

CHEM 310 Exam 2

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March 7, 2007

Honor Pledge:

In Part V of the Winthrop University Student Conduct Code, it is stated that "A fundamental tenet of all institutions of higher learning is academic honesty. ... Misrepresentation of someone else's work as one's own is a most serious offense in any academic setting. ... Academic misconduct includes but is not limited to providing or receiving assistance in a manner not authorized by the professor in the creation of work to be submitted for academic evaluation including papers, projects, and examinations ..."

By my signature below, I pledge that I did not commit academic misconduct (cheat) on this examination.

KEY _____
Printed Name Signature

Part 1 _____/15

Part 2 _____/15

Part 3 _____/20

Part 4 _____/20

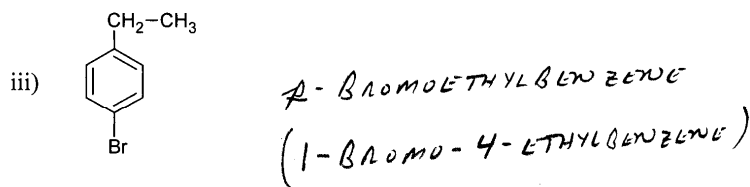
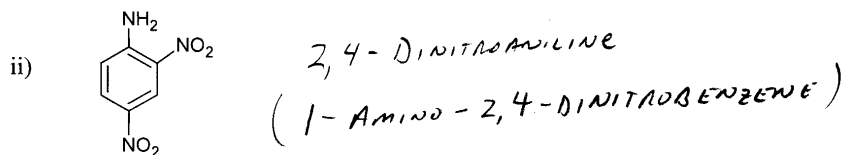
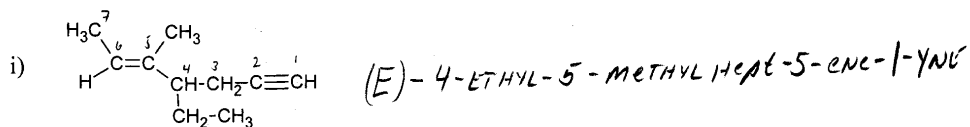
Part 5 _____/15

Part 6 _____/15

Total _____/100

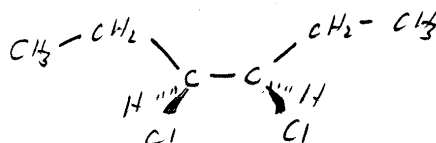
Part 1: Nomenclature (15 pts)

1a. Write IUPAC names for the following compounds (indicate stereochemistry where required):

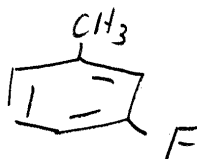


1b. Draw structures corresponding to the following IUPAC names:

i) *meso*-3,4-Dichlorohexane

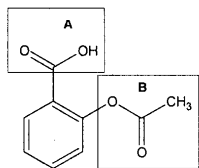


ii) *m*-Fluorotoluene

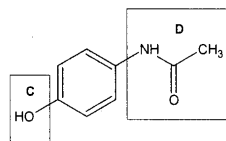


Part 2: Functional Group Identification (15 pts)

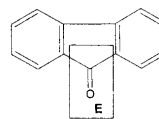
Identify the functional groups present in the following compounds:



Acetylsalicylic acid (Aspirin)



Acetaminophen

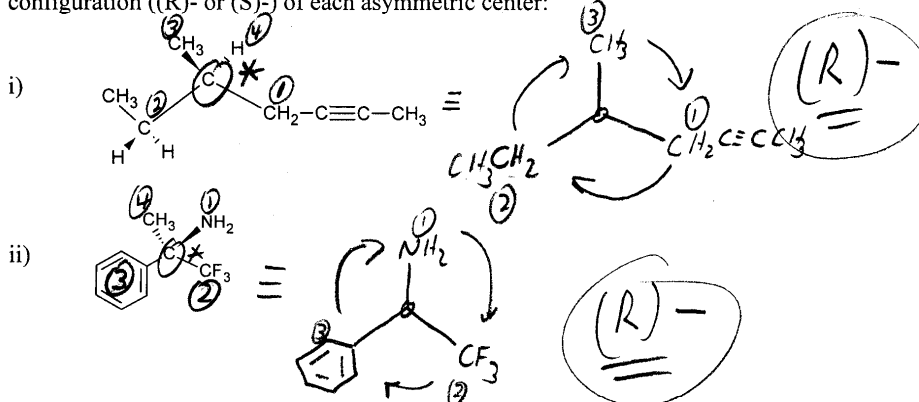


Fluorenone

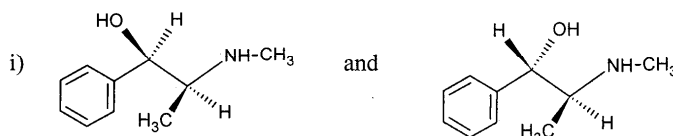
A = CARBOXYLIC ACIDB = ESTERC = ALCOHOL (HYDROXYL)D = AMIDEE = KETONE (CARBONYL)

Part 3: Stereochemistry (20 pts)

3a. Identify the asymmetric centers in the following molecules and indicate the absolute configuration ((R)- or (S)-) of each asymmetric center:



3b. Indicate the stereochemical relationship (enantiomers, diastereomers, or identical) of the following pairs of compounds:

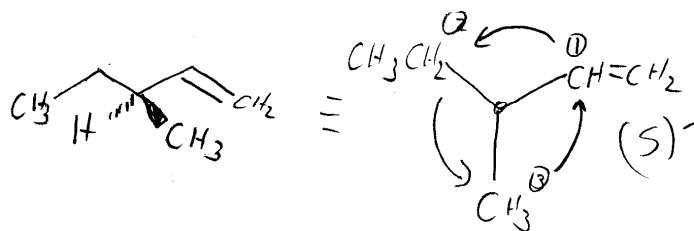


DIASTEROISMS

ii) (2S, 4R)-dichlorohexane and (2R, 4S)-dichlorohexane

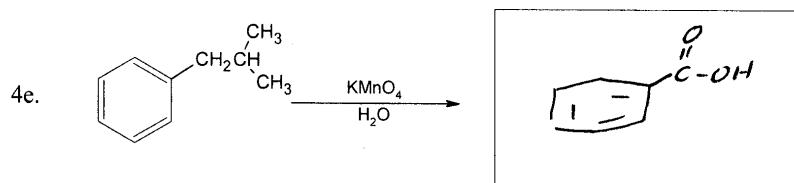
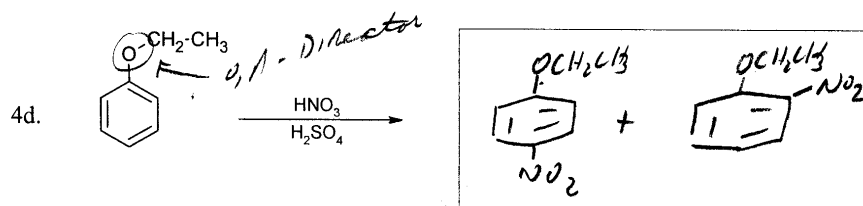
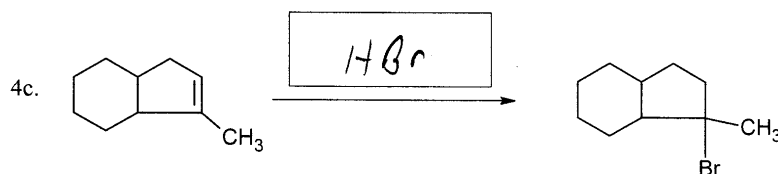
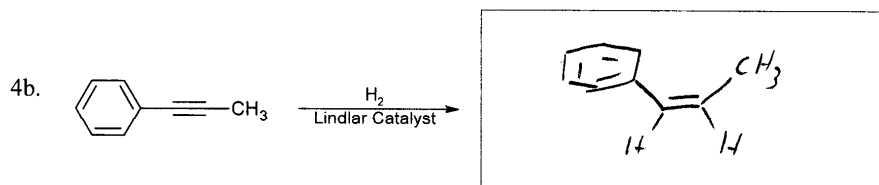
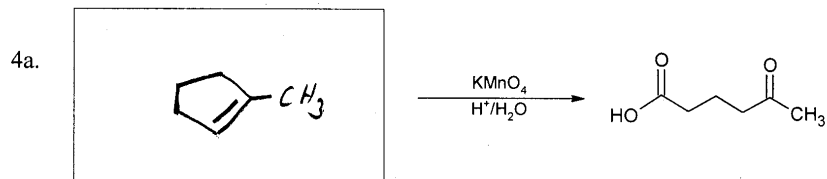
ENANTIOMERS

3c. Draw a three-dimensional representation of (S)-3-methyl-1-pentene



Part 4: Provide the Starting Material, Reagent, or Product (20 pts):

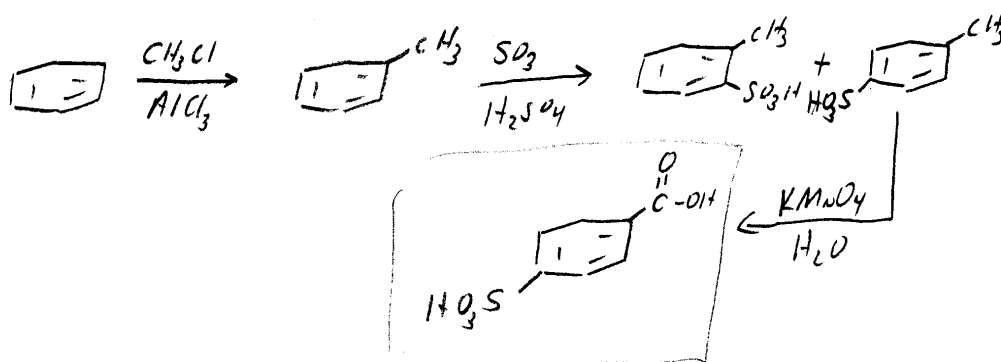
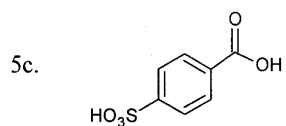
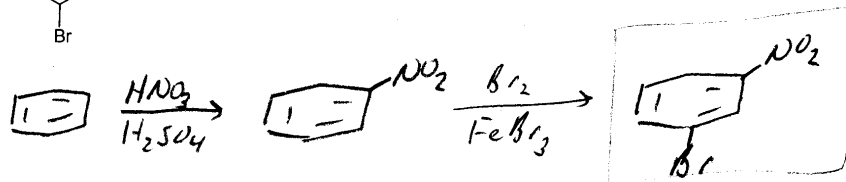
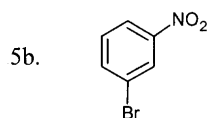
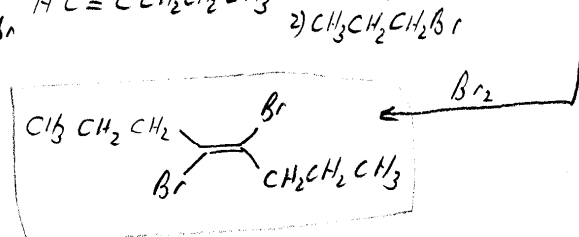
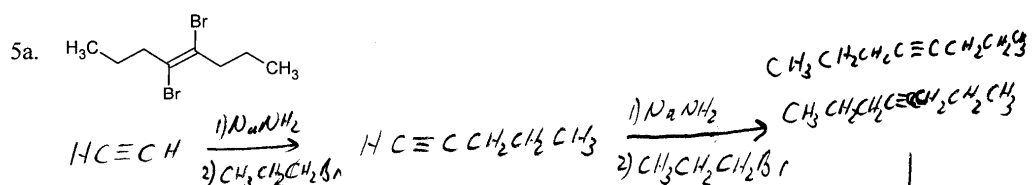
Provide the missing piece (starting material, reagent(s), or product(s)) in the box provided.



Part 5: Synthesis (15 pts)

Provide a synthesis of each of the following compounds starting from

benzene () and/or acetylene ($\text{HC}\equiv\text{CH}$), and any other inorganic reagents or alkyl halides needed. Assume ortho- and para- isomers of disubstituted benzenes can be separated.



Part 6: Mechanisms (15 pts)

Provide complete arrow-pushing mechanisms for the following transformations:

