleavage. The radicals then react with ethene to form which product?



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- 
- 
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**19** 4 points

An alkyl halide is placed in solvent and breaks apart to form a carbocation and a halide anion. What type of process is this?

- homolytic cleavage
- heterolytic cleavage