CHEMISTRY 59-230

SECOND TEST

Time: 50 Min **November 11, 1999**

NAME: _____

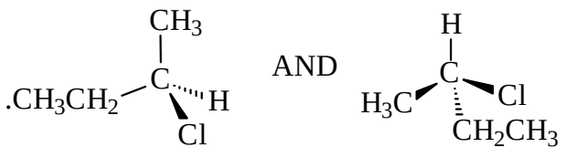
ID #: _____

LABORATORY DAY: _____ **Afternoon** _____ **Evening** _____

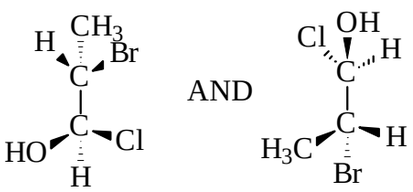
READ ALL QUESTIONS CAREFULLY AND ANSWER THE QUESTION ASKED!! Answer all questions on the test paper. Only the FIRST answer to any question will be considered. Point values for each question are given. There are 6 questions and 4 pages in this test and the available points total 100.

1. Pick a word from the following list (enantiomers, diastereomers, identical) which correctly describes the relationship between the pairs of molecules shown below. [20 points]

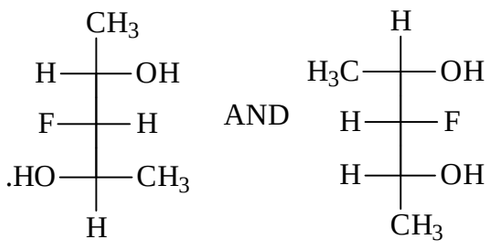
(a)



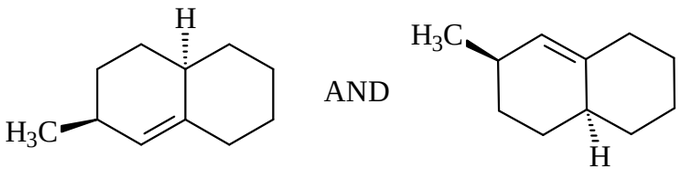
(b)



(c)



(d)



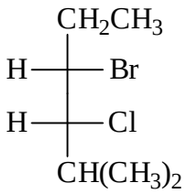
2. (a) Indicate by circling the appropriate letter (Yes or No) which, if any, of the eight drawings in question #1 represent meso forms. [8 points]

(a)	left (Y N)	right (Y N)
(b)	left (Y N)	right (Y N)
(c)	left (Y N)	right (Y N)
(d)	left (Y N)	right (Y N)

(b) Which of the pairs of molecules shown in question #1, if mixed in a 1:1 ratio, would show optical activity?[8 points]

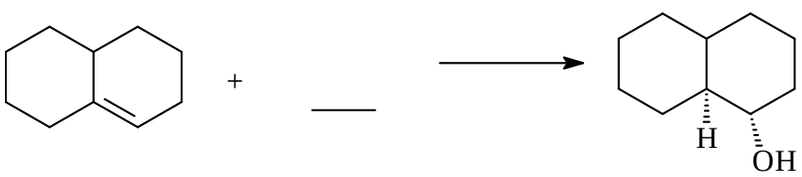
1a	Yes	No
1b	Yes	No
1c	Yes	No
1d	Yes	No

3. Deduce the correct stereochemical designator for each of the chiral centres in the molecule shown below. Show how you arrived at your answer. ALSO, give the complete IUPAC name (including stereochemistry) for the molecule. [10 points]

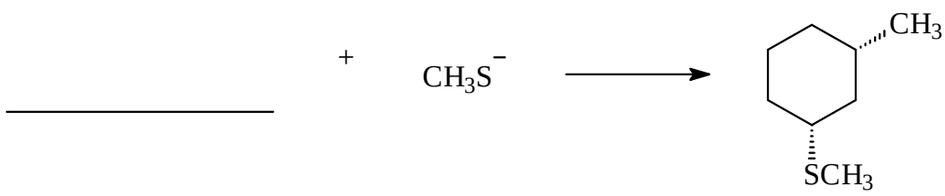


4. Fill in the blanks with the correct structural formula. Show any required catalysts over the arrow. If stereochemistry is important, make sure your drawing illustrates this. [24 points]

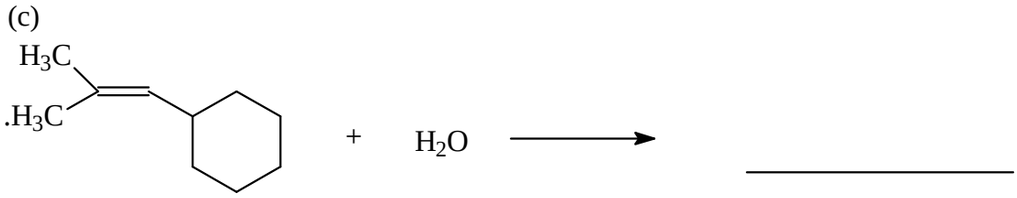
(a)



(b)

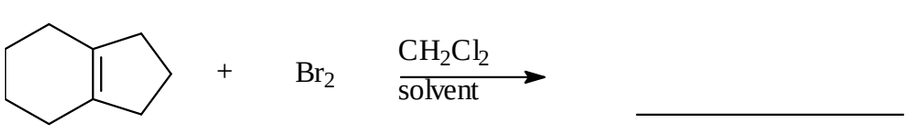


(c)

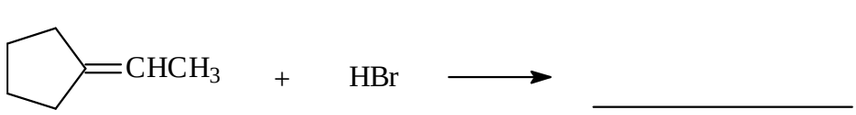


(d)

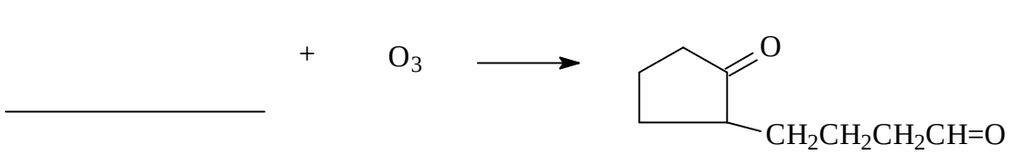
(e)



(f)



(g)



5. Draw the COMPLETE MECHANISM for the reaction of bromine in water with cyclohexene. Make sure you show stereochemical details and what steps in the reaction are reversible. ALSO draw the overall reaction. [10 points]

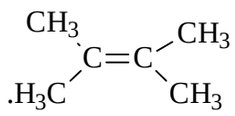
6. (a) On the axis below, draw the reaction energy profile for a reaction which proceeds in two steps and the first step is the slower one. [3 points]

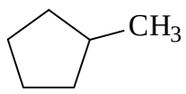
(b) What two mechanisms we have studied in this course fit this reaction profile? [4 points]

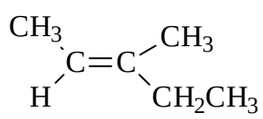
(c) A hydrocarbon with the molecular formula C_6H_{12} reacts with excess Br_2 in CH_2Cl_2 to give a molecule with the formula $C_6H_{12}Br_2$. The same hydrocarbon reacts with water under acid catalysis to give a compound that reacts instantly with Lucas Reagent. Indicate whether the following statements are **T**RUE or **F**ALSE [2 points each]

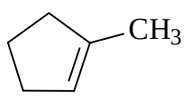
(i) The hydrocarbon is an alkene
(ii) The hydrocarbon contains a ring
(iii) The product of reaction with water is an ether
(iv) The Lucas reagent reaction means there must be a methyl group in the hydrocarbon

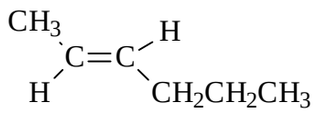
Circle ONE of the structures below which fits the data for the hydrocarbon. [5 points]

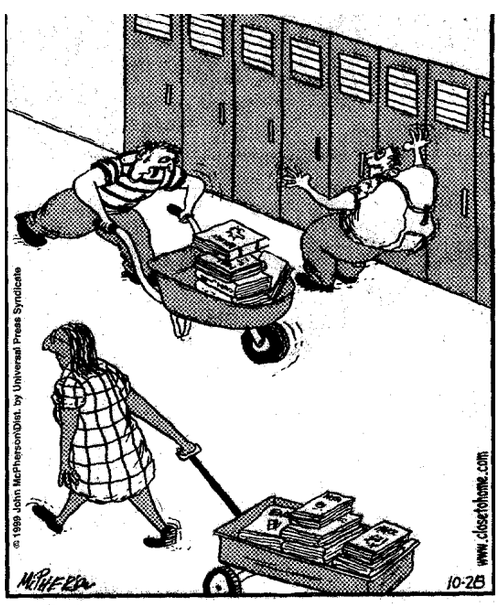












With textbook loads ever increasing, many students are finding alternatives to backpacks.