

Seat No. _____

Last Name: WST

First Name: _____

There are 7 pages to this exam. Check to make sure you have a complete exam.

PLEASE ALSO PRINT YOUR NAME ON THE TOP OF
THE **BACK** OF THE LAST PAGE OF THE EXAM

CHEMISTRY 331

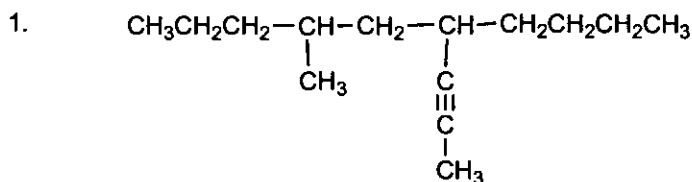
EXAM III

Spring 2009 (3/13/09)

I.	(22 Points)	_____
II.	(24 Points)	_____
III.	(10 Points)	_____
IV.	(19 Points)	_____
V.	(12 Points)	_____
VI.	(13 Points)	_____
TOTAL	(100 Points)	_____

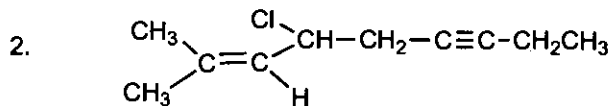
I. (22 points)

A. (6 pts) Give a correct name for each of the following compounds.



or 2 here
or here

4-butyl-6-methylnon-2-yne



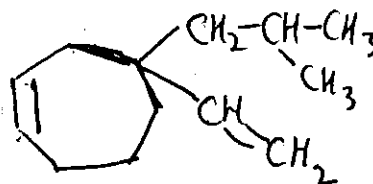
or 2 here

or 6 here

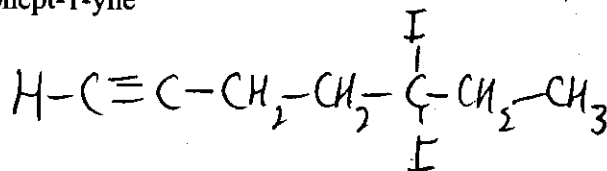
4-chloro-2-methylnon-2-en-6-yne

B. (6 pts.) Give a correct structure for each of the following names.

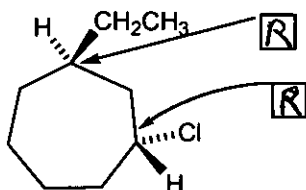
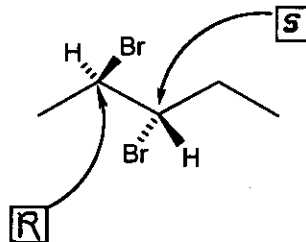
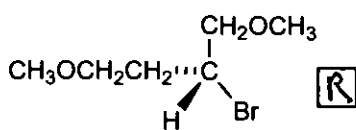
1. 4-isobutyl-4-vinylcycloheptene



2. 5,5-diiodohept-1-yne

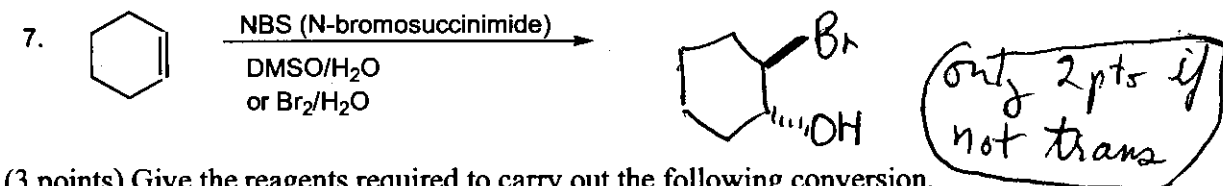
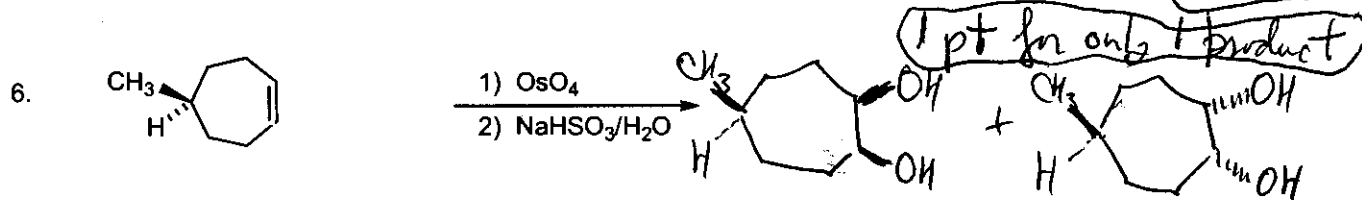
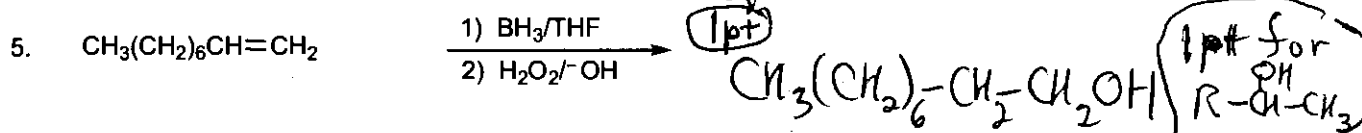
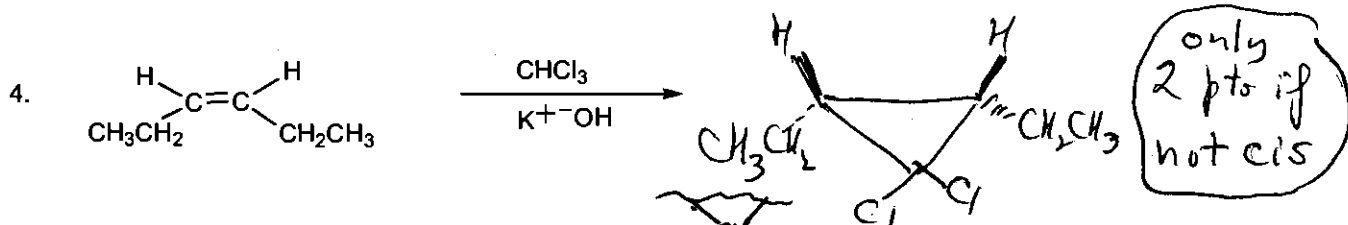
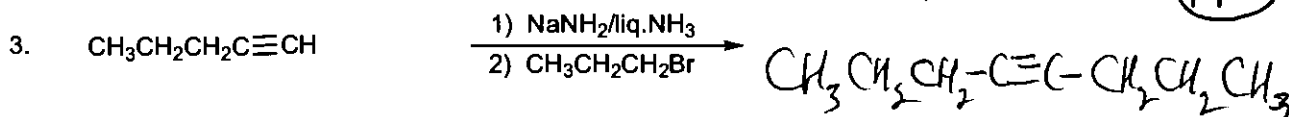
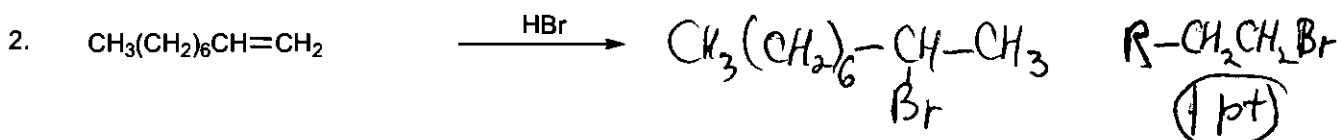
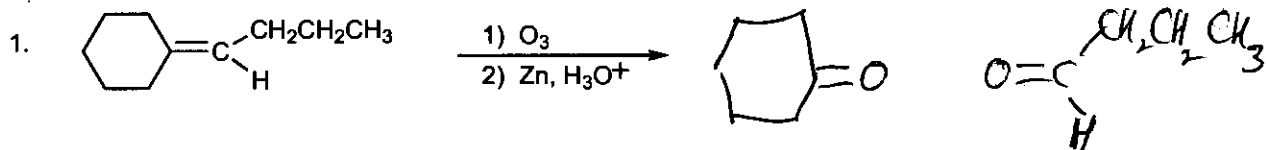


C. (10 pts) Assign R or S to the following stereogenic (chirality) centers.

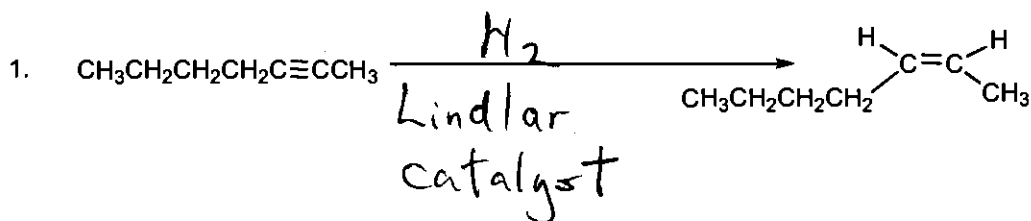


II. (24 pts)

A. (21 points) Complete the following equations giving all organic products. Stereochemistry must be clearly indicated in reactions which are stereoselective.

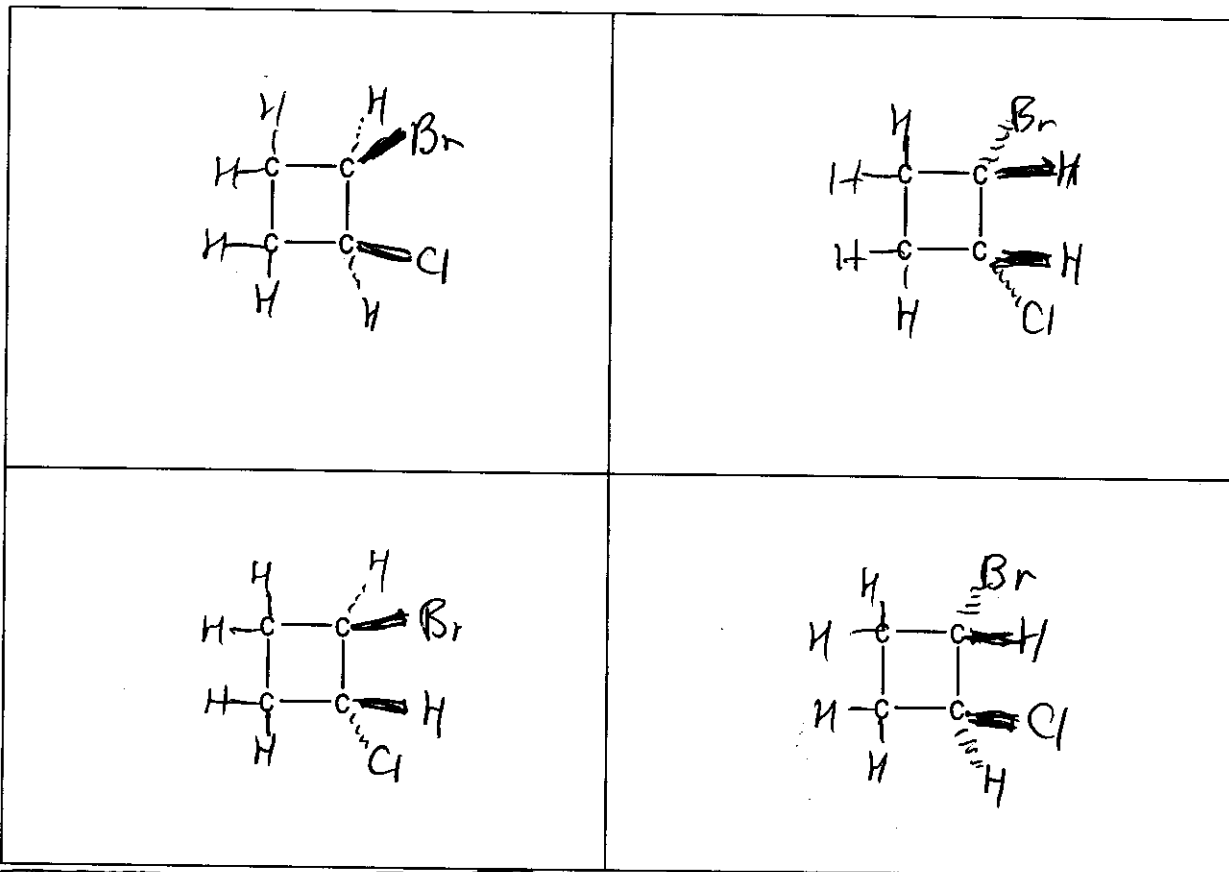


B. (3 points) Give the reagents required to carry out the following conversion.



+2 for ~~showing~~ showing all H's

- III. (10 pts.) Complete the structures below to show all of the stereoisomers of 1-bromo-2-chlorocyclobutane, C_4H_6BrCl (there are no more than four correct stereoisomers and there may be fewer; use wedges and dotted lines as needed). **Be sure to show all hydrogens.** Cross out any boxes that are not used. Points will be deduced for duplicate or incorrect structures.



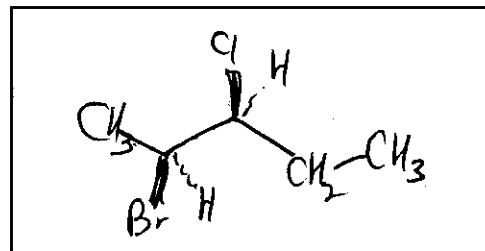
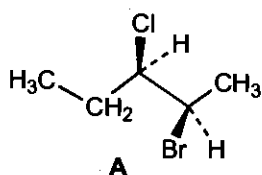
2 pts / correct structure - 2 pts for wrong or duplicate structure

Periodic Table of the Elements

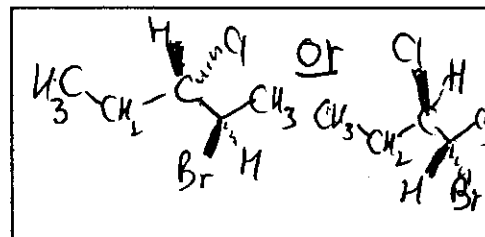
1A																		2A																		3A										4A										5A										6A										7A										8A									
1																		2																		13										14										15										16										17										18									
1																		3	4																	5	6	7	8	9	10											13	14	15	16	17	18																																						
H																		Li	Be																	B	C	N	O	F	Ne											Al	Si	P	S	Cl	Ar																																						
1.01																		6.94	9.01																	10.8	12.0	14.0	16.0	19.0	20.2											27.0	28.1	31.0	32.1	35.4	39.9																																						
																																				8B																																																											
11	12																	3B	4B	5B	6B	7B											18	2B	13	14	15	16	17	18																																																							
Na	Mg																	3	4	5	6	7											8	9	10	11	12	13	14	15	16	17	18																																																				
23.0	24.3																																																																																														
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K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr											Ga	Ge	As	Se	Br	Kr																																																														
39.1	40.1	45.0	47.9	50.9	52.0	54.9	55.8	58.9	58.7	63.5	65.4	69.7	72.6	74.9	79.0	79.9	83.8											69.7	72.6	74.9	79.0	79.9	83.8																																																														
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54											49	50	51	52	53	54																																																														
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe											In	Sn	Sb	Te	I	Xe																																																														
85.5	87.6	88.9	91.2	92.9	95.9	(98)	101	103	106	108	112	115	119	122	128	127	131											115	119	122	128	127	131																																																														
55	56	57	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86											81	82	83	84	85	86																																																														
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn											Tl	Pb	Bi	Po	At	Rn																																																														
133	137	139	178	181	184	186	190	192	195	197	201	204	207	209	(209)	(210)	(222)											204	207	209	(209)	(210)	(222)																																																														
87	88	89	104	105	106	107	108	109																																																																																							
Fr	Ra	Ac	Rf	Ha	Unh	Uns	Uno	Une																																																																																							
(223)	226	227	(261)	(262)	(263)	(262)	(265)	(266)																																																																																							

IV. (19 pts) Complete the following.

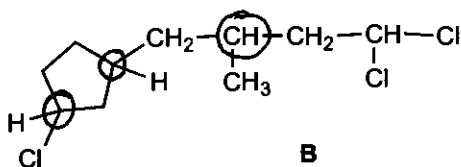
A. (3 pts) In the box provided, draw the enantiomer of A.



B. (3 pts) In the box provided, draw a diastereomer of A.



C. (3 pts) Circle the stereogenic (chirality) centers of B.

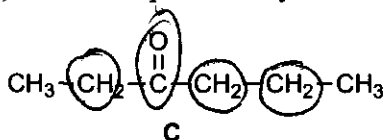


3 pts for 3 correct circles

1 pt for 2 correct circles

1 pt for 3 correct circles + 1 incorrect circle

D. (3 pts) Circle the prochirality centers in molecule C.

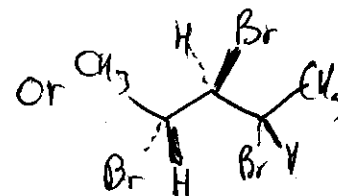
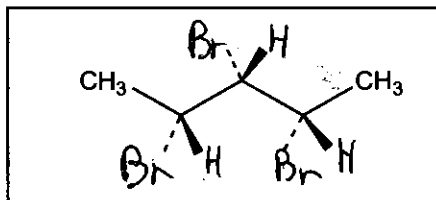
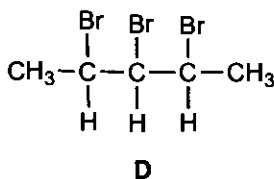


3 pts for 4 correct circles

1 pt for 1, 2, or 3 correct circles

1 pt for 4 correct circles + 1 incorrect circle.

E. (3 pts) Using the partial structure in the box provided, draw a meso stereoisomer that has the constitution of structure D.



F. (4 pts) Indicate whether the following statements are True or False by circling T or F.

T F

1. A (+) isomer should have the same melting point as its enantiomer, the (-) isomer.

T F

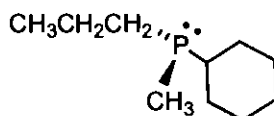
2. Racemic mixtures are rarely optically inactive (i.e., have an optical rotation of zero).

T F

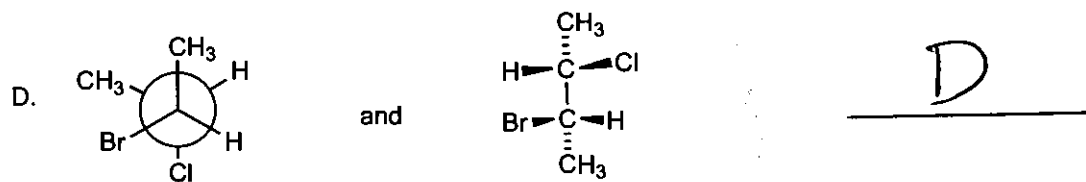
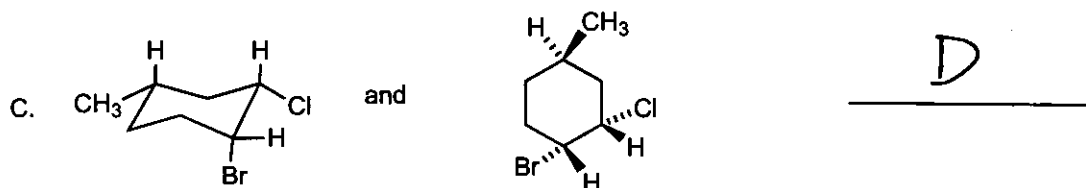
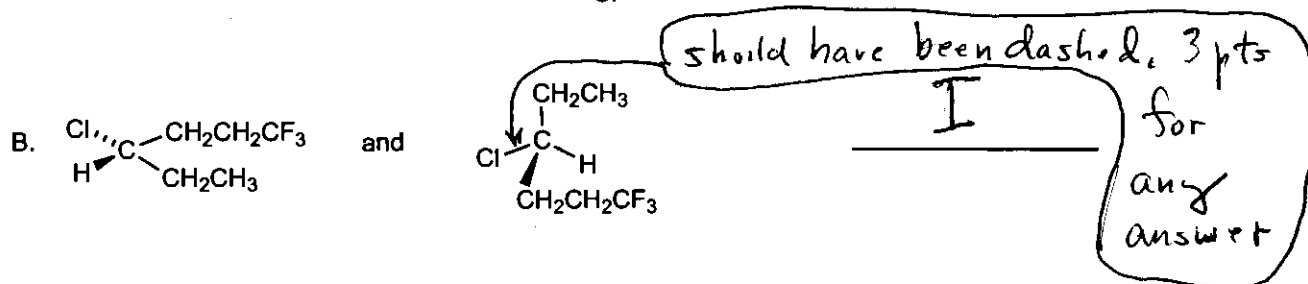
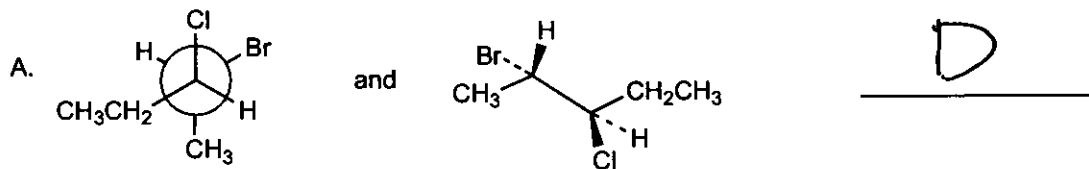
3. In many procedures used to resolve a pair of enantiomers, diastereomers are involved.

T F

4. The enantiomer E should be configurationally stable at room temperature.

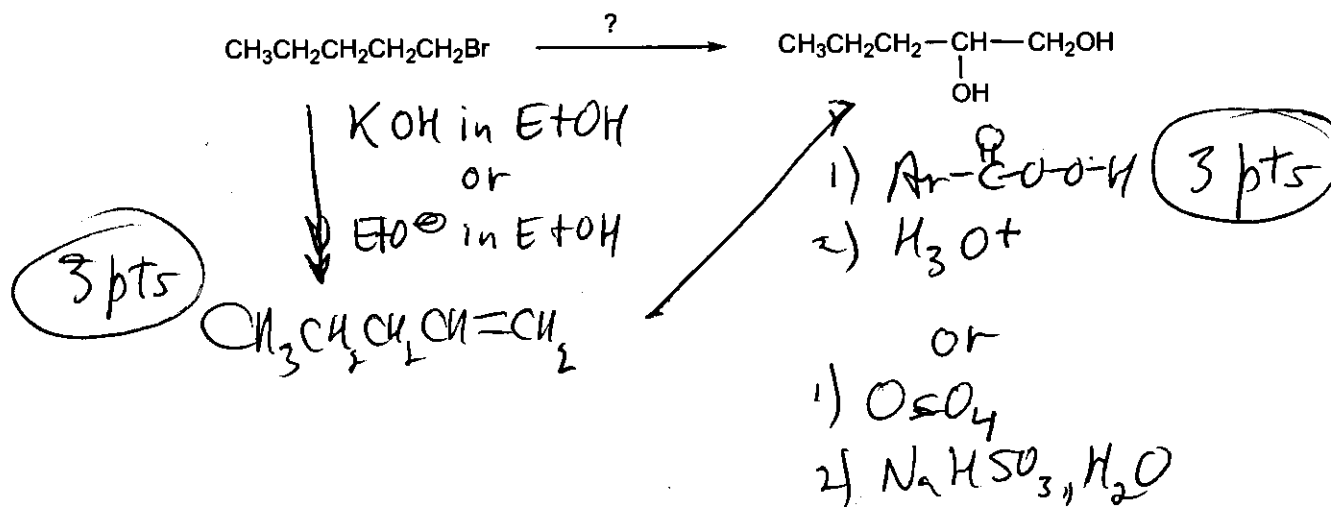


V. (12 pts) Label each pair of structures as I (identical), E (enantiomers), D (diastereomers) or C (constitutional isomers – not stereoisomers).



VI. (13 pts) Beginning with the starting material indicated, show how to achieve each of the following syntheses by showing all the reactions that are needed. (For each reaction, give the starting material, conditions over the arrow, and the products). You may use any inorganic compound or organic compound with one or two carbons.

A. (6 pts)



B. (7 pts)

