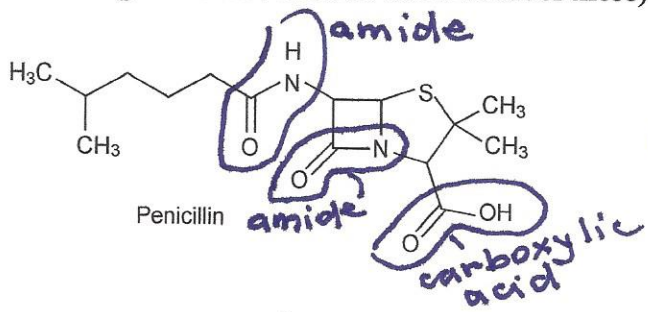
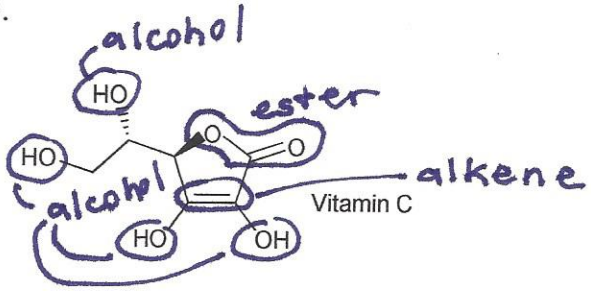
Practice Problems for Exam 4

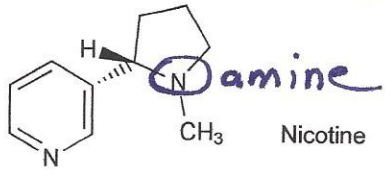
Chem 60 Fall 2017

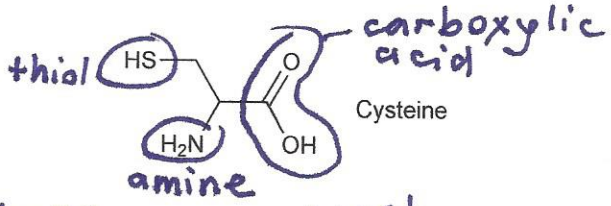
This is not meant to be a comprehensive review.

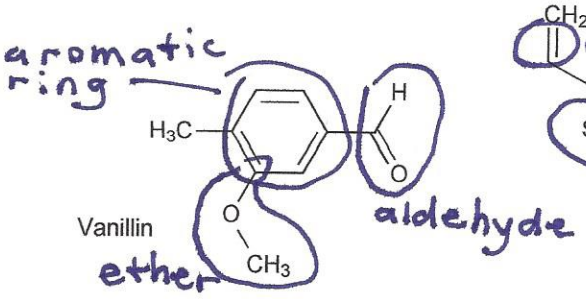
1. Review the functional groups. Then circle and label the functional groups in the molecules below. In one or two cases, there are functional groups we have not learned (you do not need to circle or label these).

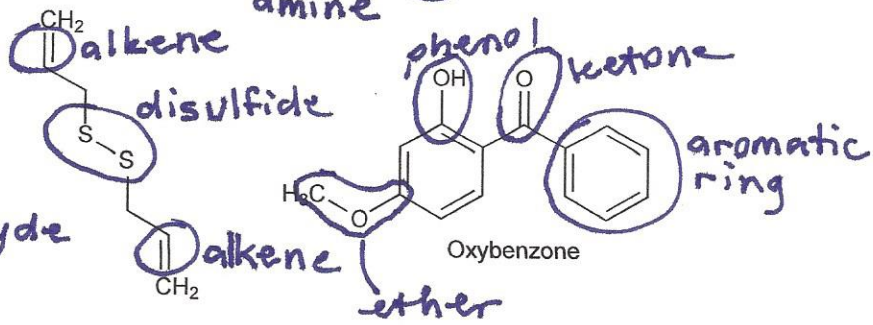




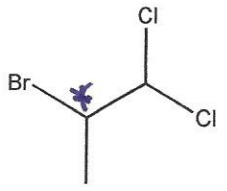


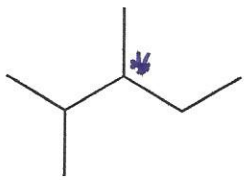


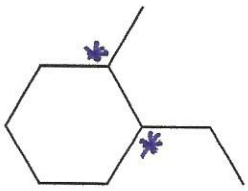




2. Mark the chiral carbons in each molecule below with an asterisk:



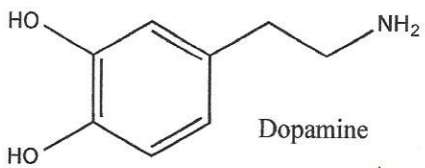


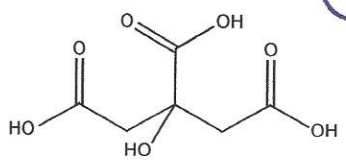


3. Redraw the structures of the following organic molecules at neutral pH:

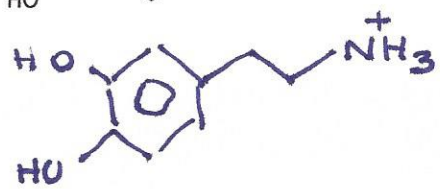
carboxylic acid → lose H^+

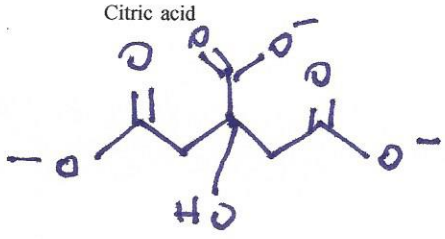
amine → gain H^+





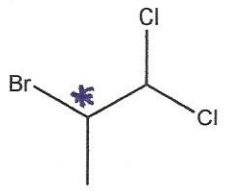
Citric acid

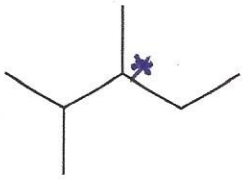


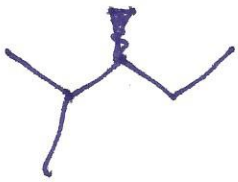


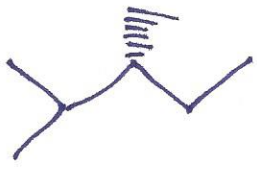
Drawing these not on exam

4. Draw **both** enantiomers of each molecule below.



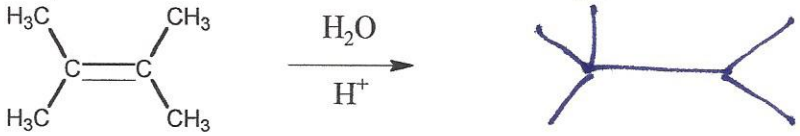




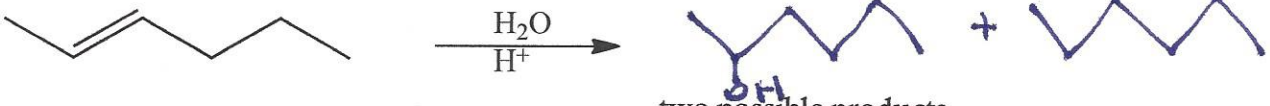


5. Draw the organic product of each reaction given below

a.

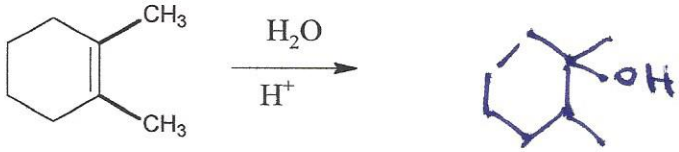


b.

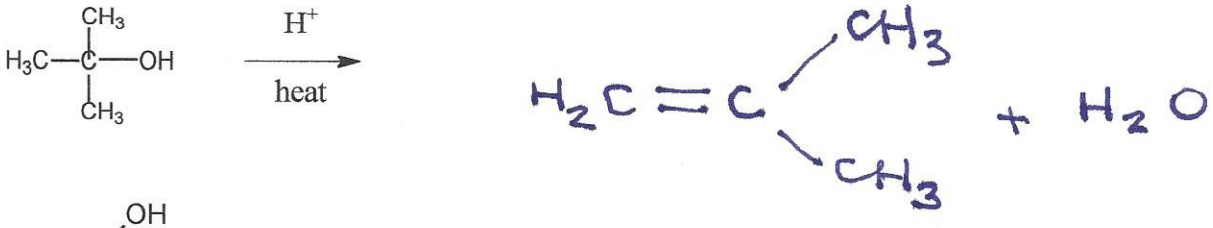


two possible products

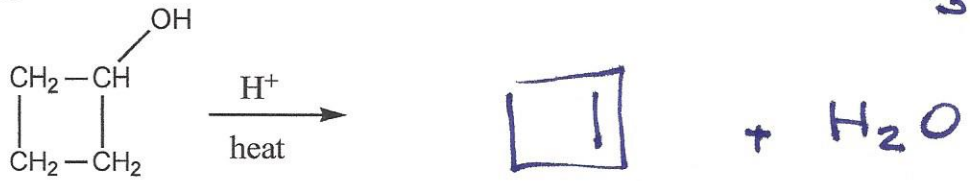
c.



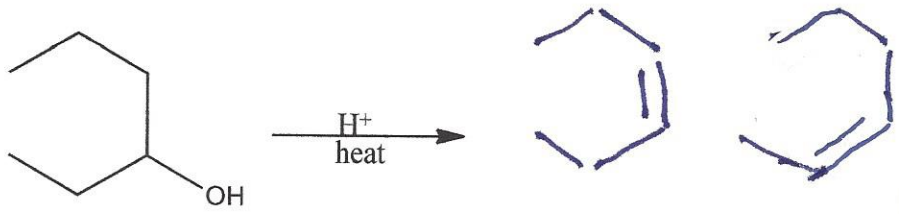
d.



e.



f.

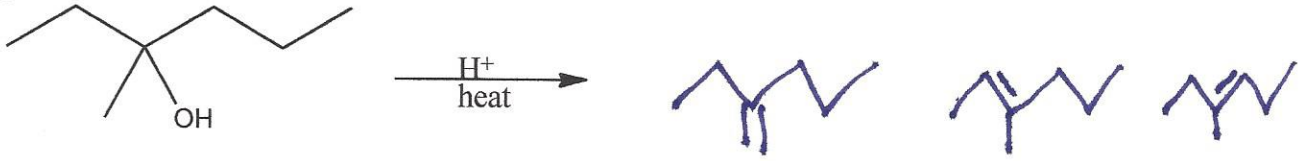


+ H_2O

two possible products

(trans isomer acceptable also)

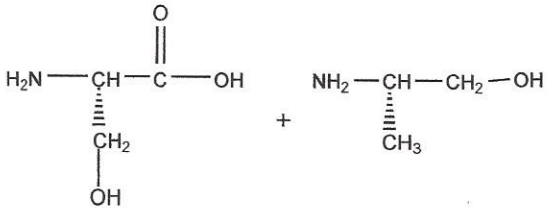
g.

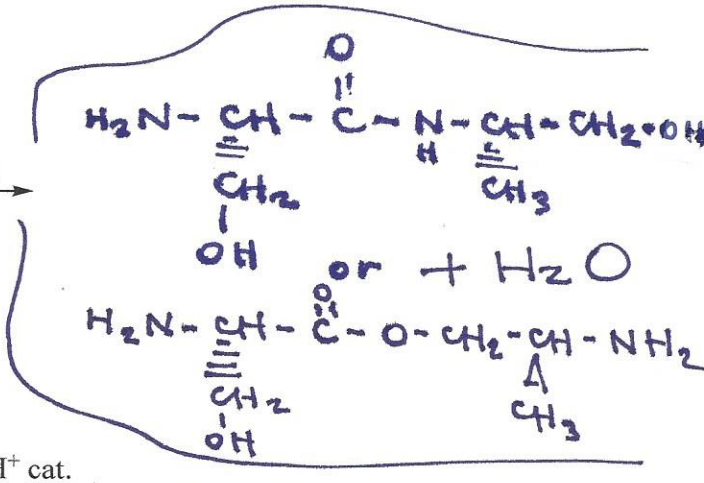


+ H_2O

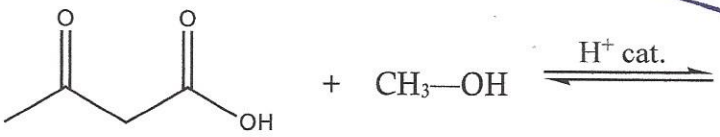
three possible products

h.

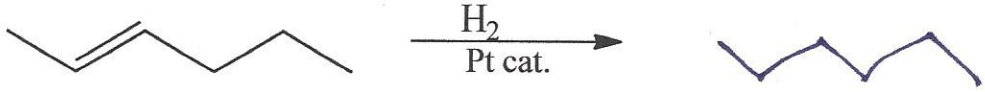




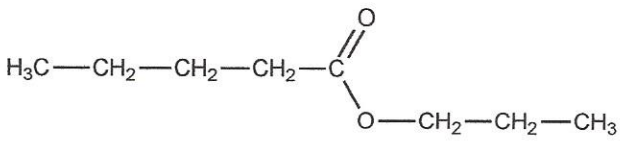
i.

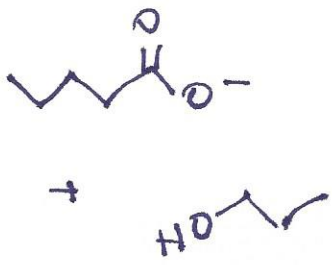


j.

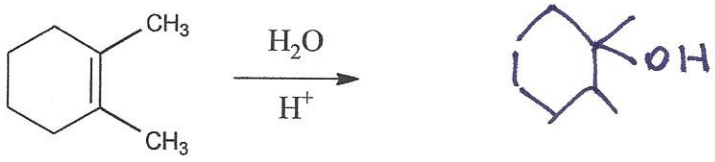


k.

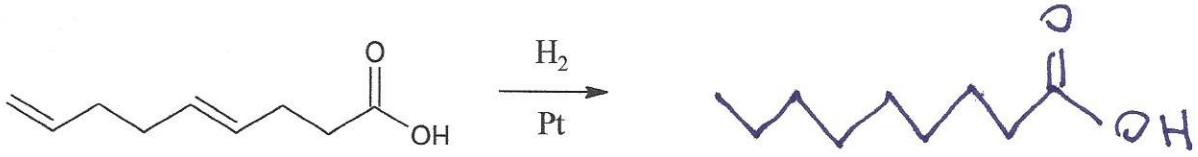




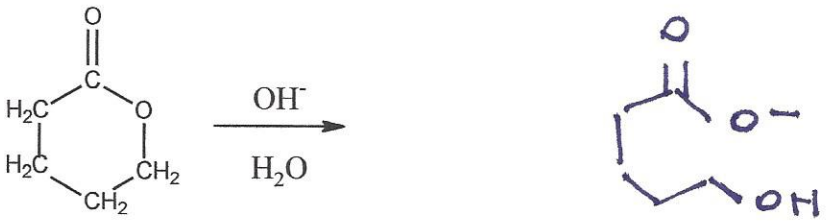
l.


CH3
CH3
H2O
H+
OH

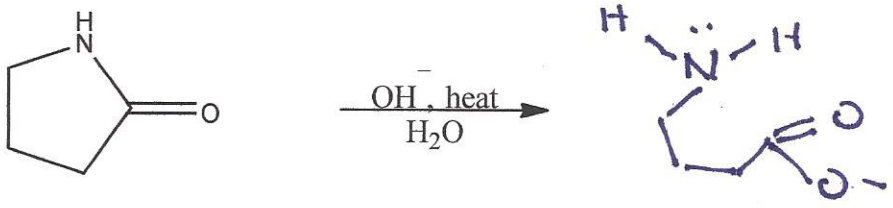
m.


O
OH
H2
Pt
O
OH

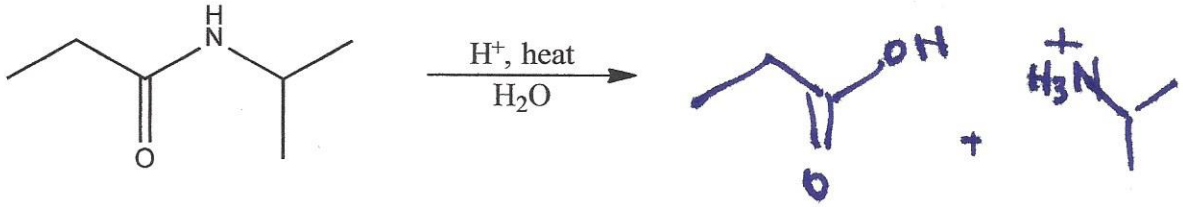
n.


O
C
H2C
O
H2C
CH2
CH2
OH-
H2O
O
O-
OH

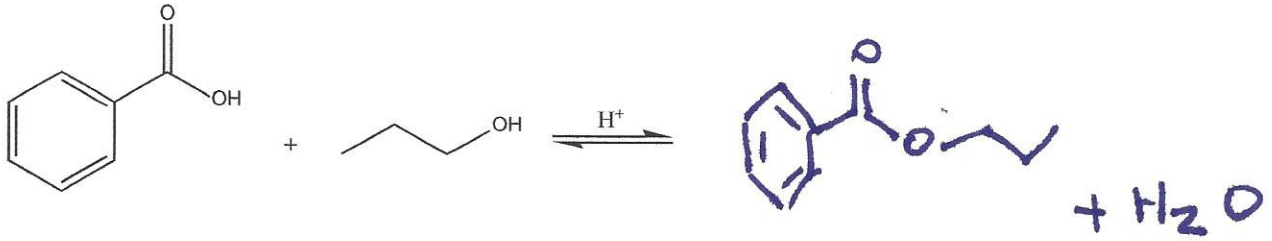
o.


H
N
O
OH- , heat
H2O
H
N
H
O
O-

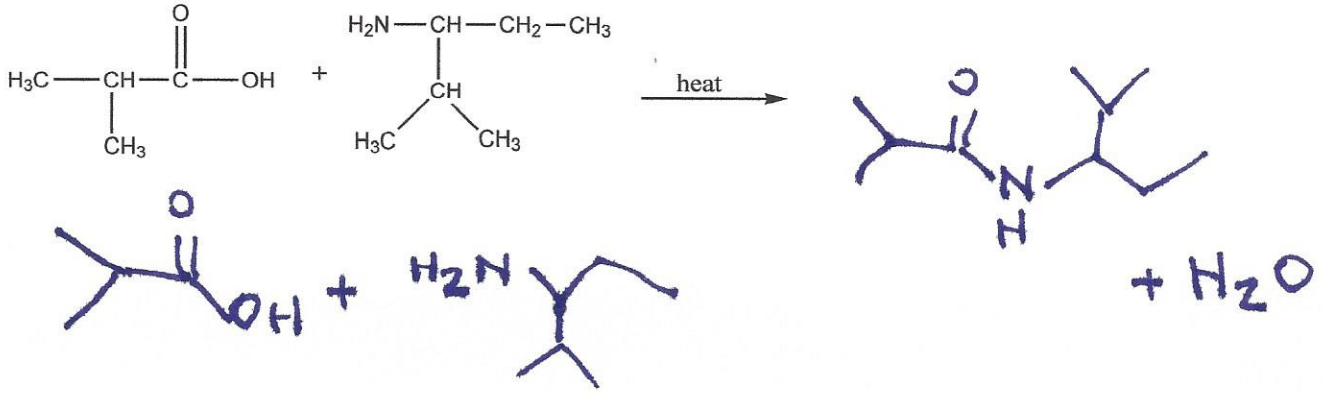
p.


H
N
O
H+, heat
H2O
OH
O
+
H3N

q.


O
OH
+
OH
H+
O
O
+ H2O

r.


O
H3C
CH
C
OH
CH3
+
H2N
CH
CH2
CH3
CH
H3C
CH3
heat
O
N
H
+ H2O
O
OH
+
H2N