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Chemistry Department

May 9, 2009 **Organic Chemistry 233** **Midterm(60 min.)**

11 - 9,30
شعبة ١٠
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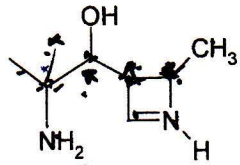
Name:.....أحمد سامي حسين حبيب.....**Registration No.:**.0085932

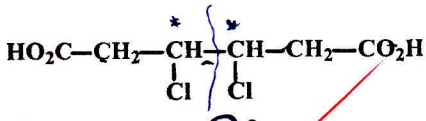
I. Circle the correct answer in each of the following: (10 pts)

➢ The number of stereogenic centers in the molecule below is:



b. 4 c. 3 d. 2 e. 1

➢ The number of possible stereoisomers of:



$2^2 = 4 - 1 = 3$ meso

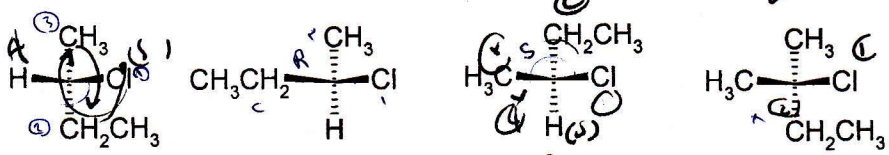
a. 5 b. 4 c. 3 d. 1 e. 1

➢ The observed α rotation for 100 mL of an aqueous solution of 1.0 g of sucrose in 20 cm sample tube is +1.33. The specific rotation [α] is: $\frac{\alpha}{l \cdot c}$

$\frac{1.33}{2 \times .01}$ $\frac{1.33}{0.02}$

a. +26 ° b. +41.5 ° c. +66.5 ° d. -26 ° e. +133 °

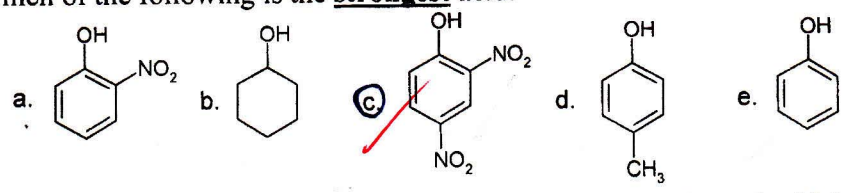
➢ Which of the following molecules are **the same**:



1 2 3 4

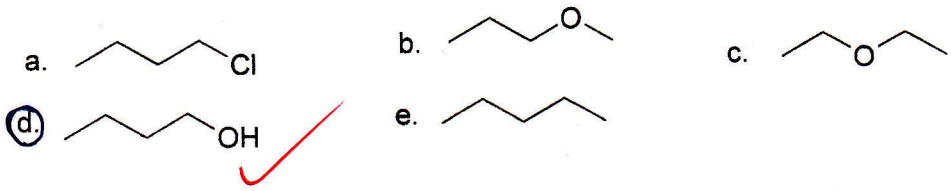
a. 2 and 4 b. 2 and 3 c. 3 and 4 d. 1 and 3 e. 1 and 2

➢ Which of the following is the **strongest** acid:



a. b. c. d. e.

➢ Which of the compounds listed below would you expect to have the **highest** boiling point?



a. b. c. d. e.

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C-OH > OH > amine > C-H > -O- > -

➢ Which of the following is the best method to prepare isopropyl methyl ether:

a. $CH_3OH + (CH_3)_2CHCH_2OH + H_2SO_4$, 140 °C

b. $CH_3OH + (CH_3)_2CHOH + H_2SO_4$, 140 °C

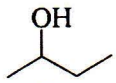
c. $CH_3ONa + (CH_3)_2CHCH_2Br$

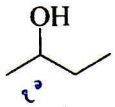
d. $CH_3I + (CH_3)_2CHONa$

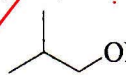
e. $CH_3ONa + (CH_3)_2CHBr$

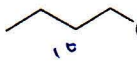
➢ Which of the following synthetic methods of alkyl halide is expected to occur at fastest rate?

a.  + HI

b.  + HBr

c.  + HCl

d.  + HBr

e.  + HI

➢ Which one of the following is the **strongest nucleophile**:

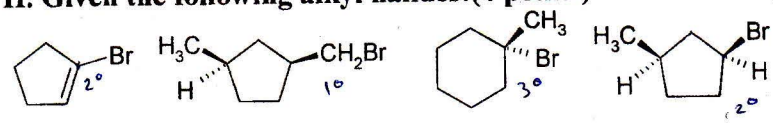
a. NaOH in H_2O b. CH_3OH in H_2O c. NaCN in H_2O

d. NaCN in Acetone e. CH_3O Na in CH_3OH

➢ Which of the following reactions proceeds with inversion of configuration at the carbon bearing the leaving group?

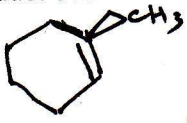
a) S_N1 b) S_N2 c) E1 d) E2 e) All of them

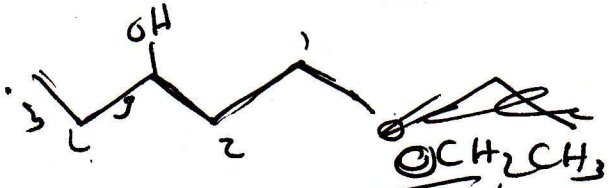
II. Given the following alkyl halides:(4 points)



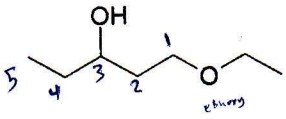
A B C D

1. The **least** reactive alkyl halide towards nucleophilic substitution.....C.....
2. The **most** reactive alkyl halide with CH_3ONa.....B.....
3. The compound that produces a pair of diastereomers when reacted with CH_3OH..D
4. Draw the structure of the **major** product obtained when heating C with NaOH..A

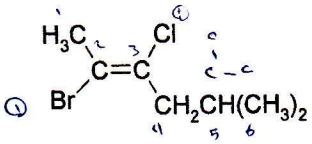




III. Give the correct IUPAC names for each of the following compounds:(4 poins)

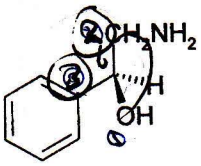


1-ethoxy-3-pentanol

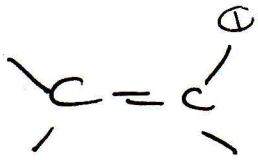


(E)-2-bromo-3-chloro-5-methyl-2-hexene

IV. The configuration of the indicated stereogenic center is:(2 points)

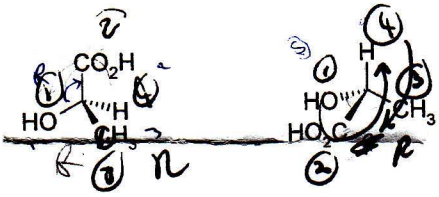


S

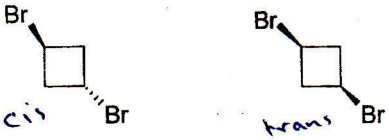


(E)

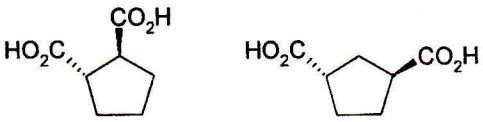
V. Label the following pairs of isomers as enantiomers, diastereomers, conformational, constitutional or identical :(8 points)



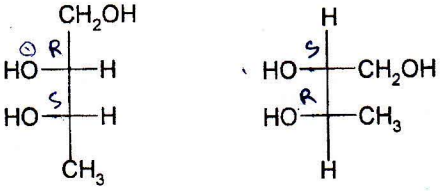
identical



diastereomers



constitutional



enantiomers

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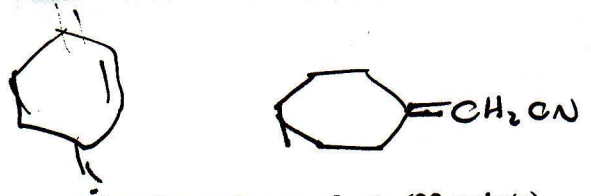
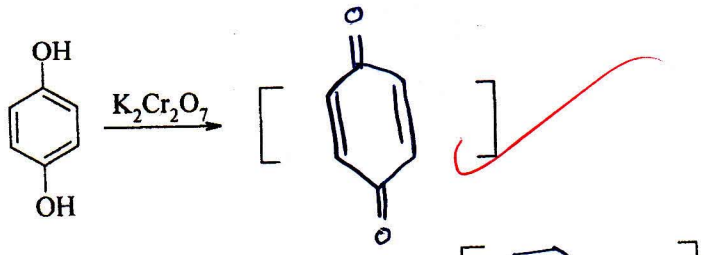
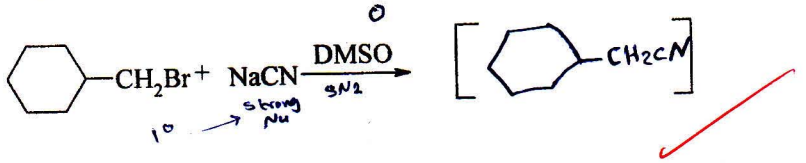
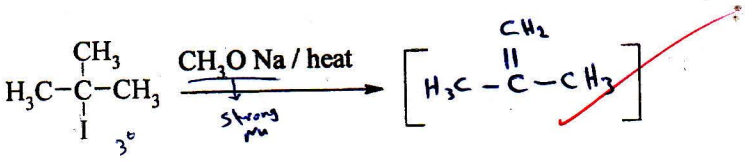
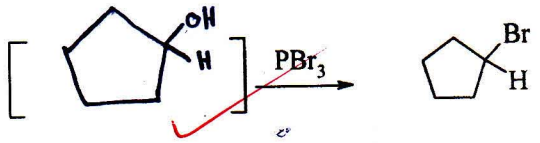


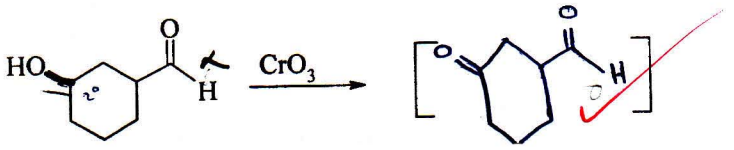
VI. Complete the following reactions giving the major products:(22 points)

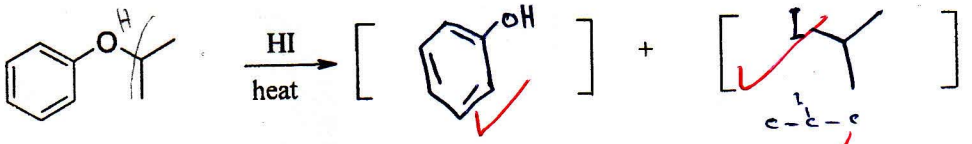


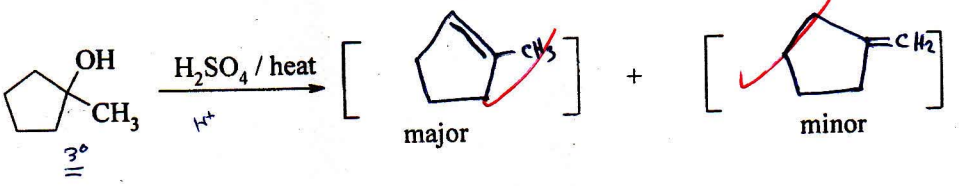


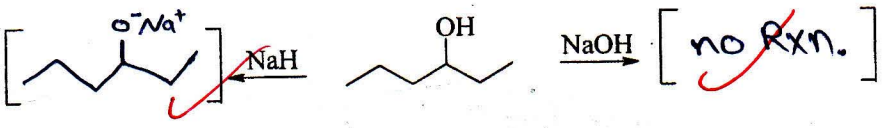


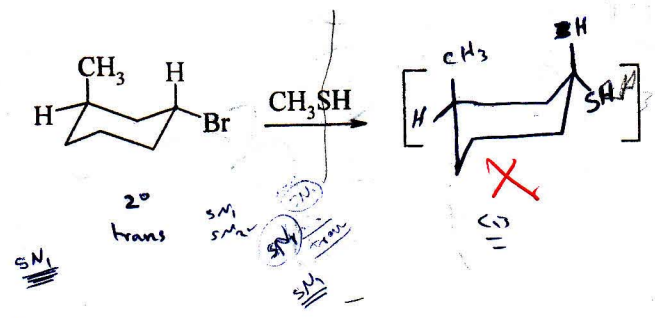












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