

Name: _____

CHEMISTRY 3311, Fall 2001
Professor Walba
Third Hour Exam
November 15, 2001

scores:

- 1) 14
- 2) 25
- 3) 25
- 4) 26
- 5) 10

This is a closed-book "open model" exam. You may use models, but no notes or books. Please put all your answers on the test. Use the backs of the pages for scratch.

100

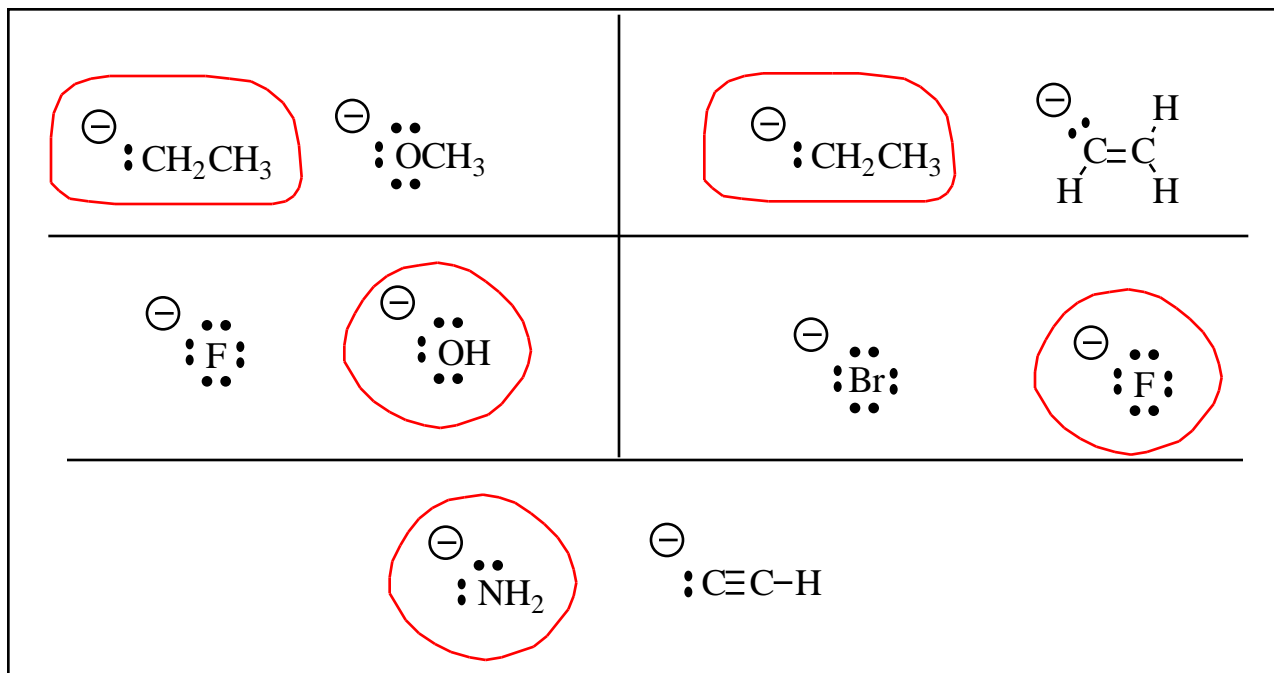
PLEASE read the questions carefully!

Partial Periodic Table

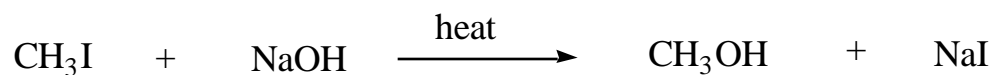
1A							8A	
1 H							2 He	
	2A	3A	4A	5A	6A	7A		
3 Li	4 Be	5 B	6 C	7 N	8 O	9 F	10 Ne	
11 Na	12 Mg	13 Al	14 Si	15 P	16 S	17 Cl	18 Ar	
							35 Br	
							53 I	

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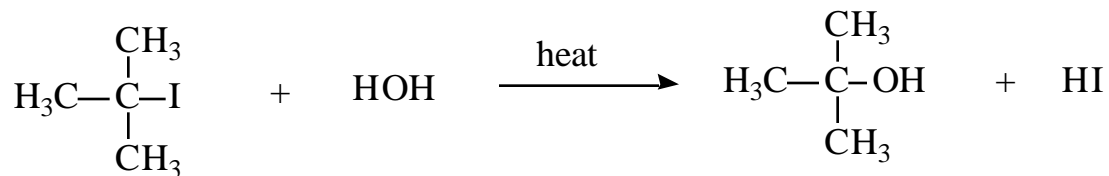
1) (14 pts) a) For each of the following pairs of anions, circle the stronger base.



b) Indicate the name of the mechanism by which each of the following two reactions takes place.



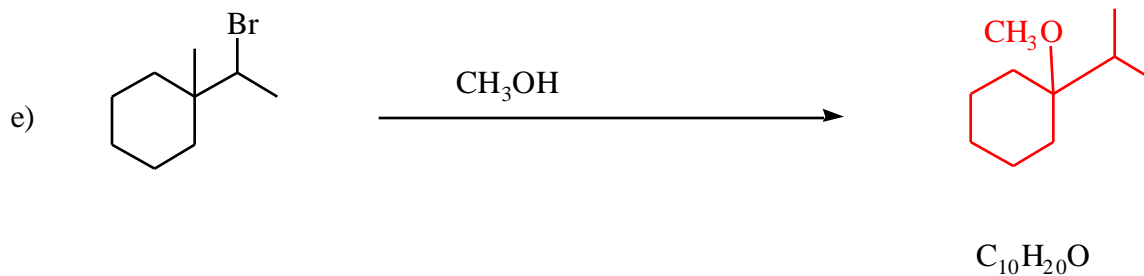
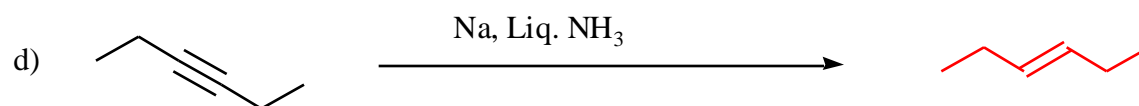
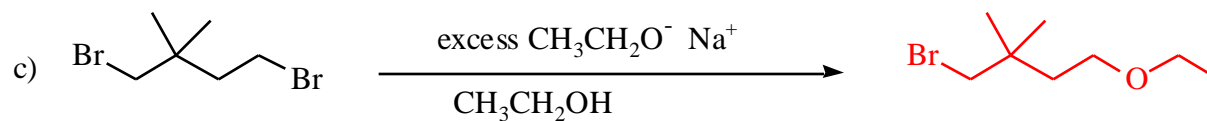
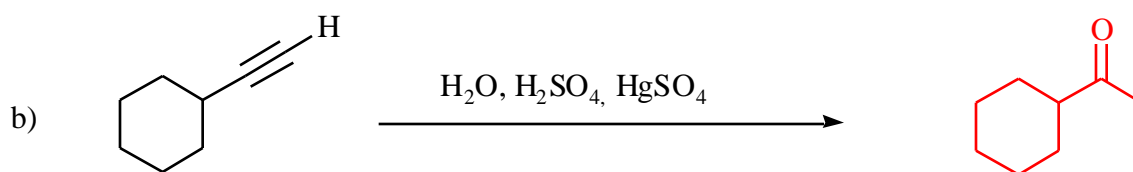
S_N2



S_N1

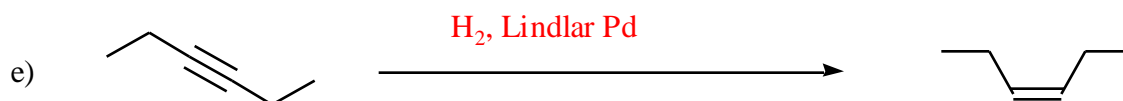
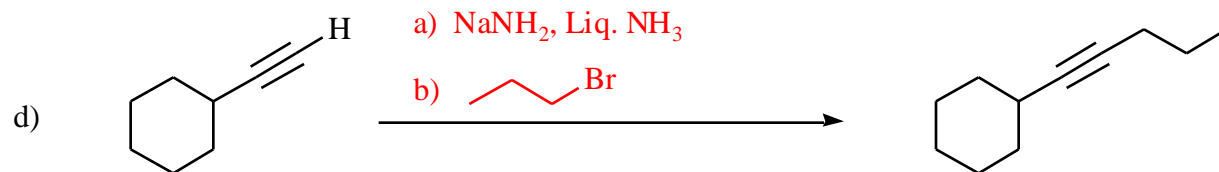
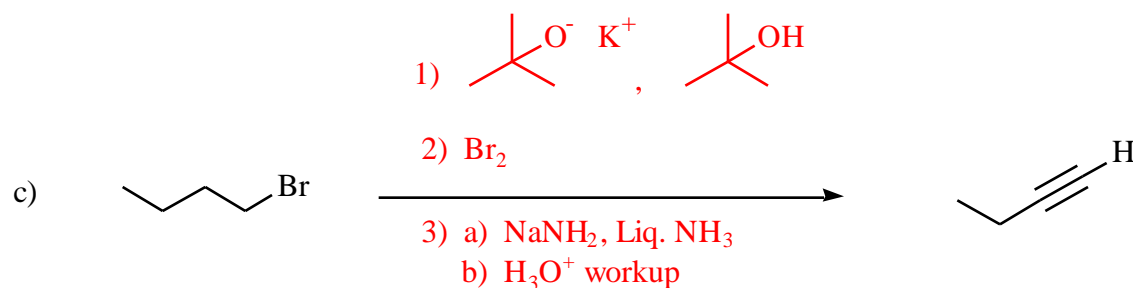
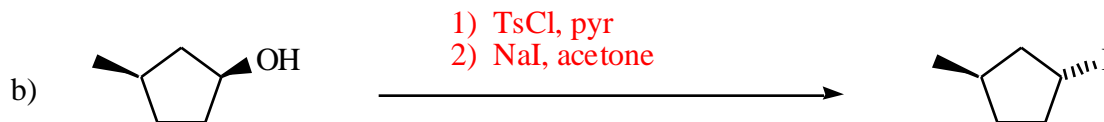
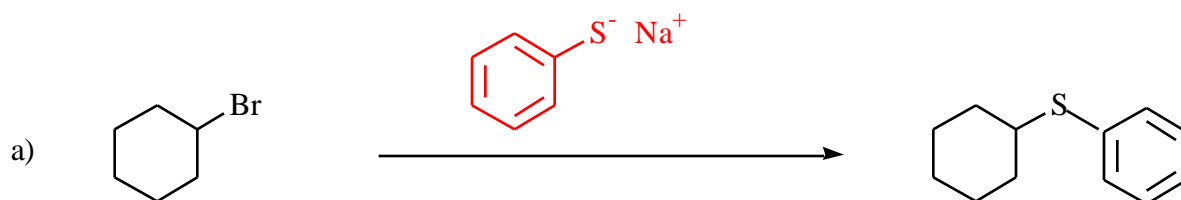
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2) (25 pts) Give the single major product of each of the following reactions. Show the stereochemistry of the product using wedges and dashes where appropriate. If a racemate is formed, show only one enantiomer.



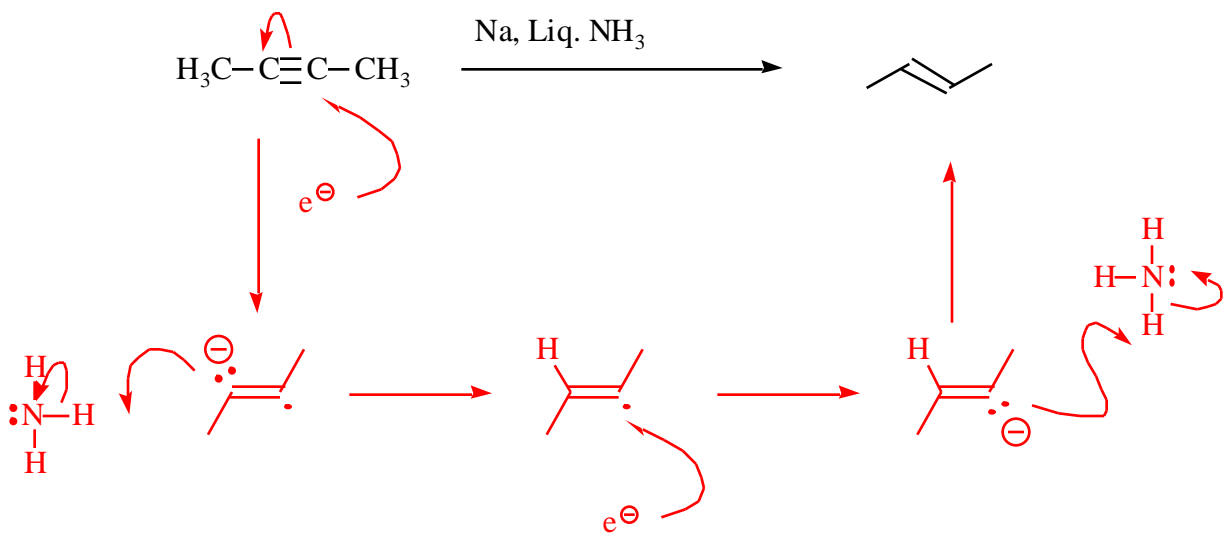
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3) (25 pts) Propose reagents for accomplishing the following transformations. NOTE: more than one step may be required! Try to make your synthesis efficient (i.e. the desired product should be the major product). You must use the starting material given, and you may use any other reagents you need.



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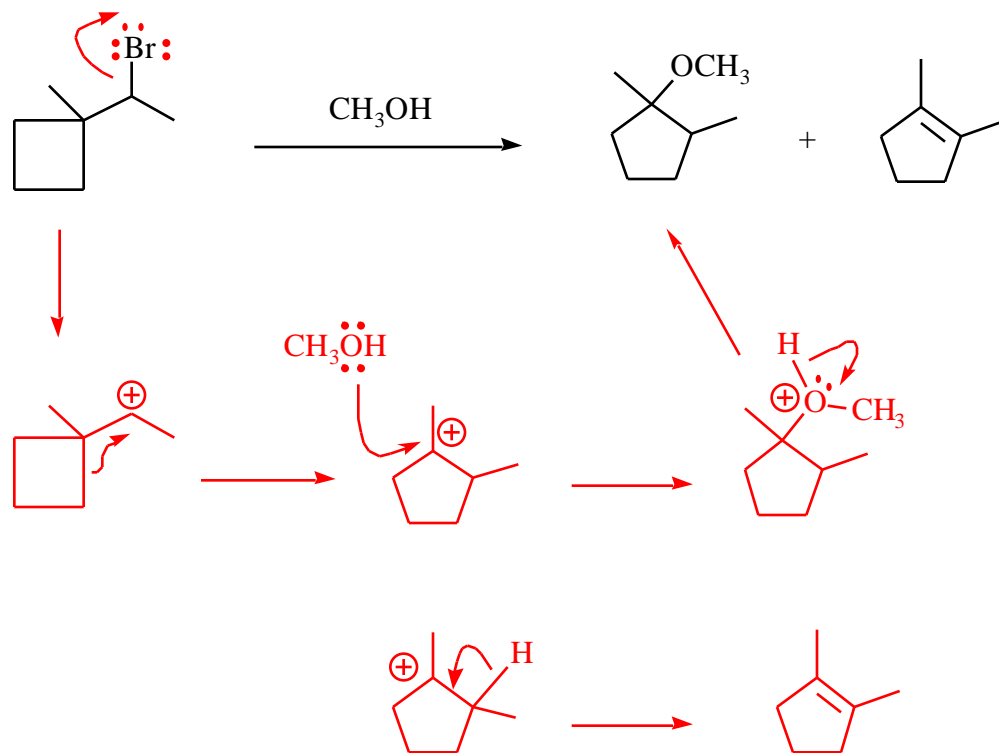
4) (26 pts) a) Propose an arrow-pushing mechanism for the following transformation. Carefully show every intermediate in your mechanism, with all lone pairs and formal charges.



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4) –continued–

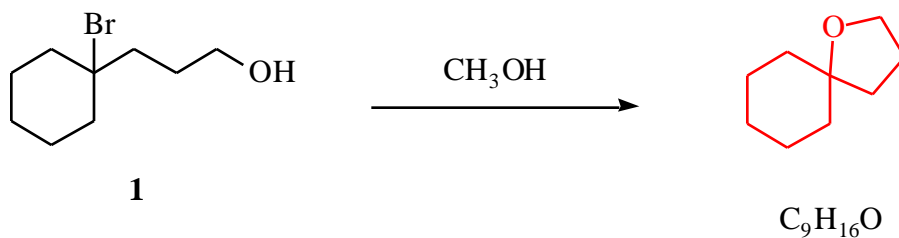
b) Propose an arrow-pushing mechanism for the following transformation showing how both products are formed. Carefully show every intermediate in your mechanism, with all lone pairs and formal charges. Ignore stereochemistry for this question.



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4) –continued-

c) When the bromoalcohol **1** is treated with methanol, a single product is formed very cleanly. It is found that this product has no OCH_3 group, and also no OH group. As indicated, the product has the molecular formula $\text{C}_9\text{H}_{16}\text{O}$. Propose a structure for this very cool product.



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5) (10 pts) Propose a sequence of reactions leading to the following target using organic starting materials with five (5) carbons or less, and any reagents or catalysts you need.

