COMMON PRE-BOARD EXAMINATION

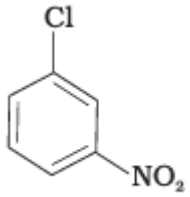
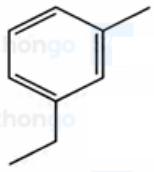
CHEMISTRY-Code No. 043

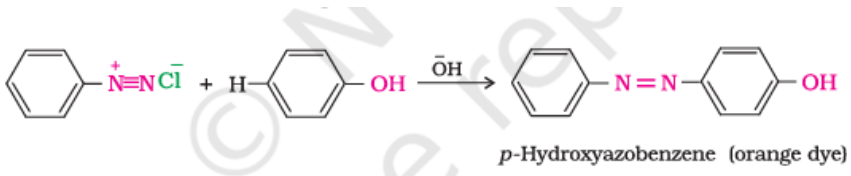
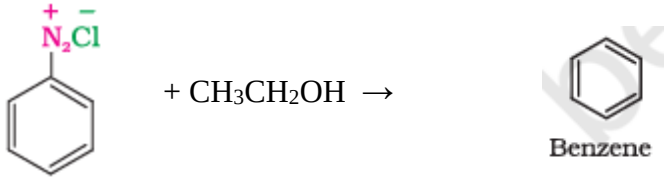
Class-XII-(2025-26)

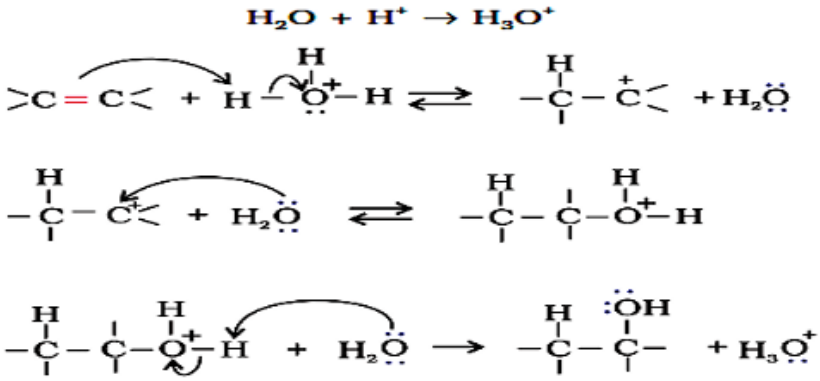
SET: 2

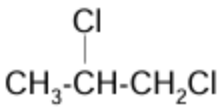
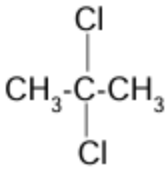
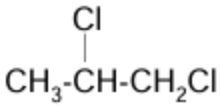
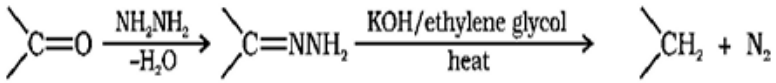
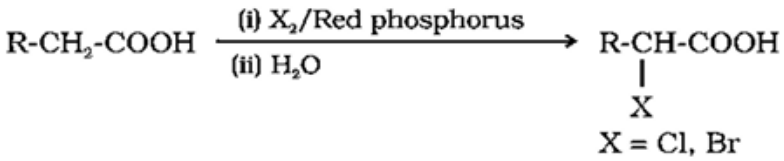
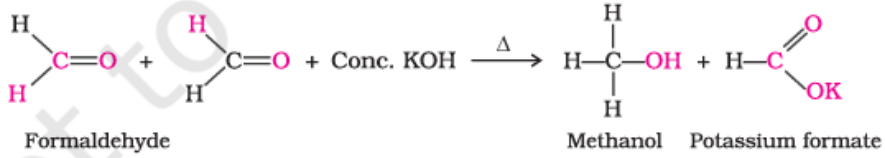
Time allowed: 3 Hrs. **Maximum Marks: 70**

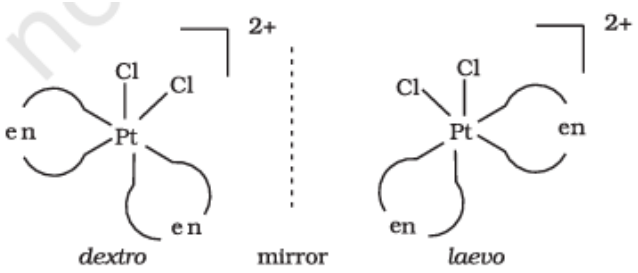
MARKING SCHEME

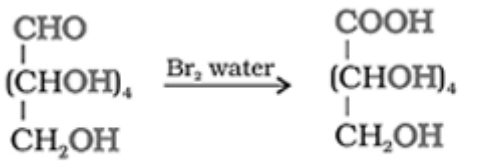
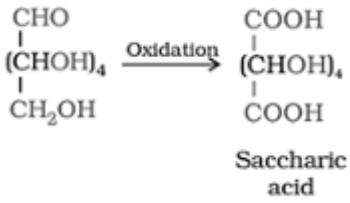
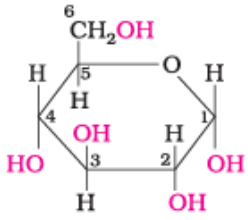
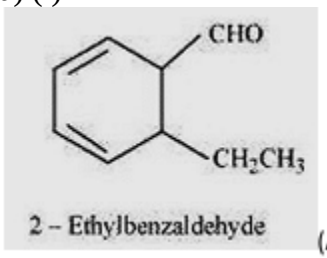
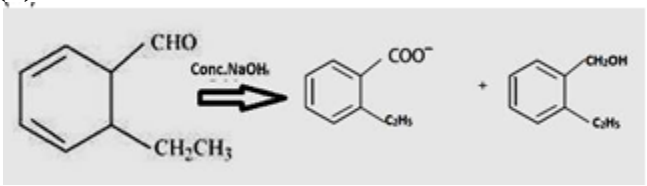
Q. No.	Section-A	Marks
1.	B) 2-methylpropene is formed	1
2	B) Geometrical isomerism	1
3	A) Sodium bicarbonate test	1
4	C) 10^{10}	1
5	A) A-IV, B-III, C-I, D-II	1
6	A) 	1
7	C) electrophilic substitution reaction	1
8	C) it shows positive deviation from Raoults law	1
9	A) Fe^{3+}	1
10	A) 	1
11	(D) $CH_3CH_2NH_2$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

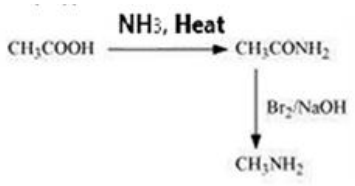
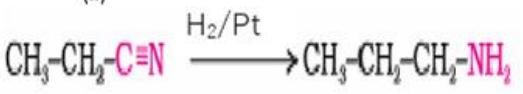
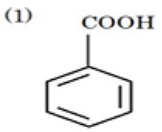
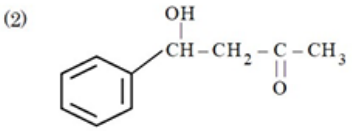
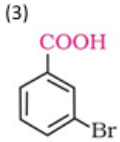
	Section-B Question No. 17 to 21 are very short answer questions carrying 2 marks each.	
17	A. Molal depression constant is the depression in freezing point observed in 1 molal solution / The depression in freezing point when one mole of non-volatile solute is dissolved in 1 kg or 1000g of the solvent. $K_f = \frac{R \times M_{solvent} \times T_f^o}{1000 \times \Delta_{fus}H^o}$ 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
18	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
19	$(CH_3)_2CHCHO + C_2H_5MgBr \rightarrow (CH_3)_2CH(OMgBr)CH\text{-}C_2H_5 \xrightarrow{H^+/H_2O} (CH_3)_2CH(OH)CH\text{-}C_2H_5$ 2-Methylpentan-3-ol	1 1
20	a) Slope = - Ea/ 2.303R b) k 1> k2	1 1
21	a)  *p*-Hydroxyazobenzene (orange dye) b)  Benzene	1 1

	Section-C Question No. 22 to 28 are short answer questions, carrying 3 marks each.	
22	a) $\pi = i\,CRT$ $4.75 = i \times \frac{5.85}{58.5} \times \frac{1}{1} \times 0.082 \times 300$ $i = 1.93$ $\alpha = \frac{i-1}{n-1} = \frac{1.93-1}{2-1} = 0.93$ or 93%	½ ½ 1 1
23	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
24	(a)  (b) 	½ 1 ½ ½ + ½
25	(a) Yes, if the concentration of ZnSO4 in the two half cell is different , the electrode potential will be different making the cell possible. (1) (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

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)  c)  d) $CH_3CN + SnCl_2 + HCl \rightarrow CH_3\text{-}CH{=}NH \xrightarrow{H_3O^+} CH_3CHO$ **(Any three)**	1 1 1 1
28	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	1 1 1

	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.	
	Section D Question No. 29 & 30 are case-based/data -based questions carrying 4 marks each.	
29	(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. $m = z\,I\,t$ $2.8\ g = \frac{56 \times 2 \times t}{2 \times 96500}$ $t = 4825\ s$	½ 1 ½
	OR	
	(iii) B $E_{cell} = E^{\circ}_{cell} - \frac{0.059}{n} \log Q_c$ $= E^{\circ}_{cell} - \frac{0.059}{2} \log \frac{10^{-3}}{10^{-2}}$ $= 2.71 + 0.0295$ $E_{cell} = 2.7395\ V$	½ ½ ½ ½
30	(i) Secondary valency = 4	1
	(ii) cis form of $[PtCl_2(en)_2]^{2+}$ shows optical isomerism  	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
	Section-E Question No. 31 to 33 are long answer type questions carrying 5 marks each.	
31	A. a) Amylopectin.	1
	b) C- 2	1
	c) Two peptide linkages.	1

	d)  Gluconic acid	1
	 Saccharic acid	1
	OR	
	B. (a) This indicates that the aldehyde group in glucose is not free.	1
	(b)  α – D – (+) – Glucopyranose	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
32	A. a) (i)  2 – Ethylbenzaldehyde (A)	1 + 1
	(ii)  	1

	b)  (ii)  (or by any other method) OR B a)    b) Aniline undergoes resonance and as a result the electrons on the N-atom are less available for donation. c) (CH3)3N < CH3NH2< (CH3)2NH	1 1 1 1 1 1 1
33	A. a) $\log \frac{k_2}{k_1} = \frac{Ea}{2{\cdot}303\ R}\left[\frac{1}{T_1} - \frac{1}{T_2}\right]$ $\log \frac{2k_1}{k_1} = \frac{Ea}{2{\cdot}303 \times 8{\cdot}314\ J\ K^{-1}\ mol^{-1}}\left[\frac{1}{300} - \frac{1}{310}\right]$ $E_a = \frac{0{\cdot}3010 \times 19{\cdot}147\ J\ mol^{-1} \times 300 \times 310}{10}$ $E_a = 53598{\cdot}2\ J\ mol^{-1}$ or $53{\cdot}598\ kJ\ mol^{-1}$ or $53.6\ kJ\ mol^{-1}$ (Deduct ½ mark for no or incorrect unit) b) When one of the reactant is present in excess. Hydrolysis of an ester/ sucrose (or any other suitable example) For elementary reaction, which takes place in a single step.	½ 1 ½ 1 1 ½ 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.	1
	Rate constant remains same.	1
	c) First order , Slope = k/2.303	½ + ½