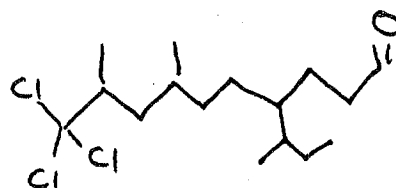
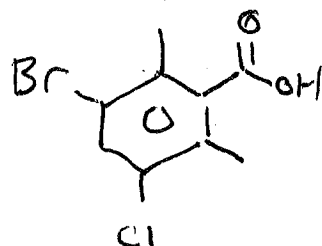
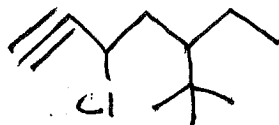
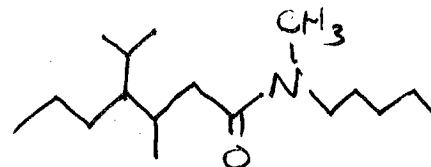
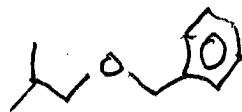
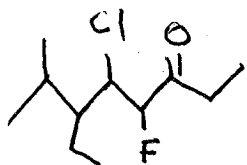


Monday, June 11th, 2012
Final Exam

Name: _____

1. Name the following molecules:



2. Explain the difference between...

(a) Ribose and deoxyribose

(b) Major and minor groove

(c) Basic and acidic amino acids

(d) Fats and Oils

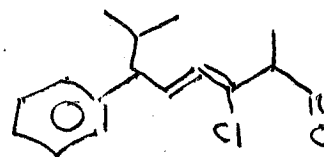
(e) Exons and Introns

(f) Activation Energy and ΔH

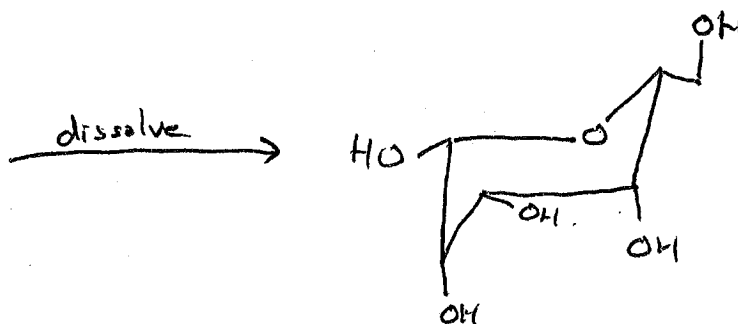
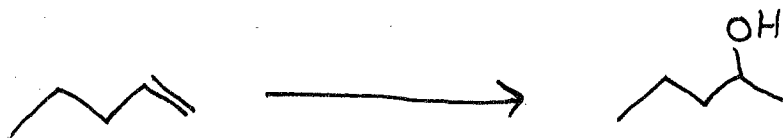
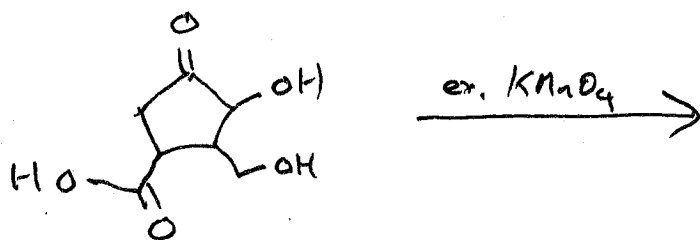
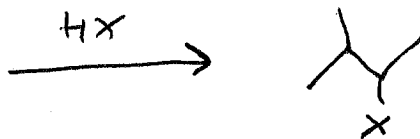
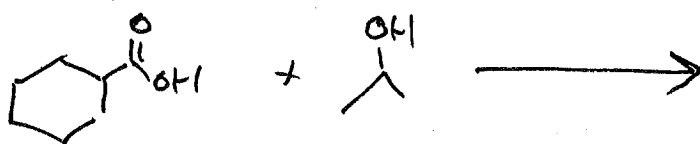
3. Show all alkenes with the formula C_5H_{10} .

4. For the molecule shown to the right...

- (a) What is the formula?
- (b) What functional groups are present?
- (c) How many sp^2 carbons are present?
- (d) How many chiral carbons are there?



5. Complete the following reactions:



6. Define the following:
(a) Reducing sugar

(b) Isoelectric point

(c) Enantiomers

(d) Mutarotation

(e) Anti-parallel

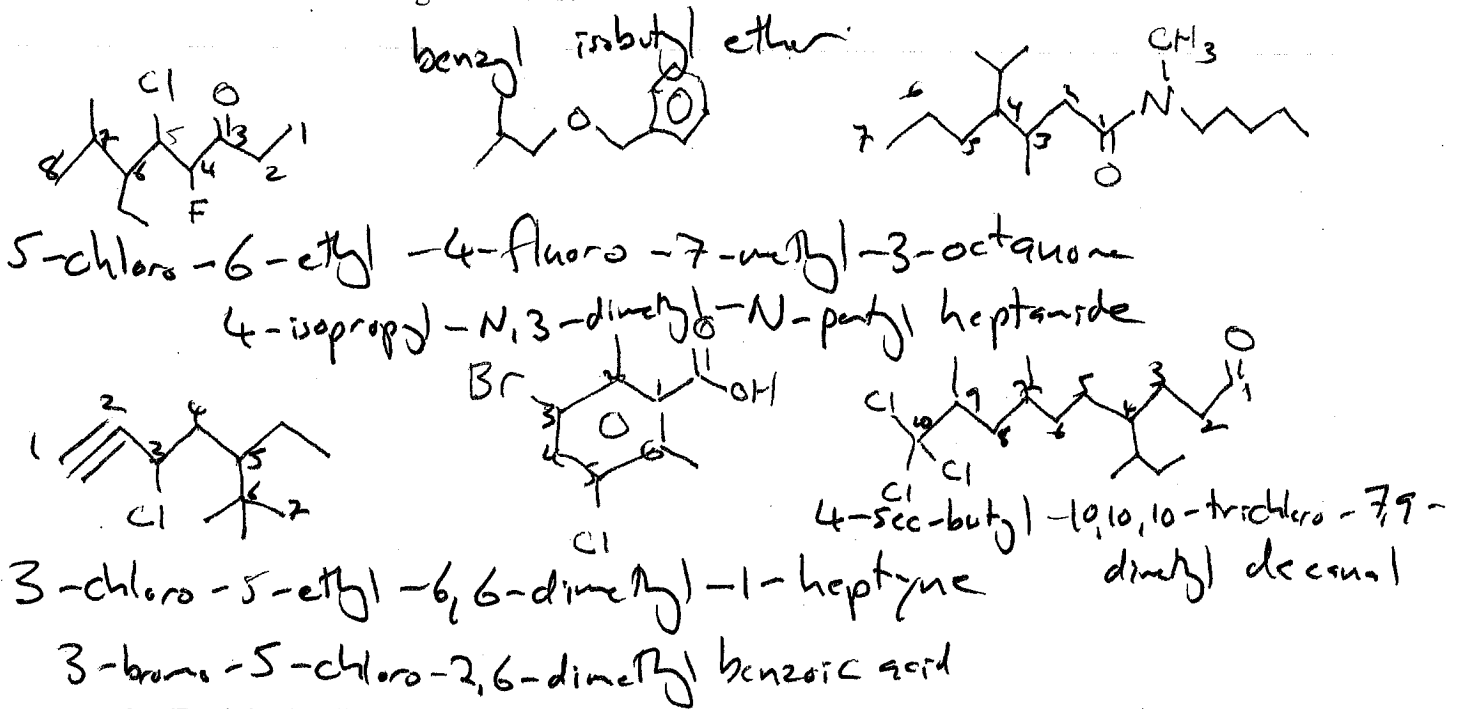
(f) Anti-codon

7. What are the three types of RNA? Briefly describe the function of each.

8. Describe in general terms how you would separate a racemic mixture.

9. Why might an error in DNA replication NOT lead to a mutation?

1. Name the following molecules:



2. Explain the difference between...

(a) Ribose and deoxyribose

↖ sugar in DNA, No OH on C #2
↗ sugar in RNA, OH on C #2

(b) Major and minor groove

The larger and smaller gap between the 2 strands of DNA in a double helix.

(c) Basic and acidic amino acids

The R group in an amino acid may contain a second amine (basic) or carboxylic acid (acidic)

(d) Fats and Oils

↖ No alkenes
↗ at least one cis non-conjugated alkene

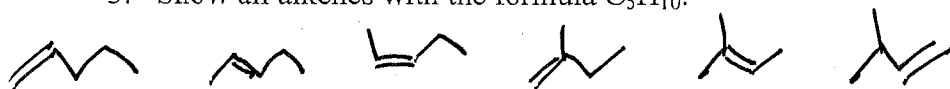
(e) Exons and Introns

↖ generally relevant DNAs that code for particular amino acids
↗ so-called "nonsense" DNA that does not code.

(f) Activation Energy and ΔH

↖ Energy required to start a rxn
↗ Energy difference between reactants + products.

3. Show all alkenes with the formula C₅H₁₀.



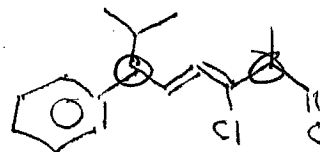
4. For the molecule shown to the right...

(a) What is the formula? C₁₆H₁₉ClO

(b) What functional groups are present?

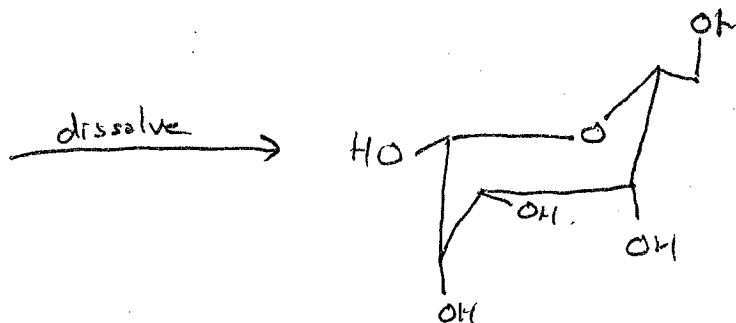
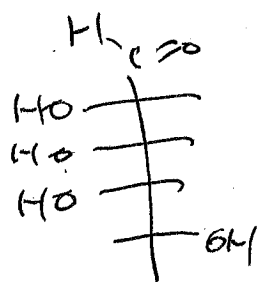
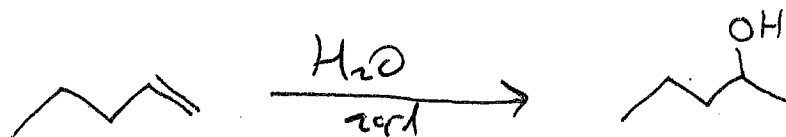
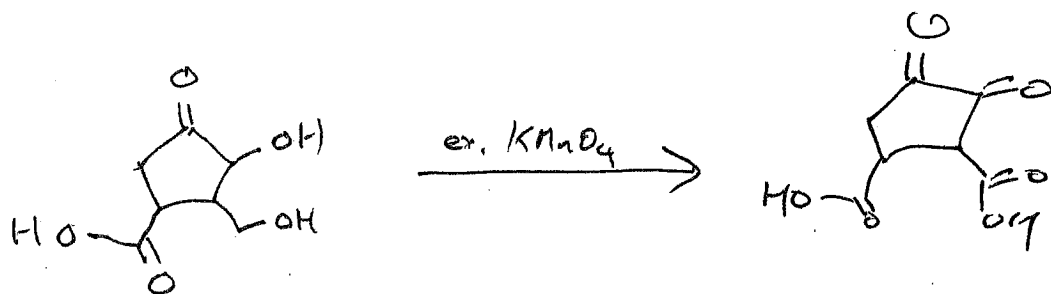
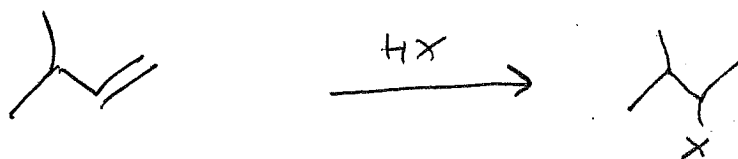
(c) How many sp² carbons are present? 9

(d) How many chiral carbons are there? 2



Aromatic, alkene,
aldehyde, alkyl halide

5. Complete the following reactions:



6. Define the following:

(a) Reducing sugar Able to react w/ Benedict's to produce a carboxylic acid.

(b) Isoelectric point pH at which amino acid is in zwitterion.

(c) Enantiomers Non-superimposable mirror images

(d) Mutarotation Equilibrium between α , β , and straight chain forms.

(e) Anti-parallel Parallel but facing in opposite directions

(f) Anti-codon Complementary to codon, found on the bottom of tRNA and related to particular amino acid.

7. What are the three types of RNA? Briefly describe the function of each.

messenger \rightarrow copy of gene

ribosomal \rightarrow assist w/ protein construction

transfer \rightarrow carries amino acid to specific site (via codon and anti-codon) for protein structure.

8. Describe in general terms how you would separate a racemic mixture.

React w/ optically pure compound (R^*) to form diastereomers. Separate according to convenient properties. Then remove the R^* .

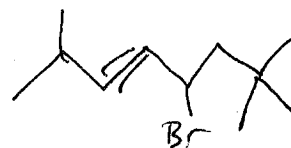
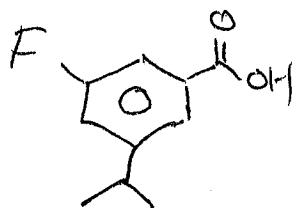
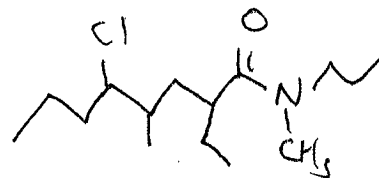
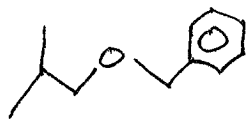
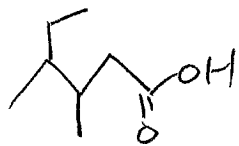
9. Why might an error in DNA replication NOT lead to a mutation?

1. Repaired
2. Redundancy
3. Insertion
4. Different amino acid may not alter protein function.

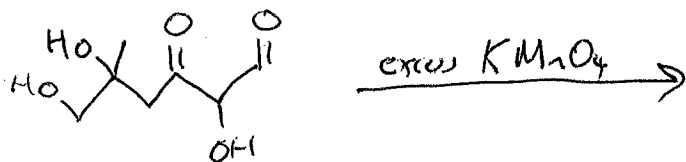
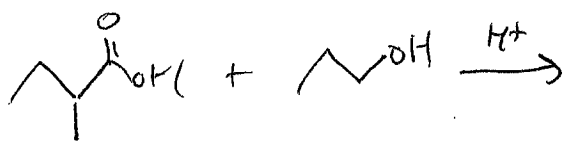
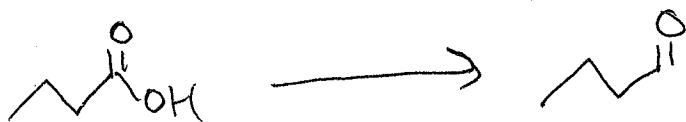
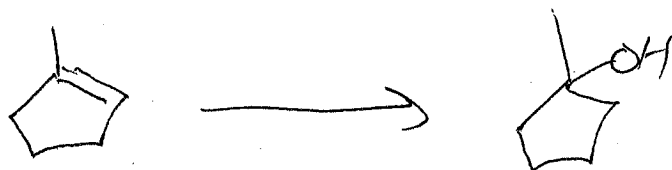
Tuesday, Dec. 8th, 2009
Final Exam

Name: _____

1. Name the following molecules:



2. Complete the following reactions:



3. Consider the bases in DNA (you may use just the letter)
 - (a) Which ones base-pair together?
 - (b) Which ones are purines?
 - (c) Which one is not found in RNA?

4. There are four so-called "levels" of protein structure. List them below and give a brief explanation of each.

5. What is the definition of a mutation?

6. In the space below, draw...
 - (a) a detergent
 - (b) a basic amino acid

7. Compare RNA with DNA in terms of the following:
 - (a) The sugar

 - (b) The phosphate group

 - (c) The average length

8. Examine the molecule and answer the following questions:

(a) What is the formula?

(b) How many chiral carbons?

(c) How many optical isomers?

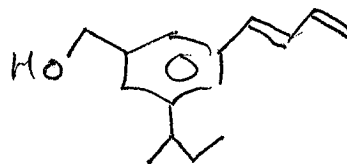
(d) Is this molecule conjugated?

(e) Is it water soluble?

(f) How many sp^2 hybridized carbons?

(g) Is it an acid, a base, or neither?

(h) Is it a terpene?

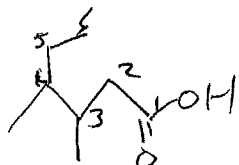


9. Give all the ether isomers with the formula $C_4H_{10}O$.

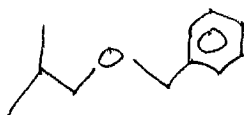
10. Give all the aldehyde isomers with the formula $C_5H_{10}O$.

11. How would you separate a mixture that contained an alcohol, a phenol, and a carboxylic acid?

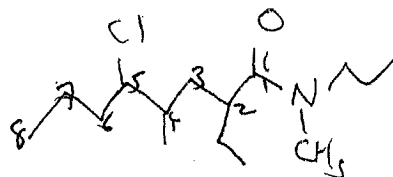
1. Name the following molecules:



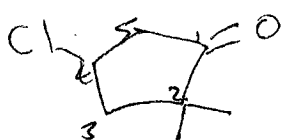
3,4-dimethyl hexanoic acid



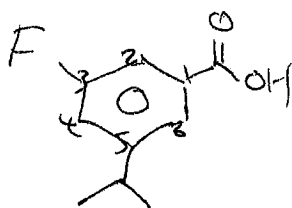
benzyl isobutyl ether



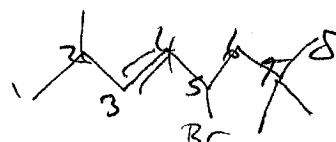
5-chloro-2-methyl-N,N-dimethyl-N-propyl octanamide



4-chloro-2,2-dimethyl cyclohexanone

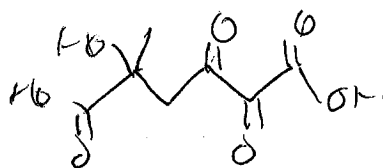
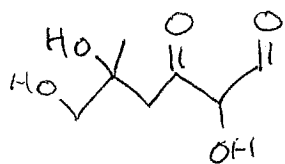
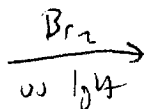
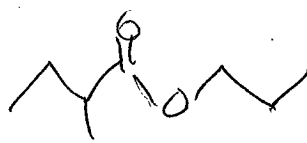
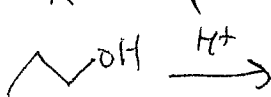
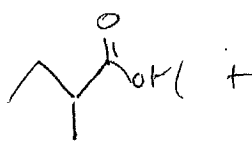
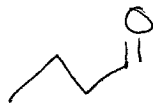
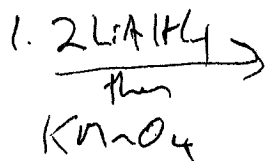
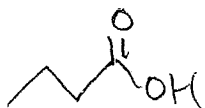
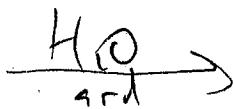
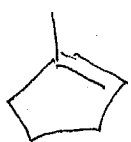


3-fluoro-5-isopropyl benzoic acid.



5-bromo-2,7,7-trimethyl-3-octyne

2. Complete the following reactions:



3. Consider the bases in DNA (you may use just the letter)

(a) Which ones base-pair together? G-C T-A

(b) Which ones are purines? G, A

(c) Which one is not found in RNA? T

4. There are four so-called "levels" of protein structure. List them below and give a brief explanation of each.

Primary - Sequence of amino acids

Secondary - Properties of chain

Tertiary - 3D shape of protein.

Quaternary - Shape relative to other proteins.

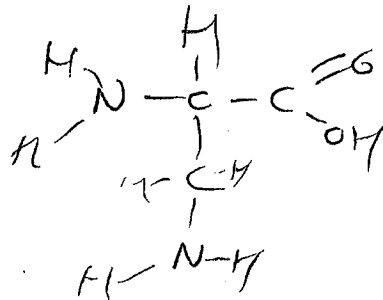
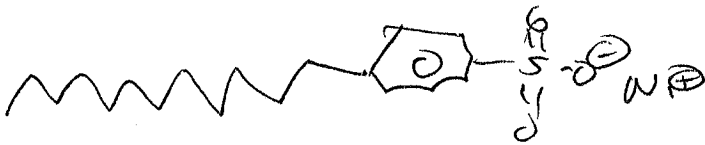
5. What is the definition of a mutation?

DNA error that leads to altered protein function.

6. In the space below, draw...

(a) a detergent

(b) a basic amino acid



7. Compare RNA with DNA in terms of the following:

(a) The sugar RNA: Sugar contains an OH on C # 2.
DNA: No OH on C # 2.

(b) The phosphate group

identical

(c) The average length

DNA is MUCH longer.

8. Examine the molecule and answer the following questions:

(a) What is the formula? $C_{15}H_{20}O$

(b) How many chiral carbons? 1

(c) How many optical isomers? 2

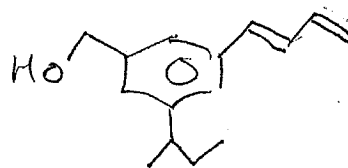
(d) Is this molecule conjugated? Yes

(e) Is it water soluble? No

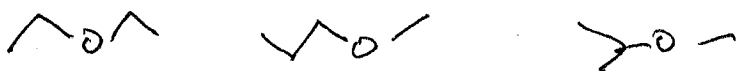
(f) How many sp^2 hybridized carbons? 10

(g) Is it an acid, a base, or neither? Neither

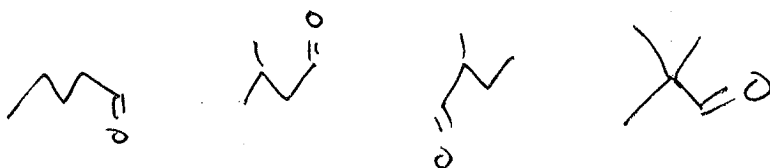
(h) Is it a terpene? No



9. Give all the ether isomers with the formula $C_4H_{10}O$.



10. Give all the aldehyde isomers with the formula $C_5H_{10}O$.



11. How would you separate a mixture that contained an alcohol, a phenol, and a carboxylic acid?

Add weak base first, such as $NaHCO_3$.

Carboxylic Acid will react to form the soluble salt that can be removed.

Now add stronger base, like $NaOH$.

Phenol will react to form the H_2O -soluble salt and can be removed.

Only Alcohol remains.