Chemistry 333

Examination #2

November 2, 2009 Professor Charonnat

Name: _____

Be certain that your examination has five (5) pages including this one.

Put your name on **each** page of this examination booklet.

By putting your name on this examination booklet you agree to abide by
California State University, Northridge policies of academic honesty and integrity.

Molecular models are allowed for this examination. All electronic devices, including calculators, are unnecessary and are not allowed.

Name: _____

1. (20 points)

Answer the following two (2) questions precisely, succinctly, and with correct grammar.

A. Define the term, "diastereospecific reaction," and give a representative example.

B. Explain why the fluoride ion of tetrabutylammonium fluoride is more nucleophilic than the fluoride ion of sodium fluoride. Draw reaction-energy diagrams to illustrate your answer.

Name: _____

2. (25 points)

Circle the number that corresponds to the correct answer for each of the following five (5) questions.

A. The alkyl halide, (5*R*,6*S*)-5,6-dibromodecane, rotates plane-polarized light

1. clockwise
2. counterclockwise
3. neither

B. The rate-determining step of an E1 reaction has

1. an early transition state
2. a late transition state
3. neither

C. The reaction of achiral reactants

1. always affords optically active products
2. sometimes affords optically active products
3. never affords optically active products

D. Which compound reacts most rapidly with ethanol?

1. 2-bromo-2-methylhexane
2. 2-bromohexane
3. 1-bromo-5-methylhexane

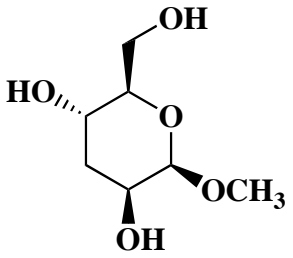
E. Which compound reacts most rapidly with potassium cyanide?

1. 2-bromo-2-methylhexane
2. 2-bromohexane
3. 1-bromo-5-methylhexane

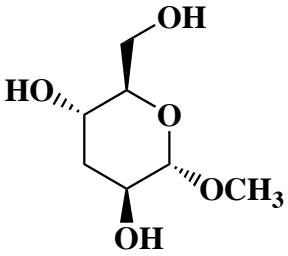
Name: _____

3. (30 points)

State the relationship between each of the six (6) structures at the bottom of this page and the acetal **1** (identical, enantiomer, diastereomer, structural isomer, conformational isomer, different compound that is not isomeric).



1



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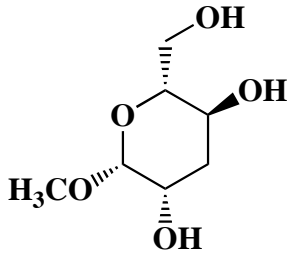

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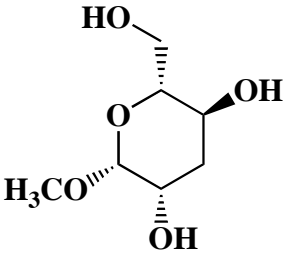

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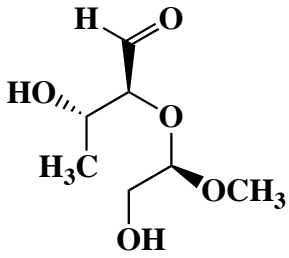

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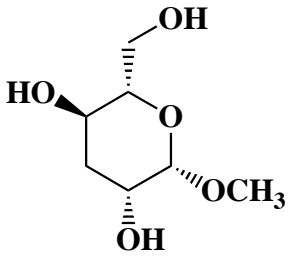

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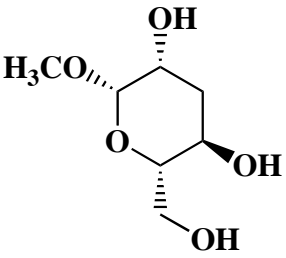

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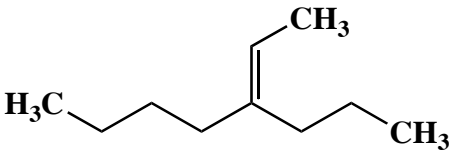
4. (10 points)

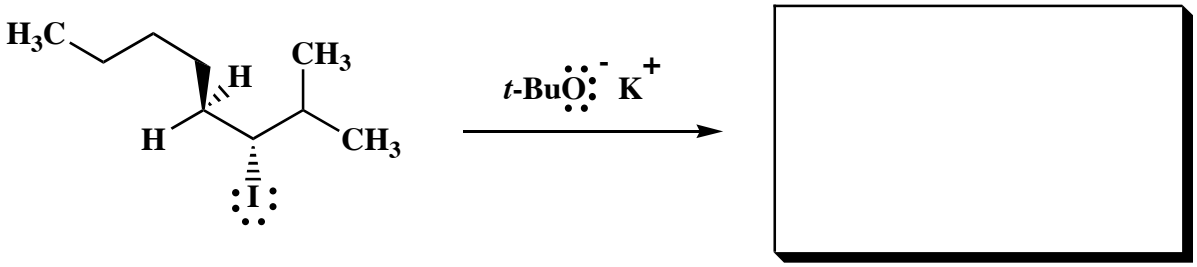
Use IUPAC nomenclature to write the systematic name of the following alkene.



Name: _____

5. (15 points)

Draw the structure of the expected major organic product of the following reaction. Then draw the mechanism for the product's formation, using the curved-arrow notation to indicate the reorganization of electron density. Denote all intermediates, lone pairs, nonzero formal charges, countercharges, and reversibility or nonreversibility. Be certain that your answer shows graphically why any proposed stereochemical result is obtained.



Congratulations!

1	/20
2	/25
3	/30
4	/10
5	/15
Total:	/100