

Student ID _____ Name _____

Recitation TA Name: _____

page points:

2 _____ (18)

3 _____ (12)

4 _____ (26)

5 _____ (20)

6 _____ (14)

7 _____ (10)

Total _____ (100)

Periodic Table

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Ha	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Fr	Ra	Ac															

Please sit with an empty seat between you and your neighbors.

Unless specifically asked, you do not have to draw mechanisms for reactions.

Please don't ask questions about your answers, it distracts your neighbors.

1. Draw the structure of each of the following molecule (4 pts each).

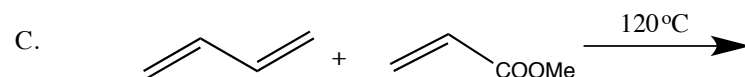
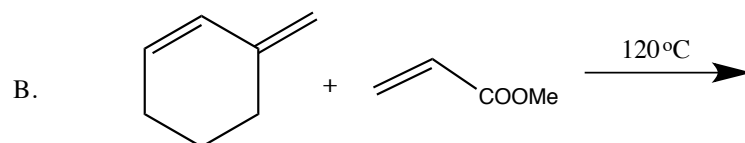
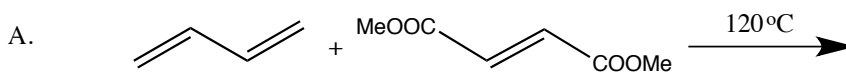
1a) 3,3-dimethyl-4-hexyn-1-ol

1b) (3E, 5Z)-3-bromo-3,5-octadiene

1c) 2,4,6-trinitrotoluene

2. Identify the fastest and the slowest reaction in each of the following sets of reactions, respectively (3 pts each).

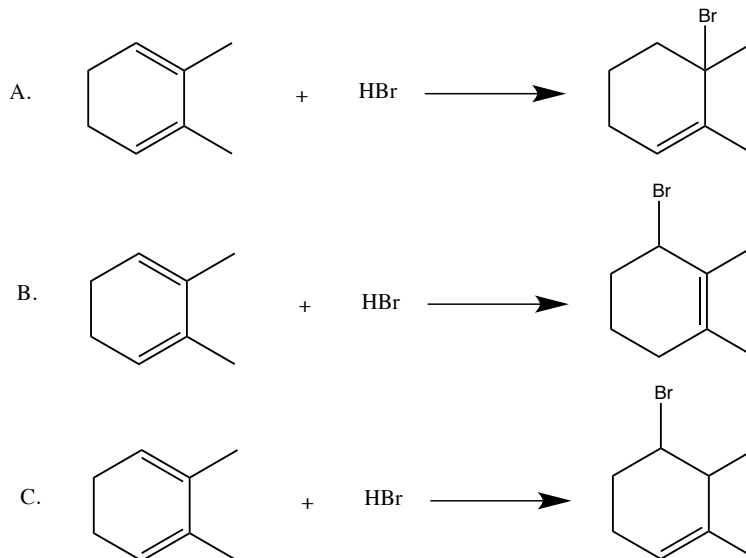
2a)



Fastest reaction: _____

Slowest reaction: _____

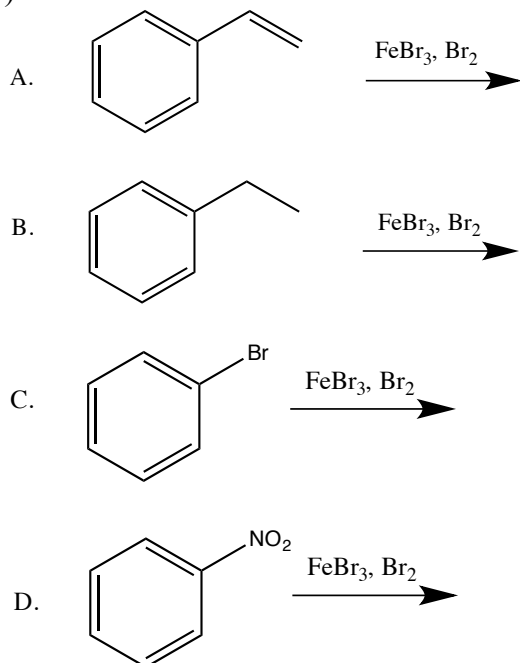
2b)



Fastest reaction: _____

Slowest reaction: _____

2c)

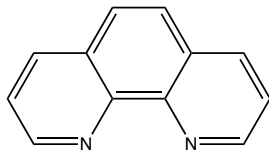


Fastest reaction: _____

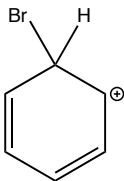
Slowest reaction: _____

3. Determine whether each of the following structure is aromatic, anti-aromatic or non-aromatic (3 pts each).

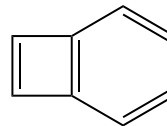
3a)



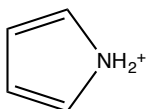
3b)



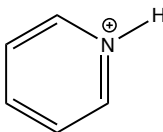
3c)



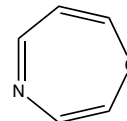
3d)



3e)

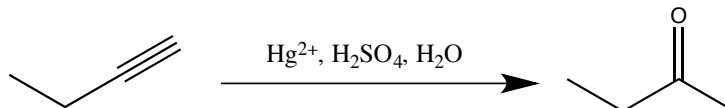


3f)

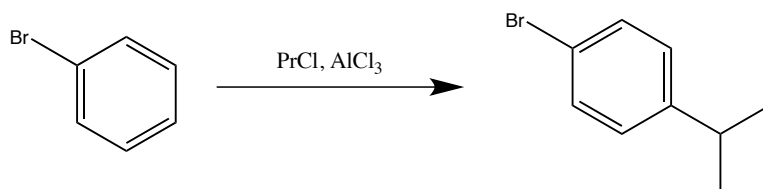


4. Use curved arrow or fishhook notation to draw the mechanism for each of the following reactions (8 pts each).

4a)

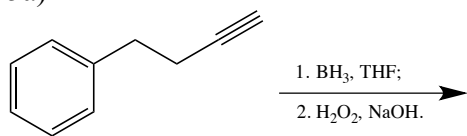


4b)

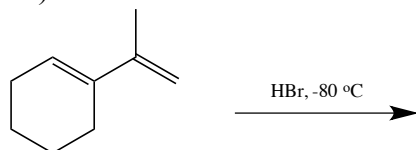


5. Provide the major product of the following reaction. If the reaction produces a racemic mixture as the major products, draw only one enantiomer. (4 pts each)

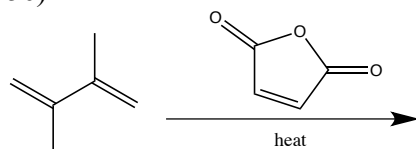
5a)

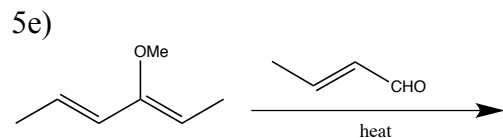
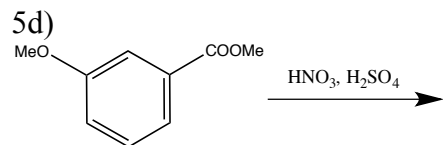


5b)



5c)

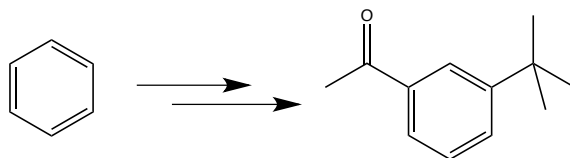




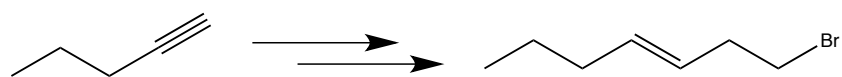
Draw the transition state of the above reaction (5e) that leads to the major product (2 points)

6. Complete the following syntheses using the provided starting material, any organic molecule of 4 carbons or less, and any inorganic reagents you need. You do not have to show the synthesis of the 4-carbon or less molecule you use. If your synthesis requires more than one step, provide the product after each step. All chiral products are racemic mixtures.

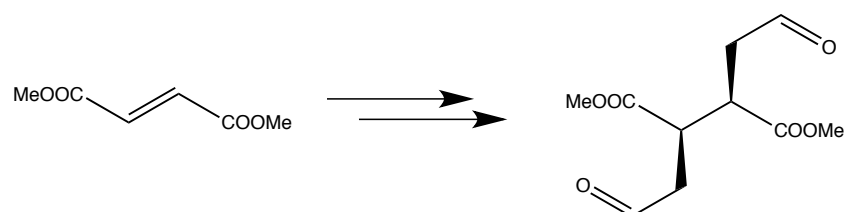
6a) 4 pts



6b) 6 pts



6c) 4 pts



(Please do NOT detach this page)