



Indian School Al Wadi Al Kabir

Assessment 1 (2026-2027)

Sub: Chemistry (043)

Class: XII

Date: 15/09/2026

Set- I(MS)

Max. Marks: 70

Time: 3 Hours

Q.No	Answers	Marks
1	(D) The C-Cl bond in chlorobenzene is longer than that in chloromethane.	1
2	(C) boil above 100°C and freeze below 0°C.	1
3	(A) 0.01 M	1
4	(C) Acetic acid	1
5	(A) Sample A	1
6	(B) H ₂ and Cl ₂	1
7	(D) Phosgene gas	1
8	(B) p – iii, q – i, r – ii, s – iv	1
9	(A) Bakelite	1
10	(B) The carboxyl group deactivates the ring and forms a complex with AlCl ₃ .	1
11	(A) The carbonyl carbon of ethanal is more electrophilic than that of ethanoic acid, as the –OH group in ethanoic acid reduces the electrophilicity of the carbonyl carbon.	1
12	(D) 2-Ethoxy-1,1-dimethylcyclohexane	1
13	(D) Assertion (A) is false, but Reason (R) is true.	1
14	(D) Assertion (A) is false, but Reason (R) is true.	1
15	(C) Assertion (A) is true, but Reason (R) is false.	1
16	(A) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).	1
17	(a) A - CH ₃ CH(Cl)CH ₃ B- CH ₃ CH(NC)CH ₃ (b) A - CH ₃ CH=CH ₂ B- CH ₃ CH(Br)CH ₃	½ × 4
18	(a) (i) Phenol is more acidic. Ethanol is less acidic due to the +I effect of the alkyl group. So, it will not react with NaOH. (ii) 2-Methylpropan-2-ol < Propan-1-ol < Water < Phenol (b) (i) o-Nitrophenol is steam volatile due to intramolecular hydrogen bonding while p-nitrophenol is less volatile due to intermolecular hydrogen bonding which causes the association of molecules (ii) Two different alcohol will be required which will produce a mixture of ethers. Separation becomes difficult.	1 1 1 1
19	(a) Dry hydrogen chloride protonates the oxygen of the carbonyl compounds and therefore, increases the electrophilicity of the carbonyl carbon facilitating the nucleophilic attack. (b) The carboxylate ion is more stable.	1 1

	The conjugate base of carboxylic acid, a carboxylate ion, is stabilised by two equivalent resonance structures in which the negative charge is at the more electronegative oxygen atom. The negative charge is delocalised over two electronegative oxygen atoms in carboxylate ion whereas it is less effectively delocalised over one oxygen atom and less electronegative carbon atoms in phenoxide ion.	
20	(a) Excess salt increases the solute concentration of body fluids, causing water to move into the tissues by osmosis, resulting in water retention and swelling (edema) (b) Low temperature: solubility of gases is higher. More dissolved oxygen at low temperature. Solute + Solvent $\rightleftharpoons$ Solution ($\Delta H = -ve$)	1 1
21	At a particular spot on an object made of iron, oxidation takes place, and that spot behaves as an anode. Anode: $2Fe(s) \rightarrow 2Fe^{2+}(aq) + 4e^{-}$ Electrons released at the anodic spot move through the metal and go to another spot on the metal and reduce oxygen in the presence of H^{+} (which is believed to be available from H_2CO_3 formed due to dissolution of carbon dioxide from air into water) Cathode: $O_2(g) + 4H^{+}(aq) + 4e^{-} \rightarrow 2H_2O$ $2Fe(s) + O_2(g) + 4H^{+}(aq) \rightarrow 2Fe^{2+}(aq) + 2H_2O(l)$ The ferrous ions are further oxidised by atmospheric oxygen to ferric ions, which come out as rust in the form of hydrated ferric oxide ($Fe_2O_3 \cdot xH_2O$)	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$
22	(a) Nucleophiles with two nucleophilic centres. Eg NO_2^{-} (b) Benzene diazonium halide Aryl halide $X = Cl, Br$ (c) Aryl halides also give analogous compounds when treated with sodium in dry ether, in which two aryl groups are joined together. It is called Fittig reaction. Diphenyl	1 1 1
23	(a) Ethanoyl chloride 2-Methoxyacetophenone (Minor) 4-Methoxyacetophenone (Major) (b)	1

	$\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-O-}\overset{\text{CH}_3}{\underset{\text{CH}_3}{\text{C}}}\text{-CH}_2\text{CH}_3 + \text{HI} \longrightarrow \text{CH}_3\text{CH}_2\text{CH}_2\text{OH} + \text{I-}\overset{\text{CH}_3}{\underset{\text{CH}_3}{\text{C}}}\text{-CH}_2\text{CH}_3$ (c) $\text{CH}_3\text{OH} + \text{CH}_3\text{COCl} \xrightarrow{\text{Pyridine}} \text{CH}_3\text{OCOCH}_3 + \text{HCl}$	1 1
24	(a) (i) 2,4-DNP- Propanone gives an orange-red ppt of 2,4-Dinitrophenylhydrazone. (ii) $\text{CH}_3\text{COOH} \xrightarrow{\text{SOCl}_2} \text{CH}_3\text{COCl} \xrightarrow{\text{H}_2/\text{Pd-BaSO}_4} \text{CH}_3\text{CHO}$ (iii) The hydrogensulphite addition compound is water soluble and can be converted back to the original carbonyl compound by treating it with dilute mineral acid or alkali. OR (i) Acetophenone < p-Tolualdehyde < Benzaldehyde < p-Nitrobenzaldehyde (ii) Ethanal < Ethanol < Ethanoic acid (b) (iii) 4-Methoxybenzoic acid < Benzoic acid < 4-Nitrobenzoic acid	1 1 1 1 1 1
25	(a) The mechanism of the reaction involves the following three steps: Step 1: Protonation of alkene to form carbocation by electrophilic attack of H_3O^+. $\text{H}_2\text{O} + \text{H}^+ \rightarrow \text{H}_3\text{O}^+$ $>\text{C}=\text{C}< + \text{H}-\overset{\text{H}}{\underset{\cdot\cdot}{\text{O}}}-\text{H}^+ \rightleftharpoons \begin{array}{c} \text{H} \\ \\ -\text{C}-\text{C}^+ < \end{array} + \text{H}_2\ddot{\text{O}}$ Step 2: Nucleophilic attack of water on carbocation. $\begin{array}{c} \text{H} \\ \\ -\text{C}-\text{C}^+ < \end{array} + \text{H}_2\ddot{\text{O}} \rightleftharpoons \begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ -\text{C}-\text{C}-\text{O}^+-\text{H} \end{array}$ Step 3: Deprotonation to form an alcohol. $\begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ -\text{C}-\text{C}-\text{O}^+-\text{H} \end{array} + \text{H}_2\ddot{\text{O}} \rightarrow \begin{array}{c} \text{H} \quad \text{:OH} \\ \quad \\ -\text{C}-\text{C}- \end{array} + \text{H}_3\text{O}^+$ (b) -OH is an activating group due to +R effect.	2 1
26	(i) Positive iodoform test Pentan-2-one $\text{CH}_3\text{COCH}_2\text{CH}_2\text{CH}_3$ or 3-Methylbutan-2-one (ii) Shows Cannizzaro reaction 2,2-Dimethylpropanal $(\text{CH}_3)_3\text{CCHO}$ (iii) Reduces Tollens' reagent and has a chiral carbon 2-Methylbutanal $\text{CH}_3\text{CH}_2\text{CH}(\text{CH}_3)\text{CHO}$	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$
27	$\alpha = i-1/n-1$; $i = 1.92$ $\Delta T_f = i \times K_f \times w_2 \times 1000/M_2 \times w_1$ $= 0.239 \text{ K}$ $T_f = 273.15 - 0.239 = 272.91 \text{ K}$	1 $\frac{1}{2}$ 1 $\frac{1}{2}$
28	(i) High efficiency and pollution-free (ii) The amount of chemical reaction which occurs at any electrode during electrolysis by a current is proportional to the quantity of electricity passed through the electrolyte (iii) 3F	1 1 1
29	(a) The stereoisomers related to each other as non-superimposable mirror images are called enantiomers	1

	$\Lambda_m = \frac{3.54 \times 10^{-4} \text{ S cm}^{-1} \times 1000}{0.05 \text{ mol L}^{-1}}$	½
	$\Lambda_m = \frac{0.354}{0.05} = 7.08 \text{ S cm}^2 \text{ mol}^{-1}$	1
	(ii)	
	(a) The cell potential is approximately 1.35 V and remains constant during its life as the overall reaction does not involve any ion in solution whose concentration can change during its lifetime.	1
	(b) Passage of direct current through an ionic solution over a prolonged period can lead to change in its composition due to electrochemical reactions.	1
	OR	
	(i) $E^\circ_{\text{cell}} = E_{\text{cathode}} - E_{\text{anode}} = 0.62 \text{ V}$ n = 2 , eqns	1
	$E_{\text{cell}} = E^\circ_{\text{cell}} - 0.059/n \log [\text{oxidised}]/[\text{Reduced}]$	½
	Subsn	½
	= calcn	½
	= 0.5609 V	½
	(ii) 2F = 58.7	½
	5×20×60=x	½
	x = 1.8 g	1