CHEM3311 Wang Fall 2014 Midterm 3

Student ID _____ Name KEY

Recitation Date/Time _____ TA Name _____

page	points:
2	(26)
3	(28)
4	(17)
5	(13)
6	(10)
7	(6)

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															

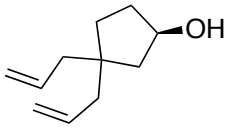
Please sit with an empty seat between you and your neighbors.

Please silence your cell phones and keep them in your bags during exam.
You may use molecular models. Please bring them in transparent bags.

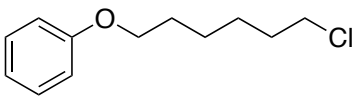
Feel free to ask questions about the questions, but please don't ask questions about your answers, it distracts your neighbors.

1. Provide the structure for each of the following compounds (4 pts each)

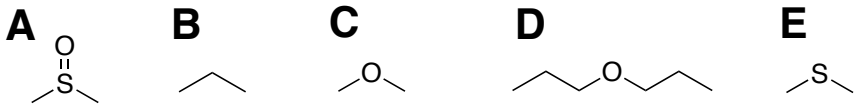
a) R-3,3-diallylcyclopentan-1-ol



b) 6-chlorohexyl phenyl ether

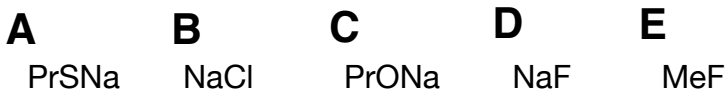


2. (3pts each) a) Identify the most and second most polar molecules, respectively.



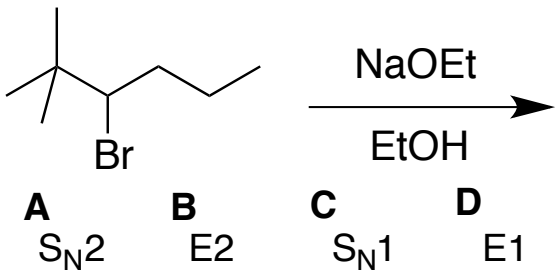
Most polar: A ; Second most polar: C .

b) Identify the strongest and weakest nucleophiles in the following series, respectively.



Strongest nucleophile: A ; Weakest nucleophile: E .

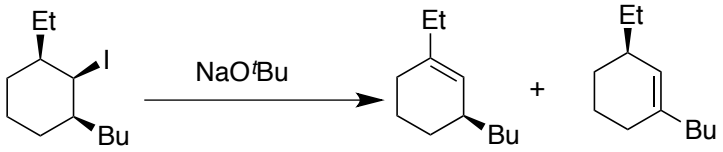
c) Identify the most and least favored reactions, respectively.



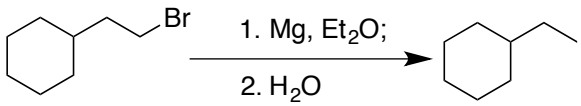
Most favored reaction: B ; Least favored reaction: A .

3. Provide the major product(s) for each of the following reaction (4 pts each);

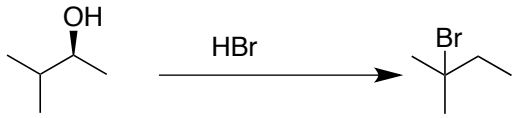
a)



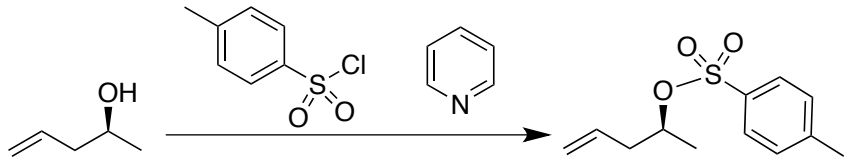
b)



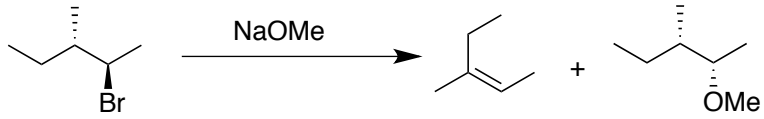
c)



d)

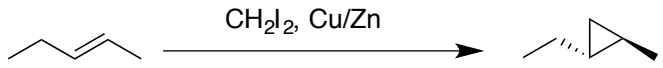


e)

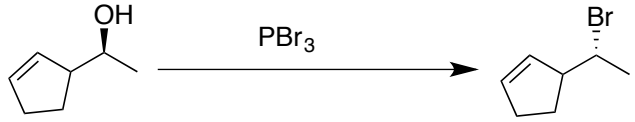


4. Propose appropriate reagents for accomplishing each of the following reactions (4 pts each).

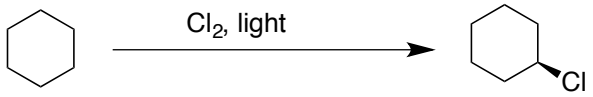
a)



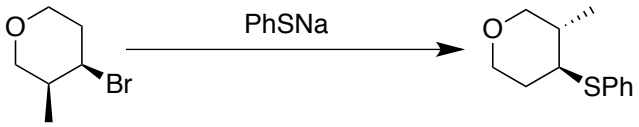
b)



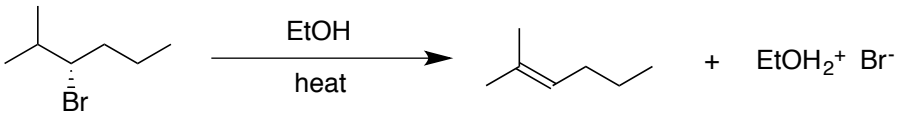
c)

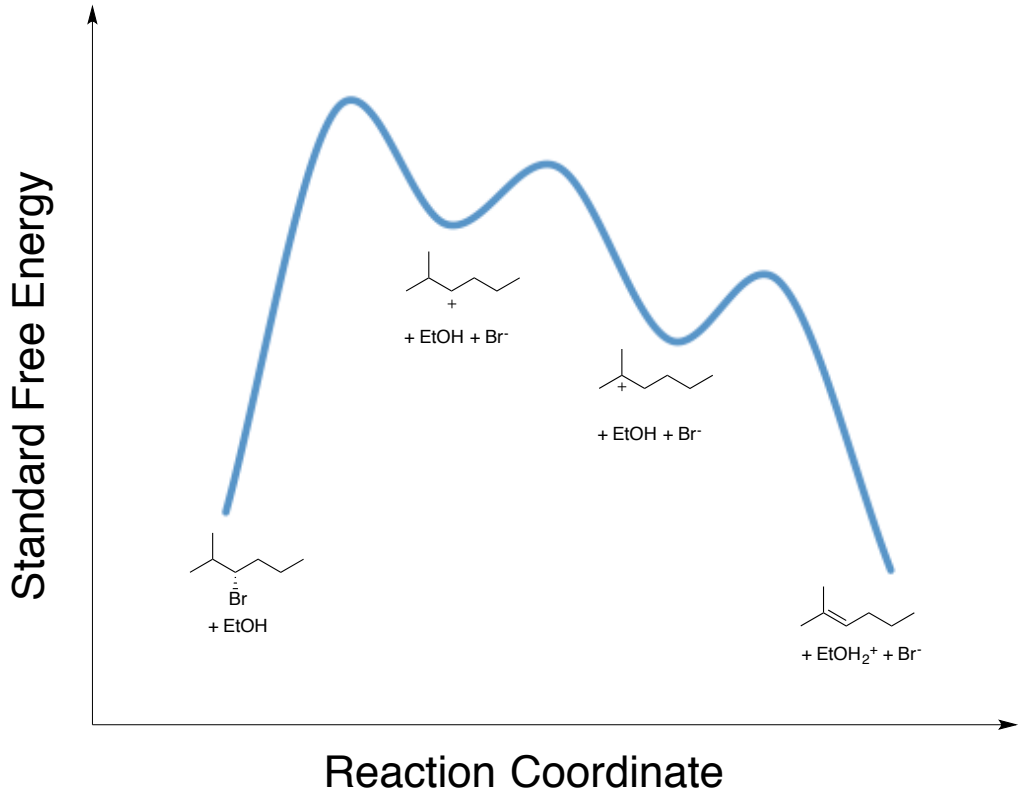


d)

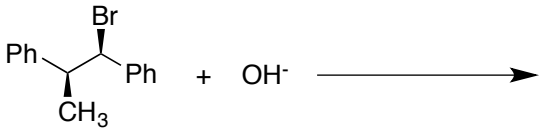


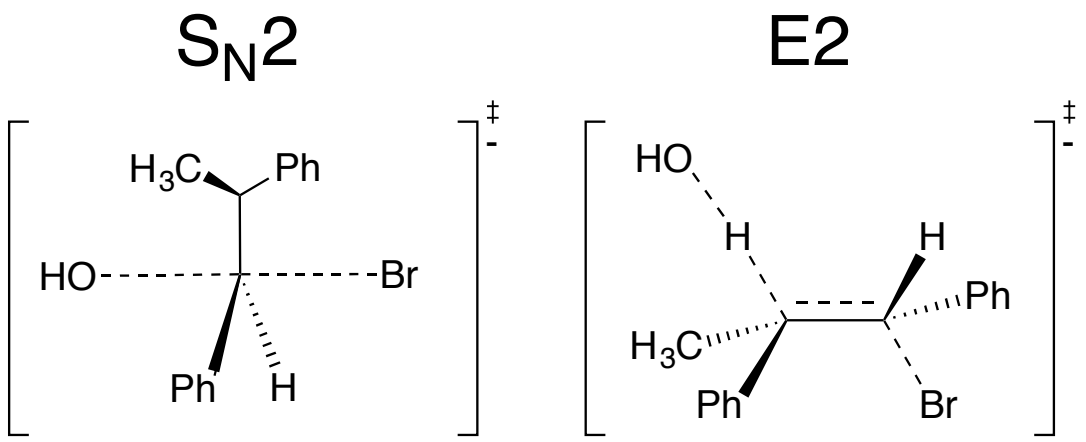
5. a) Complete the reaction coordinate for the following reaction. Draw the structure(s) of all intermediate(s). (9 pts)





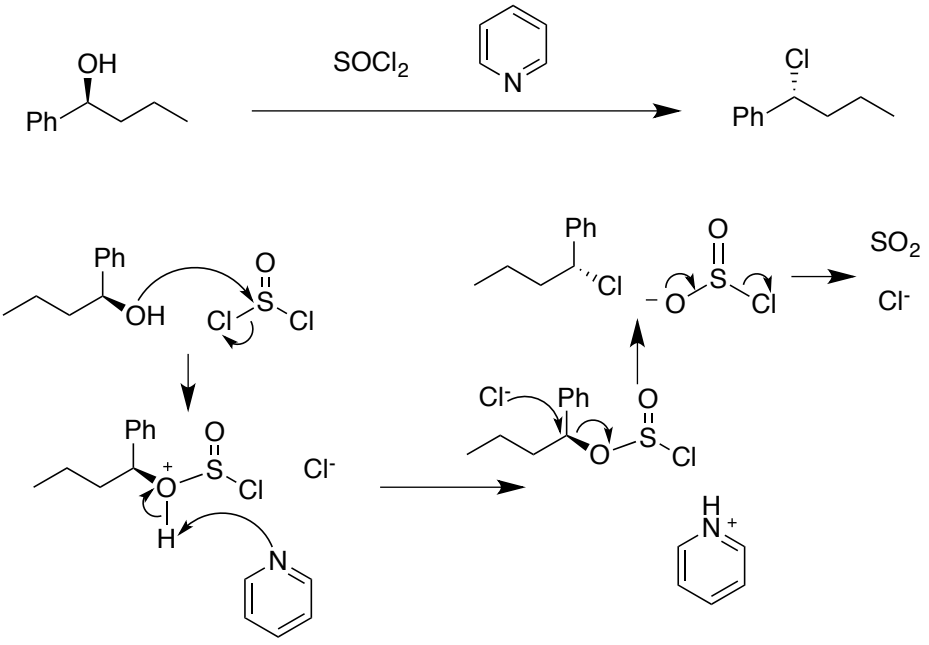
b) Draw the transition state for the following S_N2 and E2 reactions, respectively (3 pts each).



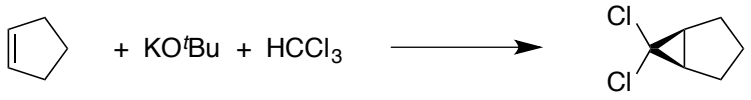


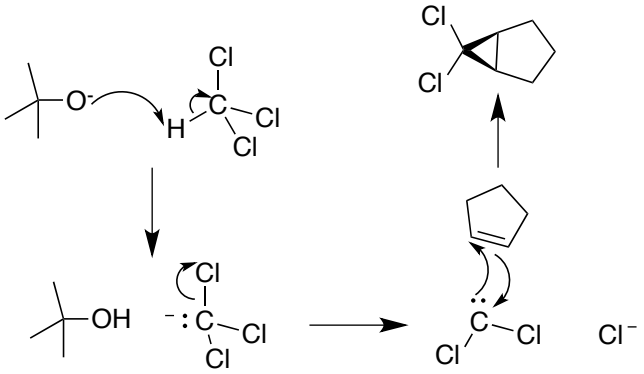
6. Use curved arrow or fishhook notation to draw the mechanism for each of the following reactions.

a) 7 pts



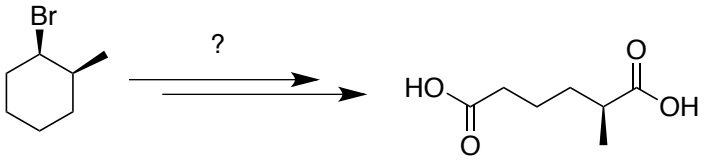
b) 6 pts

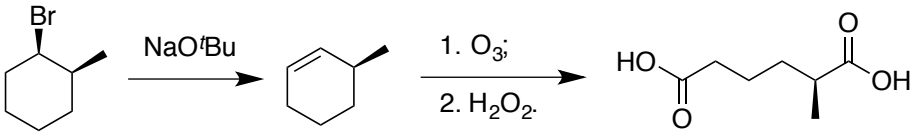




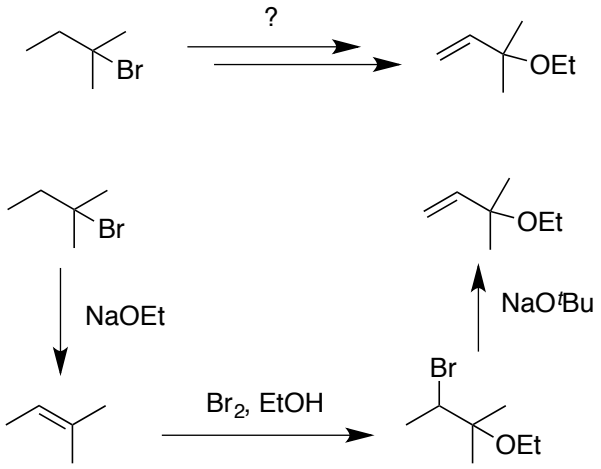
7. Propose a reasonable synthetic route for each of the following transformations. The reagents and products are required for each step.

a) (4 pts)





b) (6 pts)



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