

Final Exam Drill Sheet  
May 5, 2002  
Organic Chemistry Spring 2002

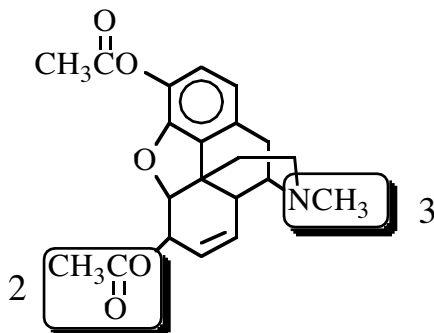
This drill sheet is meant to show you the level of questions that will be on the final and what different types of questions will be covered. We have not had many multiple-choice questions on previous tests. The final will have some multiple-choice type questions. You will also find question similar in format to those found on previous exams. You should review the assigned homework and exams as part of your preparation for the final. Answer keys for the exams were handed out in-class or can be found on the course web site.

1. Performing an aldol condensation between an aldehyde and a ketone can make the molecule trans-hexa-1,3-diene-5-one. To form the diene, the resulting aldol is treated with acid. Which pair of molecules corresponds to the starting aldehyde and ketone?
- Ethanal and butanone.
  - Propanal and propanone.
  - Ethanal and butenone.
  - Propenal and propanone.

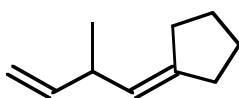
Questions 2 – 4 refer to the formula:  $(\text{CH}_3\text{CH}_2)_2\text{C}(\text{CH}_3)\text{CH}_2\text{CH}_3$ .

2. The molecule above can be combusted with oxygen to form  $\text{CO}_2$  and  $\text{H}_2\text{O}$ . How many molecules of  $\text{O}_2$  are required to completely combust 2 of these molecules?
- 25.
  - 8.
  - 17.
  - 20.
3. The IUPAC name for this molecule is most likely:
- 3-ethyl-hexane.
  - 3-ethyl-3-methylpentane.
  - 1,1-diethyl-1-methylpropane.
  - octane.
4. The molecule can also undergo free radical halogenation. How many unique mono-halogenated products can be formed?
- 7.
  - 4.
  - 3.
  - 5.

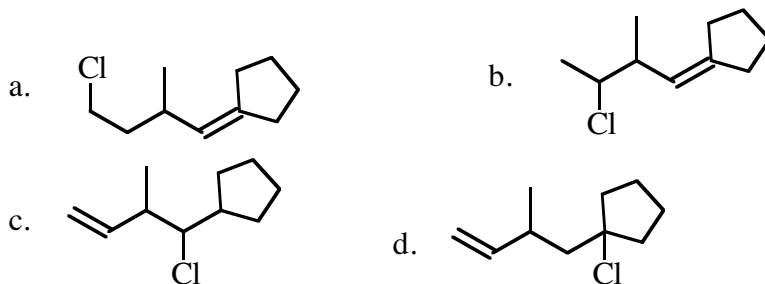
Questions 5 – 8 refer to the heroin molecule:



5. The molecular formula that corresponds to heroin is:
- a.  $C_{21}H_{20}O_5N_1$                       b.  $C_{21}H_{23}O_5N_1$   
 c.  $C_{21}H_{26}O_5N_1$                       d.  $C_{21}H_{29}O_5N_1$
6. In the molecule above, the moiety in the square marked "2" corresponds to which functionality?
- a. An Ester.                                  b. An Ether.  
 c. An Amide.                                  d. An Anhydride.
7. The moiety in the square marked "3" is an amine. What type of amine is it?
- a. Primary ( $1^\circ$ )                      b. Secondary ( $2^\circ$ )  
 c. Tertiary ( $3^\circ$ )                      d. Quaternary ( $4^\circ$ )
8. If heroin is treated with HBr, how many different products will be formed? (For the purposes of this question, assume all products are equally likely).
- a. 1      b. 2      c. 3      d. 4
9. The following molecule is treated with 1 molecule of HCl:



Which of the following molecules is most likely the major product?



10. Nomenclature. The final exam will have compounds with single and multiple functional groups. Here are a few examples of multiple functional group compounds. Name the following compounds.

