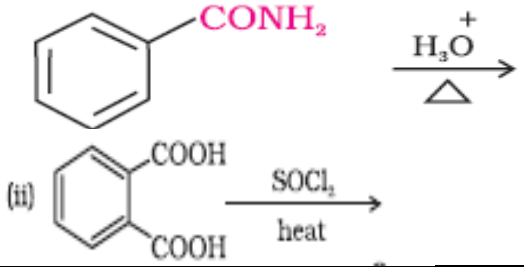
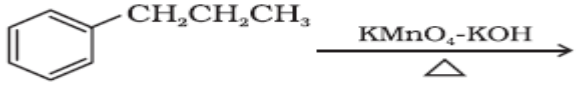
INDIAN SCHOOL DARSAIT

DEPARTMENT OF CHEMISTRY

Subject: Chemistry	Topic : Aldehydes, Ketones And Carboxylic Acids	Date of Worksheet: 12.5.2019
Resource Person: SREEKALA M		Date of Submission:_____
Name of the Student: _____ Class &Division: XII		Roll Number: _____

1.	Write the structural formula of i) 3-oxopentanal ii) pent-2-enal iii) 4-methylpent-3-en-2-one. iv) Hex-2-en-4-ynoic acid v) 3-hydroxybutanal vi) 2-phenylethanoic acid.	1 mark each
2.	Write the IUPAC name of i)$CH_3CH(CH_3)$ $CH_2C(CH_3)_2COCH_3$ ii) $(CH_3)_2C=CHCOCH_3$ iii))$(CH_3)_2CH-CH_2COCH(CH_3)_2$ iv) $CH_2(Cl)COCH(CH_3)CONH_2$	1 mark each
3.	Describe the following giving example in each case: i)Decarboxylation ii) Cannizzaro reaction. iii) Rosenmund reduction iv)Etard reaction v) Stephen reaction vi) Clemmensen reduction vii) Wolff-Kishnerreduction viii) HVZ reaction ix) Gattermann Koch reaction. x)Aldol Condensation xi) Cross-Aldol Condensation.	1 mark Each
4.	How are the following conversions carried out? i)Benzoic acid from ethylbenzene ii) Benzaldehyde from toluene iii)Ethanol to 3-hydroxybutanal iv)Benzaldehyde to benzophenone. v)Toluene to Benzaldehyde vi) Ethylcyanide to 1-Phenylpropanone vii)Ethanol to acetone viii) Benzene to acetophenone ix)Benzoic acid to Benzaldehyde. x) Ethylbenzene to benzene xi) Acetaldehyde to butane-1,3-diol xii)Acetone to propene xiii) Benzene to Benzylalcohol. xiv)Benzoic acid to aniline. xv) Bromomethane to ethanol. xvi)p-nitrotoluene to 2-Bromobenzoic acid xvii) Propanoic acid to acetic acid.	1 mark each

5.	Give reasons for the following: i)Aldehydes are more reactive than ketones towards nucleophilic reaction. ii) Electrophilic substitution in benzoic acid takes place at meta position. iii)Monochloroethanoic acid is a weaker acid than dichloroethanoic acid. iv)Benzoic acid is a stronger acid than ethanoic acid v) Benzoic acid does not undergo Friedel-Craft reaction. vi)pK_a value of chloroacetic acid is lower than pK_a value of acetic acid vii) Propanal is more reactive than Benzaldehyde. viii) The alpha hydrogen atoms of carbonyl compounds is acidic. ix)There are two $-NH_2$ groups in semicarbazide. However only one is involved in the formation of semicarbazones. x)Cyclohexanone forms Cyanohydrin in good yield but 2,2,6 –trimethylcyclohexanone does not.	1 mark each
6.	A, B and C are three non-cyclic functional isomers of a carbonyl compound with molecular formula C_4H_8O. Isomers A and C give positive Tollen's test whereas isomer B does not give Tollen's test but gives positive iodoform test. Isomers A and B on reduction with Zn-Hg and Conc HCl give the same product D. a) Write the structures of A, B , C and D b) Out of A, B and C isomers which one is least reactive towards addition of HCN?	2
7.	Arrange the following in the increasing order of the property indicated. i)Benzoic acid, 4-nitrobenzoic acid, 3,5-dinitrobenzoic acid, 4-methoxybenzoic acid (acid strength) ii)Acetaldehyde, acetone, Di-tertbutylketone, methyltert-butyl ketone. (reactivity towards HCN)	2
8.	An organic compound A contains 69.77% Carbon, 11.63% Hydrogen and rest oxygen. The molecular mass of A is 86. It does not reduce Tollens reagent but forms an addition compound with sodium hydrogen sulphite. A gives a positive iodoform test. On vigorous oxidation A gives ethanoic and propanoic acids. Deduce the possible structure of molecule of A.	3
9.	Give chemical test to distinguish between the following pairs of compounds. i)Ethanal and propanal ii)Benzaldehyde and Acetophenone iii)Phenol and benzoic acid.	3
10.	Complete the following chemical equations. i)  	1 mark each

	 iv) $(CH_3)_3C\ CO\text{-}CH_3 + NaOI$----------> Pd- $BaSO_4$ v) $C_6H_5COCl + H_2$ ---------->	
11.	Complete each of the following reaction by giving the missing reactant, reagent or product. Anhy.$AlCl_3$ i)C_6H_6 + ……. ---------- $C_6H_5COC_6H_5$ …… ii) C_6H_6 + ……. ---------- $C_6H_5COCH_3$ DilNaOH iii)$C_6H_5CHO + CH_3CH_2CHO$---------->Y iv)$CH_3CH_2CH_2CH_2OH$ ----------> $CH_3CH_2CH_2CHO$ Z v)$CH_3(CH_2)_9COOC_2H_5$ ---------- > $CH_3(CH_2)_9CHO$ vi) CH_3 □ Conc.NaOH CH_3 □ C □CHO ---------->□ CH_3 i)$NH_2 –NH_2$ vii) $CH_3\ CH_2$ C –H ---------->□ ii) KOH/Gylcol, heat O	1 mark each
12.	An unknown Aldehyde ‘A’ on reacting with alkali gives β- hydroxy aldehyde, which loses water to form an unsaturated aldehyde 2-butenal. Another aldehyde ‘B’ undergoes disproportionation reaction reaction in the presence of conc.alkali to form products C and D. C is an aryl alcohol with formula C_7H_8O. i)Identify A and B ii)Write the sequence of reaction involved. iii)Name the product, when ‘B’reacts with Zn amalgam and hydrochloric acid.	3
13.	A compound ‘X’ (C_2H_4O) on oxidation gives ‘Y’($C_2H_4O_2$). ‘X’ undergoes haloform reaction. On treatment with HCN ‘X’ forms a product ‘Z’ which on hydrolysis gives 2-hydroxypropanoic acid. i) Write down structures of ‘X’ and ‘Y’ ii) Name the product when ‘X’ reacts with dil. NaOH iii) Write down the equations for the reactions involved.	3

14.	An organic compound (A)which has characteristic odour, on treatment with NaOH it forms two compounds (B) and (C).Compound (B) has molecular formula C_7H_8O which on oxidation gives back (A). The compound (C) is a sodium salt of an acid. When (C) is treated with sodalime it yields an aromatic hydrocarbon (D). Deduce the structure of (A), (B), (C) and (D). Write the sequence of the reactions involved.	3
15.	An organic compound 'A' with molecular formula $C_5H_8O_2$ is reduced to n-pentane on treatment with Zn-Hg/HCl. 'A forms a dioxime with hydroxylamine and gives a positive iodoform test and Tollen's test. Identify the compound A and deduce its structure.	3
16.	A compound A on oxidation gives B ($C_2H_4O_2$). A reacts with dil.NaOH and on subsequent heating forms C. C on catalytic hydrogenation gives D. Identify A, B, C, and D and write down the reactions involved.	3
17.	An organic compound X undergoes acid hydrolysis to form two compounds Y and Z. Y reacts with sodium carbonate to form A. A is heated with sodalime to form B (CH_4). Y on reduction with $LiAlH_4$ forms Z.Identify X, Y,Z,A,B and write the reactions involved.	3
18.	Complete the following reactions by identifying A, B and C. i) $A + H_2(g) \xrightarrow{Pd/BaSO_4} (CH_3)_2CHCHO$ ii) $(CH_3)_3C\ CO\text{-}CH_3 + NaOI \longrightarrow B + C$	3
19.	An organic compound 'A' with molecular formula C_8H_8O gives positive DNP and iodoform tests. It doesnot reduce Tollen's or fehlings reagent and does not decolourise bromine water also. On oxidation with Chromic acid (H_2CrO_4), it gives a carboxylic acid (B) with molecular formula $C_7H_6O_2$. Deduce the structure of A and B.	3
20.	An alkene with molecular formula C_5H_{10} onozonolysis gives a mixture of two compounds B and C. Compound B gives positive Fehlings test and also reacts with I_2 and NaOH solution. Compound C does not give Fehling solution test but forms iodoform. Identify the compounds A, B and C.	3