

Exam 3

Professor R. Hoenigman

I pledge to uphold the CU Honor Code:

Signature _____

Name (printed) _____

Last four digits of your student ID number _____

Recitation TA _____

Recitation number, day, and time _____

You have 1 hour and 30 minutes to complete this exam.
No model kits or calculators allowed.
Periodic table and scratch paper are attached.

DO NOT TURN THIS PAGE UNTIL INSTRUCTED TO DO SO.

Recitation Sections:

#	Day	Time	TA	SCORE:	
122	Monday	5 pm	Tom		
121	Tuesday	8 am	Tom	Page 1 _____/20	Page 3 _____/30
131	Tuesday	12 pm	Tom		
132	Tuesday	12 pm	Lee	Page 2 _____/20	Page 4 _____/30
161	Thursday	8 am	Tom		
171	Thursday	12 pm	Lee		
					TOTAL _____/100

Extra Credit (5 pts) Draw maleic anhydride.

1. (5 pts) Draw malonic acid.

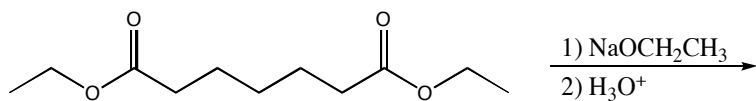
2. (5 pts) What are the two main steps of a nucleophilic acyl substitution reaction?

3. (10 pts) Propose an efficient synthesis of 1-bromocyclopentanecarboxylic acid from cyclopentyl bromide.

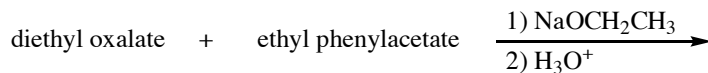
4. (20 pts) Using arrows to show the flow of electrons, propose a mechanism for the hydrolysis of propanenitrile in acidic solution.

5. (20 pts) Draw the major organic product(s) of the following reactions. Write NR if no reaction occurs. Be sure to show stereochemistry if necessary.

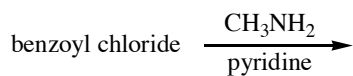
A.



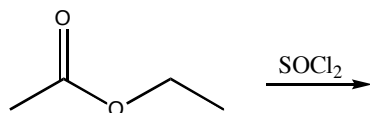
B.



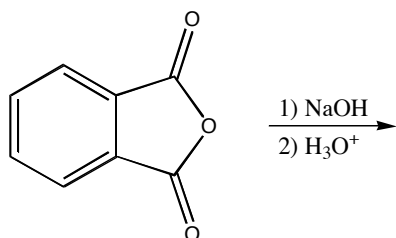
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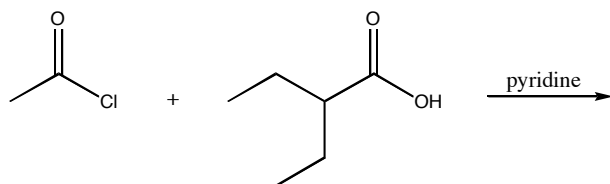
D.



E.



6. (10 pts) Fill in the organic product(s) of the following reaction and give a mechanism for its formation.



7. (15 pts) Use the malonic ester synthesis and any other necessary transformations to synthesize *N,N*-diethyl-5,5-dimethylhexanamide. You must start with diethyl malonate, but you may use any reagents you like.

8. (15 pts) Propose an efficient synthesis for the ketone below. You must start your synthesis with the Claisen condensation of methyl acetate. You may use any other reactions and reagents you like.

