Chemistry 372
Exam #3
April 24, 2019

Name: Key

Clearly print your name in the space provided.
Maintain appropriate security over your exam.
Do not open exam until instructed to do so.
Do not write on the front or back of this exam besides your name.

PERIODIC TABLE OF THE ELEMENTS

1A	2A	3B	4B	5B	6B	7B	8B	8B	8B	1B	2B	3A	4A	5A	6A	7A	8A
1 H 1.01																	2 He 4.00
3 Li 6.94	4 Be 9.01											5 B 10.81	6 C 12.01	7 N 14.01	8 O 16.00	9 F 19.00	10 Ne 20.18
11 Na 22.99	12 Mg 24.31											13 Al 26.98	14 Si 28.09	15 P 30.97	16 S 32.07	17 Cl 35.45	18 Ar 39.95
19 K 39.10	20 Ca 40.08	21 Sc 44.96	22 Ti 47.88	23 V 50.94	24 Cr 52.00	25 Mn 54.94	26 Fe 55.85	27 Co 58.93	28 Ni 58.69	29 Cu 63.55	30 Zn 65.39	31 Ga 69.72	32 Ge 72.61	33 As 74.92	34 Se 78.96	35 Br 79.90	36 Kr 83.80
37 Rb 85.47	38 Sr 87.62	39 Y 88.91	40 Zr 91.22	41 Nb 92.91	42 Mo 95.94	43 Tc (98)	44 Ru 101.07	45 Rh 102.91	46 Pd 106.42	47 Ag 107.87	48 Cd 112.41	49 In 114.82	50 Sn 118.71	51 Sb 121.76	52 Te 127.60	53 I 126.90	54 Xe 131.3
55 Cs 132.91	56 Ba 137.33	57 La 138.91	72 Hf 178.49	73 Ta 180.95	74 W 183.85	75 Re 186.21	76 Os 190.2	77 Ir 192.22	78 Pt 195.08	79 Au 196.97	80 Hg 200.59	81 Tl 204.38	82 Pb 207.19	83 Bi 208.98	84 Po (209)	85 At (210)	86 Rn (222)
87 Fr (223)	88 Ra 226.03	89 Ac (227)	104	105	106	107	108	109									

1. Draw all the following organic compounds. (16 pts)

a) benzonitrile

- 2pts CN

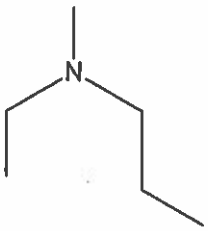
c) *N*-methylazacyclopentane

b) isopropyl propanoate

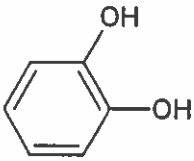
d) furan

- 1pt double bonds

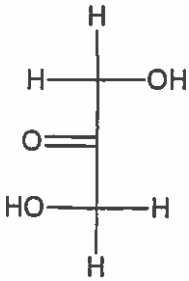
2. Name the following organic compounds. (16 pts)



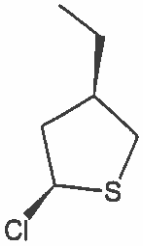
N-ethyl-N-methyl propanamine



1,2-benzenediol (catechol)

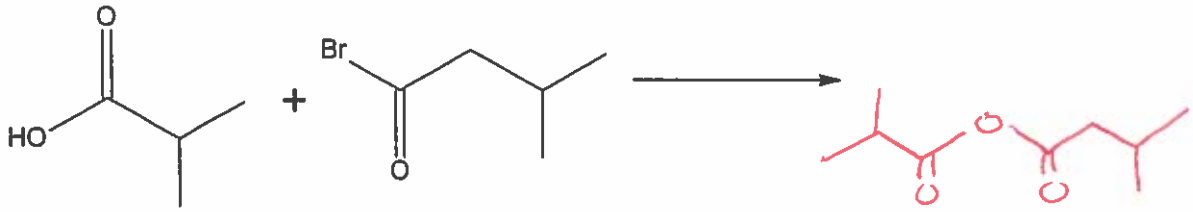


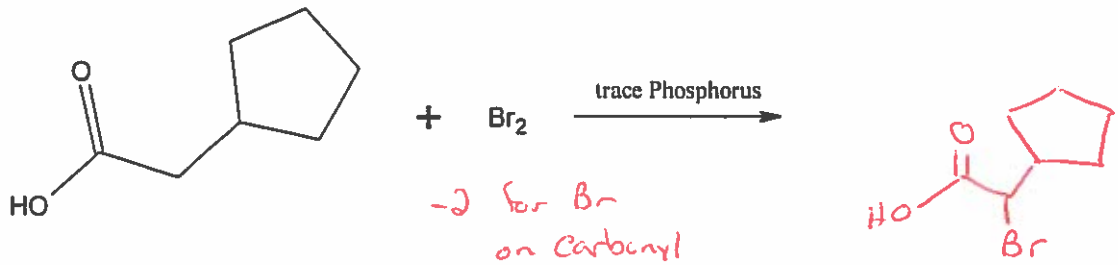
1,3-dihydroxy propanone (margin)



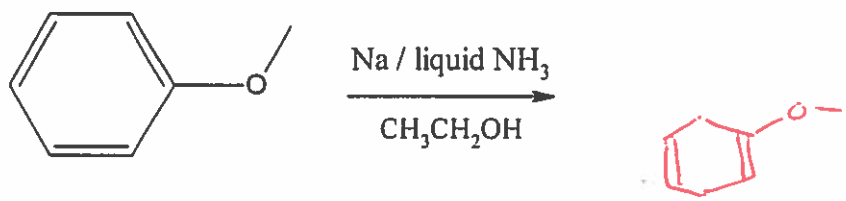
Cis-2-chloro-4-ethyl thia cyclopentane

3. Determine the major organic product for the following reactions. (20 pts)

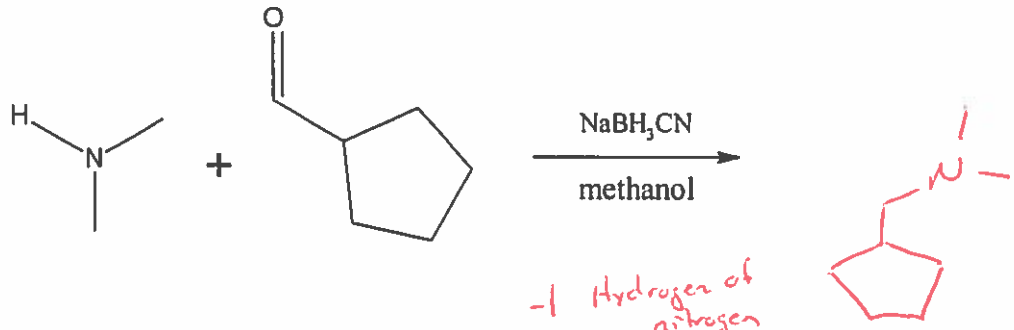




-2 for Br on Carbonyl

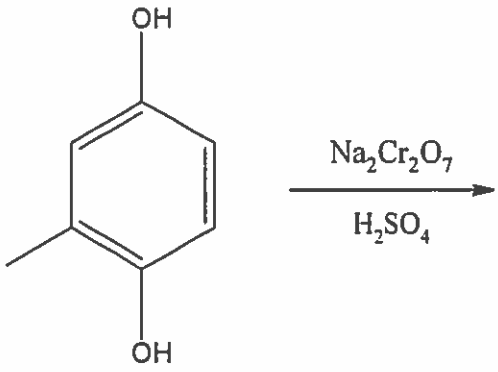


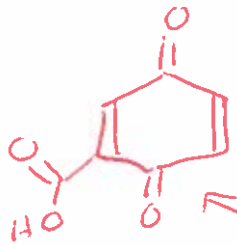
-2 - not 1,4-diene



-1 Hydrogen of nitrogen

-2 if C=O



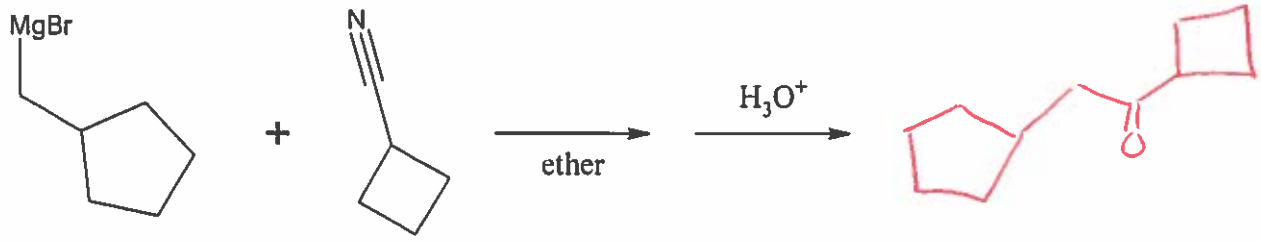


← -1 not 1,4-diene

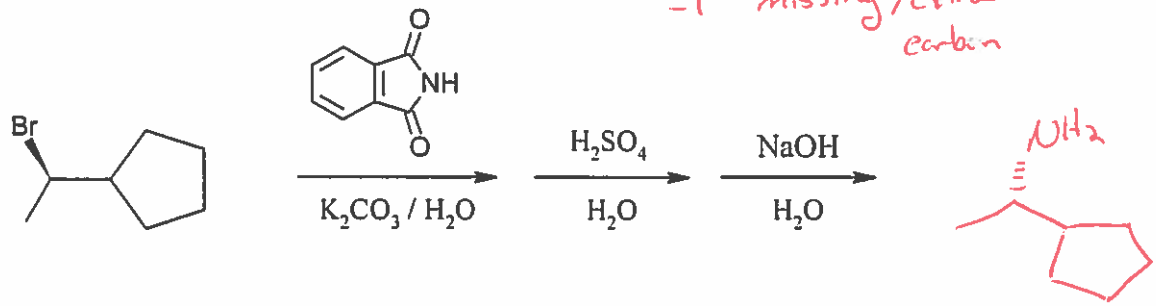
-1 not 1,4-dione

-1 no carboxylic

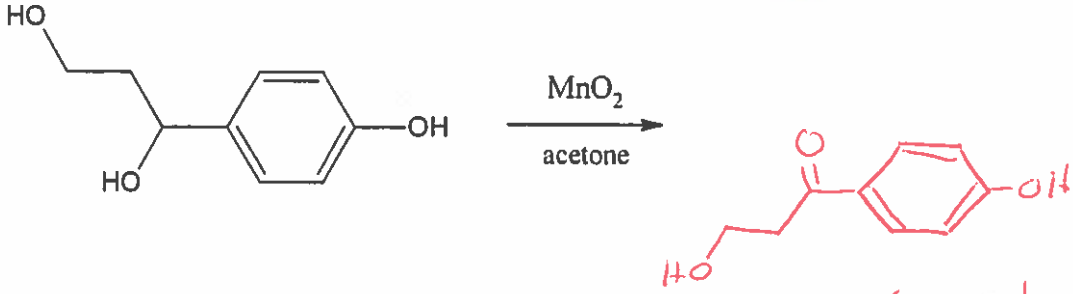
4. Determine the major organic product for the following reactions. Show stereochemistry when appropriate. (20 pts)



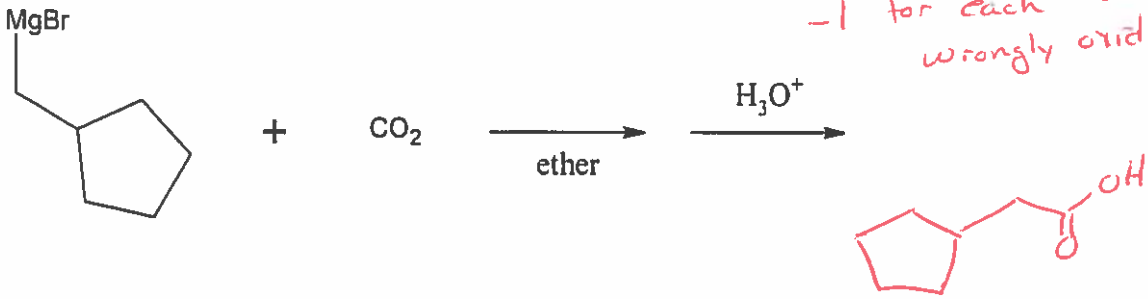
-1 missing/extra carbon

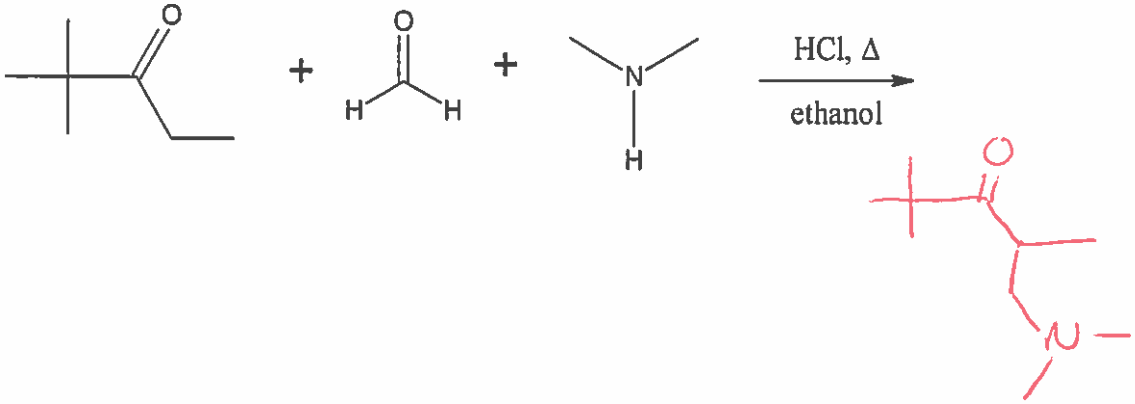


-1 not inversion

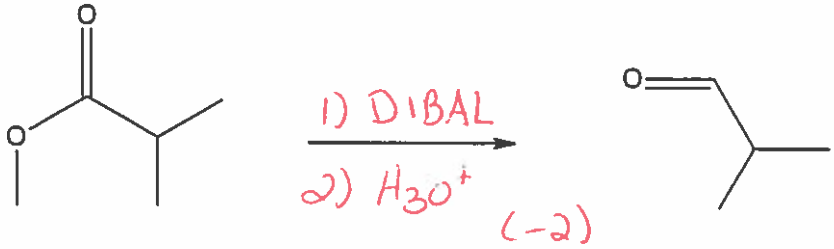


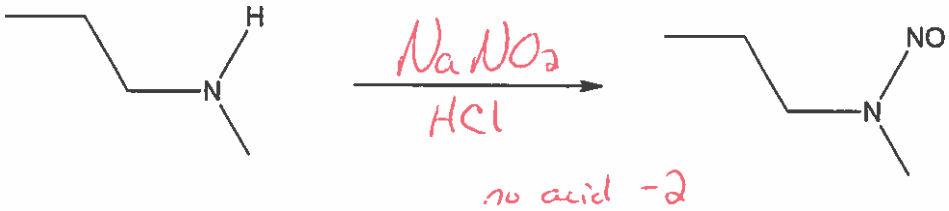
-1 for each -OH wrongly oxidized

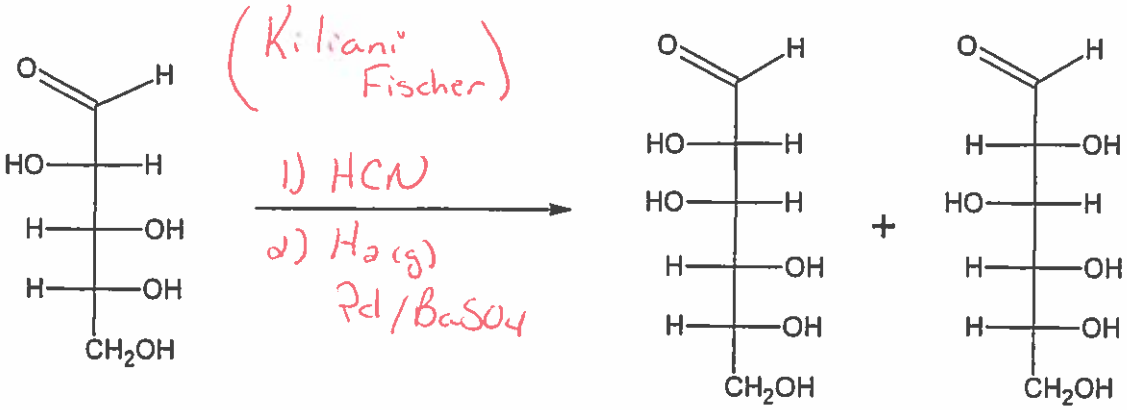


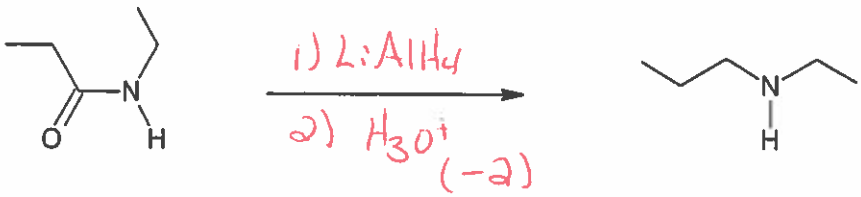


5. Show what reagents, as discussed in class, you would use to make the following synthetic transformations. (25 pts)

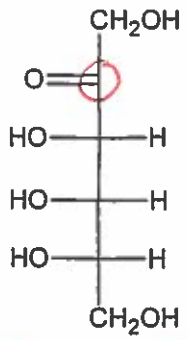








6. For the following monosaccharide, complete each of the following questions. (18 pts)

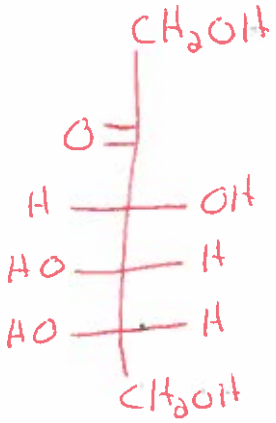


a. Classify as an Aldose or a Ketose. +3

b. Classify as either a Triose, Tetrose, Pentose or Hexose. +3

c. Classify as either D or L. +3

d. Draw an epimer of this saccharide. +5



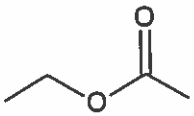
−2 more than 1 OH group switched

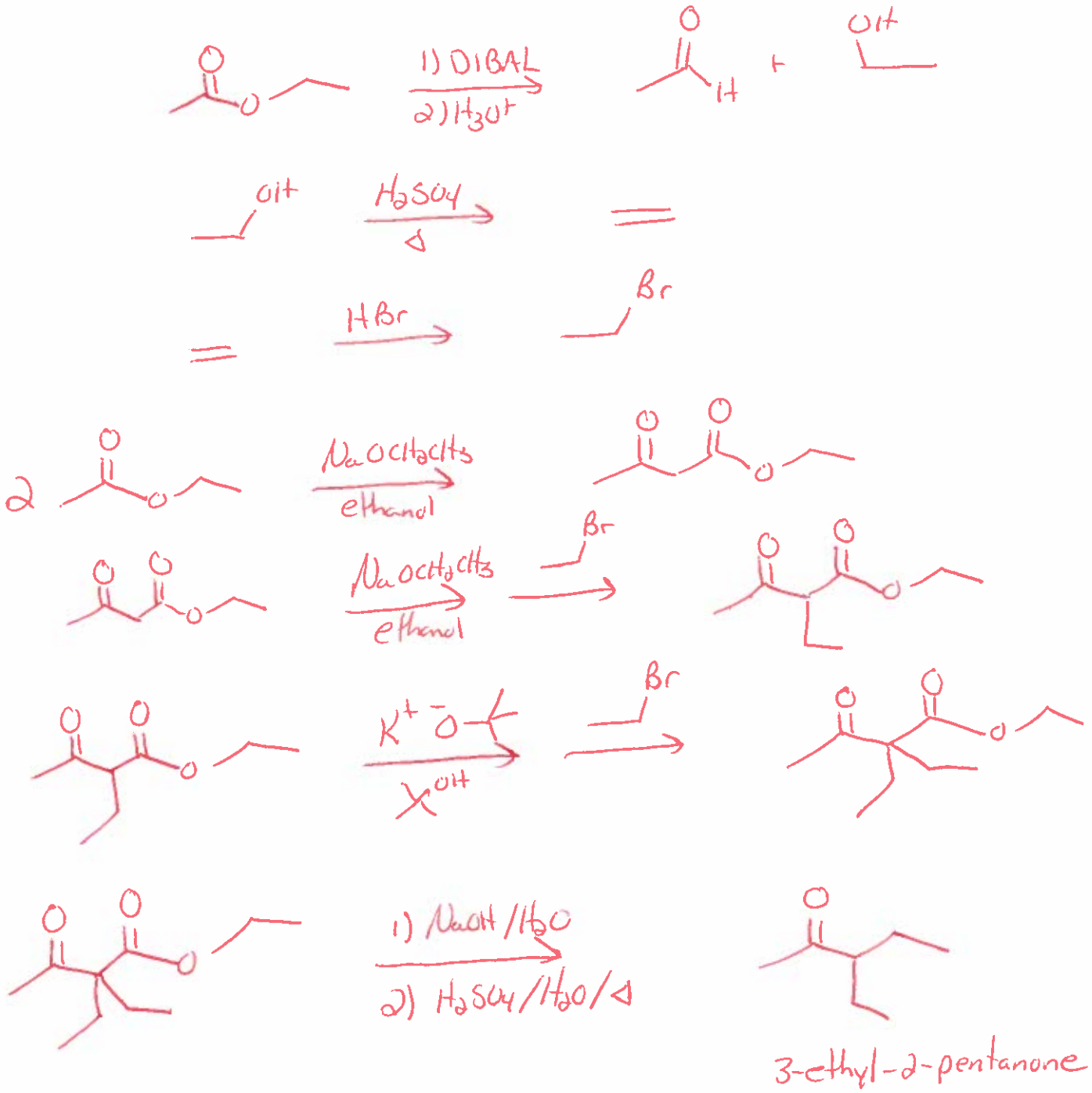
e. After cyclization, circle the carbon atom that would become the anomeric carbon. +3

f. After cyclization, how many stereocenters would the formed hemiacetal have? 4 or 5 +3

if answer is 3 −1

7. Starting with only the ester shown and using any reagents, which were discussed in class, form 3-ethyl-2-pentanone. ~~*Hint:*~~ *All the carbons in the product must originate from the ester*. (20 pts)

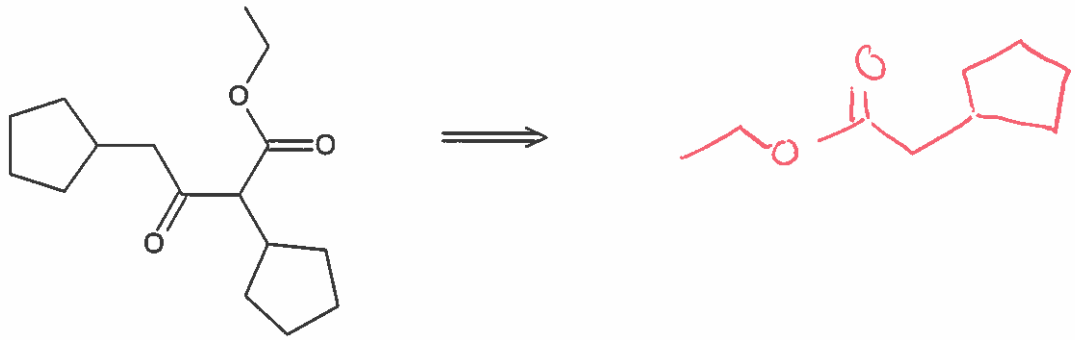




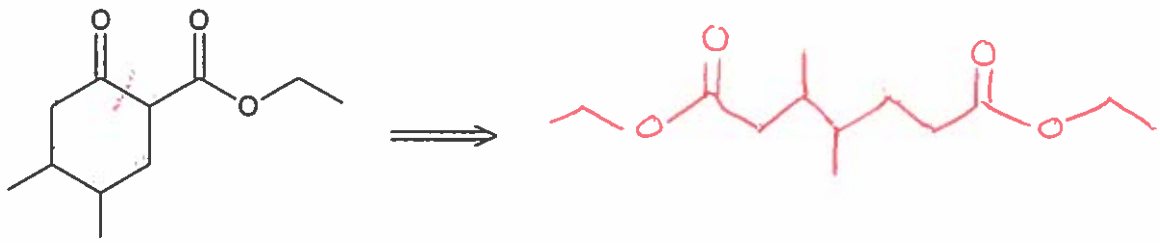
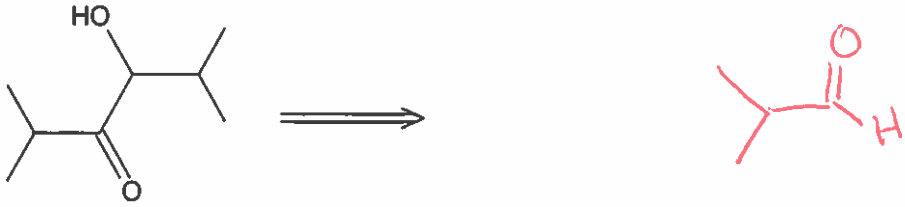
8. Show the organic starting material that would be needed to synthesize the following compounds. (13 pts)

organic

a. Claisen Condensation



b. Dieckmann Condensation



c. *N*-Dodecylthiazolium Bromide Coupling