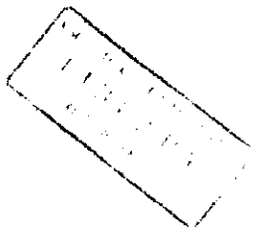
Time : 2 hrs

Chem. 208
Final Exam

August 30,1996
H. Deeb



Family name:
First name:
Student number:
Major:

Grading

I	/33
II	/40
III	/30
IV	/21
V	/15
VI	/18
VII	/27
VIII	/16
Total	/200

I) Draw the structure of each of the following:

a- Optically inactive α-aminoacid , in its Zwitterion form.

b- Optically inactive ketopentose.

c- A non reducing disaccharide and name it.

d- Amethylglucoside and name it.

e- β-D-glucofuranose.

f- A Lactone.

g- t-butyl-p-nitrobenzoate.

h- p-nitrosobenzylamine.

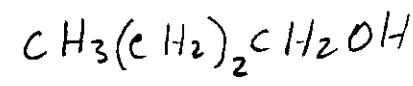
i- N-ethyl-m-toluamide.

j- R-3-methylcyclopentanol.

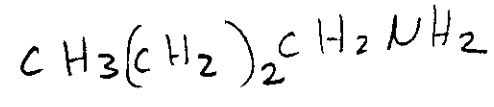
k- A disaccharide that can show mutarotation.

II) Fill in the blanks,after examining the structures carefully in each of the following.

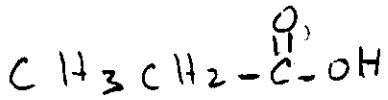
a-



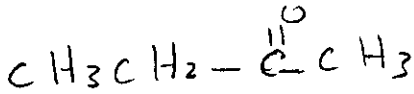
A



B



C

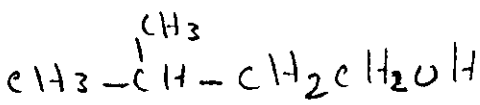


D

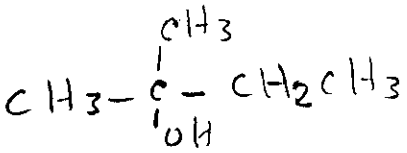
_____ **has the highest boiling point.**

_____ **has the lowest boiling point.**

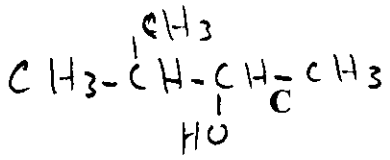
b-



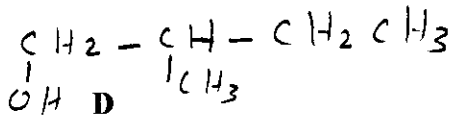
A



B



C

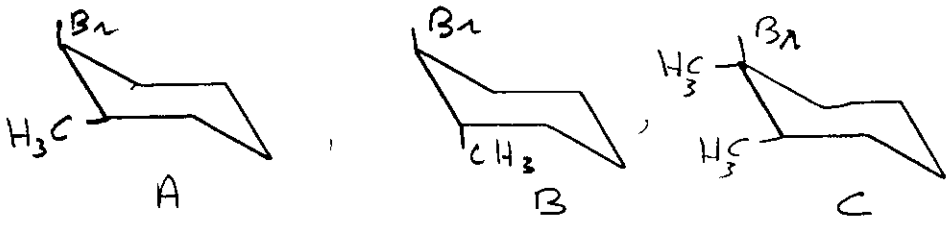


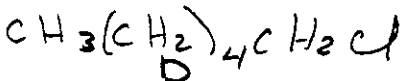
D

_____ **is the most reactive towards dehydration.**

_____ **is the least reactive towards dehydration.**

c-

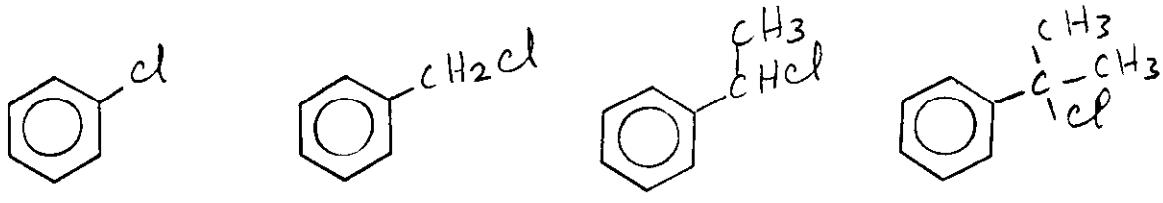




_____ **is the most reactive towards elimination.**

_____ **is the least reactive towards elimination.**

d-

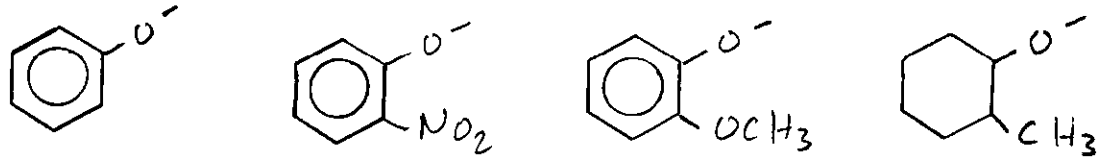


A **B** **C** **D**

_____ **is the most reactive towards SN^2.**

_____ **is the least reactive towards SN^2.**

e-

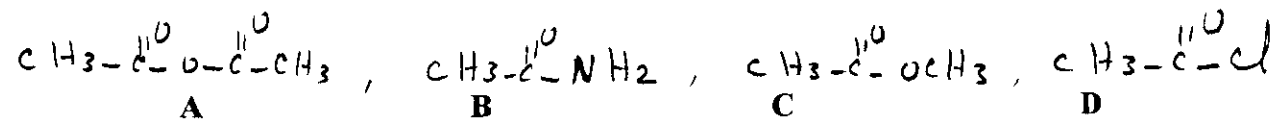


A **B** **C** **D**

_____ **is the strongest base.**

_____ **is the weakest base.**

f-

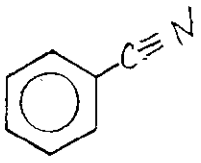


A **B** **C** **D**

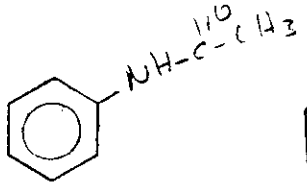
_____ is the most reactive towards hydrolysis.

_____ is the least reactive towards hydrolysis.

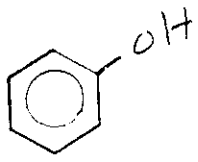
g-



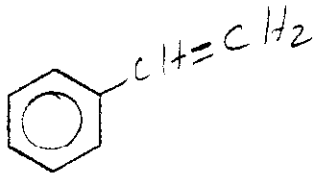
A



B



C

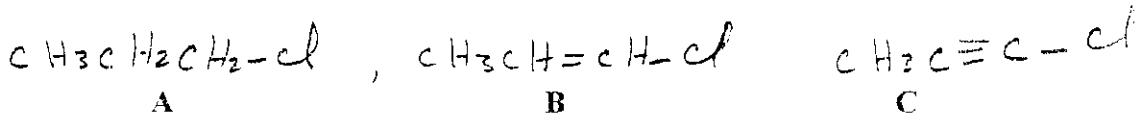


D

_____ is the most reactive towards electrophilic aromatic substitution.

_____ is the least reactive towards electrophilic aromatic substitution.

h-

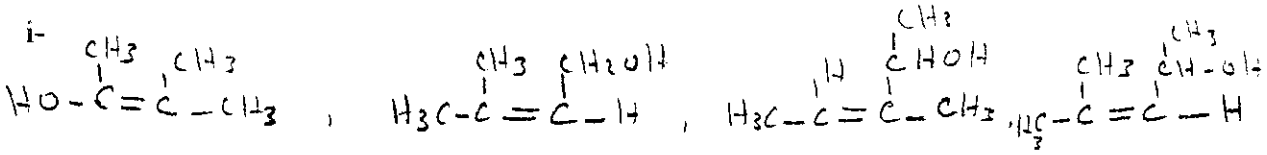


A B C

_____ has the longest C___ cl bond.

_____ has the shortest C___cl bond.

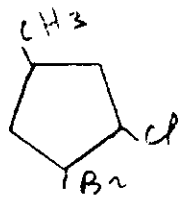
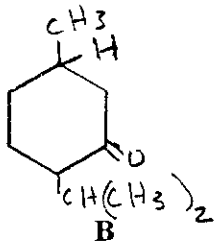
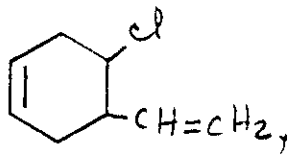
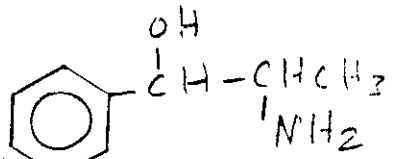
i-



A B C D

_____ can show both optical activity and cis-trans isomerism.

_____ can show optical activity,but cannot show cis-trans isomerism.

j-  ,  ,  , 

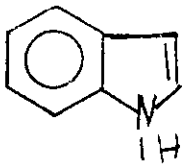
A B C D

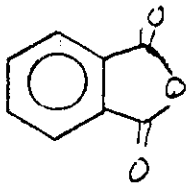
_____ has the largest number of chiral centers.

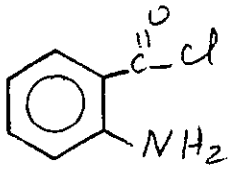
_____ has the smallest number of chiral centers.

III) Draw the structure of the major organic product(s) of each of the following reactions,if no reaction takes place,write "No Reaction".

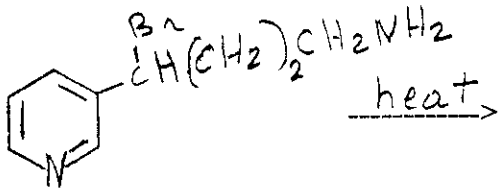
1-  + CH_3 cl ---------->

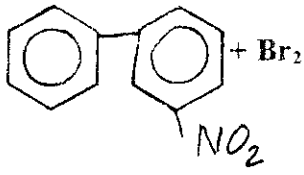
2-  + H^+ ---------->

3-  + CH_3OH $\xrightarrow{H^+}$

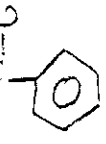
4-  heat>

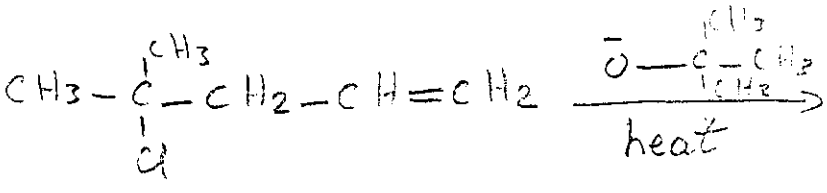
5- $CH_3-\underset{\displaystyle CH_3}{\overset{|}{C}}=CHCH_3$ 1- B_2H_6>
2- H_2O_2, OH^-

6- 

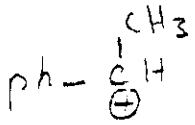
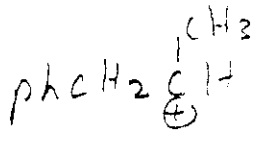
7-  + Br_2 $\xrightarrow{FeBr_3}$

8- $(C_2H_5)_2$ NH + $NaNo_2$ + Hcl $\xrightarrow{0^\circ C}$

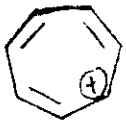
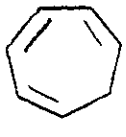
9- CH_3CH_2-C(=O)-  + NH_2OH $\xrightarrow{H^+}$

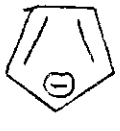
10- 

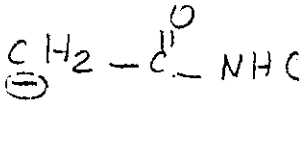
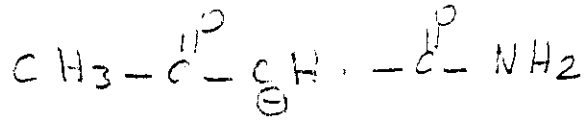
IV) Circle the more stable species in each of the following pairs.

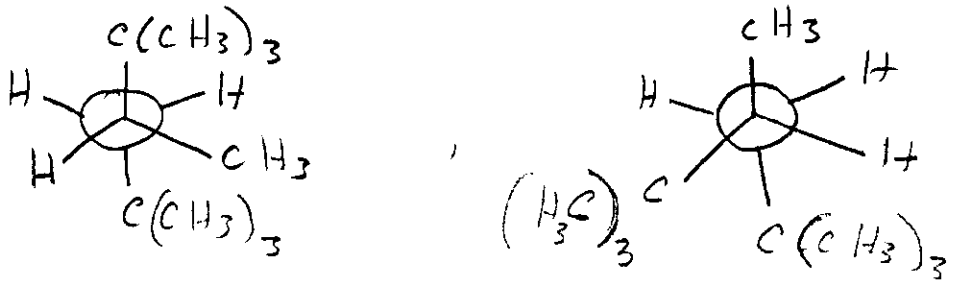
a-  , 

b- $(CH_3)_3CO^-$, $CH_3(CH_2)_2CH_2O^-$

c-  , 

d-  

e-  , 

f- 

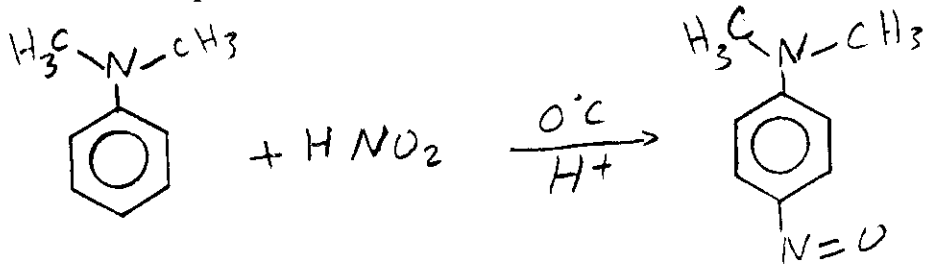
g- 

V) a) draw the structure of a compound of molecular formula (C_7H_6O) that can react with both tollen's reagent and phenylhydrazine,but does not decolorize Br_2/ccl_4.

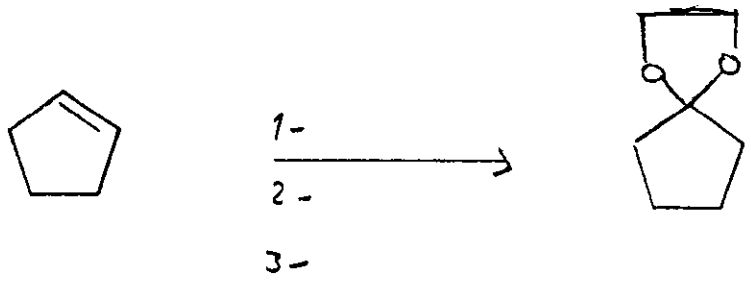
b) draw the structure of a compound that can react with both Br_2/ccl_4 and $NaNH_2/NH_3$.

c) The structure of a compound of moleculor formula $C_{10}H_{18}$ that can yield three monochlorinated structural isomers when treated with Cl_2 in presence of light.

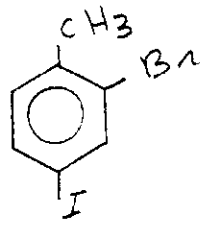
VI) a- Write the stepwise mechanism of the following reaction.



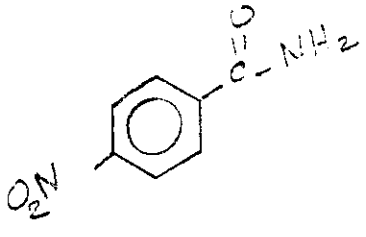
b- Fill in the reagents needed in the three steps to carry out the following transformation.



VII) Outline a possible laboratory synthesis of each of the following from the indicated starting materials and any needed organic or inorganic reagents.

a-  **from benzene**

b- $phCH_2CH_2CH_2-\overset{O}{\overset{\|}{C}}-OH$ **from** $phCH_2CH_2OH$

c-  **from Toluene**