

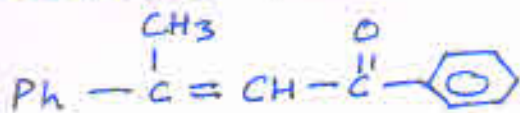
Organic Chemistry Assignment - (1)

class. XII

- Q.1. An alkyl halide X having molecular formula $C_6H_{13}Cl$ on treatment with ter. butoxide gives two isomeric alkenes Y & Z. Both alkenes on hydrogenation gives 2,3-Dimethyl butane. Identify X, Y & Z.
- Q.2. An organic compound C_8H_9Br has three isomers A, B & C. A is optically active. Both A & B gave the white ppt. when warmed with alcoholic $AgNO_3$ solution in alkaline medium. Benzoic acid, Terephthalic acid and p-bromo benzoic acid were obtained on oxidation of A, B & C respectively.
- Q.3. An organic compound (A) having molecular formula C_3H_7Cl on reaction with alcoholic solution of KCN gives compound B. The compound 'B' on hydrolysis with dil HCl gives compound C and C on reduction with H_2/Ni gives 1-aminobutane. Identify A, B & C.
- Q.4. An alcohol ($C_4H_{10}O$) on oxidation with acidified $K_2Cr_2O_7$ gives carboxylic acid B ($C_4H_8O_2$). Compound A when dehydrated with conc. H_2SO_4 at 443 K gives compound C. Treatment of C with aqueous H_2SO_4 gives compound D ($C_4H_{10}O$) which is an isomer of A. Compound D is resistant to oxidation but compound A can be easily oxidised. Identify A, B, C and D and write their structures.
- Q.5. Compound 'A' gives precipitate in 5 minutes in Lucas reagent test. When 6 gs. of compound 'A' is treated with excess of Na, 1120 ml. of H_2 gas is obtained at STP. Compound 'A' contains one oxygen atom per molecule of 'A'. On treatment with PBr_3 , compound 'A' gives compound 'B'. When compound 'B' is treated with benzene in the presence of anhydrous $AlCl_3$, compound 'C' is formed. Identify the compounds A, B & C.

- Q.6. An organic compound 'A' having molecular formula C_6H_6O gives a characteristic colour with aqueous $FeCl_3$. When 'A' is treated with $NaOH$ & CO_2 at $400K$ under a pressure, compound 'B' is obtained. Compound 'B' on acidification gives compound 'C', which reacts with acetyl chloride to form D, which is popular painkiller. Deduce the structures of A, B, C & D. What is the popular name of Drug D.
- Q.7. An ether A ($C_5H_{12}O$) when heated with hot conc. HI produced two alkyl halides, which on hydrolysis form compounds B & C. Oxidation of B gives an acid D whereas oxidation of C gave a ketone E. Deduce the structures A, B, C, D & E.
- Q.8. Phenol, when it first reacts with conc H_2SO_4 forms Y. Y is treated with conc HNO_3 to form Z. Identify Y & Z and explain why Phenol is not converted to Z by reacting it with conc HNO_3 .
- Q.9. Formaldehyde and acetaldehyde on treatment with dil $NaOH$ forms A, which on heating changes to B. When B is treated with HCN , it forms C. Reduction of C with $LiAlH_4$ yields D which on hydrolysis yields E. Write the structures of A, B, C, D & E.
- Q.10. An organic compound 'A' having molecular formula $C_5H_{10}O$ gives positive DNP test. It does not reduce Tollen's reagent but forms an addition compound with $NaHSO_3$. On reaction with I_2 in alkaline medium, it forms a yellow ppt. of compound B and another compound C having molecular formula $C_4H_7O_2Na$. On oxidation with $KMnO_4$, 'A' forms two acids D & E having molecular formula $C_3H_6O_2$ and $C_2H_4O_2$ respectively. Identify A, B, C, D & E.

Q. 11. A tertiary alcohol 'A' on acid catalysed dehydration gave product 'B'. Ozonolysis of 'B' gives compounds C & D. Compound 'C' on reaction with KOH gives benzyl alcohol and compound 'E'. Compound 'D' on reaction with KOH gives a β -unsaturated ketone having the following structure



Identify A, B, C, D & E.

Q. 12. Three isomeric amines A, B & C have the molecular formula $\text{C}_3\text{H}_9\text{N}$. Compound A on reaction with Hinsberg reagent forms a product which is soluble in NaOH. Compound B on reaction with Hinsberg reagent forms a product which is insoluble in NaOH. Compound C does not react with Hinsberg reagent. Identify A, B & C.

Q. 13. An organic compound 'A' with molecular formula $\text{C}_3\text{H}_6\text{O}_2$ on reaction with NH_3 followed by heating yields B. Compound B on reaction with Br_2 and alc. NaOH gives compound C ($\text{C}_2\text{H}_7\text{N}$). Compound 'C' forms a foul smelling compound D on reaction with CHCl_3 & NaOH. Identify A, B, C & D. Write the reactions involved.

Q. 14. Two moles of organic compound 'A' on treatment with a strong base gives two compounds B & C. Compound 'B' on dehydrogenation with Cu gives 'A' while acidification of 'C' yields carboxylic acid 'D' having molecular formula of $\text{C}_2\text{H}_2\text{O}_2$. Identify the compounds A, B, C and D.

Q. 15. Two isomeric compounds A & B having molecular formula $\text{C}_4\text{H}_{11}\text{N}$, both lose N_2 on treatment with HNO_2 and gives compound 'C' and 'D' respectively. 'C' is resistant to oxidation but immediately responds to Lucas reagent, whereas 'D' responds to Lucas reagent after 5 minutes and gives a positive iodoform test. Identify A & B.

Organic Chemistry, Assignment - 2

Class - XII

Explain the following name reactions

1. Williamson's Synthesis
2. Kolbe's reaction
3. Friedel-Craft (i) alkylation (ii) acylation
4. Dehydration of alcohols at (i) 443 K (ii) 413 K
5. Hydroboration oxidation of alkenes
6. Sandmeyer's reaction
7. Wurtz, Wurtz-Fittig and Fittig Reaction
8. Finkelstein Reaction
9. Swart's reaction
10. Elard Reaction
11. Stephen's Reaction
12. Rosenmund's reduction
13. Aldol condensation
14. Cannizzaro's reaction
15. Decarboxylation reaction
16. Haloform Reaction
17. Clemmenson's Reduction
18. Cross-aldol condensation
19. Gatterman-Koch reaction
20. Hoffmann - Bromamide reaction
21. Gabriel - Phthalimide Synthesis
22. Coupling Reactions
23. Diazotisation Reactions
24. Ammonolysis
25. Carbylamine Reaction
26. Acetylation of aniline

Organic chemistry - Assignment - 3
Class - XII

Give reasons for the following. (Give equations also wherever required.)

1. Sulphuric acid is not used during the reactions of alcohol with KI.
2. The dipole moment of chlorobenzene is lower than that of cyclohexyl chloride.
3. Alkyl halides, though polar are immiscible in water.
4. Grignard reagent should be prepared under anhydrous conditions.
5. p-dichlorobenzene has higher melting point and lower solubility than o- & m-isomers.
6. R-X with aq. KOH leads to the formation of alcohols but in presence of alc. KOH, alkenes are the major product.
7. Haloarenes are insoluble in water but soluble in benzene.
8. Haloarenes are much less reactive than haloalkanes towards nucleophilic substitution reactions. Why?
9. Haloalkanes can easily be prepared from alcohols while aryl halides cannot be prepared from phenols. Why?
10. Why is iodination of benzene difficult?
11. Chloroform does not give white ppt. with AgNO_3 solution. Why?
12. B.P. increases in the order tert-butyl bromide < isobutyl bromide < n-butyl bromide. Why?
13. Why chloroform is kept in coloured bottles and filled upto the brim?
14. Presence of nitro group facilitates nucleophilic substitution reaction in alkyl halides. Explain.
15. p-dichlorobenzene is less soluble in organic solvents than the corresponding o-isomer. Explain.

16. Propanol has higher boiling point than that of the hydrocarbons why?
17. Alcohols are more soluble in water than hydrocarbons of comparable molar mass.
18. *O*-Nitrophenol is more acidic than *ortho*-methoxyphenol. why?
19. Sodium may be used to dry diethyl ether and benzene but it cannot be used to dry alcohol. why?
20. anhydrous CaCl_2 cannot be used to dry ethanol. why?
21. Among the three isomeric nitrophenols, *O*-isomer is steam volatile. why?
22. 2,4-dinitrophenol and 2,4,6-trinitrophenol are soluble in aq. Na_2CO_3 . why?
23. Alcohols react with HCl or PCl_5 , but phenol does not. why?
24. Phenols have smaller dipole moment than methanol. why?
25. why is that phenol is acidic and hexanol is neutral towards NaOH ?
26. Dipole moment of diethyl ether (1.18 D) is less than that of water (1.84 D). why?
27. Diethyl ether does not react with sodium. why?
28. Unlike phenols, alcohols are easily protonated. Explain.
29. Di-*tert*-butyl ether cannot be prepared by Williamson synthesis. why?
30. Ethers are cleaved only by acids and not by bases. Explain.
31. The bond angle C-O-H in alcohols is slightly less than the tetrahedral angle while in ethers it is greater than the tetrahedral angle. Explain.
32. why does 2,4,6-trimethyl cyclohexanone not form cyanohydrin while cyclohexanone forms?
33. Dipole moments of aldehydes and ketones are higher than those of alcohols, why?

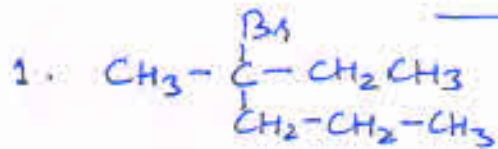
34. Why it is necessary to control the pH during the reaction of aldehydes and ketones with NH_3 derivatives?
35. Benzaldehyde gives Cannizzaro's reaction whereas acetaldehyde does not. Why?
36. Why acetaldehyde gives aldol condensation whereas formaldehyde does not?
37. Acetaldehyde gives aldol condensation whereas formaldehyde does not. Why?
38. Benzophenone and di-tert-butyl ketone do not give addition product with sodium bisulphite.
39. CH_3CHO is more reactive than CH_3COCH_3 towards reaction with HCN . Why?
40. Although phenoxide ion has more number of resonating structures than carboxylate ion, carboxylic acids are stronger acid than phenols. Why?
41. Explain, why carboxylic acids do not give the characteristic reactions of carbonyl group.
42. Why is ester hydrolysis slow in the beginning and becomes faster after some time?
43. Why is monochloroacetic acid has higher pK_a value than dichloroacetic acid?
44. Why is benzoic acid less soluble in water than acetic acid?
45. Rate of esterification decrease with the increase in the size of alkyl group attached to $-\text{COOH}$ group and $-\text{OH}$ group. Why?
46. Oxalic acid reduces Tollen's reagent and Fehling solution but formic acid does not? Why?
47. Hydroxy ketones are not directly used in Grignard reagent?
48. pK_b of aniline is more than that of methylamine. Why?

49. Ethylamine is soluble in water whereas aniline is not. Why?
50. Methylamine in water reacts with Ferric chloride to precipitate hydrated ferric oxide.
51. Aniline does not undergoes Friedel Craft Reaction. Why?
52. Why aromatic amines cannot be prepared by Gabriel-Phthalimide synthesis?
53. Why are 1° amines higher boiling than tertiary amines?
54. Ethylamine is more basic than ammonia while aniline is less basic than ammonia. Why?
55. Amines are soluble in HCl. Why?
56. CH_3CONH_2 is weaker base than $\text{CH}_3\text{CH}_2\text{-NH}_2$. Explain.
57. Aniline gets coloured on standing in Air. Why?
58. Why C-N bond length shorter in aromatic amines
59. Silver chloride dissolves in methylamine. Why?
60. It is difficult to prepare pure amines by ammonolysis of alkyl halides.
61. N_3^- is a weaker base than NH_2^- . Why?

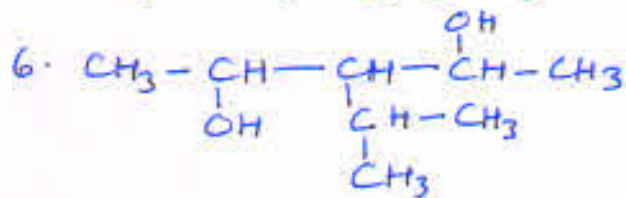
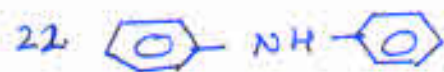
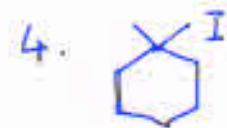
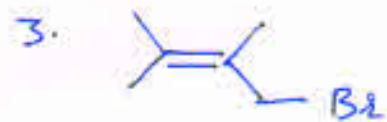
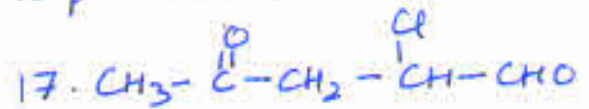
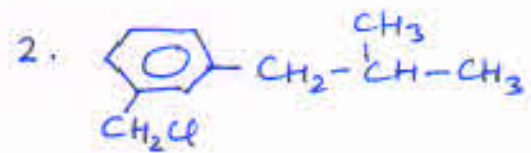
62.

Class XII - Organic chemistry - Assignment - (4)

IUPAC Nomenclature



16. p-touidine



7. DDT

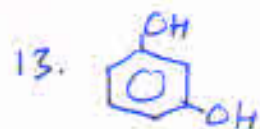
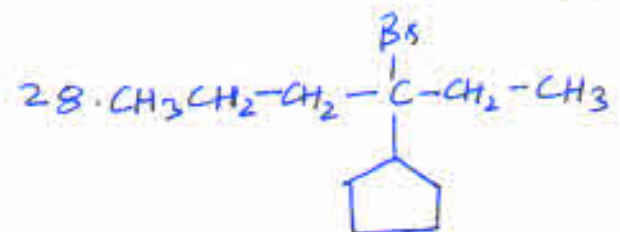
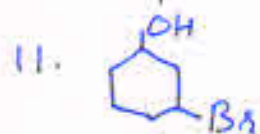
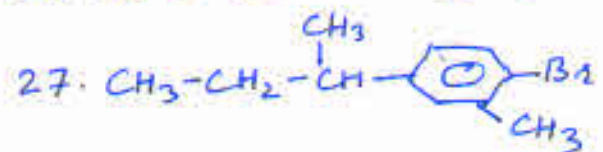
25. Perfluorobenzene

8. p-bromo toluene



9. neo pentyl alcohol

10. Aspirin



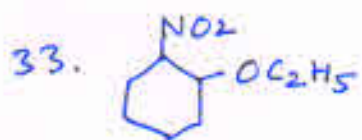
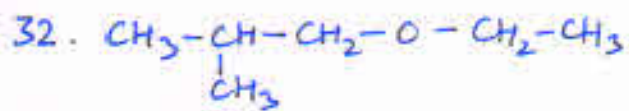
29. Catechol

14. p-cresol

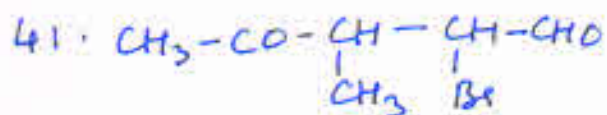
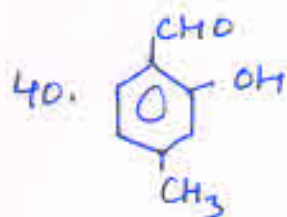
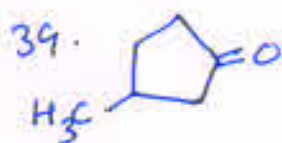
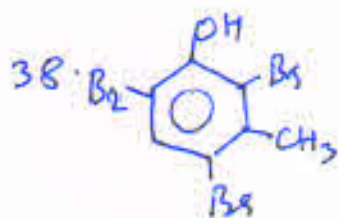
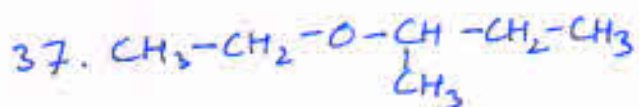
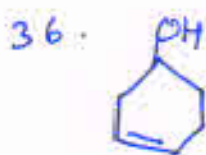
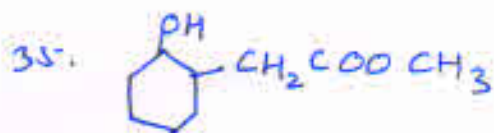
30. Resorcinol

15. glycerol

31. Picric acid



34. Cumene



42.

Organic Chemistry, Assignment - 5

Class XII

How will you distinguish between following pairs of organic compounds? Give one chemical test.

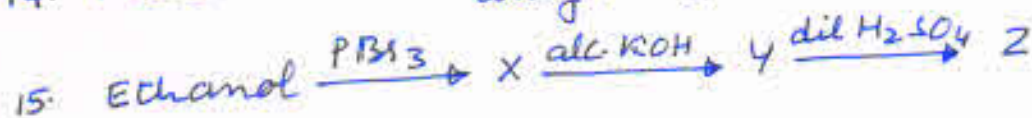
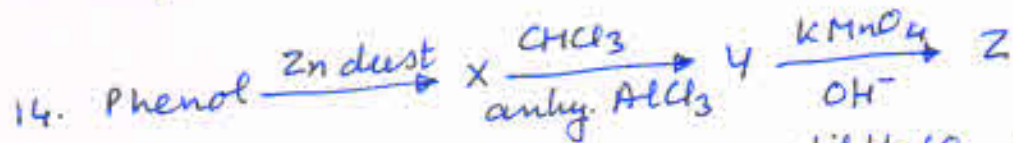
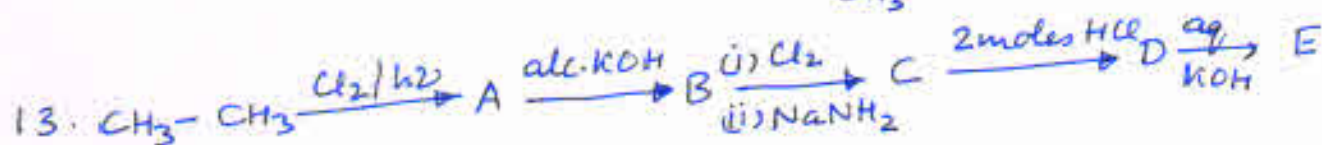
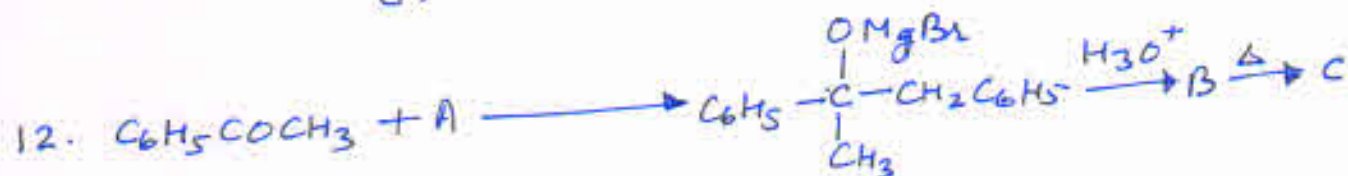
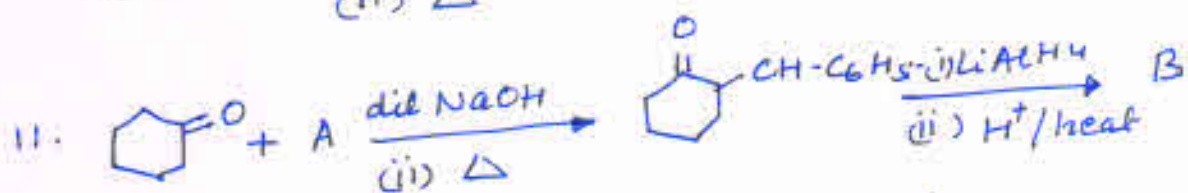
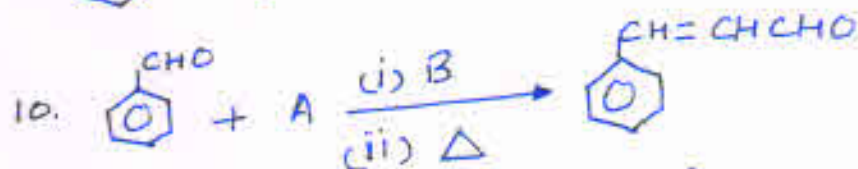
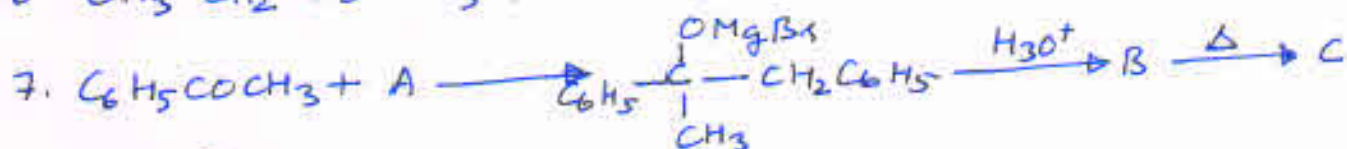
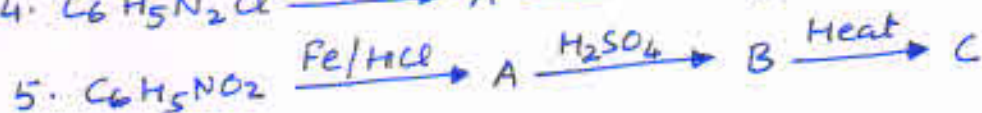
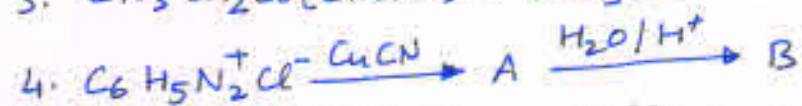
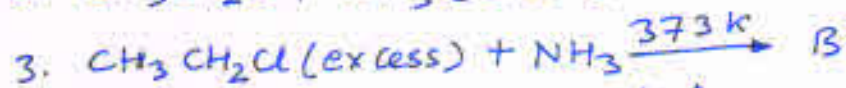
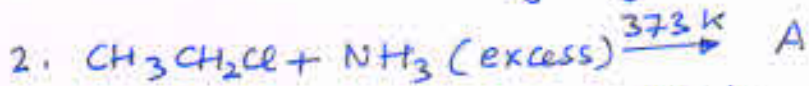
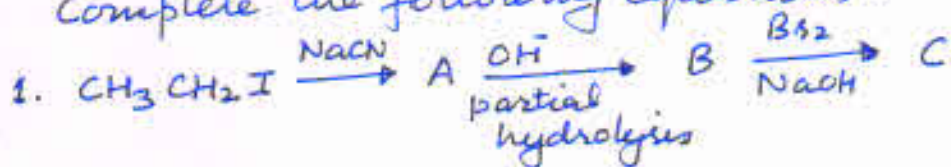
1. Chlorobenzene and cyclohexyl chloride
2. vinyl chloride and ethyl chloride
3. n-propyl bromide and isopropyl bromide
4. n-propyl alcohol and isopropyl alcohol
5. methanol and ethanol
6. Cyclohexanol and Phenol
7. Propan-2-ol and 2-methylpropan-2-ol
8. Phenol & Anisole
9. Ethanol and diethyl ether
10. Propanol and propanone
11. Ethyl acetate and methyl acetate
12. Benzaldehyde and benzoic acid
13. Benzaldehyde and acetaldehyde
14. Formic acid and acetic acid
15. Propanal & Propanol
16. Ethanoic acid and ethyl ethanoate
17. methyl amine and dimethylamine
18. secondary and tertiary amines
19. Ethylamine and aniline
20. aniline and benzylamine
21. methylamine and methanol
22. ethanol and ethanamine
23. Chloroform and carbon tetrachloride
24. Phenol and benzoic acid

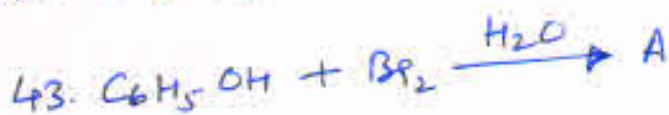
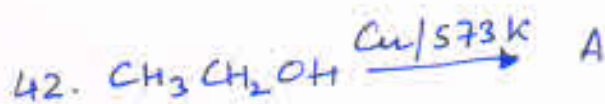
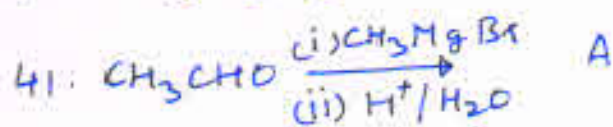
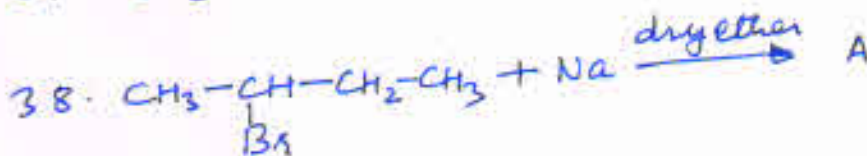
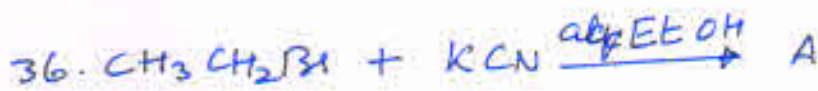
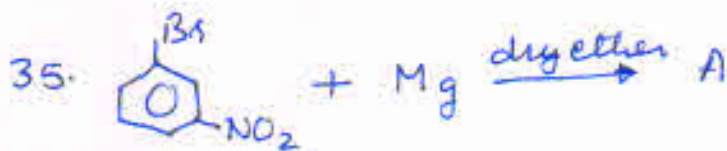
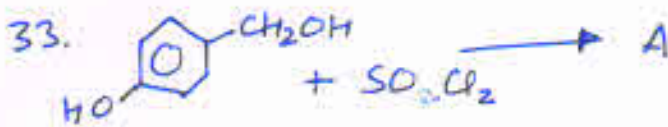
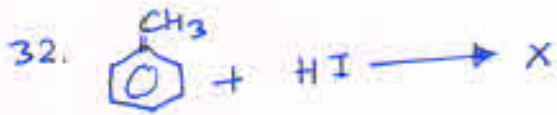
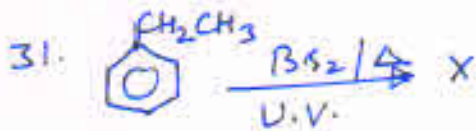
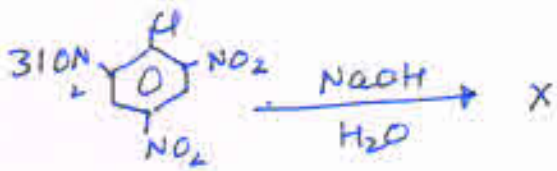
25. Ethyl alcohol and acetaldehyde.
26. Acetophenone and benzophenone
27. Acetophenone and benzaldehyde.
28. Benzamide and paminobenzoic acid.
29. Starch and sucrose.
30. Fructose and starch.

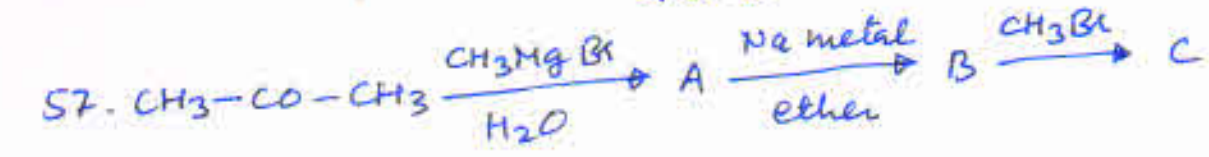
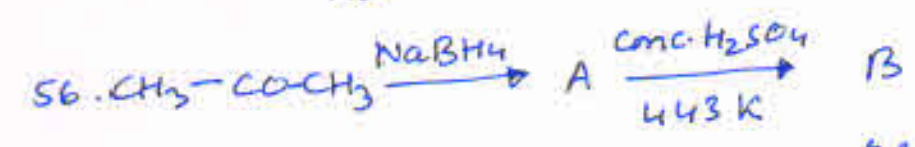
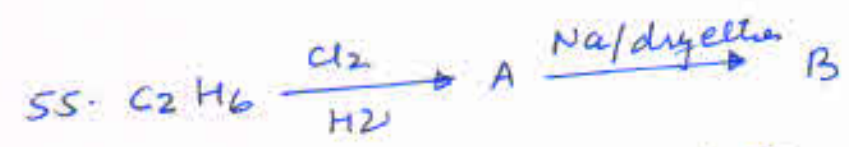
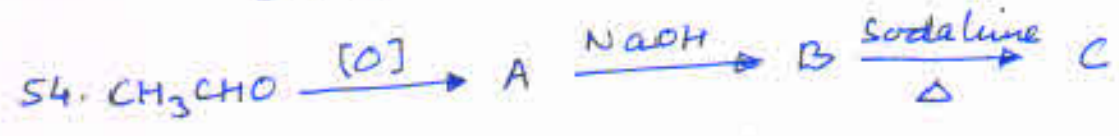
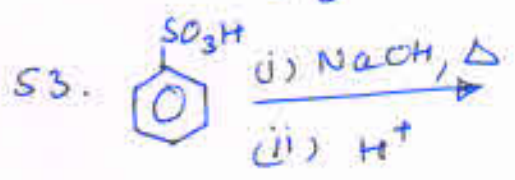
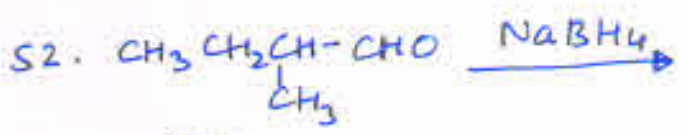
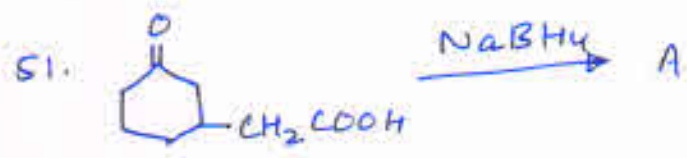
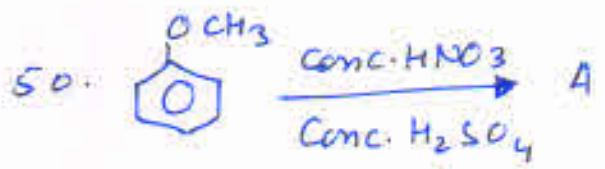
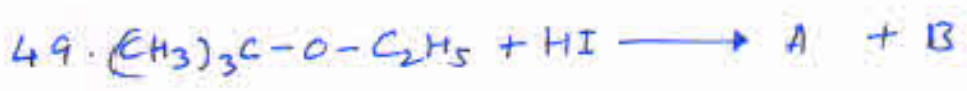
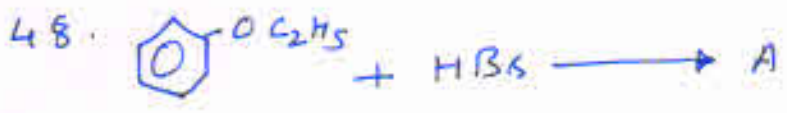
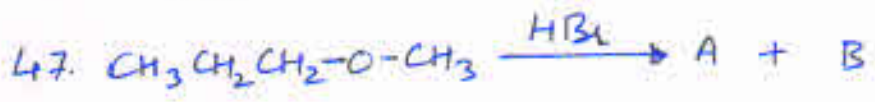
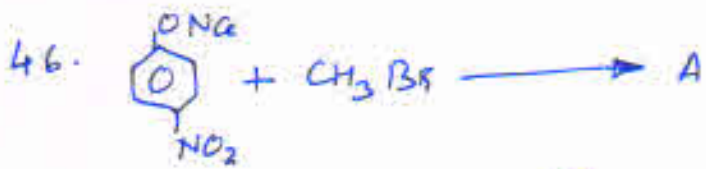
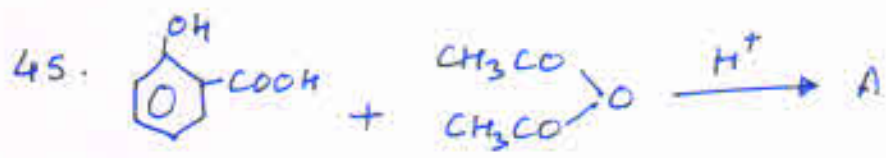
Organic Chemistry - Assignment - 6

Class - XI

Complete the following equations.







Organic Chemistry - Assignment - (7)

Class - XII

How will you bring out the following organic conversions.

1. Benzene to Aniline
2. Aniline to benzene
3. Ethanoic acid to ethanamine
4. ethanamine to ethanoic acid
5. p-toluidine to 2-Bromo-4-methylamine
6. Methylbromide to ethanamine
7. benzene diazonium chloride to nitrobenzene
8. Ethylamine to methylamine
9. methylamine to ethylamine
10. ethyl alcohol to methyl alcohol
11. methanol to ethanol
12. Benzene to sulphamic acid
13. Hexanenitrile to 1-aminopentane
14. isopropyl chloride to 2-methylpropanaldehyde
15. benzene to benzaldehyde
16. Benzaldehyde to benzene
17. Benzoic acid to acetophenone
18. propene to propan-2-ol
19. butanoic acid to 2-hydroxybutanoic acid
20. benzoic acid to m-nitrobenzylalcohol
21. Propanol to butan-2-one
22. methylmagnesium bromide to ethanoic acid
23. benzoic acid to benzyl chloride
24. acetone to chloroform
25. acetylene to acetic acid

26. formaldehyde to propan-1-ol.
27. acetophenone to 2-phenyl-2-butanol
28. Anisole to phenol
29. Phenol to ethoxybenzene
30. 1-Phenylethane to 1-Phenylethanol
31. formaldehyde to cyclohexylmethanol
32. Butyl bromide to pentan-1-ol
33. toluene to benzyl alcohol
34. 1-propoxypropane to propyl iodide
35. ethyl bromide to ethoxyethane
36. ethyl bromide to ethylbenzene
37. ethanol to benzylethyl ether
38. methyl bromide to 2-methoxy-2-methylpropane.
39. aniline to p-hydroxyazobenzene.
40. bromobenzene to m-nitrobenzoic acid
41. benzoic acid to 3-bromobenzoic acid
42. Ethyne to acetic acid
43. methane to acetone
44. methyl chloride to acetic acid
45. Ethanol to ethanediol.
46. methanol to acetone
47. Ethyne to cyclohexane
48. Bromobenzene to benzoic acid
49. Benzaldehyde to L-hydroxyphenyl acetic acid
50. Benzene to m-nitroacetophenone.