St. Mary's School, Dwarka
Holiday Homework
Class XII
Subject: Chemistry (043)

Note: Answer the following questions in your respective notebook

Q1. Why is sulphuric acid not used during the reaction of alcohols with KI. 1

Q2. In the following pair of halogen compounds, which undergoes faster S_N1 reaction ?
$CH_3CH_2CH_2CH_2CH_2CHClCH_3$ or $CH_3CH_2CH_2CH_2CH_2CH_2CH_2Cl$ 1

Q3. Arrange the following set of compounds in order of their increasing boiling points :
Pentan-1-ol, n-Butane, Pentanal, Ethoxyethane 1

Q4. Predict the major product of acid catalysed dehydration of 1-Methylcyclohexanol. 1

Q5. Write the IUPAC name of Ph-CH=CH-CHO. 1

Q6. Complete the following acid-base reaction and name the product:
$(C_2H_5)_3N + HCl \rightarrow$ 1

Q7. How can you distinguish between the following pairs of compounds.
(i) Phenol and Benzoic acid
(ii) Benzaldehyde and acetophenone 2

Q8. Write the IUPAC name of the following compounds
(a) $(CH_3)_2CHNH_2$
(b) $C_6H_5NHCH_3$ 2

Q9. Account for the following:
(i) pKb of aniline is more than that of methylamine.
(ii) Aniline does not undergo Friedel-Crafts reaction. 2

Q10. Accomplish the following conversions:
(a) Nitrobenzene to benzoic acid
(b) Benzoic acid to aniline 2

Q11. (a) Write the isomers of the compound having formula C_4H_9Br. 2
(b) What is the harmful effect of excess use of DDT and freons ? 2

Q12. (i) p-Dichlorobenzene has higher melting point and solubility than those of o- and m-isomers. Discuss. 2
(ii) Write the mechanism of the following reaction:
$nBuBr + KCN \xrightarrow{EtOH\text{-}H_2O} nBuCN$ 2

Q13. Write the equations involved in the following reactions :
(i) Reimer – Tiemann reaction
(ii) Kolbe's reaction 2

Q14. Give the equations of reactions for the preparation of
(i) phenol from Cumene.
(ii) phenol from chlorobenzene. 2

Q15. Draw structures of the following derivatives.
(i) The 2,4-dinitrophenylhydrazone of benzaldehyde
(ii) The semicarbazone of cyclobutanone
(iii) The methyl hemiacetal of formaldehyde 3

Q16. Give the structures of A, B and C in the following reactions:
(i) $C_6H_5N_2Cl \xrightarrow{CuCN} \mathbf{A} \xrightarrow{H_2O/H^+} \mathbf{B} \xrightarrow{NH_3,\Delta} \mathbf{C}$
(ii) $C_6H_5NO_2 \xrightarrow{Fe/HCl} \mathbf{A} \xrightarrow{HNO_2(273K)} \mathbf{B} \xrightarrow{-C_6H_5OH} \mathbf{C}$ 3

Q17. How the following conversions can be carried out ?
(i) 1-Bromopropane to 2-bromopropane

(ii) 2-Bromopropane to 1-Bromopropane
(iii) Benzyl alcohol to 2-phenyl ethanoic acid 3

Q18. Explain why
(i) the dipole moment of chlorobenzene is lower than that of cyclohexyl chloride ?
(ii) alkyl halides, though polar, are immiscible with water ?
(iii) Grignard reagents should be prepared under anhydrous conditions ? 3

Q19. (a) Write the mechanism of acid dehydration of ethanol to yield ethene. 2
(b) Give reason for the higher boiling point of ethanol in comparison to methoxymethane. 1

Q20. Predict the product of the following reactions:
(i) CH_3-CH_2-CH_2-O-CH_3 + HBr →
(ii) Ph-O-C_2H_5 + HBr →
(iii) $(CH_3)_3$C-O-C_2H_5 -----HI----→ 3

Q21. Write chemical reactions to affect the following transformations :
(i) Butan-1-ol to butanoic acid
(ii) Benzyl alcohol to phenylethanoic acid
(iii) 3-Nitrobromobenzene to 3-Nitrobenzoic acid
(iv) 4-Methylacetophenone to benzene-1,4-dicarboxylic acid
(v) Cyclohexene to hexane-1,6-dioic acid 5

Q22. An organic compound contains 69.77% carbon, 11.63% hydrogen and rest oxygen. The molecular mass of the compound is 86. It does not reduce Tollen's reagent bur forms an addition compound with sodium hydrogensulphite and give positive iodoform test. On vigorous oxidation it gives ethanoic and propanoic acid. Write the possible structure of the compound. 5

Q23. Complete the following acid-base reaction and name the product:
$(C_2H_5)_3N$ + HCl→ 1

Q24. In the following pair of halogen compounds, which undergoes faster S_N1 reaction ?
$CH_3CH_2CH_2CH_2CH_2CHClCH_3$ or $CH_3CH_2CH_2CH_2CH_2CH_2CH_2Cl$ 1

Q25 Arrange the following set of compounds in order of their increasing boiling points :
Pentan-1-ol, n-Butane, Pentanal, Ethoxyethane 1

Q26 Predict the major product of acid catalysed dehydration of 1-Methylcyclohexanol. 1

Q27 Write the IUPAC name of Ph-CH=CH-CHO. 1

Q28 Why is sulphuric acid not used during the reaction of alcohols with KI. 1

Q29 How can you distinguish between the following pairs of compounds.
(i) Phenol and Benzoic acid
(ii) Benzaldehyde and acetophenone 2

Q30 Write the IUPAC name of the following compounds
(a) $(CH_3)_2CHNH_2$
(b) $C_6H_5NHCH_3$ 2

Q31 Account for the following:
(i) pKb of aniline is more than that of methylamine.
(ii) Aniline does not undergo Friedel-Crafts reaction. 2

Q32. Accomplish the following conversions:
(a) Nitrobenzene to benzoic acid
(b) Benzoic acid to aniline 2

Q33. Write the isomers of the compound having formula C_4H_9Br. 2

Q34. The treatment of alkyl chlorides with aqueous KOH leads to the formation of alcohols but in the presence of alcoholic KOH, alkenes are major products. Explain. 2

Q35. Write the equations involved in the following reactions :
(i) Reimer – Tiemann reaction
(ii) Kolbe's reaction 2

Q36. Give the equations of reactions for the preparation of
(i) phenol from Cumene.
(ii) phenol from chlorobenzene. 2

Q37. Draw structures of the following derivatives.
(i) The 2,4-dinitrophenylhydrazone of benzaldehyde
(ii) The semicarbazone of cyclobutanone
(iii) The methyl hemiacetal of formaldehyde 3

Q38. Give the structures of A, B and C in the following reactions:
(i) $C_6H_5N_2Cl$ -----CuCN--→ **A** ---H_2O/H+---→ **B** ----NH_3,Δ--→ **C**
(ii) $C_6H_5NO_2$ ----Fe/HCl--→ **A** ----HNO_2(273K)--→ **B** –C_6H_5OH--→ **C** 3

Q39. How the following conversions can be carried out ?
(i) 1-Bromopropane to 2-bromopropane
(ii) 2-Bromopropane to 1-Bromopropane
(iii) Benzyl alcohol to 2-phenyl ethanoic acid 3

Q40. Explain why
(i) the dipole moment of chlorobenzene is lower than that of cyclohexyl chloride ?
(ii) alkyl halides, though polar, are immiscible with water ?
(iii) Grignard reagents should be prepared under anhydrous conditions ? 3

Q41. (a) Write the mechanism of acid dehydration of ethanol to yield ethene. 2
(b) Give reason for the higher boiling point of ethanol in comparison to methoxymethane. 1

Q42. Predict the product of the following reactions:
(i) CH_3-CH_2-CH_2-O-CH_3 + HBr →
(ii) Ph-O-C_2H_5 + HBr →
(iii) $(CH_3)_3$C-O-C_2H_5 -----HI----→ 3

Q43. (a) How will you convert 4-nitrotoluene to 2-Bromobenzoic acid. 3
(b) Write chemical equations for the following reactions:
(i) Reaction of ethanolic NH_3 with C_2H_5Cl
(ii) Ammonolysis of benzyl chloride and reaction of amine so formed with two moles of CH_3Cl. 2