



Medical Committee
The University of Jordan

ORGANIC

Past Papers

مع تمنياتنا لكم بالنجاح والتوفيق

72.5

29/11/2008

Name: V. Al-Hadi Reg. number: 910 Section: 1 Seat no: 110

Q1 (22.5 points): Circle the correct answer in each of the following:

19.5

≡ The correct name of $\text{CH}_3-\underset{\text{OCH}_3}{\text{CH}}-\text{CH}=\text{CH}-\text{CH}_3$ is?

a- 2-methyl-3-pentene

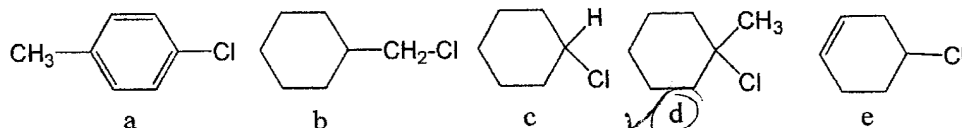
b- 2-methoxy-3-pentene

c- 1-methoxy-1-methyl-2-butene

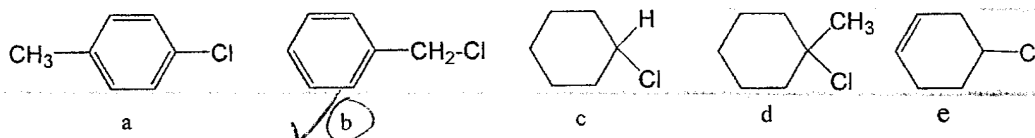
d- 4-methyl-2-pentene

 e- 4-methoxy-2-pentene

≡ The most reactive toward substitution with CH_3OH is



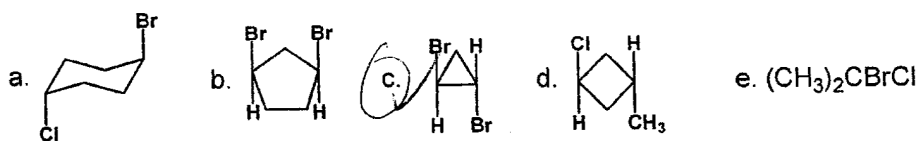
≡ The most reactive toward substitution with $\text{CH}_3\text{O}^-\text{Na}^+$ is



≡ The solvent with the highest rate of reaction in $\text{S}_{\text{N}}1$ type reaction is?

a- water b- ether c- benzene d- hexane e- all are the same

≡ Which of the following compounds is chiral?

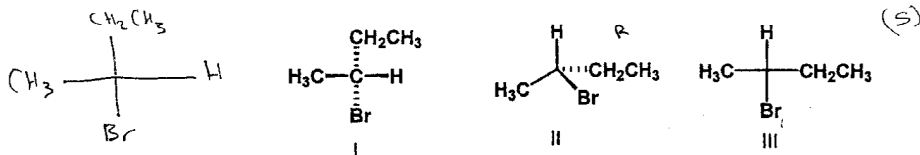


≡ Which of the following groups have the highest priority according to priority rules?

(H = 1; C = 12; N = 14; O = 16)

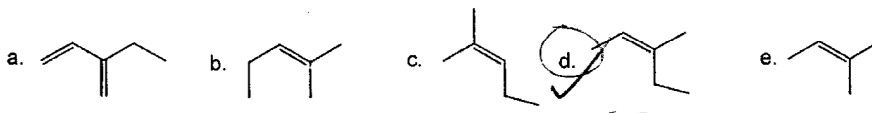
a. $-\text{CH}=\text{CH}-\text{CH}_3$ b. $-\text{CH}=\underset{\text{CH}_3}{\text{C}}-\text{CH}_3$ c. $-\text{CH}_2\text{OH}$ d. $-\text{C}\equiv\text{C}-\text{CH}_3$ e. $-\text{C}\equiv\text{N}$

≡ Which of the following is the enantiomer of R-2-butane?

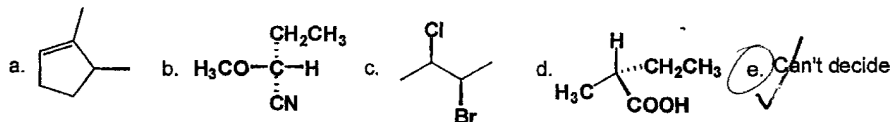


- a. only I b. only II **c. only III** d. I and II e. I and III

≡ Which of the following alkenes has Z-configuration?



≡ Which of the following compounds is dextrorotatory?



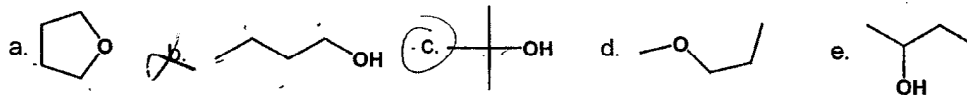
≡ Which of the following is not true about enantiomers?

- a. They have the same melting and boiling points.
 b. They have the same absolute value of specific rotation.
~~c. 1:1 mixture is optically active.~~
 d. They could be separated using a chiral reagent.
 e. none of the above.

≡ The maximum number of possible stereoisomers for $\text{HOH}_2\text{C}-\text{CH}(\text{H})-\text{CH}(\text{OH})-\text{CH}(\text{H})-\text{C}(=\text{O})\text{H}$?

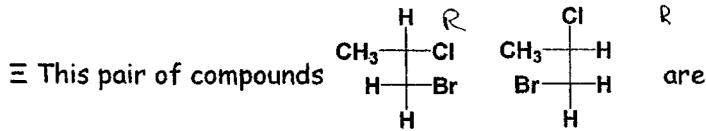
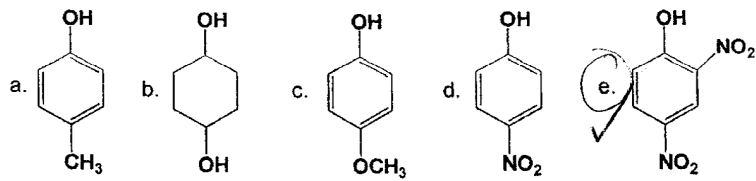
- a. 16 **b. 8** c. 32 d. 4 e. 64

≡ Which of the following compounds has the highest boiling point?

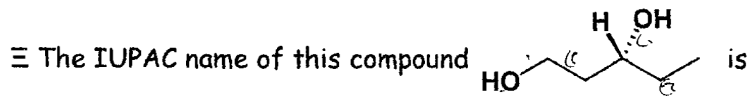


≡ Which of the following is the strongest acid?

5



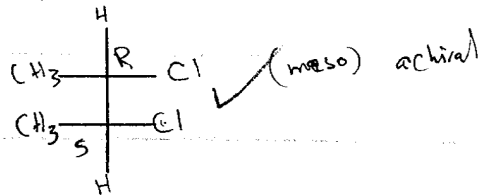
a- enantiomers b- diastereomers c- meso compound d- identical e- not related



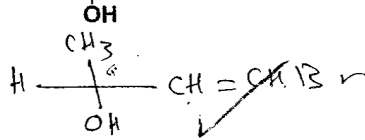
- a- (R)-3,5-dihydroxypentane b- (S)-3,5-dihydroxypentane
 c- (R)-1-hydroxy-3-pentanol d- (S)-1,3-pentandiol e- (R)-1,3-pentandiol

10 Q2 (10 Pt) Draw the structure of each of the following

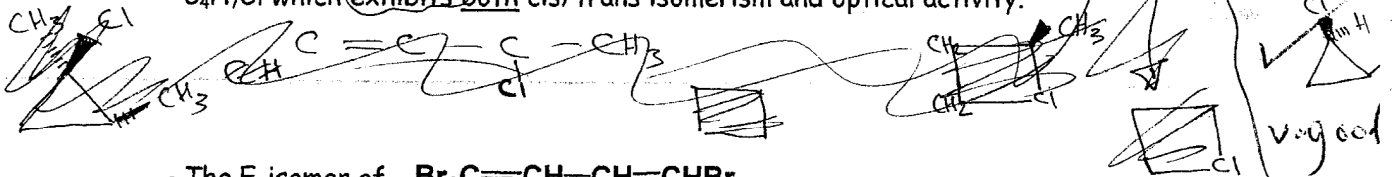
- The Fischer projection of the optically inactive 2,3-dichlorobutane.



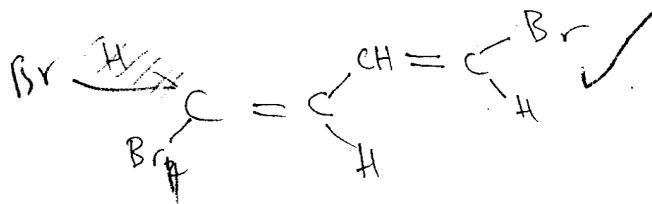
- A stereoisomer of $\text{CH}_3-\overset{\text{H}}{\overset{\text{R}}{\text{C}}}-\text{CH}=\text{CHBr}$ which has an opposite sign of rotation.



- $\text{C}_4\text{H}_7\text{Cl}$ which exhibits both cis/trans isomerism and optical activity.



- The E-isomer of $\text{Br}_2\text{C}=\text{CH}-\text{CH}=\text{CHBr}$

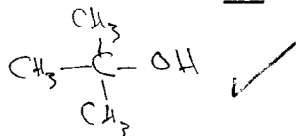


6

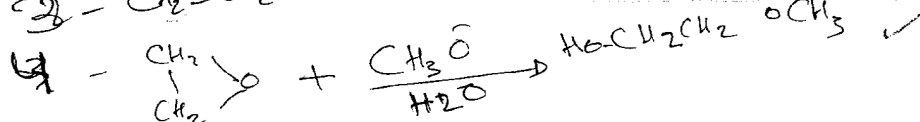
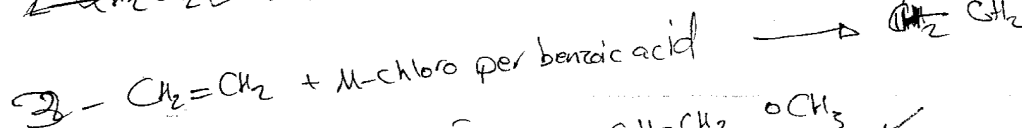
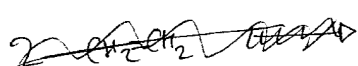
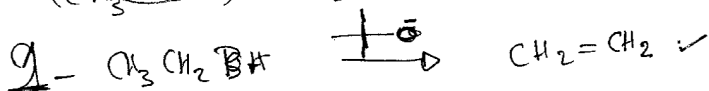
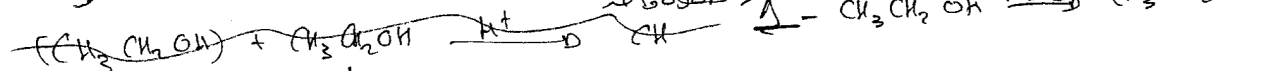
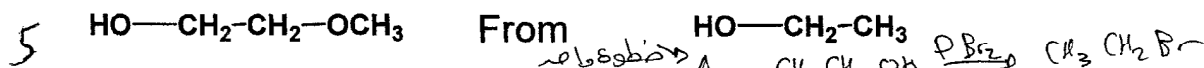
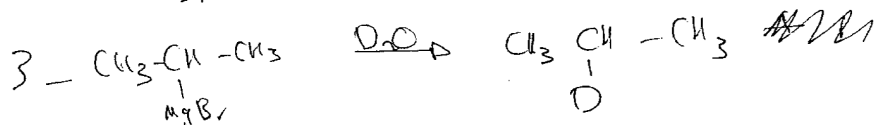
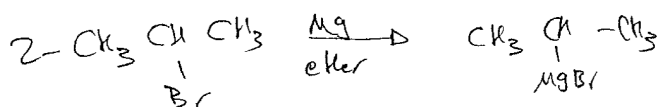
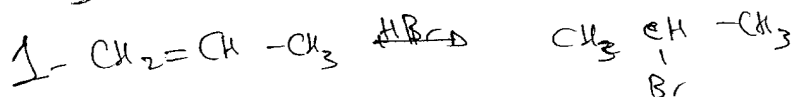
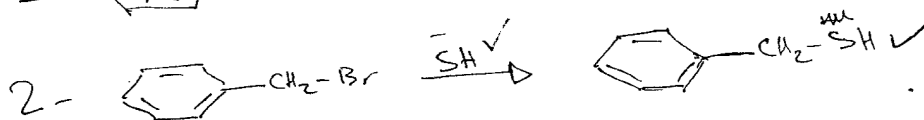
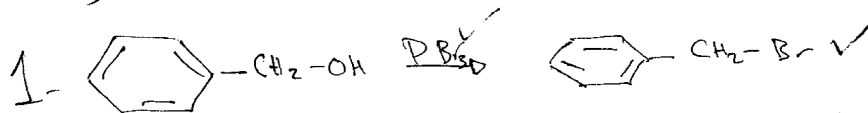
3

Thank you

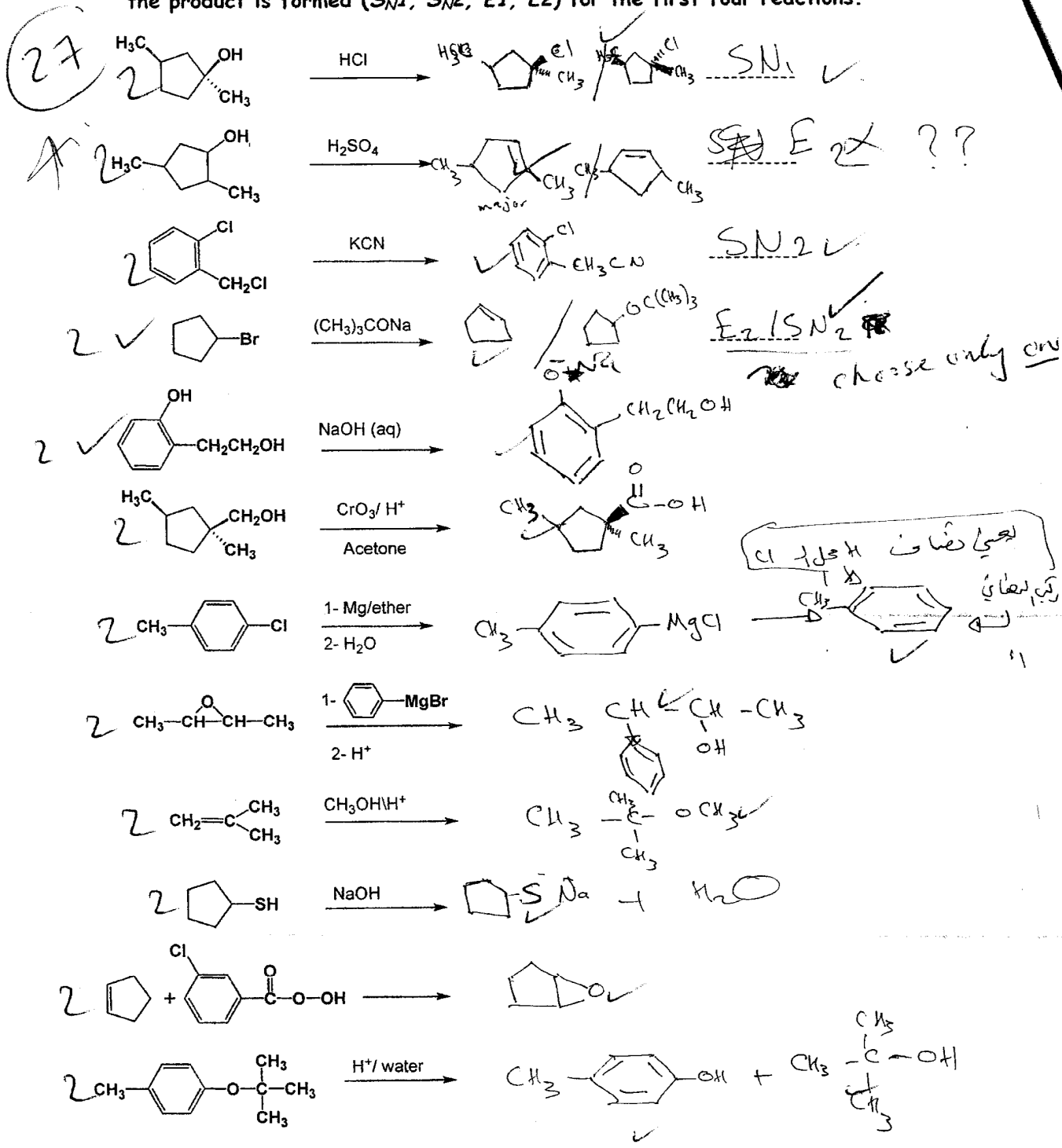
- C₄H₁₀O alcohol which is not oxidized by CrO₃.



(15) Q3 (15 pt) Show the synthesis of each of the following from the designated starting material, use any other needed reagents.



Q4 (28 points): Complete the following equations by writing product(s), show the stereochemistry where appropriate: Write the name of the mechanism by which the product is formed (S_N1 , S_N2 , $E1$, $E2$) for the first four reactions.



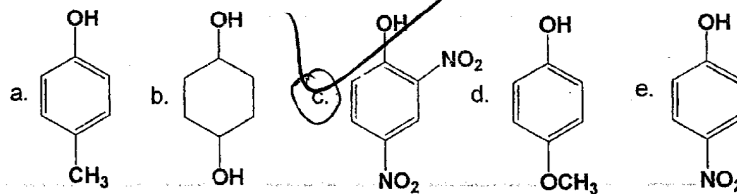
Q1 (22.5 points): Circle the correct answer in each of the following:

≡ Which of the following is not true about enantiomers?

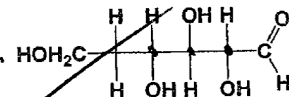
- a. They have the same melting and boiling points.
- b. 1:1 mixture is optically active.
- c. They have the same absolute value of specific rotation.
- d. They could be separated using a chiral reagent.
- e. none of the above.

71 73

≡ Which of the following is the strongest acid?



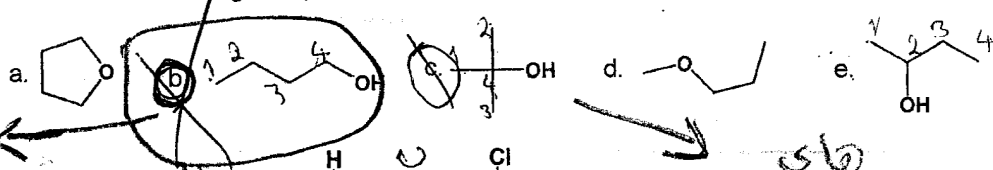
≡ The maximum number of possible stereoisomers for



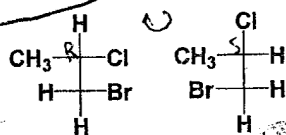
$2^3 = 8$

- a. 64
- b. 4
- c. 32
- d. 8
- e. 16

≡ Which of the following compounds has the highest boiling point?



≡ This pair of compounds



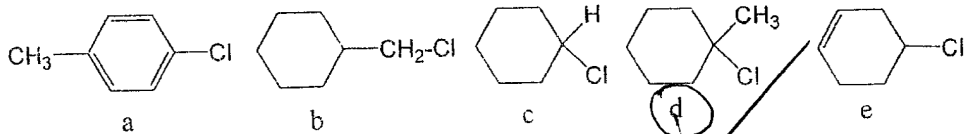
are

- a- identical
- b- enantiomers
- c- meso compound
- d- diastereomers
- e- not related

و الله اعلم
 45 2009
 15b
 15c
 15d
 15e
 15f
 15g
 15h
 15i
 15j
 15k
 15l
 15m
 15n
 15o
 15p
 15q
 15r
 15s
 15t
 15u
 15v
 15w
 15x
 15y
 15z

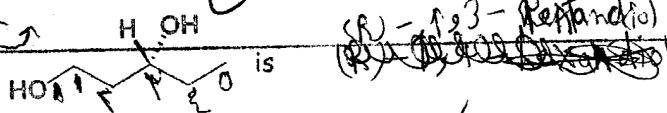
6

≡ The most reactive toward substitution with CH_3OH is



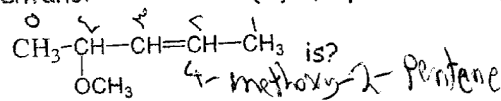
3°
weak Nu

≡ The IUPAC name of this compound



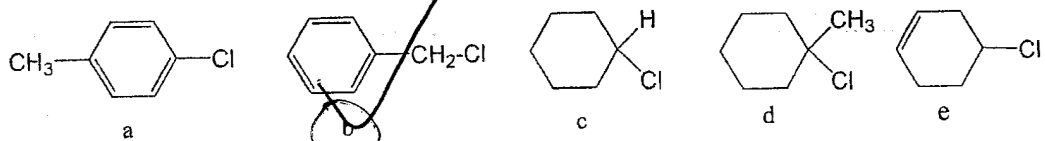
- a- (R)-3,5-dihydroxypentane b- (S)-3,5-dihydroxypentane
 c- (R)-1-hydroxy-3-pentanol d- (S)-1,3-pentandiol e- (R)-1,3-pentandiol

≡ The correct name of

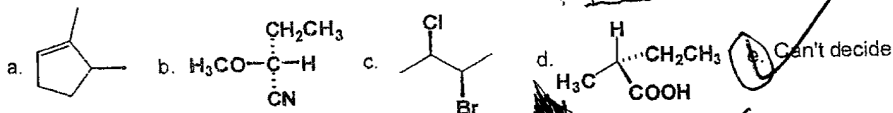


- a- 2-methyl-3-pentene b- 2-methoxy-3-pentene
 c- 1-methoxy-1-methyl-2-butene d- 4-methyl-2-pentene
 e- 4-methoxy-2-pentene

≡ The most reactive toward substitution with $\text{CH}_3\text{O}^-\text{Na}^+$ is



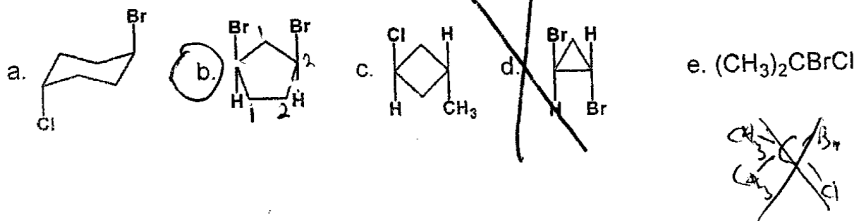
≡ Which of the following compounds is dextrorotatory?



≡ The solvent with the highest rate of reaction in $\text{S}_{\text{N}}1$ type reaction is?

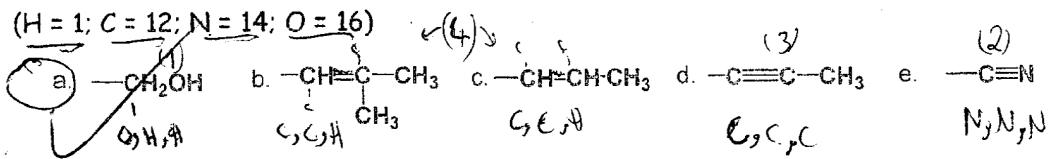
- a- hexane b- ether c- benzene d- water e- all are the same

≡ Which of the following compounds is chiral?

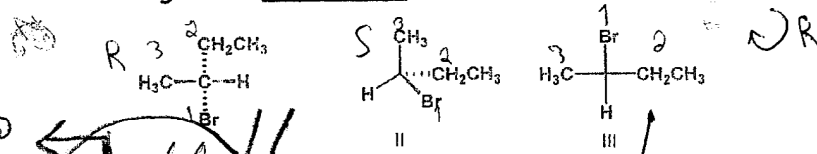


9

≡ Which of the following groups have the highest priority according to priority rules?

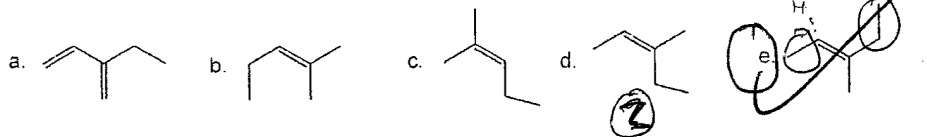


≡ Which of the following is the enantiomer of R-2-butane?



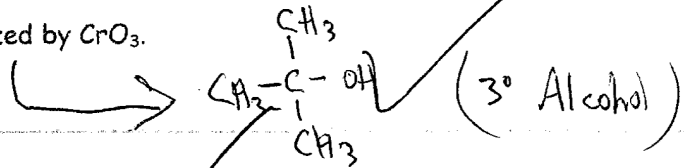
- a. only I b. only II c. only III d. I and II e. I and III

≡ Which of the following alkenes has E-configuration?

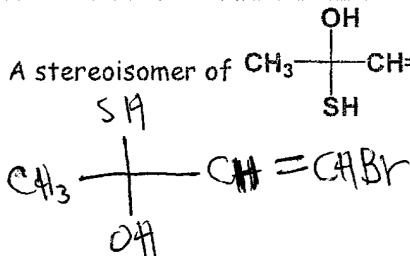


Q2 (10 Pt) Draw the structure of each of the following

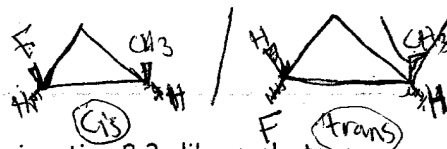
- $\text{C}_4\text{H}_{10}\text{O}$ alcohol which is not oxidized by CrO_3 .



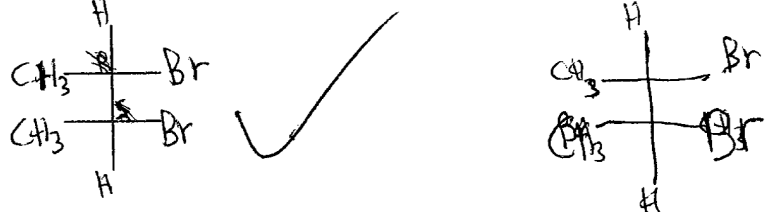
- A stereoisomer of $\text{CH}_3-\text{CH}(\text{OH})-\text{CH}=\text{CHBr}$ which has an opposite sign of rotation.



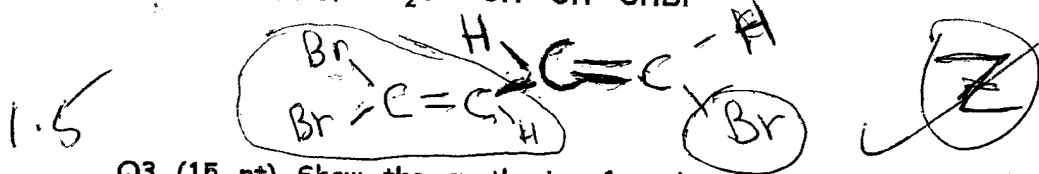
- $\text{C}_4\text{H}_7\text{F}$ which exhibits both cis/trans isomerism and optical activity.



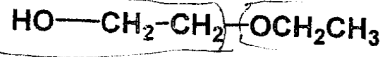
- The Fischer projection of the optically inactive 2,3-dibromobutane.



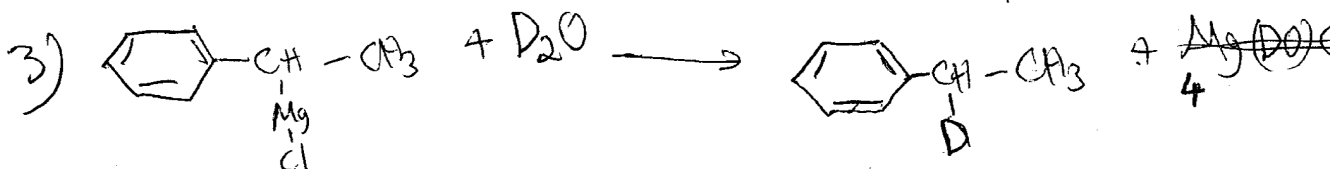
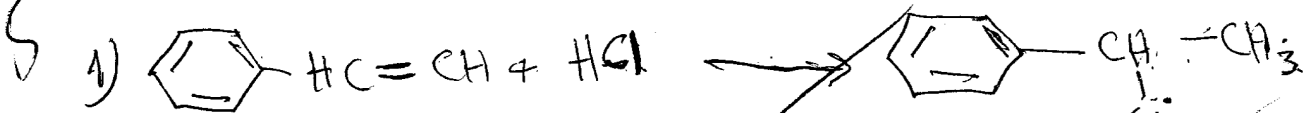
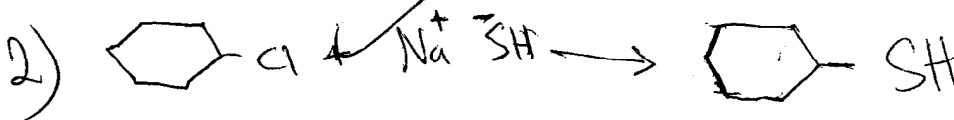
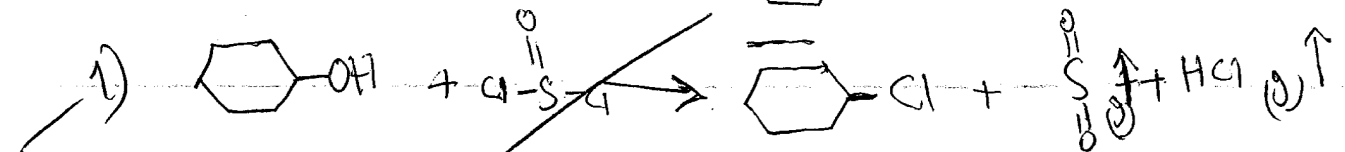
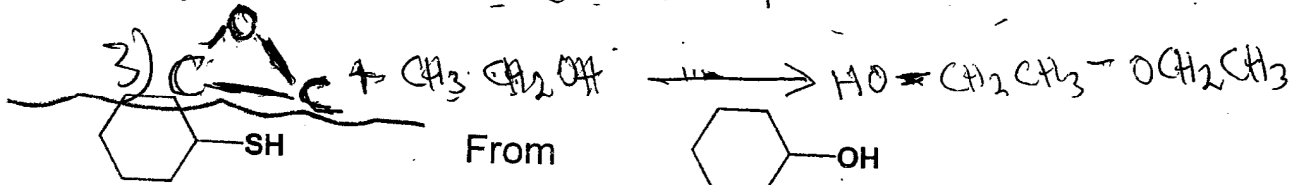
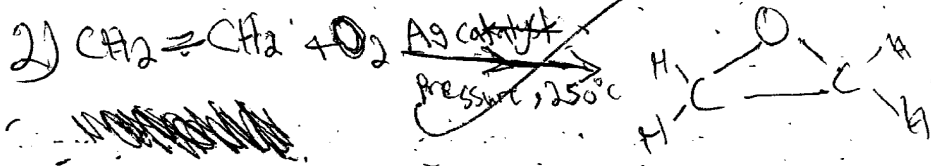
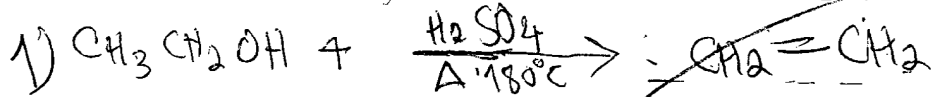
- The Z-isomer of $\text{Br}_2\text{C}=\text{CH}-\text{CH}=\text{CHBr}$



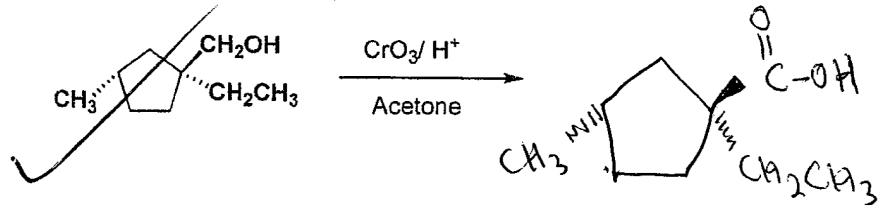
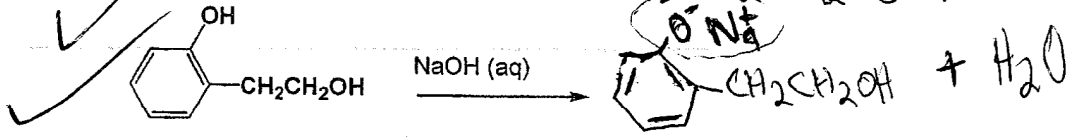
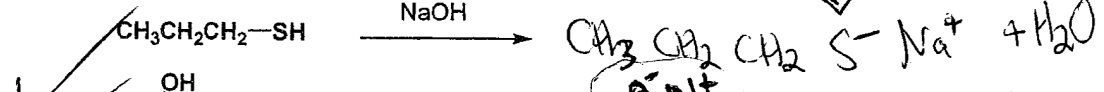
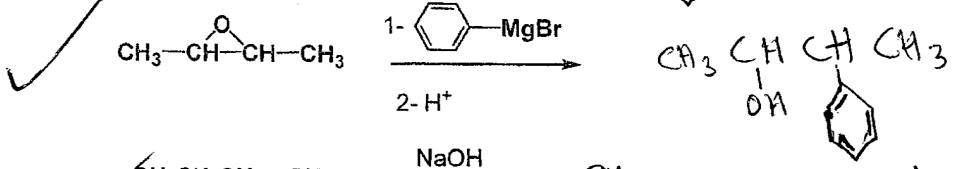
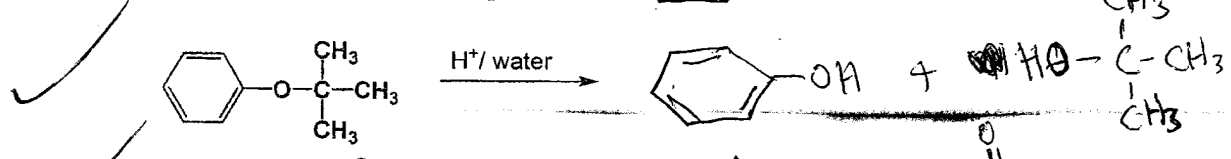
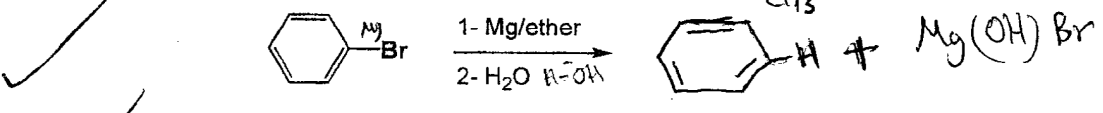
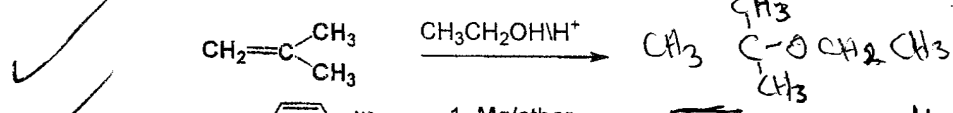
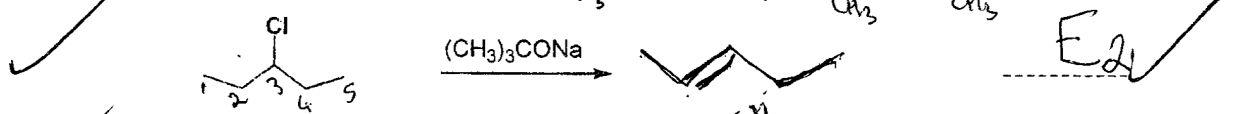
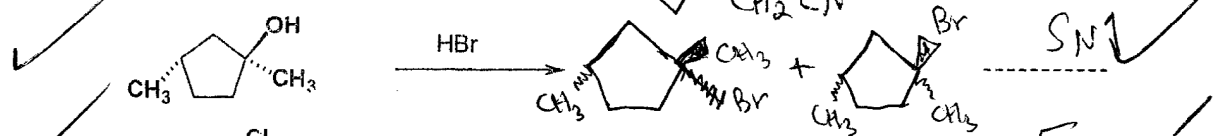
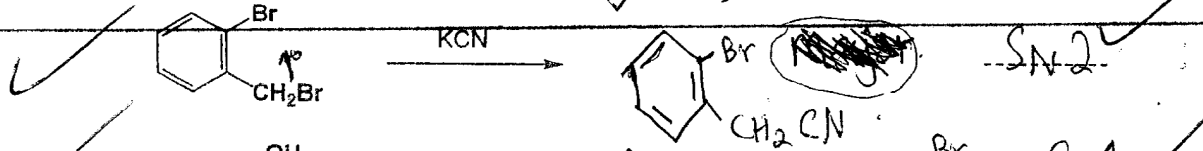
Q3 (15 pt) Show the synthesis of each of the following from the designated starting material, use any other needed reagents.



From



Q4 (28 points): Complete the following equations by writing product(s), show the stereochemistry where appropriate: Write the name of the mechanism by which the product is formed (S_N1 , S_N2 , $E1$, $E2$) for the first four reactions.



28
5