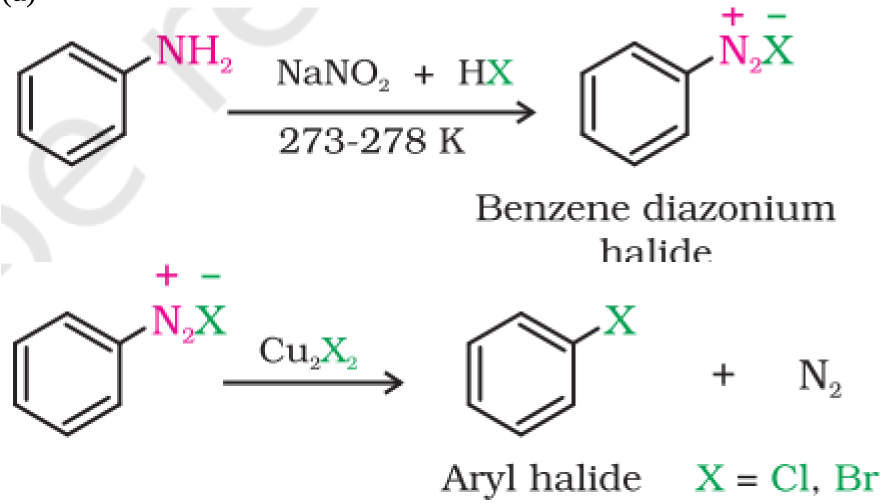
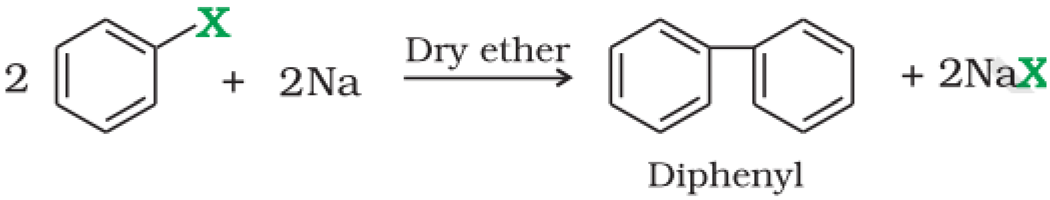
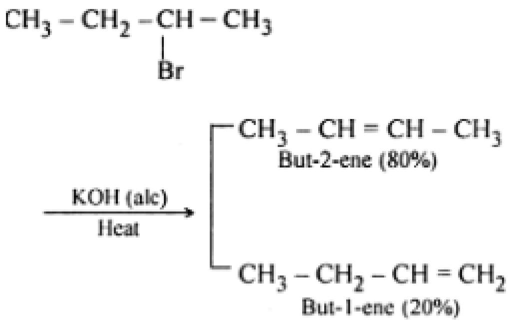
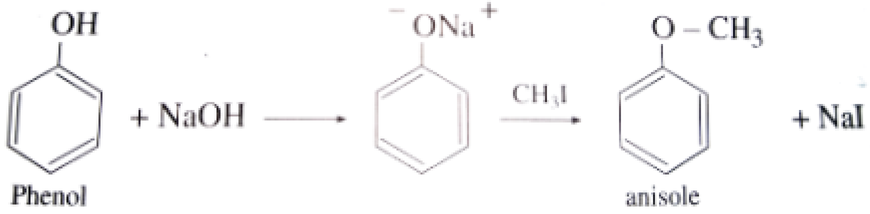
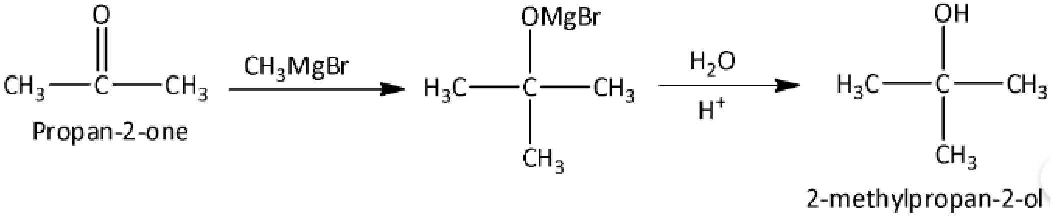
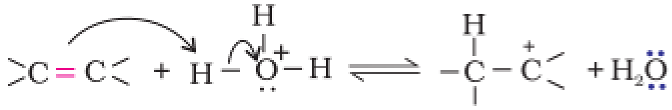
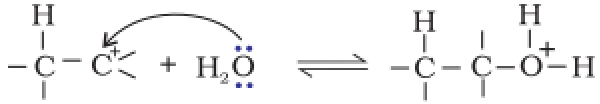
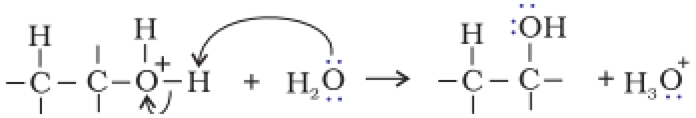
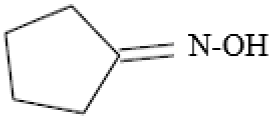
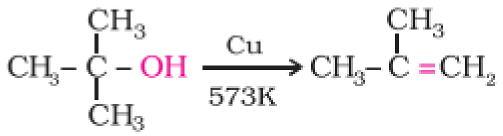
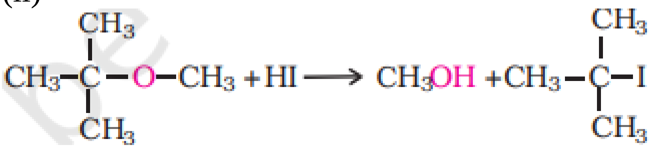
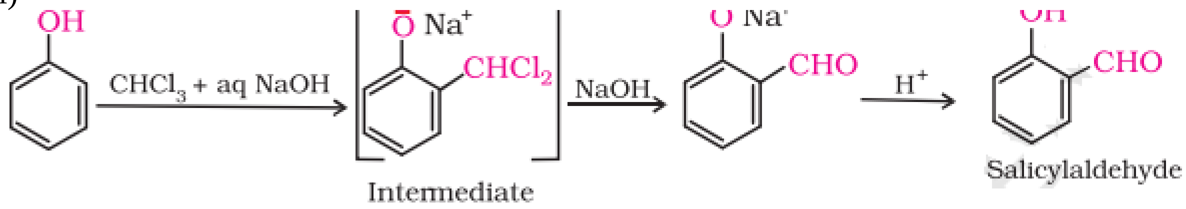
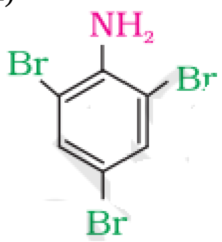
INDIAN SCHOOL AL WADI AL KABIR
ASSESSMENT 1 (2024-25)
Sub: Chemistry (043)
SET-I MARKING SCHEME
CLASS XII

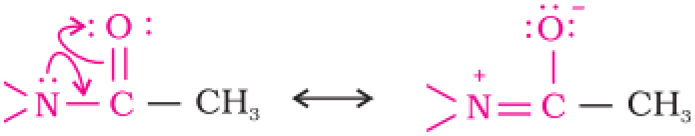
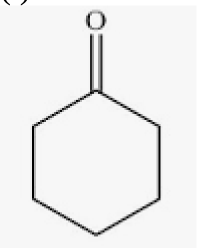
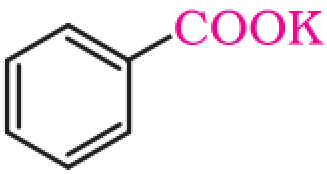
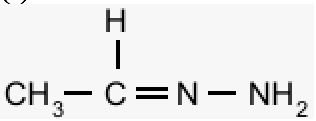
Q.No	Answers	Marks
1	(a) primary < secondary < tertiary	**1**
2	(b) X- alcohol, Y- amine, Z- alkane	**1**
3	(d) 2,4,6-Trinitrophenol	**1**
4	(b) Secondary structure	**1**
5	(a) Ethanal	**1**
6	(d) (IV)	**1**
7	(d) Thymine	**1**
8	(b) Hinsberg's reagent	**1**
9	(c) that the carbonyl group is present as an aldehydic group.	**1**
10	(d) α- D-Glucose and α- D-Glucose.	**1**
11	(c) Coupling reaction.	**1**
12	(a) P: more acidic than phenol Q: less acidic than phenol	**1**
13	(d) A is false but R is true.	**1**
14	(b) Both A and R are true but R is not the correct explanation of A.	**1**
15	(c) A is true but R is false.	**1**
16	(a) Both A and R are true and R is the correct explanation of A.	**1**
17	(a) In order to dissolve haloalkane in water, energy is required to overcome the attractions between the haloalkane molecules and break the hydrogen bonds between water molecules. Less energy is released when new attractions are set up between the haloalkane and the water molecules as these are not as strong as the original hydrogen bonds in water. (b) In this reaction alkyl halide is formed along with gases SO_2 and HCl. The two gaseous products are escapable, hence, the reaction gives pure alkyl halides.	1
18	(a) A-CH_3CH_2CHO B-CH_3COCH_3 (b) Phenol-Neutral $FeCl_3$ -Violet colouration/ Benzoic acid-$NaHCO_3$- Brisk effervescence	½ , ½ 1
19	(a) Nucleoside-Ribose sugar + Nitrogenous bases Nucleotide- Nucleoside + Phosphate group (b) Phosphodiester linkage. **OR** (a) Globular protein-Albumin, Insulin Fibrous protein-Keratin, Myosin (b) its structure is similar to amylopectin and is rather more highly branched.	½ , ½ 1 ½ , ½ 1
20	(a) Ascorbic acid (b) Vitamin K	1 1
21	(a) Propanal > acetone> benzaldehyde	1

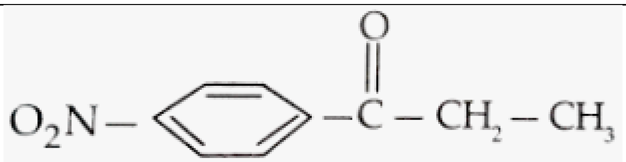
	(b) Propane< Dimethylether < Propanal < Ethanol	1
22	(a)  (b)  (c) $H_3C-Br + AgF \longrightarrow H_3C-F + AgBr$	1 1 1
23	(a) 1-Bromo-2-methylbut-2-ene (b) (i)  (ii) $CH_3-CH_2-Cl \xrightarrow{AgNO_2} CH_3-CH_2-NO_2 + AgCl$	1 ½ ,1/2 1
24		

	(a)  (b)  (c) Hydroboration reagents	1 1 1
25	Step 1: Protonation of alkene to form carbocation by electrophilic attack of H_3O^+. $H_2O + H^+ \rightarrow H_3O^+$  Step 2: Nucleophilic attack of water on carbocation.  Step 3: Deprotonation to form an alcohol. 	1 1 1
26	(a) (i) undergo Aldol condensation- CH_3CHO (ii) undergo Cannizzaro reaction - C_6H_5CHO (iii) answer Fehling's test - CH_3CHO (iv) answer Iodoform test - CH_3CHO (b) Dry hydrogen chloride protonates the oxygen of the carbonyl compounds and therefore, increases the electrophilicity of the carbonyl carbon facilitating the nucleophilic attack of ethylene glycol,	½ ½ ½ ½ 1
27	(a) (i) Hinsberg's test, primary and secondary amine (ii) Aniline will undergo diazotisation followed by coupling reaction to form an azo dye.	1 1

	(b) Tertiary amines do not have a replaceable hydrogen atom on the nitrogen. This lack of a replaceable hydrogen prevents the formation of stable products during the reaction	**1**
28	A-CH_3CHO B-$CH_3CH(OH)CH_2CHO$ C- $CH_3CH=CHCHO$	**1,1,1**
	OR	
	(a) (i)The inductive effect decreases with distance and hence the conjugate base of 2-fluorobutanoic acid is more stable.	**1**
	(ii) -CHO group is deactivating group, resonance, less electron density at ortho and para positions.	**1**
	(b) 	**1**
29	(a) (i) NaOH,368K, (ii) H^+	**1**
	(ii) CH_3COCl, An $AlCl_3$	**1**
	(b) i) The C—X bond length in haloalkane is shorter than in haloarene. Hence haloarenes are less reactive towards nucleophilic substitution than haloalkane.	**1**
	(c) (ii) 2−Bromobutane	
	OR	**1**
	(c) (i) 1−Bromobutane	
30	(a)	**1**
	(i) The amide linkage formed between the amino group of one amino acid and the carboxyl group of the other.eg	
	(ii) When a protein in its native form, is subjected to physical change like change in temperature or chemical change like change in pH, the hydrogen bonds are disturbed. Due to this, globules unfold and helix get uncoiled and protein loses its biological activity. During denaturation secondary and tertiary structures are destroyed but primary structure remains intact.eg	**1**
	(b) Indicates the absence of free CHO group, presence of cyclic structures.	**1**
	OR	
	(b) The main forces which stabilise the 2° and 3° structures of proteins are hydrogen bonds, disulphide linkages, van der Waals and electrostatic forces of attraction.	
	(c) This behaviour is due to the presence of both acidic (carboxyl group) and basic (amino group) groups in the same molecule. In aqueous solution, the carboxyl group can lose a proton and amino group can accept a proton, giving rise to a dipolar ion known as zwitter ion. This is neutral but contains both positive and negative charges.	**1**
31	(a)	
	(i) Partial double bond character on account of the conjugation of unshared electron pair of oxygen with the aromatic ring and (ii) sp^2 hybridised state of carbon to which oxygen is attached.	**1**
	(ii) It is due to the activation of benzene ring by the methoxy group.	
	(b)	**1**
	(i)	

	 $CH_3-\underset{CH_3}{\overset{CH_3}{C}}-OH \xrightarrow[573K]{Cu} CH_3-\overset{CH_3}{C}=CH_2$	1
	(ii)  $CH_3-\underset{CH_3}{\overset{CH_3}{C}}-O-CH_3 + HI \longrightarrow CH_3OH + CH_3-\underset{CH_3}{\overset{CH_3}{C}}-I$	1 1
	(iii) $(CH_3)_3CCl$	
	OR	
	(a) (i)  	1
	(ii) $R-X + R'-\ddot{\underset{..}{O}}^{-}\overset{+}{Na} \longrightarrow R-\ddot{\underset{..}{O}}-R' + Na\,X$	1
	(b)	
	(i) $KMnO_4$(alkaline/acidic/neutral)	1
	(ii) Con H_2SO_4, 413K	1
	(c) The commercial alcohol is made unfit for drinking by mixing in it some copper sulphate (to give it a colour) and pyridine (a foul-smelling liquid). It is known as denaturation of alcohol.	1
32	A-$C_6H_5CONH_2$, B- $C_6H_5N_2^+Cl^-$ C-C_6H_6 D-C_6H_5NC E-C_6H_5I	**5**
	OR	
	(a) (i)  	½ ½
	2,4,6-Tribromoaniline	½ ½
	(ii) $C_6H_5NHCOCH_3$ N-Phenylethanamide	1
	(b) (i) The lone pair of electrons on N atom interacts with the oxygen atom due to resonance.	

		**1**
	(ii) Aromatic primary amines cannot be prepared by this method because aryl halides do not undergo nucleophilic substitution with the anion formed by phthalimide.	**1**
	(iii) Aniline does not undergo Friedel-Crafts reaction (alkylation and acetylation) due to salt formation with aluminium chloride, the Lewis acid, which is used as a catalyst. Due to this, nitrogen of aniline acquires positive charge and hence acts as a strong deactivating group for further reaction.	
33	(a)	
	(i) CO, HCl, An $AlCl_3$/HCl Gattermann Koch reaction	½ ½
	(ii) CrO_2Cl_2/CS_2, H_3O^+	½ ½
	(iii) Clemmensen- Zn/Hg con HCl Wolff Kishner -NH_2NH_2, KOH, Ethylene glycol/heat	½ ½
	(b)	
	(i) Di-tert-butyl ketone-Steric factor and electronic factor	**1**
	(ii) Carboxylic acids-Two equivalent resonating structures, -ve charge on electronegative oxygen atom	**1**
	OR	
	(a)	
	(i) 	**1**
	(ii) 	**1**
	(iii) $CH_3CH(Cl)COOH$	**1**
	(b)	
	(i)  $CH_3-\overset{H}{\overset{\vert}{C}}=N-NH_2$	**1**
	(ii)	

		**1**