Time: 50 minutes | **Chemistry 212 Quiz III** | **Jan. 21,1997 A. Salameh**

Family Name: Nashawi

First Name: [redacted] Tarek

Student Number: 92-17892 Section: 8 II 11 F

Question I 30 out of 36

II 27 out of 27

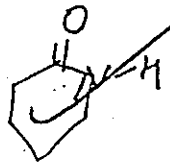
III 15 out of 15

IV 08 out of 23

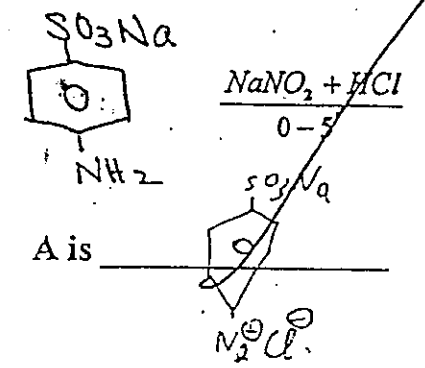
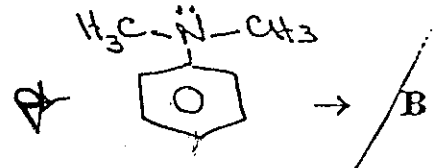
Total 80 out of 100%

30

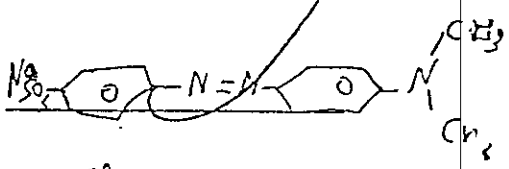
I (36%) Complete each of the following reactions specifying the major product where possible.

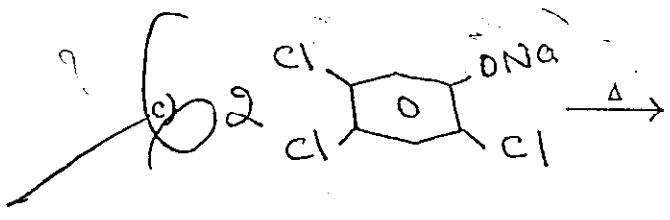
a) $H_2NCH_2CH_2CH_2CH_2COOH \xrightarrow{\Delta}$  $+ H_2O$ (NR)

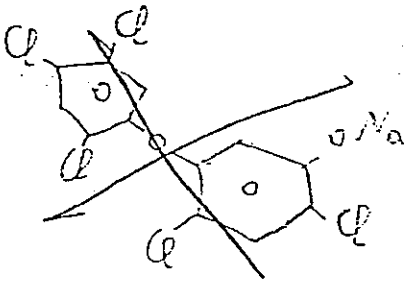
When you see heat ⇒ nucleophilic attack

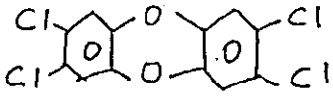
b)  $\xrightarrow{NaNO_2 + HCl,\ 0-5}$ A $\xrightarrow{}$  B

A is

B is 

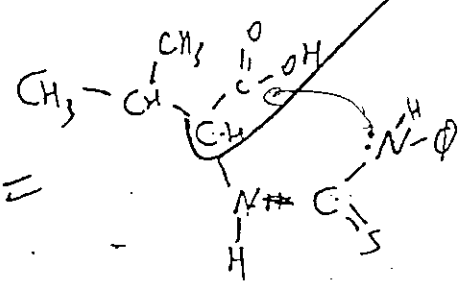


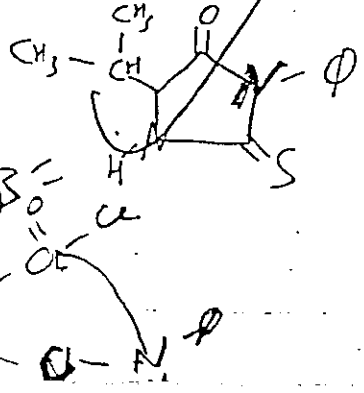


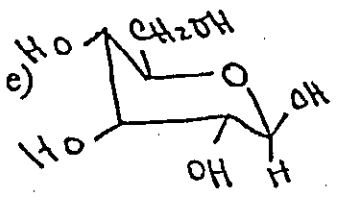


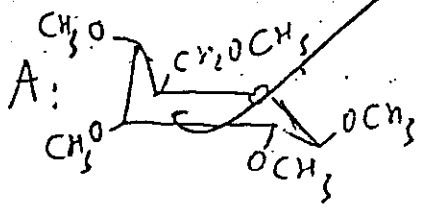
Dioxin.

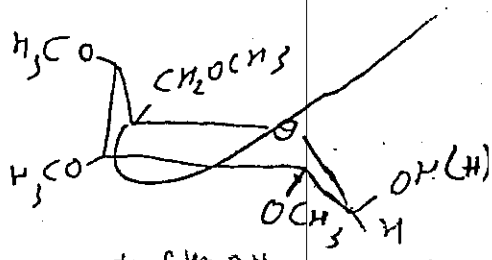
c) $(CH_3)_2CH\text{-}\underset{NH_2}{\underset{|}{CH}}\text{-}\overset{O}{\overset{\|}{C}}\text{-}OH + \phi\text{-}N=C=S \rightarrow A \xrightarrow{H_3O^{\oplus}} B$

A is 

B is 

e)  $\xrightarrow[Ag_2O]{CH_3I}$ **A** $\xrightarrow{H_3O^{\oplus}}$ **B**

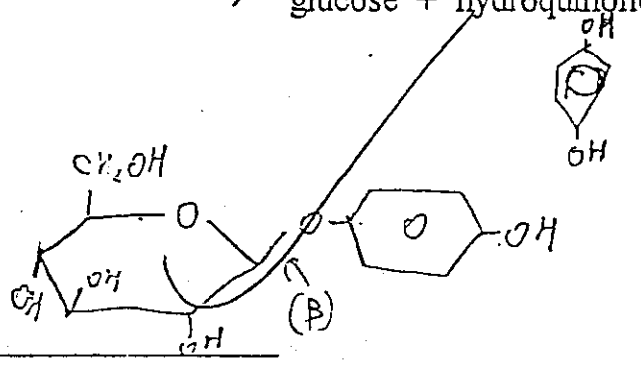
A: 

B: 

+ CH_3OH

hydrolysis of acetal

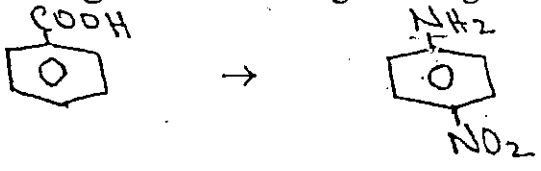
f) Arbutin (a diuretic) $\xrightarrow{\text{emulsin}}$ glucose + hydroquinone

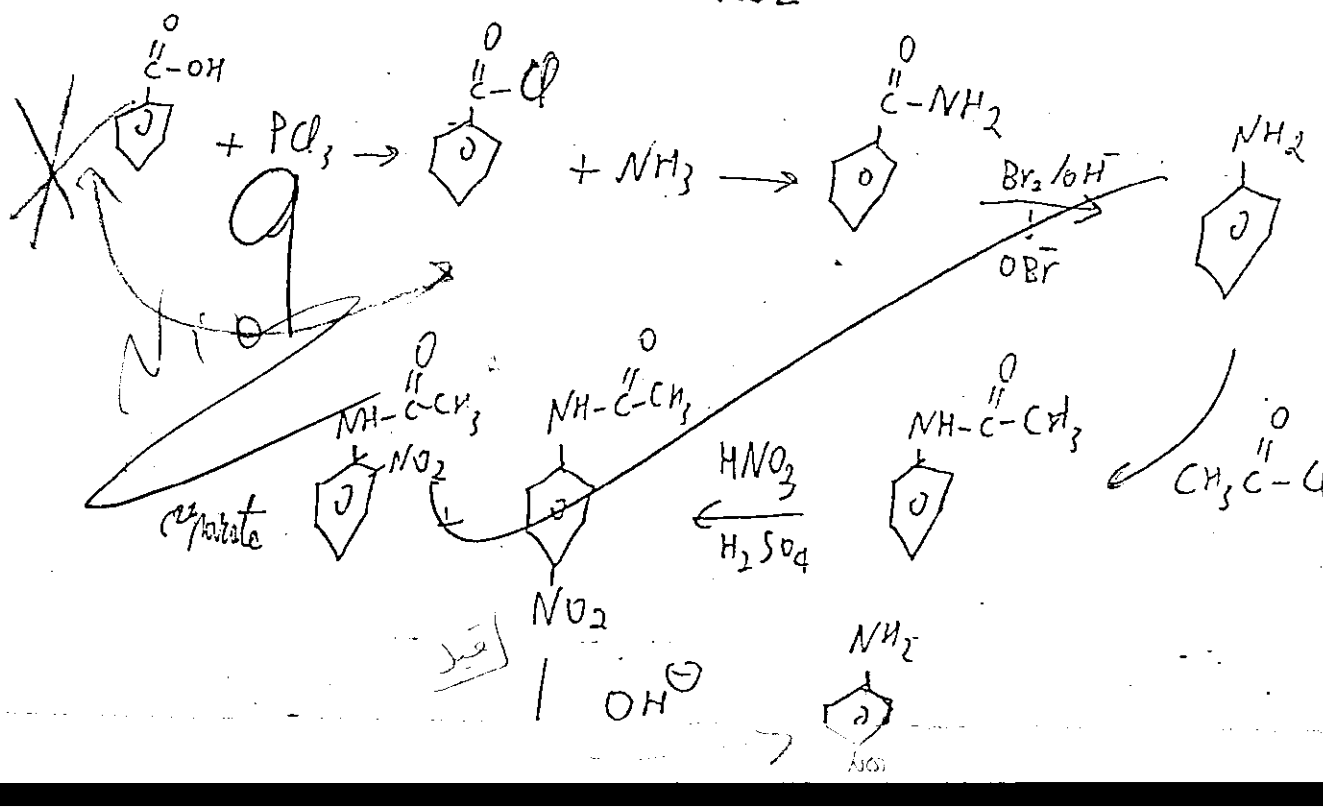


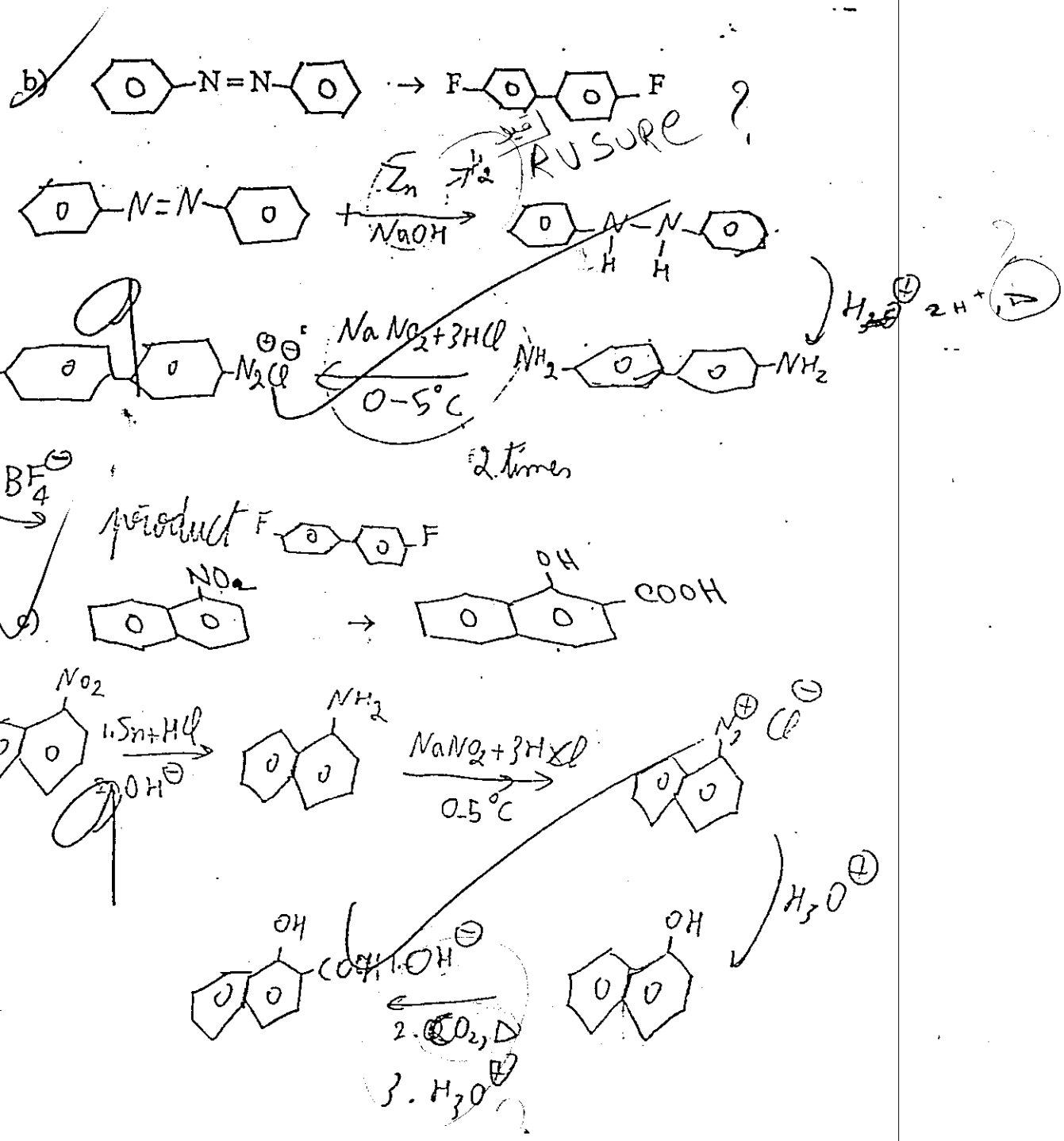
Arbutin is _____

97

II (27%) Write chemical equations to show how each of the following transformations can best be accomplished. You may use any organic and/or inorganic reagents needed.

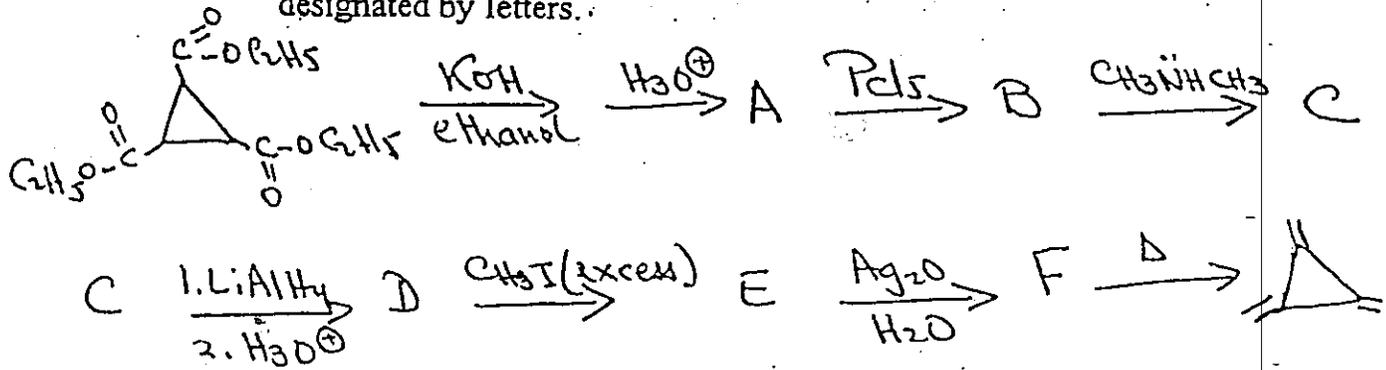
a) 



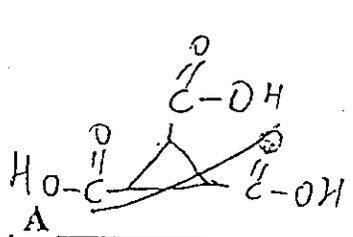

b)
N=N
F
F
RUSURE ?
Zn
NaOH
H
H
NaNO2+3HCl
0-5°C
2 times
2BF4
product
NO2
OH
COOH
1.Sn+HCl
2.OH
NaNO2+3HCl
0-5°C
H3O
1.OH
2.CO2, Δ
3. H3O

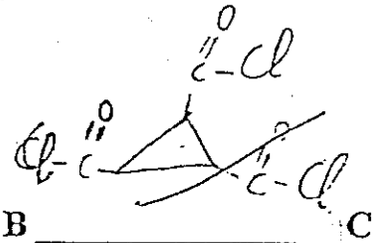
15

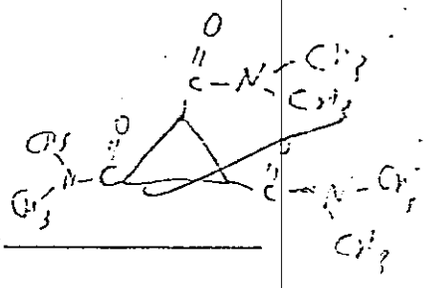
III (15%) Trimethylenecyclopropene, C_6H_6, is a constitutional isomer of benzene. A sample of the compound was synthesized according to the method outlined below, to study its physical and chemical properties. Give the structural formulas for the compounds designated by letters.

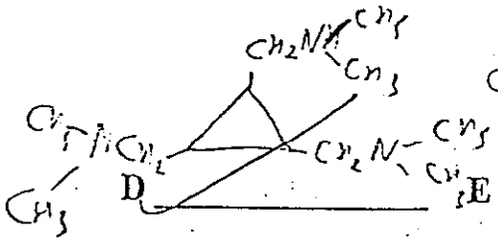


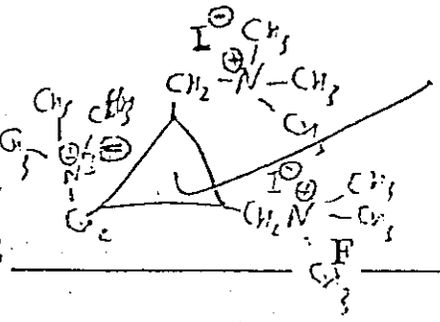
Identify A → F


A


B


C


D


E

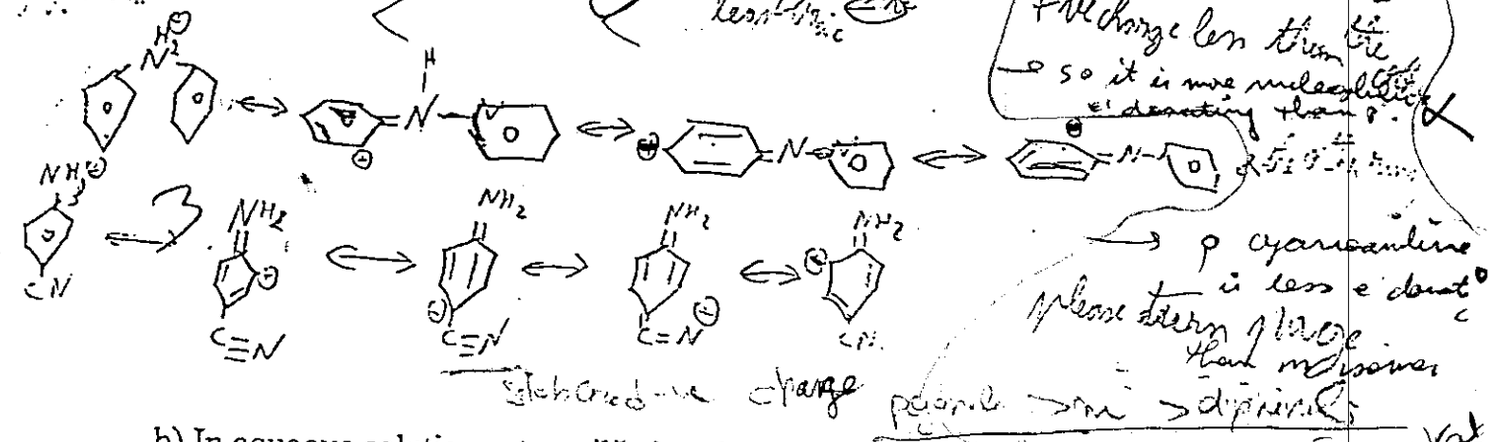
F

m-cyanoaniline > p-cyanoaniline > diphenylamine

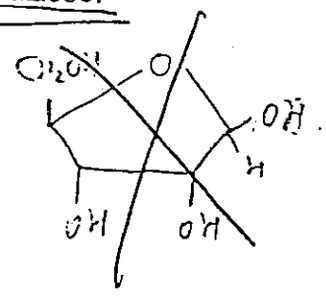
IV (23%) 8

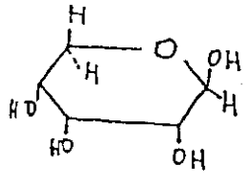
a) Arrange the following in order of decreasing basicity (most basic first, least basic last). Justify your answer by using resonance.

diphenylamine, p-cyanoaniline and m-cyanoaniline.

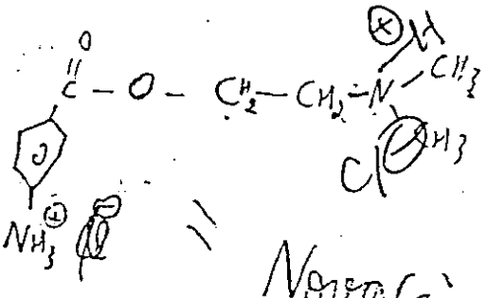


b) In aqueous solutions at equilibrium 80% of ribose molecules are in the pyranose form. Draw a Haworth structural formula for β - D-ribopyranose.





c) 2- (N,N-dimethylamino) ethyl p-aminobenzoate is the local anesthetic procaine that is widely used in dentistry as its hydrochloride salt, Novacain. Give the structure of Novacain.



Novocain