COMMON PRE-BOARD EXAMINATION

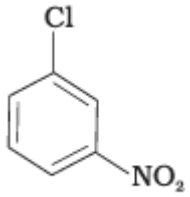
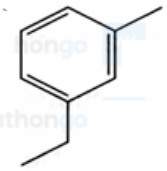
CHEMISTRY-Code No. 043

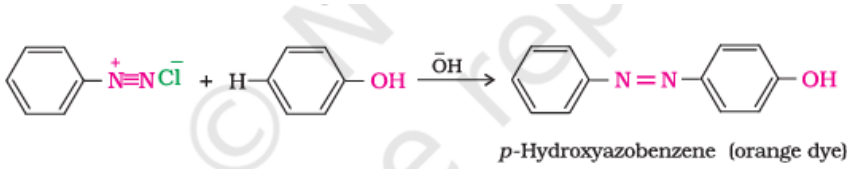
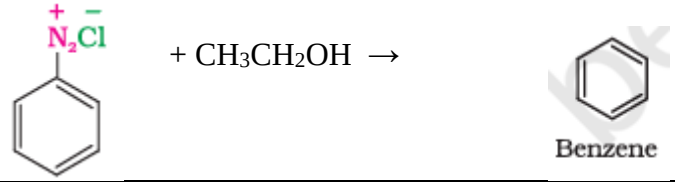
Class-XII-(2025-26)

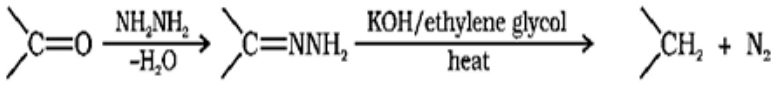
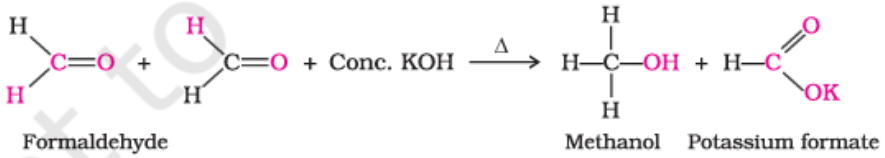
SET: 3

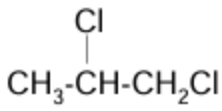
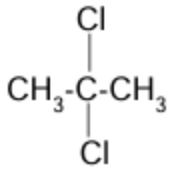
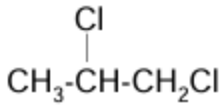
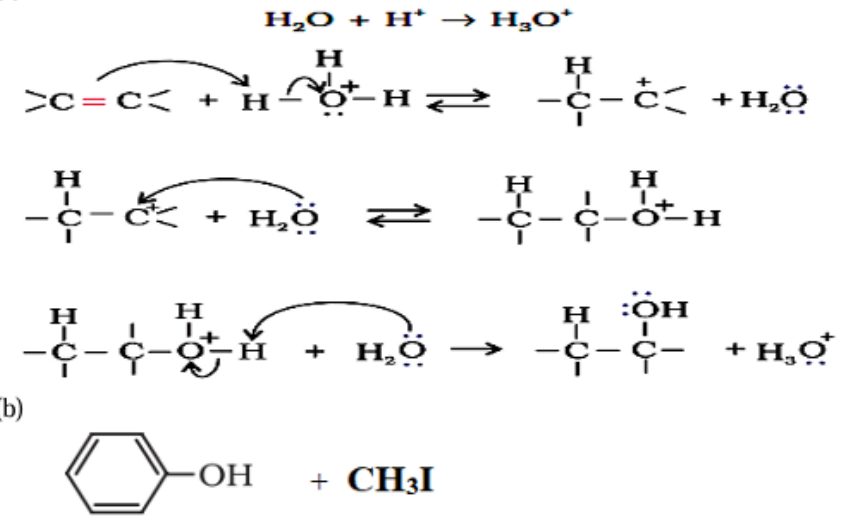
Time allowed: 3 Hrs. **Maximum Marks: 70**

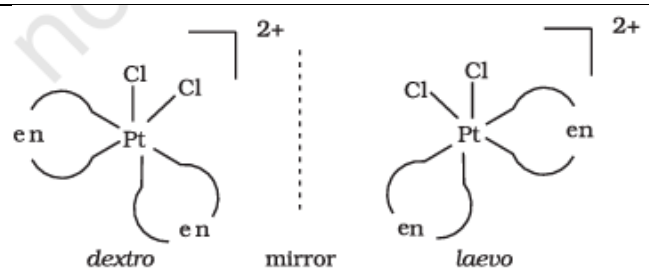
MARKING SCHEME

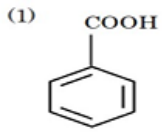
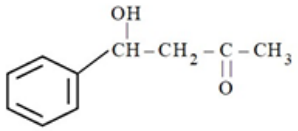
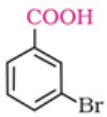
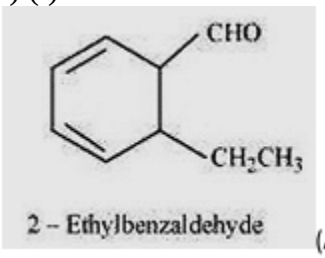
Q. No.	Section-A	Marks
1.	C) electrophilic substitution reaction	1
2	B) Geometrical isomerism	1
3	C) it shows positive deviation from Raoults law	1
4	B) 2-methylpropene is formed	1
5	D) P = $CH_3{-}CH_2{-}CH_2{-}NO_2$, Q= $CH_3{-}CH_2{-}CH_2{-}NC$	1
6	A) 	1
7	D) Cr^{3+}	1
8	C) 10^{10}	1
9	D) Oxime	1
10	A) A-IV, B-III, C-I, D-II	1
11	A) 	1
12	D) $CH_3CH_2NH_2$	1
13	A) Both A and R are true, and R is the correct explanation of A.	1
14	B) Both A and R are true, and R is not the correct explanation of A.	1
15	C) A is true but R is false.	1
16	B) Both A and R are true, and R is not the correct explanation of A.	1

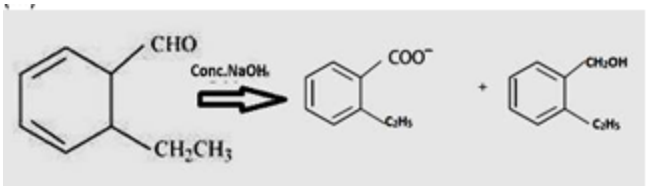
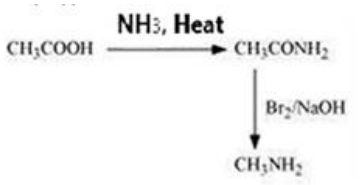
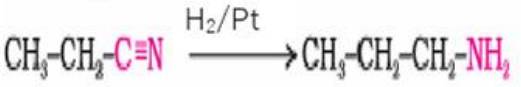
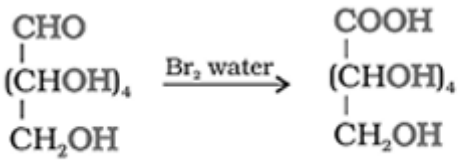
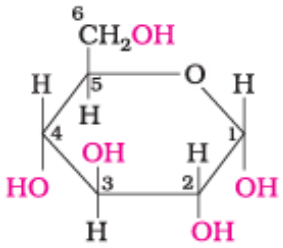
	Section-B Question No. 17 to 21 are very short answer questions carrying 2 marks each.	
17	a)  *p*-Hydroxyazobenzene (orange dye) b)  Benzene	1 1
18	$(CH_3)_2CHCHO + C_2H_5MgBr \rightarrow (CH_3)_2CHCH(OMgBr)-C_2H_5 \xrightarrow{H^+/H_2O} (CH_3)_2CHCH(OH)-C_2H_5$ 2-Methylpentan-3-ol	1 1
19	a) Slope = - Ea/ 2.303R b) k 1> k2	1 1
20	a) NH_4^+ , because there is no lone pair of electron on Nitrogen. b) $[Cr(H_2O)_5Cl]Cl_2 .H_2O$ Pentaaquachloridochromium(III) chloride monohydrate	½ + ½ ½ + ½
21	A. Molal depression constant is the depression in freezing point observed in 1 molal solution / The depression in freezing point when one mole of non-volatile solute is dissolved in 1 kg or 1000g of the solvent. $K_f = \frac{R \times M_{solvent} \times T_f^o}{1000 \times \Delta_{fus}H^o}$ OR B. 1 M has higher concentration than 1m. 1 m solution = 1 mole in 1000 g solvent or 1 mole in 1000 cm^3 of solvent if d = 1 g / cm^3 But 1 M solution = 1 mole in 1000 cm^3 of solution i.e. solvent is less here.	1 1 1 1
	Section-C Question No. 22 to 28 are short answer questions, carrying 3 marks each.	
22	(a) Yes, if the concentration of ZnSO4 in the two half cell is different , the electrode potential will be different making the cell possible. (b) $\Lambda^0m\ (MgCl2) = \lambda^0m\ (Mg2+) + 2\ \lambda^0m\ (Cl-)$ $258.6 = 106 + 2\ \lambda^0m\ (Cl-)$ $\lambda^0m\ (Cl-) = 76.3\ Scm^2mol^{-1}$ **(c)** At anode : $Zn(Hg) + 2OH^- \rightarrow ZnO + H_2O + 2e$ At cathode: $HgO + H_2O + 2e \rightarrow Hg + 2OH^-$	1 ½ ½ ½ ½

23	$\Delta T_f = i\, K_f\, m$ $\Delta T_f = i \times K_f \times \frac{w_B \times 1000}{MB \times w_A}$ $2.94 = i \times 4.9 \times \frac{5 \times 1000}{122 \times 35}$ $i = 0.512$ $\alpha = \frac{i - 1}{\frac{1}{n} - 1}$ $\alpha = \frac{0.512 - 1}{\frac{1}{2} - 1}$ $= 0.976$ $= 97.6\%$	½ ½ ½ ½ ½ ½
24	a) Cu^{2+} oxidizes iodide ion to iodine. b) Because of large number of unpaired electrons in their atoms they have stronger interatomic interaction or strong metallic bonding c) The chromates and dichromates are interconvertible in aqueous solution depending upon pH of the solution. Increasing the pH (in basic solution)of dichromate ions a colour change from orange to yellow is observed as dichromate ions change to chromate ions.	1 1 1
25	a)  b) $R\text{-}CH_2\text{-}COOH \xrightarrow[(ii)\ H_2O]{(i)\ X_2/\text{Red phosphorus}} R\text{-}\underset{\displaystyle X}{\underset{\vert}{CH}}\text{-}COOH$, X = Cl, Br c)  Formaldehyde Methanol Potassium formate d) $CH_3CN + SnCl_2 + HCl \rightarrow CH_3\text{-}CH{=}NH \xrightarrow{H_3O^+} CH_3CHO$ **(Any three)**	1 1 1 1

26	 $CH_2Cl\text{-}CH_2\text{-}CH_2Cl$ $CH_3\text{-}CH_2\text{-}CHCl_2$  The following isomer will exhibit enantiomerism:  IUPAC name: 1,2-Dichloropropane.	½ × 6
27	(a)  (b) 	½ 1 ½ ½ + ½
28	a) $3MnO_4^{2-} + 4H^+ \rightarrow 2MnO_4^- + MnO_2 + 2H_2O$ b) $KMnO_4 \xrightarrow{\Delta} K_2MnO_4 + MnO_2 + O_2$ **c)** $5Fe^{2+} + MnO_4^- + 8H^+ \rightarrow 5Fe^{3+} + Mn^{2+} + 4H_2O$	1 1 1
	Section D Question No. 29 & 30 are case-based/data -based questions carrying 4 marks each.	
29	(i) Secondary valency = 4 (ii) cis form of $[PtCl_2(en)_2]^{2+}$ shows optical isomerism	1

		1
	(iii) A (1) $Fe_4[Fe(CN)_6]_3$	1
	(2) $t_2g^3\ e_g^2$	1
	OR	
	(iii) B. dsp2, diamagnetic	1 + 1
30	(i) The amounts of different substances liberated by the same quantity of electricity passing through the electrolytic solution are proportional to their chemical equivalent weights	1
	(ii) When an external potential greater than cell potential is applied.	1
	(iii) A.	
	$m = z\,I\,t$	½
	$2.8\ g = \frac{56 \times 2 \times t}{2 \times 96500}$	1
	$t = 4825\ s$	½
	OR	
	(iii) B	
	$E_{cell} = E^\circ_{cell} - \frac{0.059}{n} \log Q_c$	½
	$= E^\circ_{cell} - \frac{0.059}{2} \log \frac{10^{-3}}{10^{-2}}$	½
	$= 2.71 + 0.0295$	½
	$E_{cell} = 2.7395\ V$	½
	Section-E	
	Question No. 31 to 33 are long answer type questions carrying 5 marks each.	
31	A. a)	
	$\log \frac{k_2}{k_1} = \frac{Ea}{2.303\ R} \left[\frac{1}{T_1} - \frac{1}{T_2}\right]$	½
	$\log \frac{2k_1}{k_1} = \frac{Ea}{2.303 \times 8.314\ J\ K^{-1}\ mol^{-1}} \left[\frac{1}{300} - \frac{1}{310}\right]$	1
	$E_a = \frac{0.3010 \times 19.147\ J\ mol^{-1} \times 300 \times 310}{10}$	½
	$E_a = 53598.2\ J\ mol^{-1}$ or $53.598\ kJ\ mol^{-1}$ or $53.6\ kJ\ mol^{-1}$ (Deduct ½ mark for no or incorrect unit)	1
	b) When one of the reactant is present in excess.	1
	Hydrolysis of an ester/ sucrose (or any other suitable example)	½
	For elementary reaction, which takes place in a single step.	½

	OR	
	B a) $a=1g,\ a-x=0.125g,\ t=24hours$ $k=\frac{2.303}{t}\log\frac{a}{a-x}$ $k=\frac{2.303}{t}\log\frac{1}{0.125}$ $=0.0866hr^{-1}.$	1
	$t_{1/2}=\frac{0.693}{k}$ $t_{1/2}=\frac{0.693}{0.0866}$ $=8hours$	1
	b) Rate of the reaction will increase. Rate constant remains same.	1 1
	c) First order , Slope = k/2.303	½ + ½
32	A a) (1)  (2)  (3) 	1 1 1
	b) Aniline undergoes resonance and as a result the electrons on the N-atom are less available for donation.	1
	c) (CH3)3N < CH3NH2< (CH3)2NH	1
	OR	
	B. a) (i) 	1 + 1

	(ii)  b)  (ii)  (or by any other method)	1 1 1
33	A. a) Amylopectin. b) C- 2 c) Two peptide linkages. d)  Gluconic acid  Saccharic acid OR B. (a) This indicates that the aldehyde group in glucose is not free. (b)  α – D – (+) – Glucopyranose	1 1 1 1 1 1 1

	(c) 'D' gives the configuration i.e. the – OH gp at carbon 5 is on the right hand side. (+) indicates that the isomer is dextro rotatory. (d) Vitamin B_2 , Milk , Egg white , liver, kidney (any two)	½ ½ 1 + 1