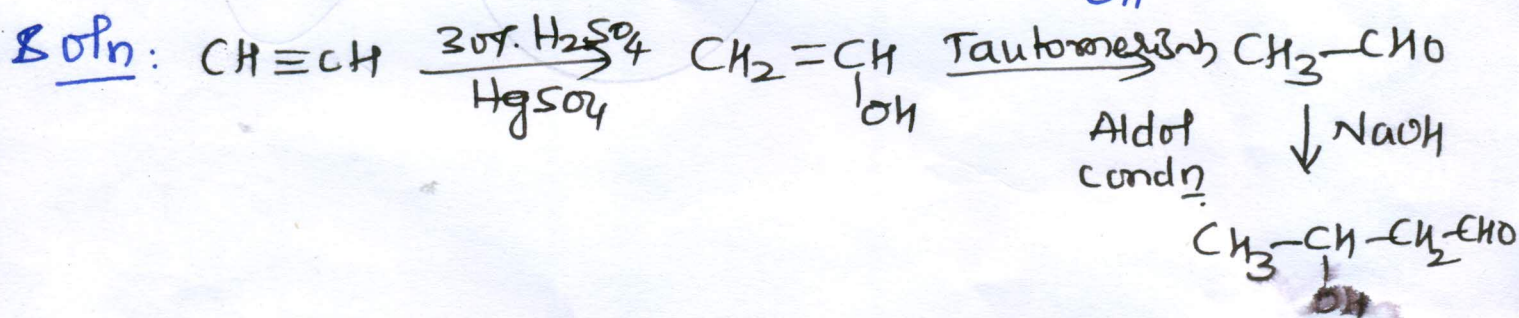
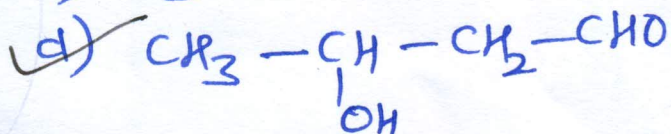
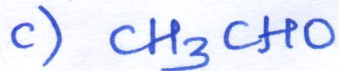
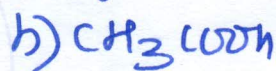
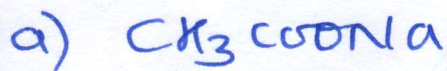
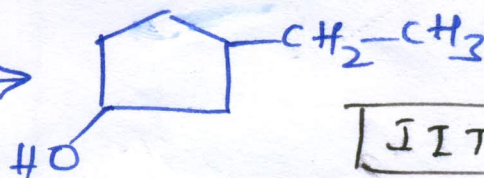
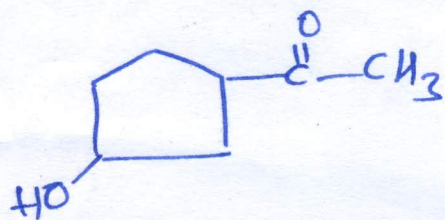


Aldehydes & Ketones

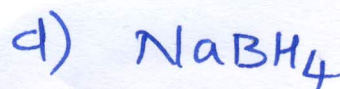
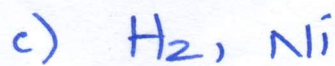
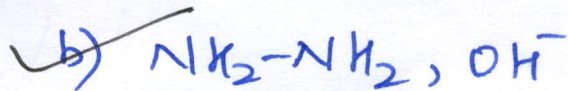
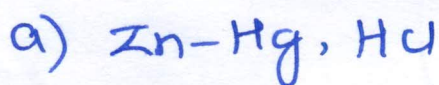
① Predict the product 'B' in the sequence of reaction $\text{CH}\equiv\text{CH} \xrightarrow[\text{HgSO}_4]{30\% \text{ H}_2\text{SO}_4} \text{A} \xrightarrow{\text{NaOH}} \text{B}$



② The appropriate reagent for the transformation



IIT 2000



Soln

Both Zn-Hg/HCl & $\text{NH}_2-\text{NH}_2/\text{OH}^-$ can reduce

$\text{CH}_3-\text{CO}-$ to CH_2-CH_2- , But HCl will

reacts with $-\text{OH}$ group

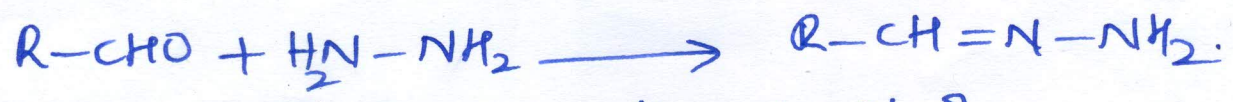
$\therefore \text{NH}_2-\text{NH}_2/\text{OH}^-$ is more effective

Arrange the following compds in increasing order of their reactivity in nucleophilic addition reactions. Ethanal (I), Propanal (II), Propanone (III), Butanone (IV).

- a) $\text{III} < \text{II} < \text{I} < \text{IV}$ b) $\text{II} < \text{I} < \text{III} < \text{IV}$
 ✓ c) $\text{IV} < \text{III} < \text{II} < \text{I}$ d) $\text{I} < \text{II} < \text{III} < \text{IV}$

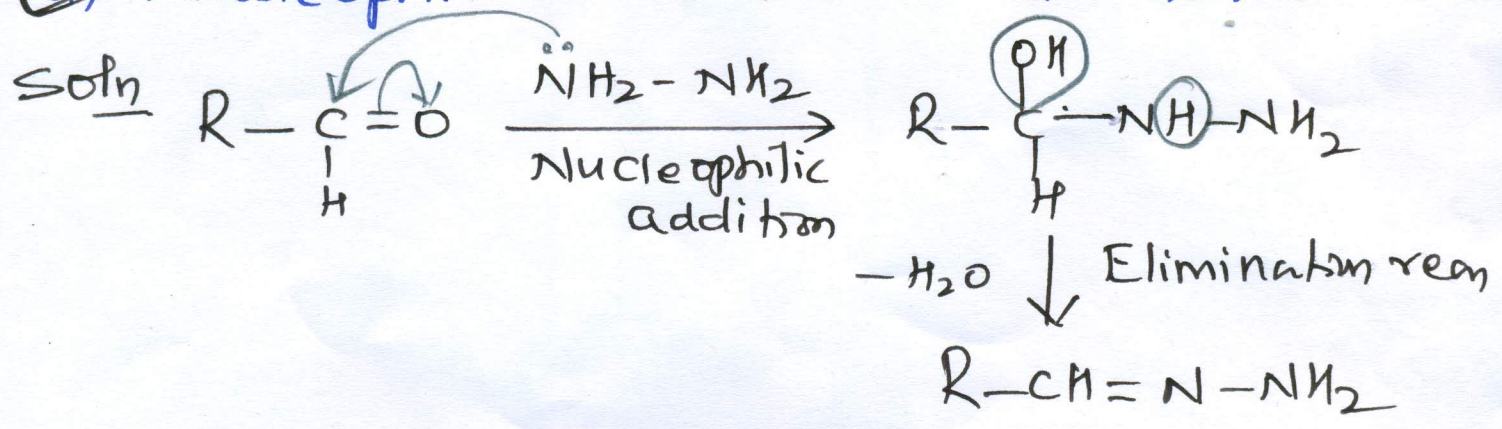
Soln: Reactivity of carbonyl (C=O) gr. decreases with size of alkyl groups & no. of alkyl gr.
 CH_3CHO (I), $\text{CH}_3\text{CH}_2\text{-CHO}$ (II), CH_3COCH_3 (III), $\text{CH}_3\overset{\text{O}}{\text{C}}\text{-CH}_2\text{-CH}_3$ (IV)
 Butanone < Propanone < Propanal < Ethanal

Q consider the reaction: AIPMT main 2012

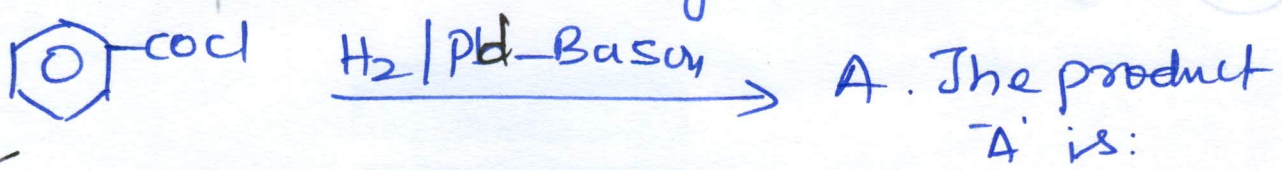


What sort of reaction is it?

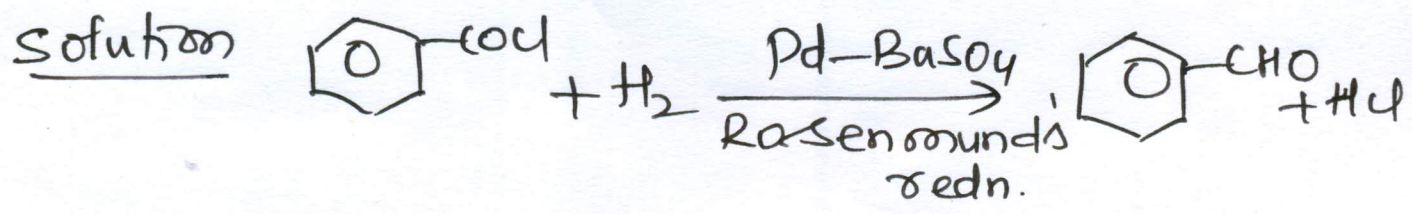
- a) Electrophilic addition - Elimination rxn.
 b) Free radical addition - Elimination rxn.
 c) Electrophilic substitution - Elimination rxn.
 ✓ d) Nucleophilic addition - Elimination rxn.



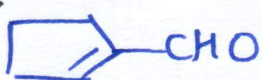
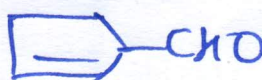

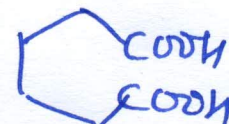
5) consider the following reaction:

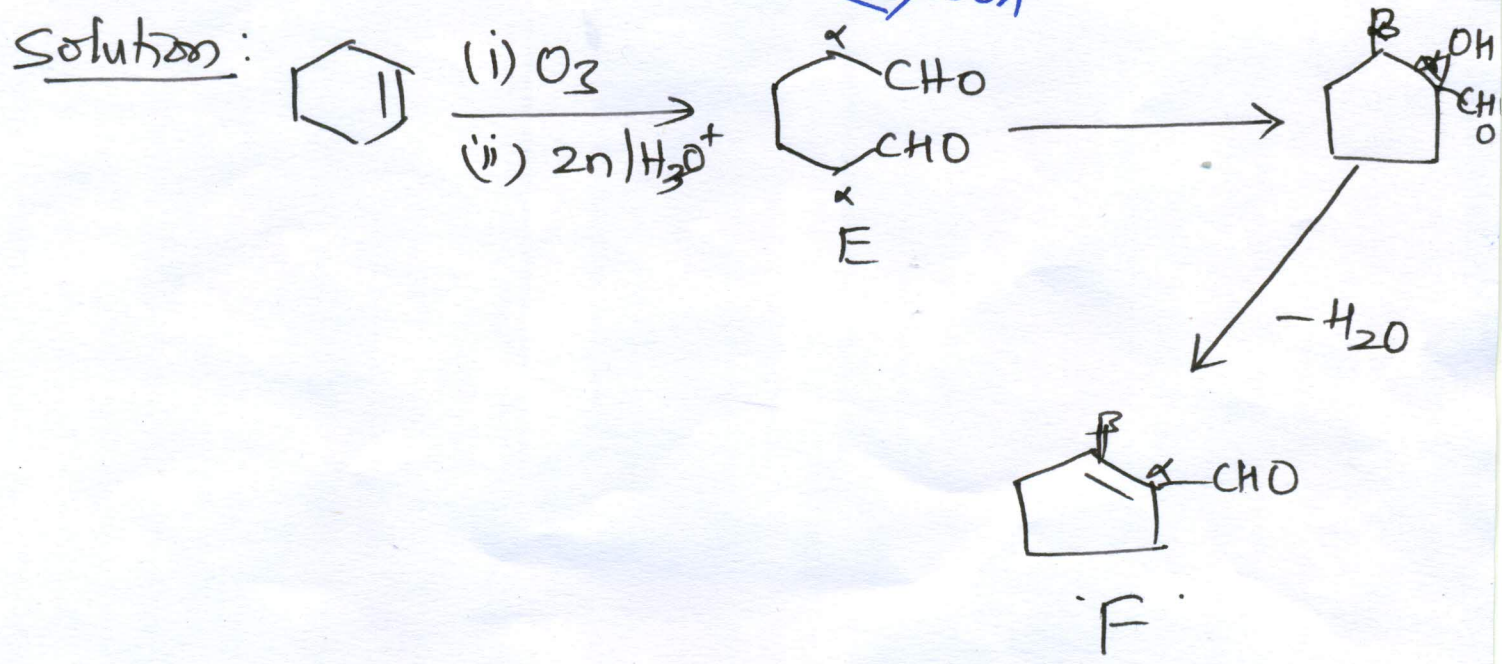


- a) C_6H_5-CHO
- b) C_6H_5-OH
- c) $C_6H_5-COCH_3$
- d) C_6H_5-Cl



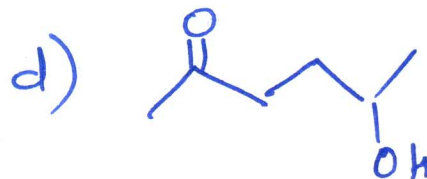
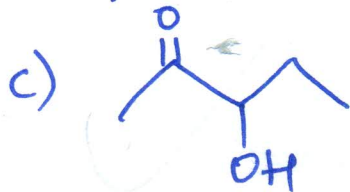
6) Cyclohexene on ozonolysis followed by reaction with ~~the~~ Zn-dust and water gives compd. "E". The compd. "E" on further treatment with aq. KOH yields compd. "F". The compd. "F" is: (IIT-2007)

- a) 
- b) 
- c) 
- d) 

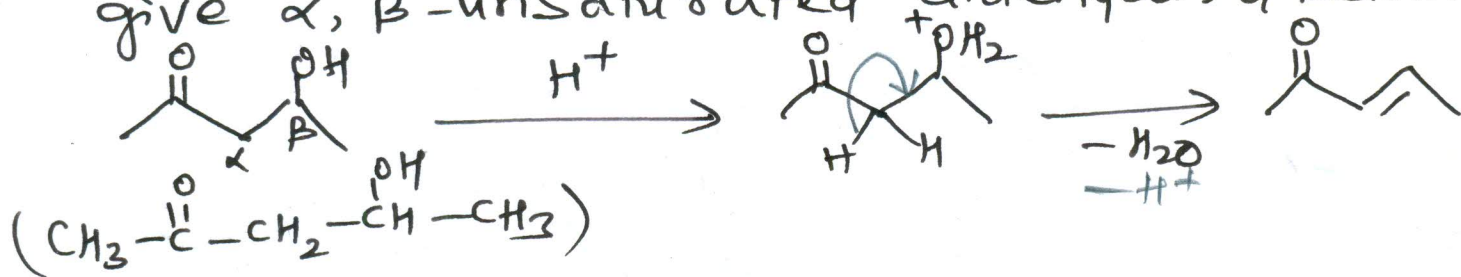


Which of the following will be most readily dehydrated under acidic conditions?

IIT 2000



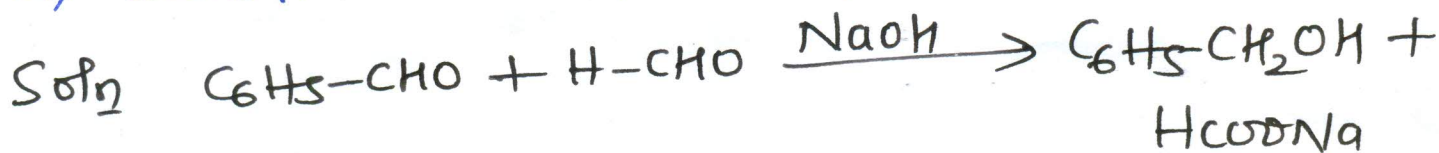
Soln: β -hydroxy aldehydes & β -hydroxy ketones readily undergo dehydration to give α, β -unsaturated aldehydes & ketones.



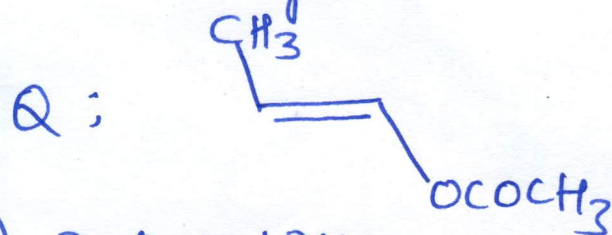
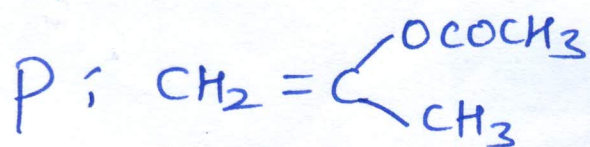
A mixture of benzaldehyde and formaldehyde on heating with aqueous NaOH solution gives:

IIT 2001

- a) Benzyl alcohol & sod. formate
- b) Sod. benzoate & methyl alcohol
- c) Sod. Benzoate & Sodium formate
- d) Benzyl alcohol & methyl alcohol.

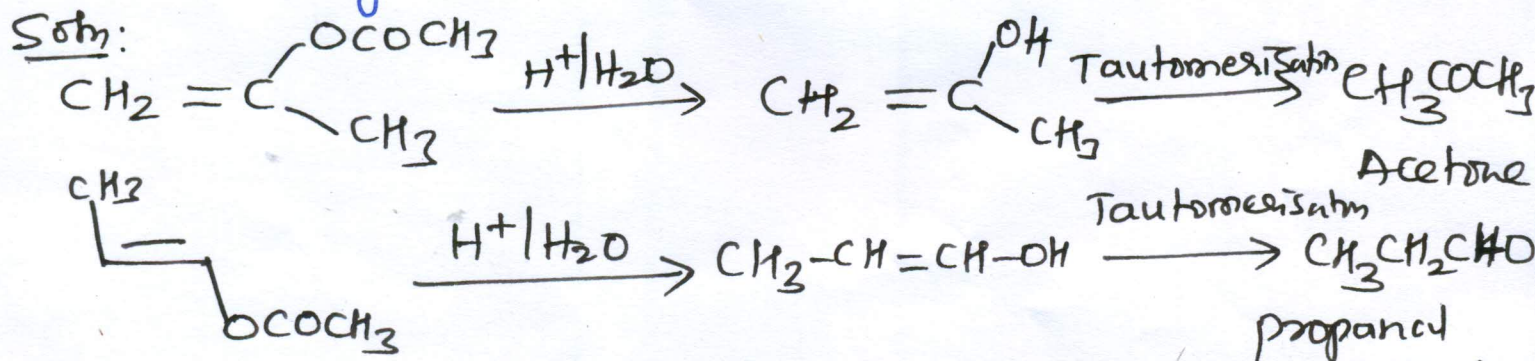


The product of acid hydrolysis of P & Q can be distinguished by:



- a) Lucas reagent
~~c) Fehling's soln~~

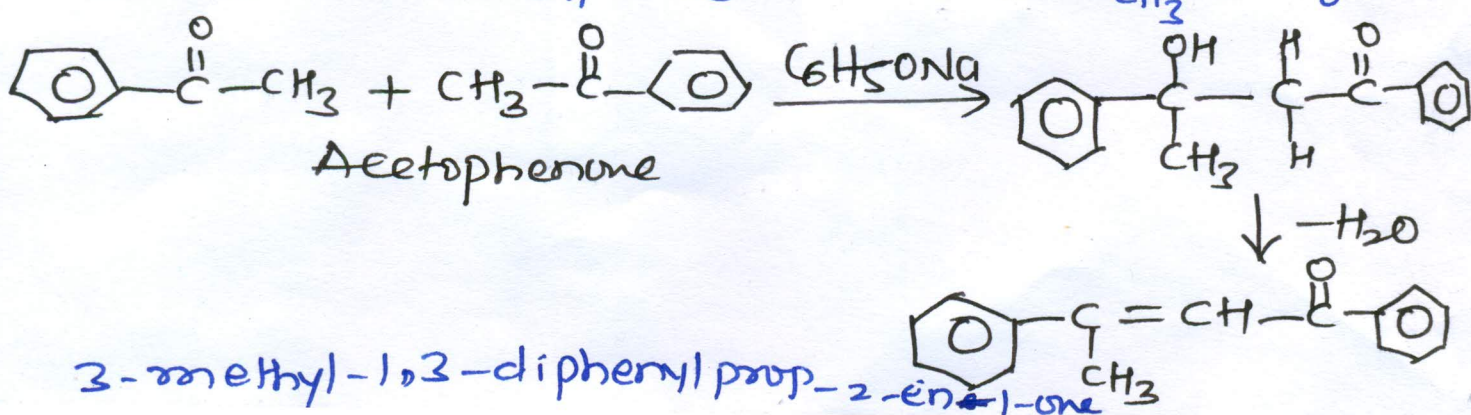
- b) 2,4-DNPH
 d) NaHSO_3



Acetone and propanal can be distinguished using Fehling's soln.

Acetophenone when reacted with a base, $\text{C}_6\text{H}_5\text{ONa}$, yields a stable compound which has the structure: CBSE PMT 2008

- a) $\text{C}_6\text{H}_5 - \text{CH}(\text{CH}_3) - \text{CH}_2 - \text{C}(=\text{O}) - \text{C}_6\text{H}_5$
- b) $\text{C}_6\text{H}_5 - \text{C}(\text{OH})(\text{CH}_3) - \text{C}(\text{OH})(\text{CH}_3) - \text{C}_6\text{H}_5$
- c) $\text{C}_6\text{H}_5 - \text{CH}(\text{OH}) - \text{CH}(\text{OH}) - \text{C}_6\text{H}_5$
- ~~d) $\text{C}_6\text{H}_5 - \text{C}(\text{CH}_3) = \text{CH} - \text{C}(=\text{O}) - \text{C}_6\text{H}_5$~~

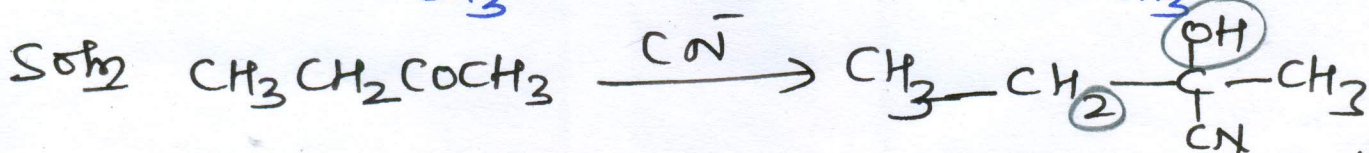
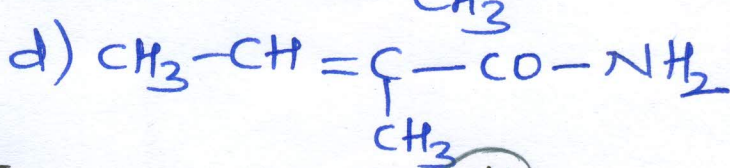
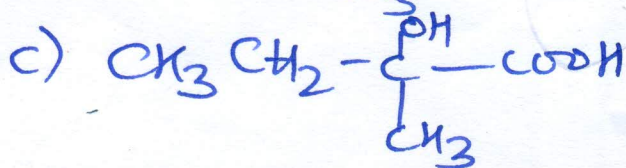
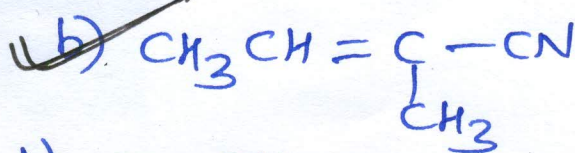
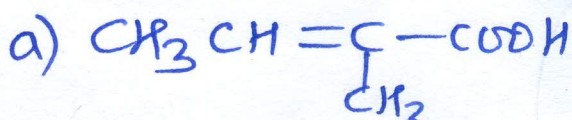
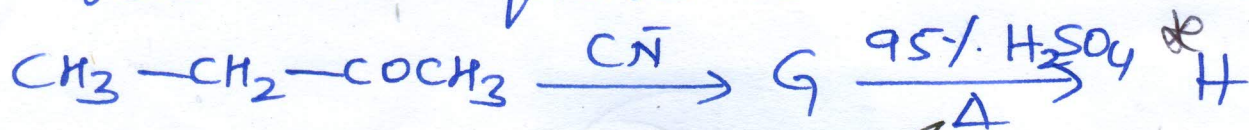


11) The major product "H" of the given

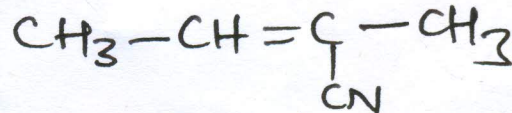
6

reaction sequence is:

IIT JEE 2012



dehydration \downarrow 95% H_2SO_4



12) CH_3-CHO & $\text{C}_6\text{H}_5\text{CH}_2\text{CHO}$ can be distinguished chemically by:

AIPMT-2012

a) Benedict's test

b) Iodoform test

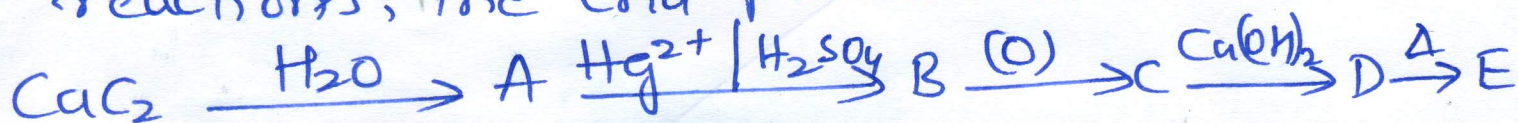
c) Tollen's reagent test

d) Fehling's soln test

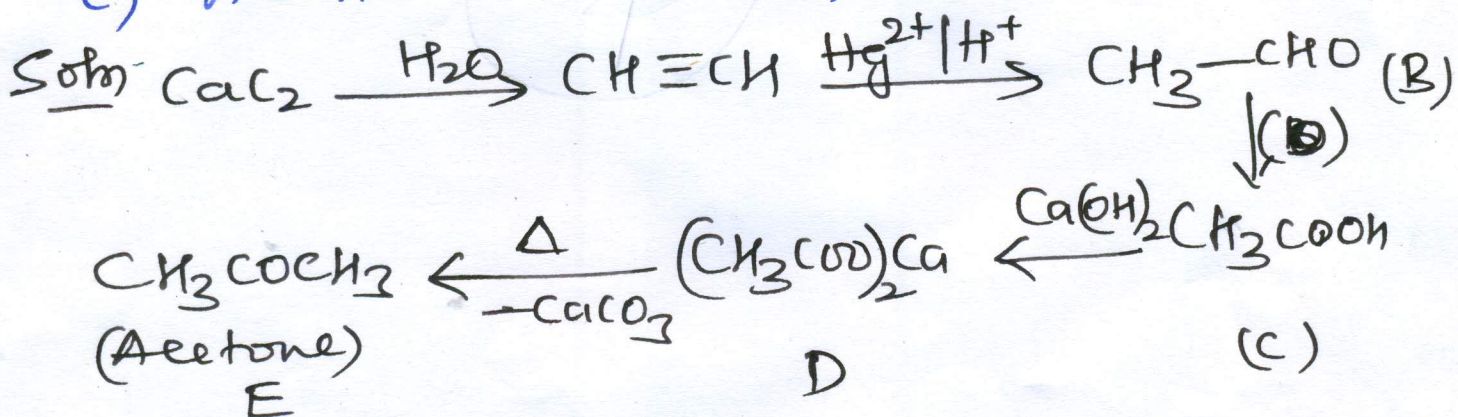
Soln CH_3CHO answers for iodoform test

Where as $\text{C}_6\text{H}_5-\text{CH}_2-\text{CHO}$ will not answer iodoform test. Iodoform test is answered by compounds containing $\text{CH}_3-\text{CO}-$ group.

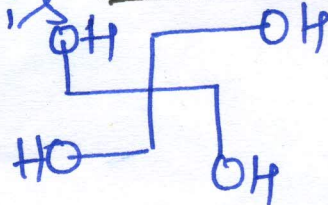
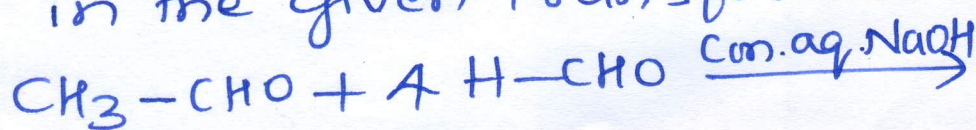
13 In the following sequence of reactions, the end product is:



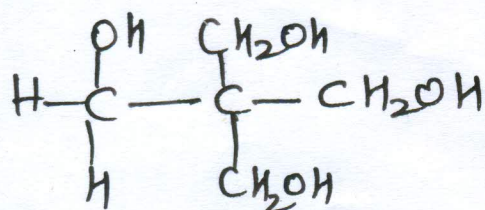
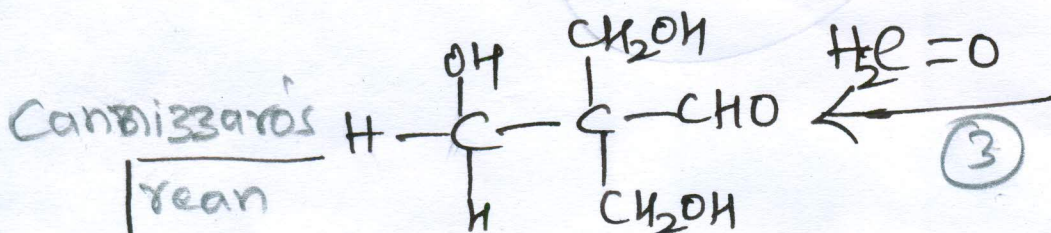
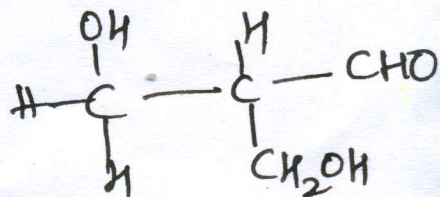
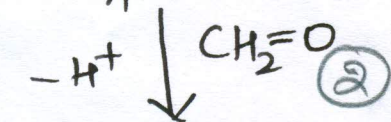
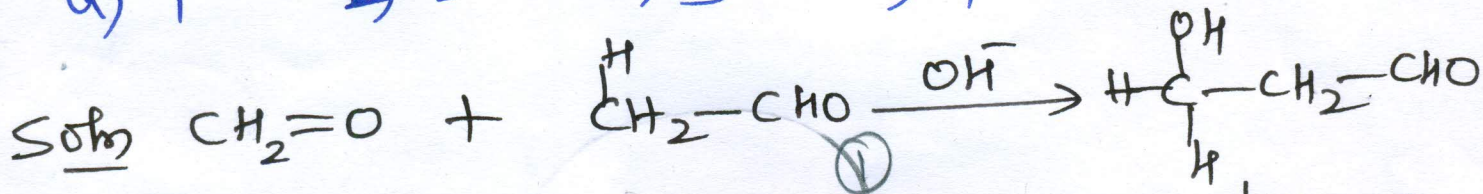
- a) Acetaldehyde b) formaldehyde
c) Acetic acid d) acetone



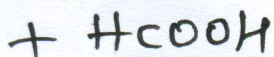
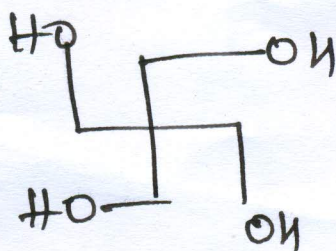
14 The number of aldol reactions that occurs in the given transformation is IITJEE 2012



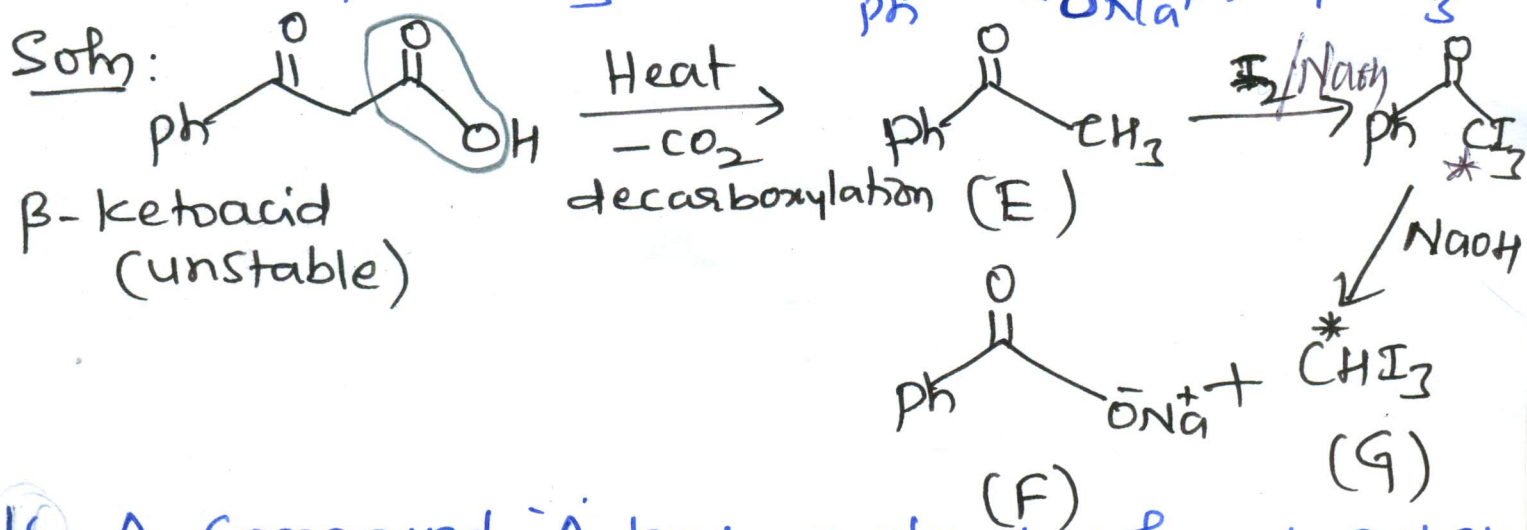
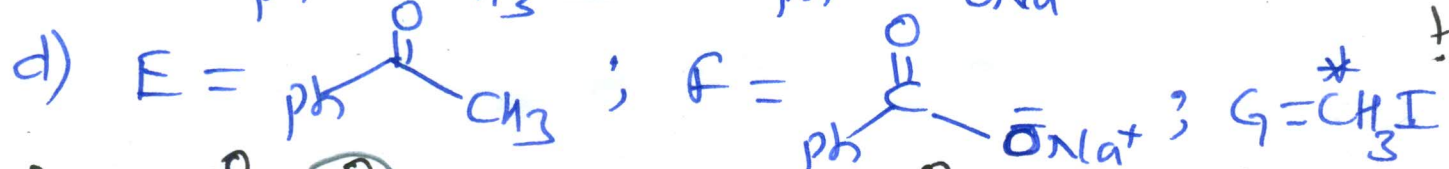
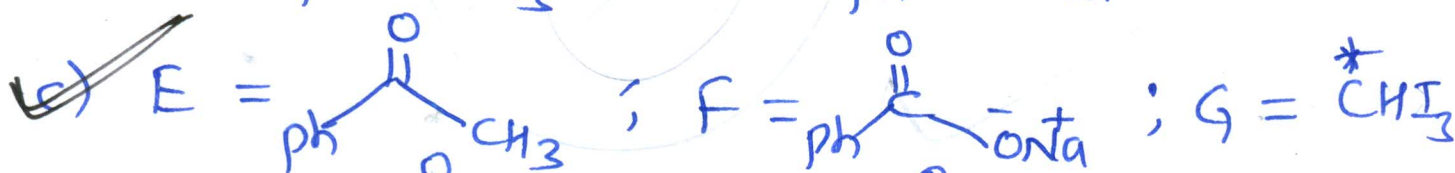
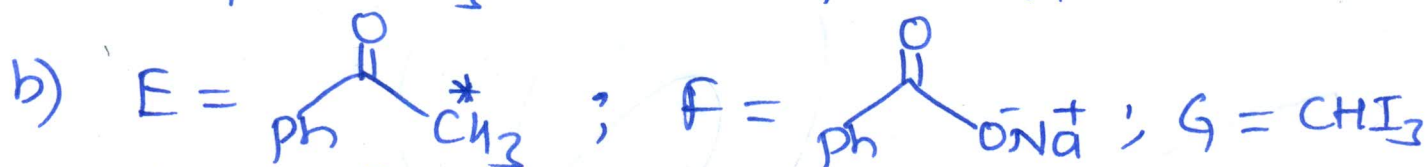
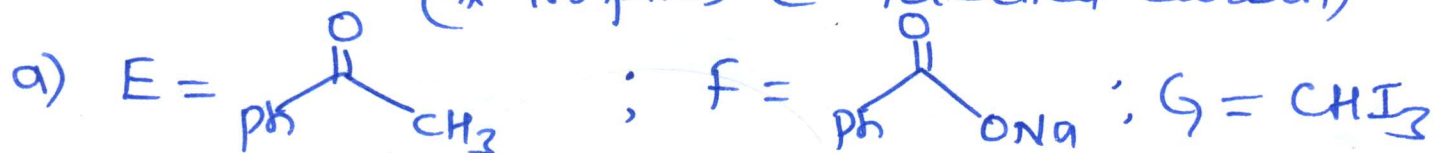
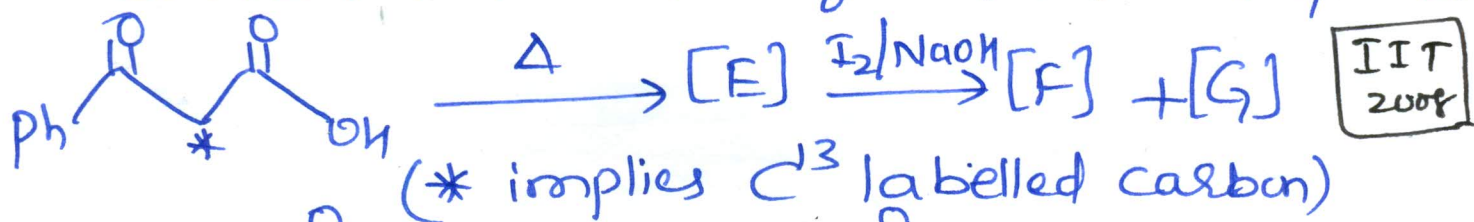
- a) 1 b) 2 c) 3 d) 4



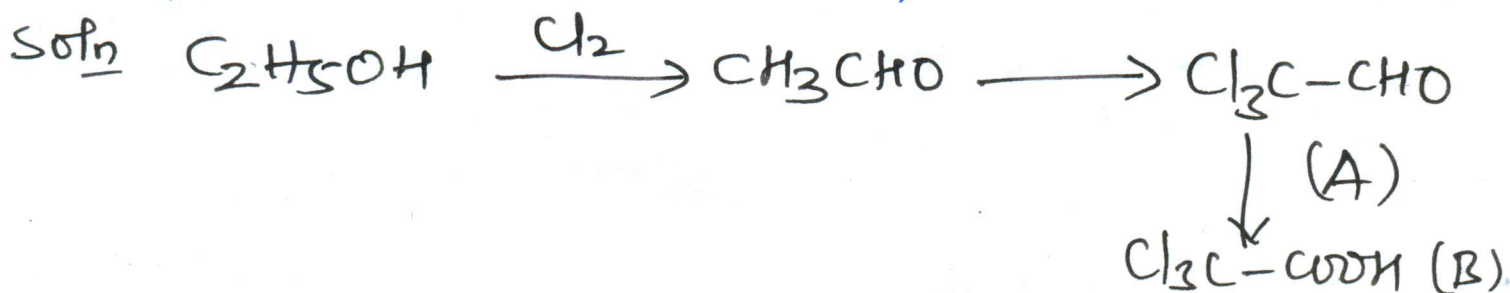
or

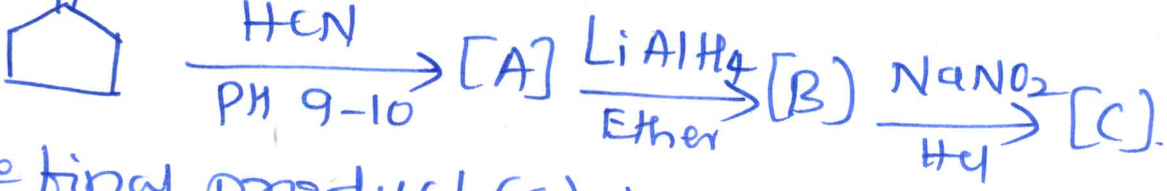


In the following reaction sequence, the correct structures of 'E', 'F', and 'G' are



- 16) A compound 'A' has molecular formula $\text{C}_2\text{Cl}_3\text{OH}$. It reduces Fehling's solution & on oxidation gives monocarboxylic acid 'B'. 'A' is obtained by the action of " Cl_2 " on ethyl alcohol. 'A' is:
- a) chloral b) chloroform
 c) chloromethane d) chloroacetic acid.



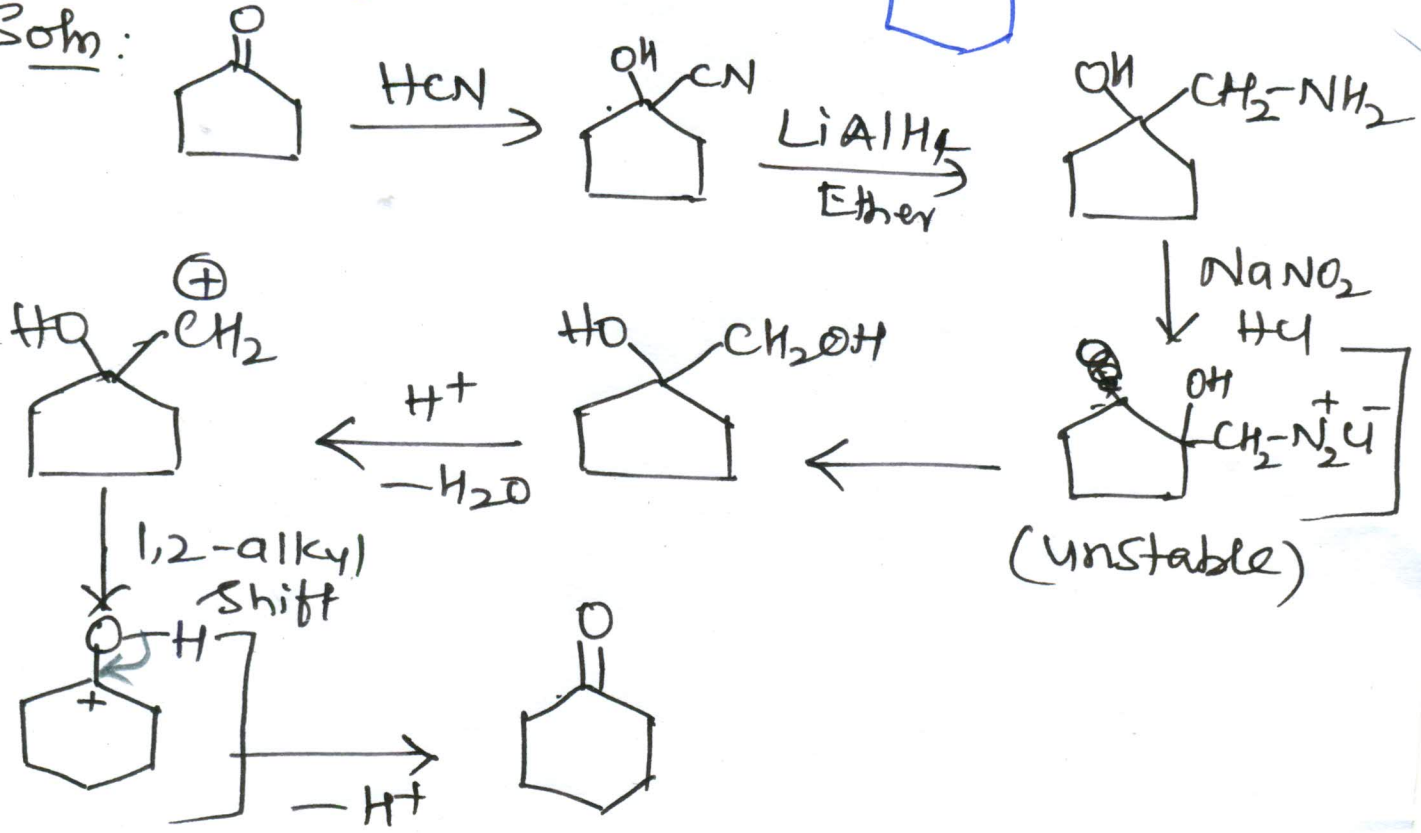


9

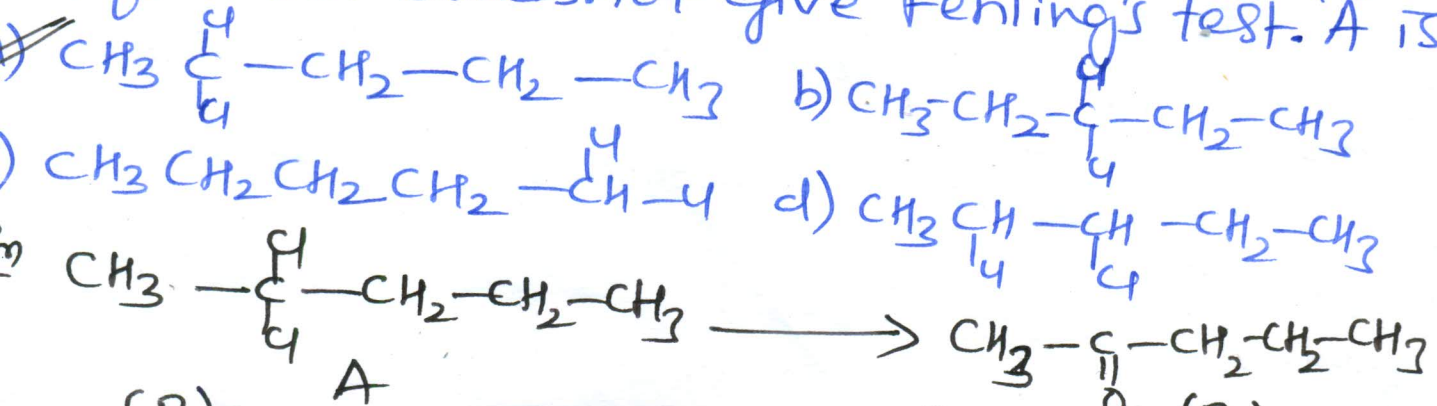
The final product (C) in the above reaction is;

- a) C1CCCC1=O
 b) C1CCCC1C(=O)CO
 c) C1CCCC1(O)CO
 d) C1CCCCC1=O

Soln:



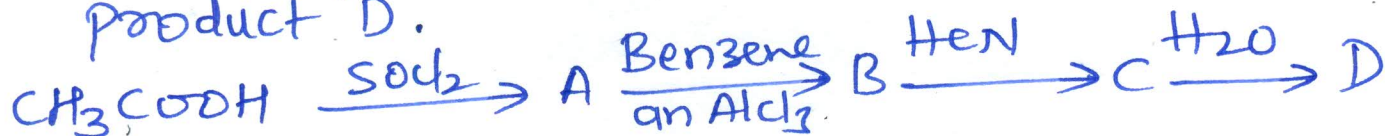
18) A compd. 'A' ($\text{C}_5\text{H}_{10}\text{Cl}_2$) on hydrolysis gives $\text{C}_5\text{H}_{10}\text{O}$, which reacts with NH_2OH , forms iodoform but doesnot give fehling's test. 'A' is:



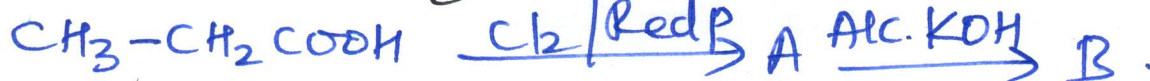
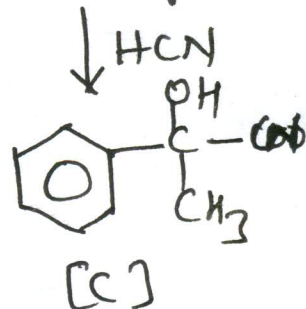
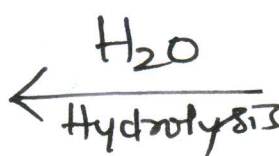
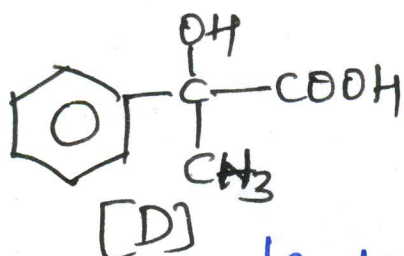
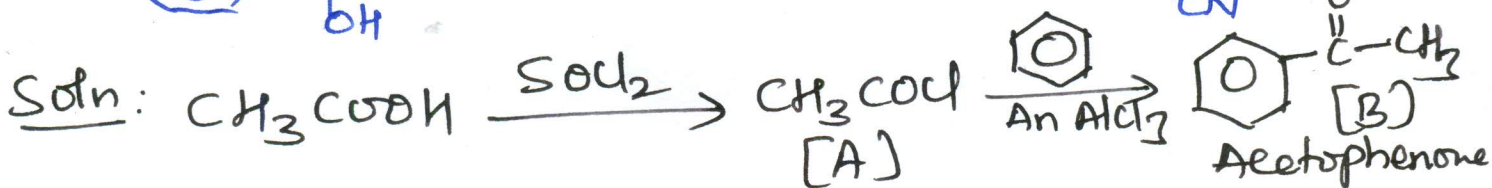
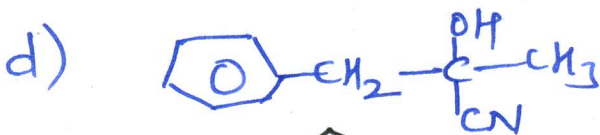
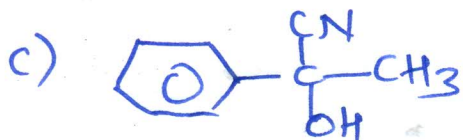
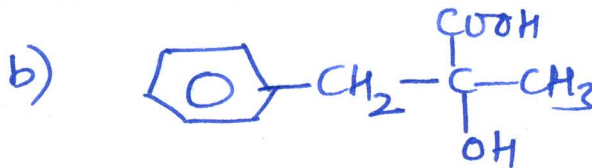
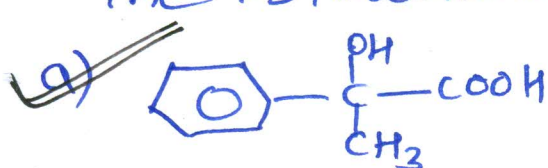
(B) Do not answer for fehling's test

- reacts with NH_2OH
 - forms Iodoform
 2-pentanone (B)

In a set of reactions, acetic acid yielded product "D".

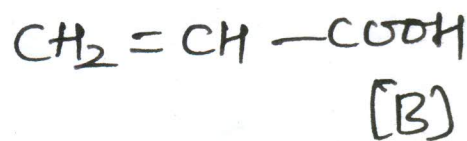
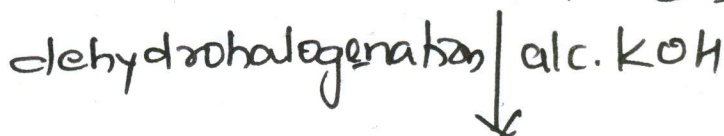
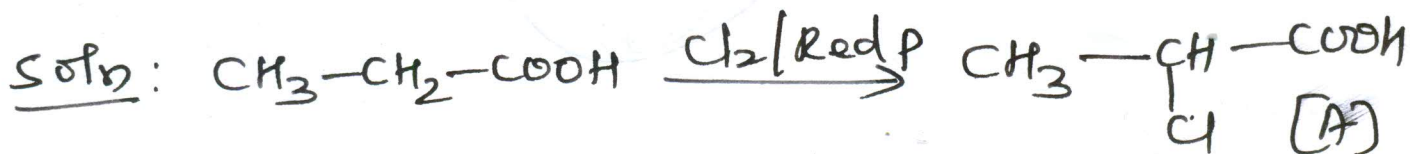
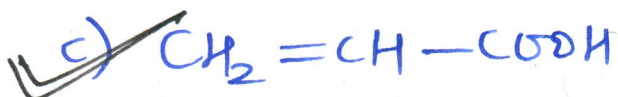


The structure of 'D' would be:



B is:

[Aieeeo2]



21) The strongest acid amongst the following compound is:

AIEEE 2011

- a) CH_3COOH b) H-COOH
c) $\text{CH}_3\text{CH}_2\text{CH}(\text{Cl})\text{CO}_2\text{H}$ d) $\text{ClCH}_2\text{CH}_2\text{CH}_2\text{COOH}$

Soln: $\text{CH}_3\text{CH}_2-\underset{\text{Cl}}{\text{CH}}-\text{COOH}$ is strongest due to $-I$ effect of Cl-atom
* With distance $-I$ effect falls.

Among the following acids which has the lowest pKa value?

AIEEE 02

- a) CH_3COOH b) H-COOH
c) $(\text{CH}_3)_2\text{CH-COOH}$ d) $\text{CH}_3\text{CH}_2\text{-OH}$

Soln * K_a is the dissociation const of weak acid.

$$\text{pKa} = -\log_{10} K_a$$

* $K_a \propto$ Strength of acid

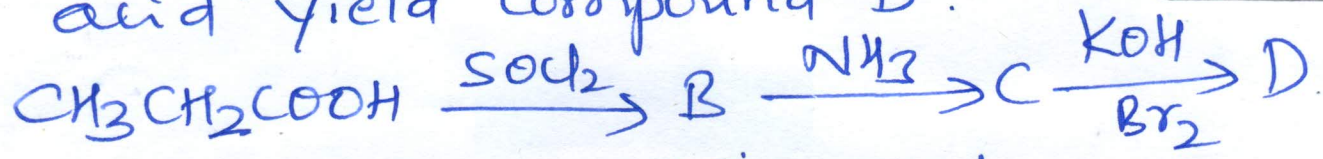
$\text{pKa} \propto \frac{1}{\text{Strength of acid}}$

Lower the pKa value, stronger is the acid

23

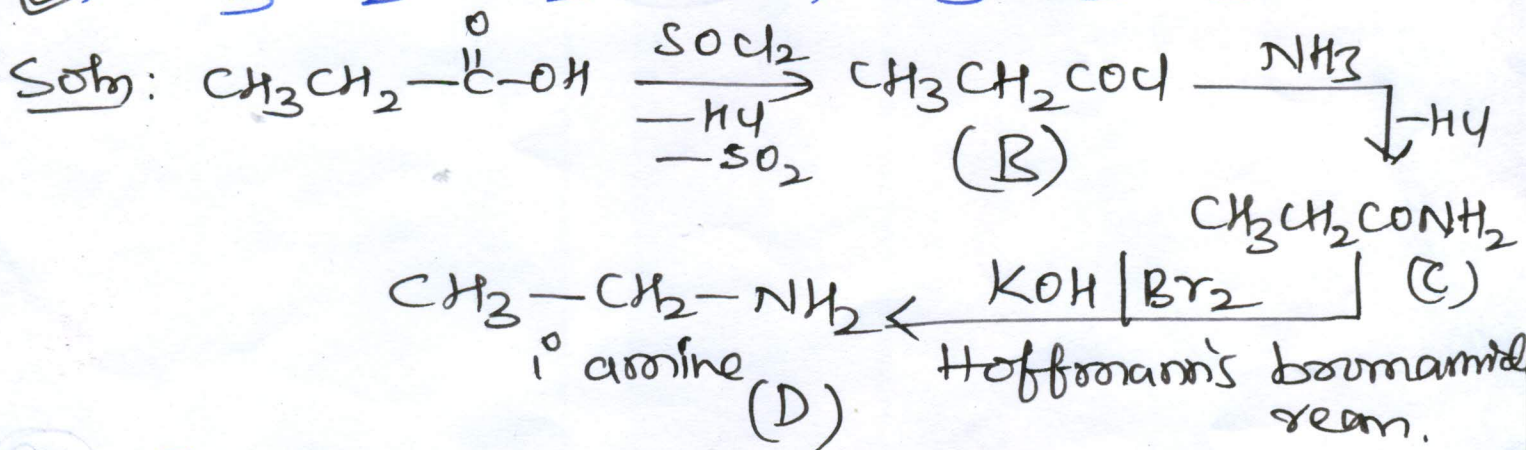
In a set of reactions propionic acid yield compound 'D'.

CBS E med 06



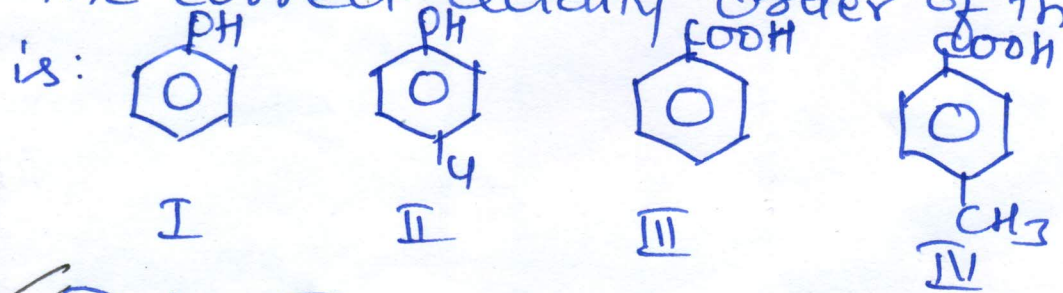
The structure of 'D' would be:

- a) $\text{CH}_3\text{CH}_2\text{CONH}_2$ b) $\text{CH}_3\text{CH}_2\text{NHCH}_3$
 ✓ c) $\text{CH}_3\text{CH}_2\text{-NH}_2$ d) $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-NH}_2$



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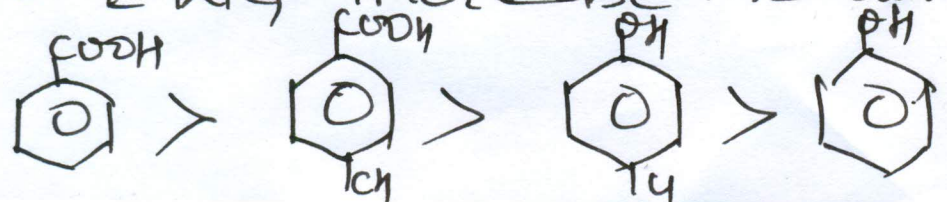
The correct acidity order of the following is:



IIT 2009

- ✓ a) III > IV > II > I
 b) IV > III > I > II
 c) III > II > I > IV
 d) II > III > IV > I

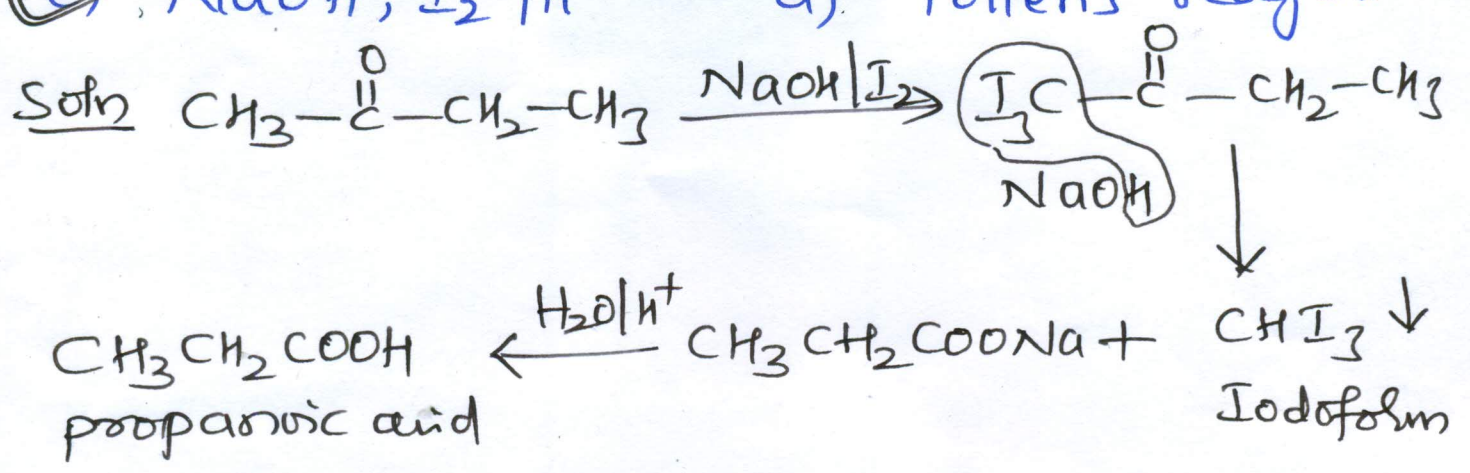
Soln: * Carboxylic acids > phenols
 * ERG decrease the acidic nature
 * EWG increase the acidic nature



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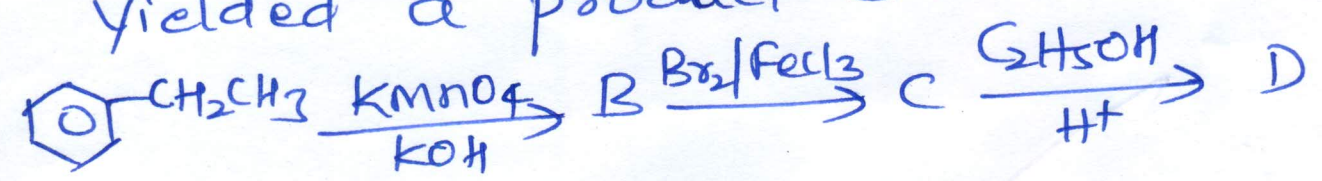
Butan-2-one can be converted to propanoic acid by which of the following

- a) NaOH, NaI/H⁺
- b) Fehling's soln.
- c) NaOH, I₂/H⁺
- d) Tollen's reagent.

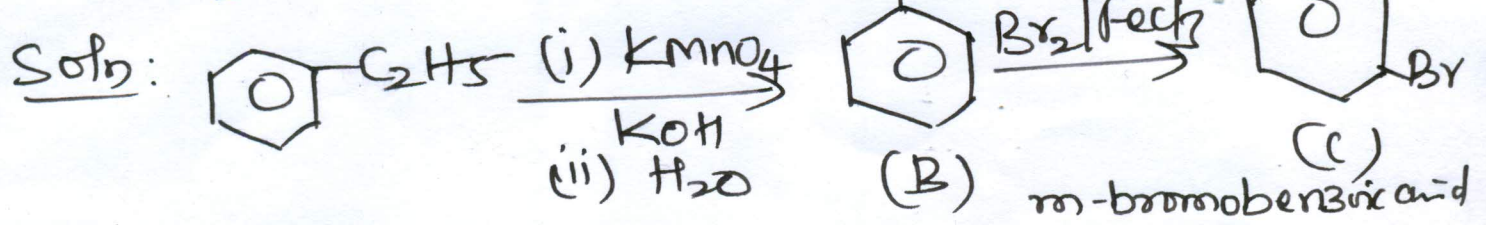
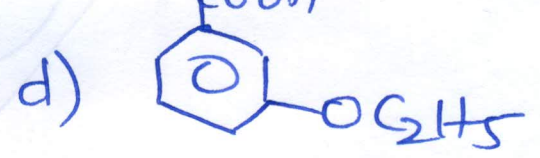
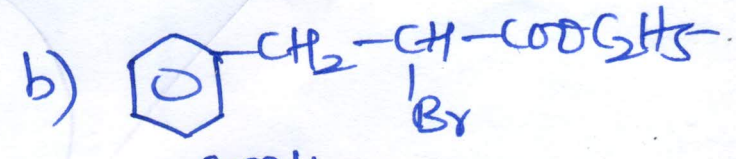
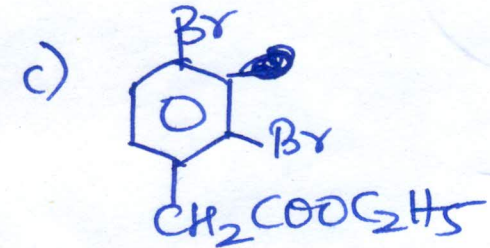
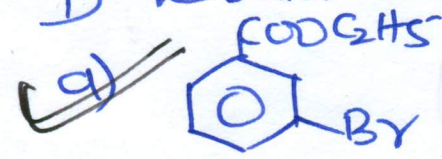


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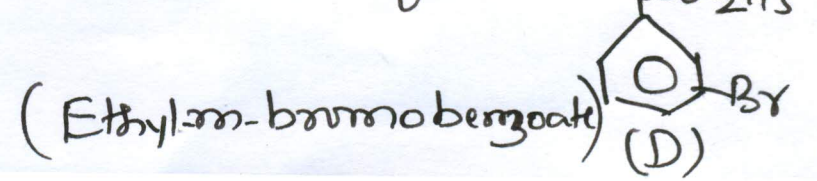
In a set of reaction, ethylbenzene yielded a product D.

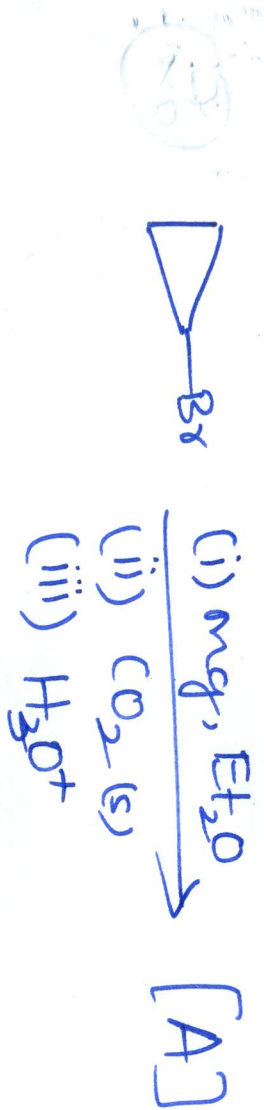


D would be:



Fisher-speier esterification

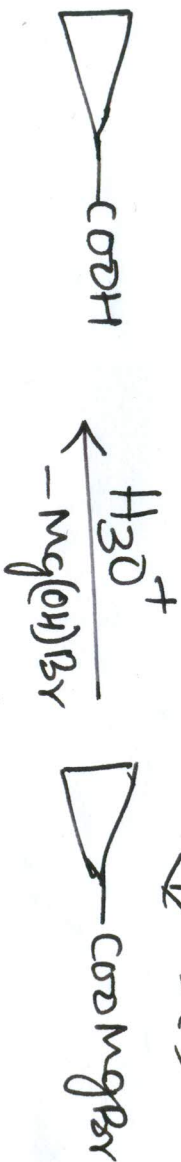
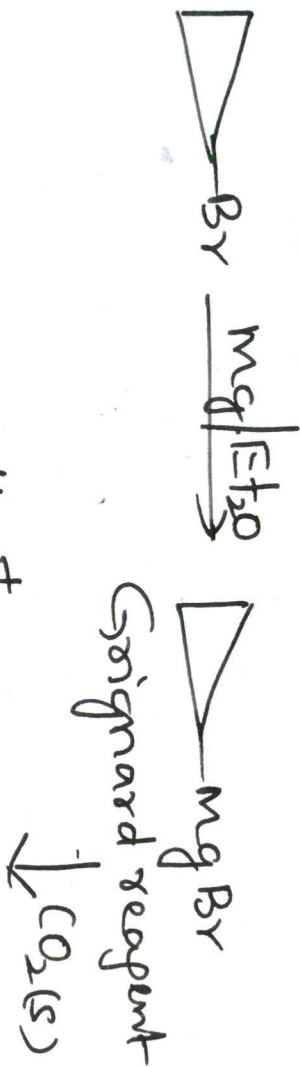




The product [A] is :



Soln :



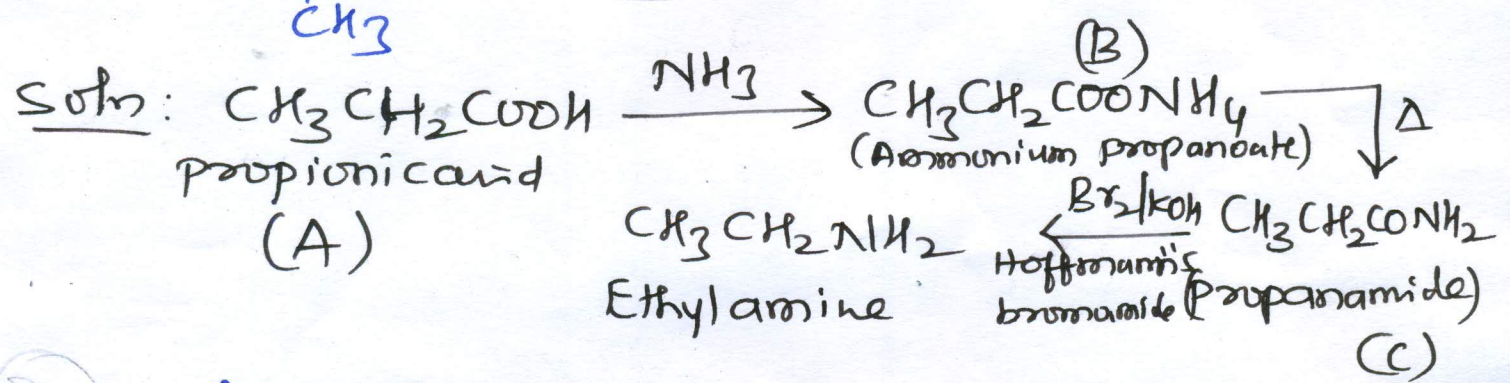
Amines

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An organic compd. A on treatment with NH₃ gives B, which on heating gives C. C, when treated with Br₂ in presence of KOH produces ethylamine. Compound A is:

- a) CH₃COOH
- b) CH₃CH₂CH₂COOH
- c) CH₃CH(CH₃)COOH
- d) CH₃CH₂COOH



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Which of the following is the correct increasing order of basicity of amines in gaseous phase?

IIT KCEET 2010

- a) (CH₃)₂NH > CH₃NH₂ > (CH₃)₃N > NH₃
- b) (CH₃)₃N > (CH₃)₂NH > CH₃-NH₂ > NH₃
- c) (CH₃)₂NH > (CH₃)₃N > CH₃-NH₂ > NH₃
- d) (CH₃)₃N > CH₃NH₂ > (CH₃)₂NH > NH₃

In gaseous phase, the basicity increases with +I effect of alkyl groups.

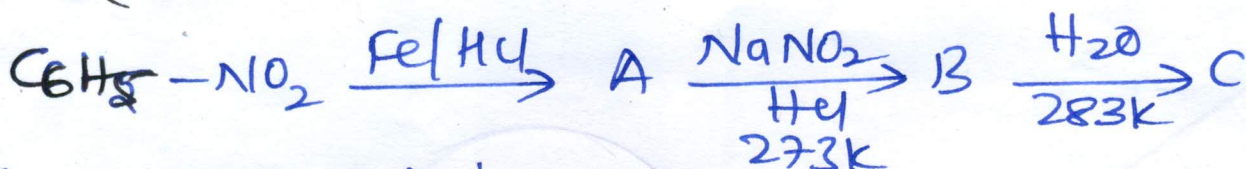
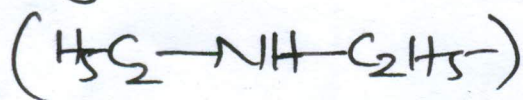
The strongest base in aqueous solution among the following is:

- a) N,N-diethylethanamine
- b) N-ethylethanamine
- c) N-methylethanamine
- d) ethanamine.

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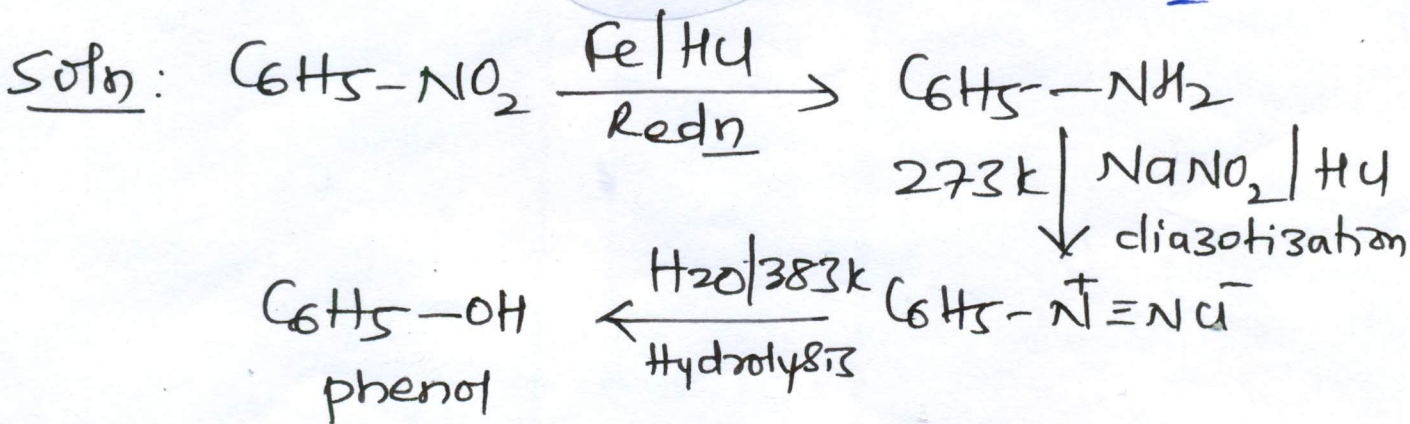
Soln In aqueous soln $2^\circ > 1^\circ > 3^\circ$ amines

* Among 2° amines $(C_2H_5)_2NH > (CH_3)_2NH$ due to stronger +I effect of $-C_2H_5$ over $-CH_3$ gr.

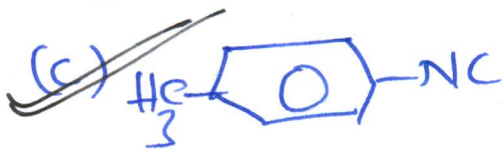
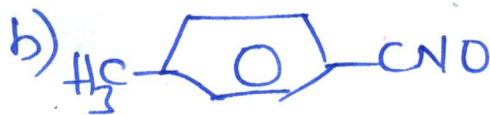
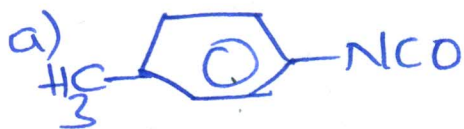


The product 'C' would be:

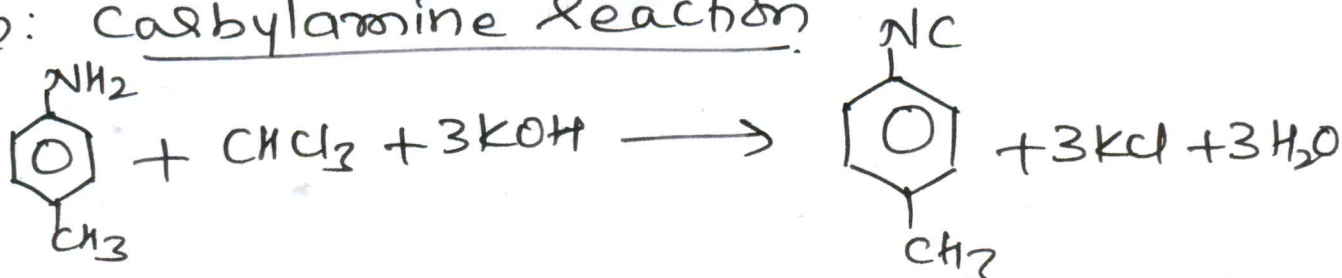
- a) $C_6H_5-CH_2OH$
- c) C_6H_5-OH
- b) C_6H_5-CHO
- d) $C_6H_5-NH_2$



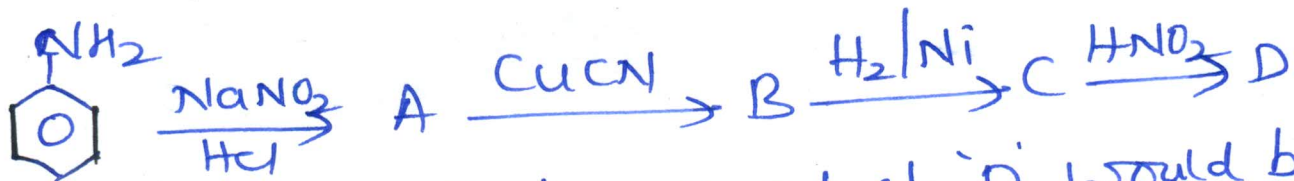
The reaction of CHCl_3 and alcoholic KOH with p-toluidine gives:



Soln: Carbylamine Reaction



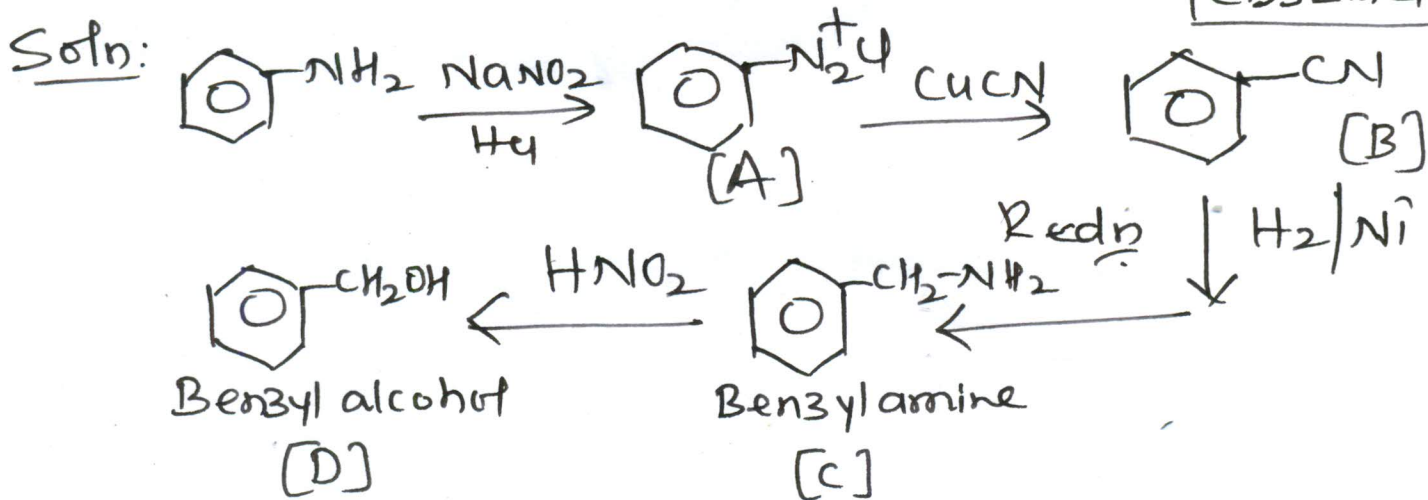
p-toluidine



The structure of the product 'D' would be:



CBSE med 02



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Toluene is nitrated and the resulting product is reduced with tin & hydrochloric acid (Sn/HCl). The product so obtained is diazotised and then heated with cuprous bromide (Cu₂Br₂). The reaction mixture so formed contains:

- a) mixture of o- & m-bromotoluene
- b) mixture of o & p-bromotoluene
- c) mixture of o & p-dibromobenzene
- d) mixture of o & p-bromoanilines.

