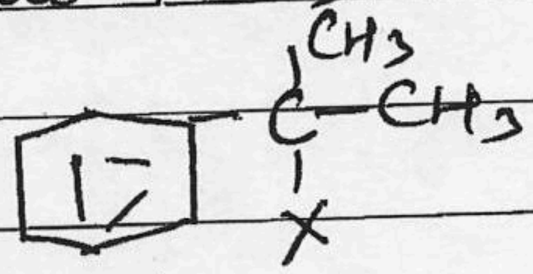
BHARTIYA SHIKSHA BOARD

MARKING SCHEME

SAMPLE QUESTION PAPER 2025-26

CLASS - XII

CHEMISTRY (151)

1.	(d) $E_{cell} < E_{ext}$	1
2.	(b) increase in collision frequency	1
3.	(c) oxides and fluorides	1
4.	(a) Polar solvents	1
5.	(b) Pentanol > 3-Methylbutan-2-ol > 2-Methylbutan-2-ol	1
6.	(d) 2-Methylpent-2-ene	1
7.	(b) 5	1
8.	(d) $C_6H_5SO_2Cl$	1
9.	(a) Rate = $k[A]$	1
10.	(d) 	1
11.	(c) nitration, bromination, reduction	1
12.	(d) can't be predicted	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.	(d) A is false but R is true	1
16.	(d) A is false but R is true	1
	Section B	

17. As RL solution are isolonic

so $\pi_{glucose} = \pi_{org.comp}$ Ufm

so their molarities will also be equal

$M_{glucose} = M_{O.C.}$

$$\frac{4}{180} \times \frac{1000}{100} = \frac{3}{x} \times \frac{1000}{100}$$ 1

$x = 135 g/mol$ 1/2

Or.

$x_{N_2} = 0.78$

$P_t = 1 atm = 760 mmHg$

$K_H = 8.42 \times 10^{-7} M/mmHg.$

$P_{N_2} = x_{N_2} \times P_t$

$= 0.78 \times 1 atm$

$= 0.78 atm$ 1/2

Acc to Henry's Law

Solubility $\propto$ Partial Press. of gas 1/2

$S = K_H \times P$

$= 8.42 \times 10^{-7} \times 0.78 \times 760$ 1/2

$S = 499.37 \times 10^{-7}$ 1/2.

Q.No.:	Expected Answer(s)	
18. (a)	Sucrose gives α-D glucose + β-D fructose	1/2 + 1/2
(b)	Lactose gives β-D galactose + β-D glucose	1/2 + 1/2
19. (a)	$[Co(NH_3)_6][Cr(CN)_6]$ & $[Cr(NH_3)_6][Co(CN)_6]$ Or any other suitable example	1/2 + 1/2
(b)	$[Cr(H_2O)_6]Cl_3$, $[Cr(H_2O)_5Cl]Cl_2 \cdot H_2O$ or any other suitable example	1/2 + 1/2
20. (a)	due to the presence of unpaired electrons in their incomplete d-orbitals & hence posses the capacity to absorb & re-emit wide range of energies.	1/2
	Transition metal because of variable oxidation state may form intermediate compounds.	1/2
(b)	This is due to more frequent metal-metal bonding present in them.	1

21. $E^\circ_{cell} = E^\circ_c - E_a$

$= -0.14 - (+0.76)$

$= 0.62V$ — 1/2

$E_{cell} = E^\circ_{cell} - \frac{0.0591}{n} \log \frac{[Zn^{2+}]}{[Sn^{2+}]}$ — 1/2

$= E^\circ_{cell} - \frac{0.0591}{2} \log \frac{0.1}{0.001}$ — for correct substitution 1/2

$= 0.62 - \frac{0.0591}{2} \log 10^2$

$E_{cell} = 0.5609V$ — 1/2

Section C

22. $Ag = 1.5\ g$

$I = 1.5\ A$

Acc. to faraday's first law

$w = ZIt$ — 1

$1.5 = \frac{108}{96500} \times 1.5 \times t$ — 1

$t = 893.5$ sec

or

$t = 14.89$ min. — 1/2 for correct answer + 1/2 for unit

23. $\log \frac{K_2}{K_1} = \frac{E_a}{2.303R}\left(\frac{1}{T_1} - \frac{1}{T_2}\right)$ — 1

$$\log \frac{3K1}{K1} = \frac{Ea}{19.15}\left(\frac{1}{290} - \frac{1}{300}\right)$$ 1

$$0.48 = \frac{Ea}{19.15}\left(\frac{300-290}{290\times300}\right)$$

$Ea = 80356\ J/mol$ 1

24. (a) $CH_3-\overset{CH_3}{\overset{|}{C}}=CH_2$ 1

(b) $CH_3CH_2CH_2I$ 1

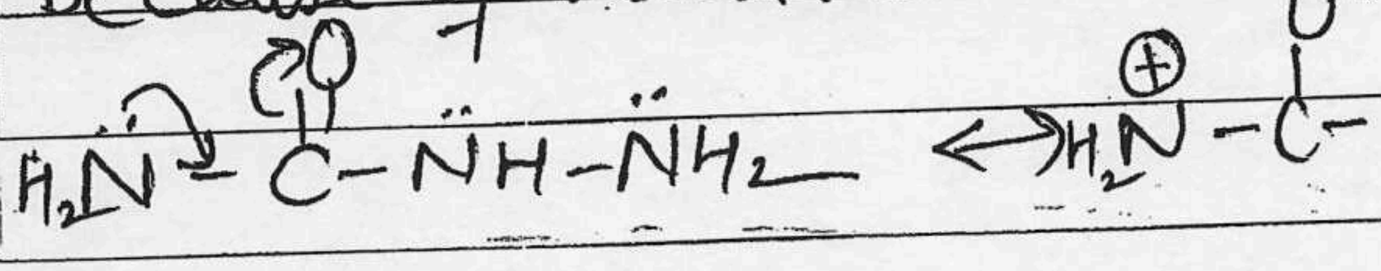
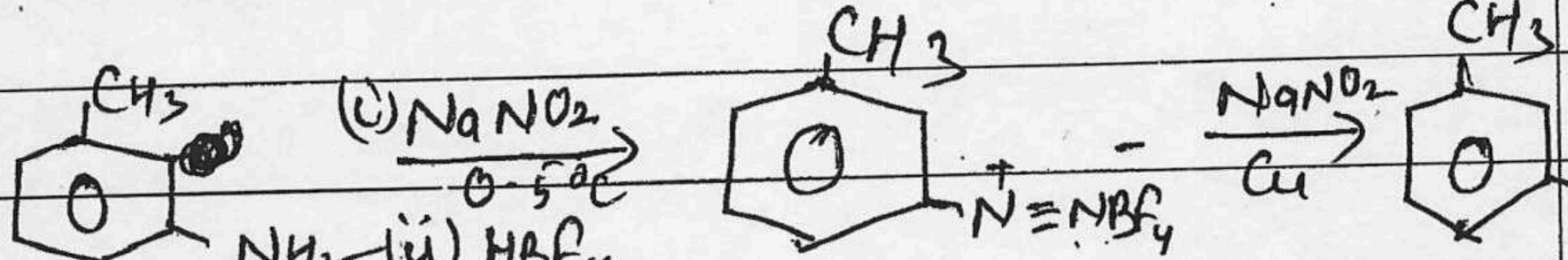
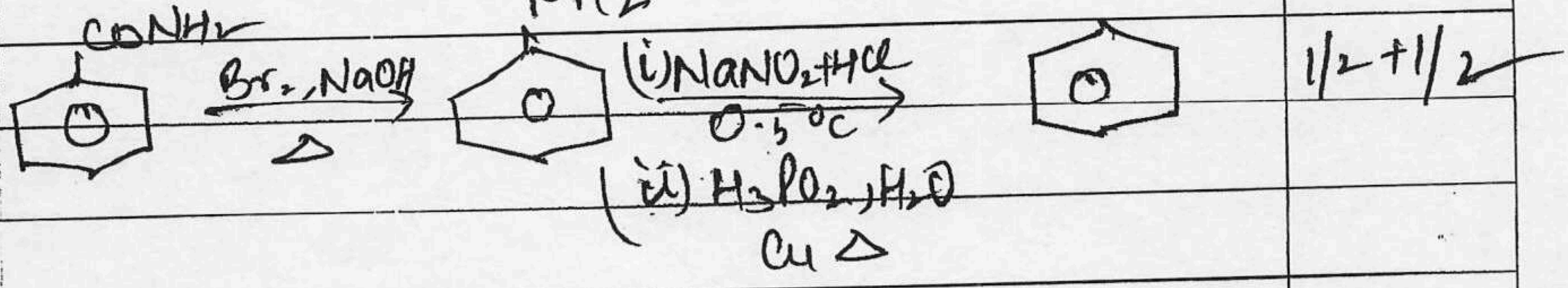
(c) $CH_3CH_2-\overset{Br}{\overset{|}{C}}-(CH_3)_2$ 1

Or

$CH_3-\overset{CH_3}{\overset{|}{\underset{CH_3}{\overset{|}{C}}}}-CH_3$ 1

2,2-Dimethylpropane 1

Hydrocarbon should be this ∵ all the H are equivalent, hence a single monochloroderivative 1

Q.No.:		
25(a)	because of the presence of three methyl group at α-position w.r.t the >C=O g/p, the nucleophillic attack by CH^- doesn't occur due to <u>steric hindrance</u>.	1
(b)	because of resonance 	1
(c)	because this reaction is a reversible reaction, so to shift the equilibrium in the forward direction, the water or ester should be removed as soon as it is formed.	1
26. (a)	$CH_3CH_2-Cl \xrightarrow{KCN} CH_3CH_2CN \xrightarrow{LiAlH_4} CH_3CH_2CH_2NH_2$	1/2+1/2
(b)		1/2+1/2
(c)		1/2+1/2
27 (a)	FCH_2COOH due to greater stability of FCH_2COO^- ion over CH_3COO^- ion.	1/2 1/2

Q.No..		
(b)	CH_3CHFCH_2COOH	1/2
	∵ Inductive effect decreases with distance	1/2
(c)	FCH_2COOH	1/2
	∵ F is more electronegative than Cl	1/2
28.		
(a)	Cu electrode	1
(b)	Cu half cell	1
(c)	$Ni(s)\|Ni^{2+}(1M)\|\|Cu^{2+}(1M)\|Cu(s)$	1

Section D

29(a) Nucleotides are nucleoside monophosphates — 1

(b) Ribose + Phosphoric acid + Uracil — 1/2 + 1/2

(c) Both are nucleic acids — 1
or any other similarity

DNA controls transmission of hereditary effects whereas RNA controls protein synthesis — 1/2 + 1/2
Or
any other suitable difference.

30.(a) Oxidation state = 3 — 1
Coordination Number = 4 — 1

(b) aquacyanidobis(ethane-1,2-diamine)cobalt(III)ion — 1

(c) The complex in which the metal atom or ion is linked to more than one kind of ligands are called heteroleptic complexes — 1

Section E

31(a)	Trifluoroacetic acid will produce the greatest depression in freezing point because it is a strong acid & hence will have highest value of i (Van't Hoff factor)	1 1
(b)	$\pi = i\frac{m}{V}RT$	1
	$\pi = i\frac{\omega}{MV}RT.$	
	$\omega = \frac{\pi MV}{iRT}$	
	$\omega = \frac{0.75 \times 111 \times 2.5}{2.47 \times 0.0821 \times 300}$	1
	$\omega = 3.42\,g$ Or.	1/2+1/2.
(a)	V.P of Pure solvent $= p^0$	
	V.P. of Solution $= p_s$	

$P_S \propto x_1$ — 1/2

$P_S = P^0 x_1$ — 1/2

$\Delta p = P^0 - P_S = P^0 - P^0 x_1$

$= P^0(1 - x_1)$ — 1/2

$\Delta p = P^0 x_2$

$\frac{P^0 - P_S}{P^0} = x_2$ — 1/2

$\frac{P^0 - P_S}{P^0} = \frac{n_2}{n_1 + n_2}$

(b) $\frac{P^0 - P_S}{P^0} = x_{solute}$ — 1

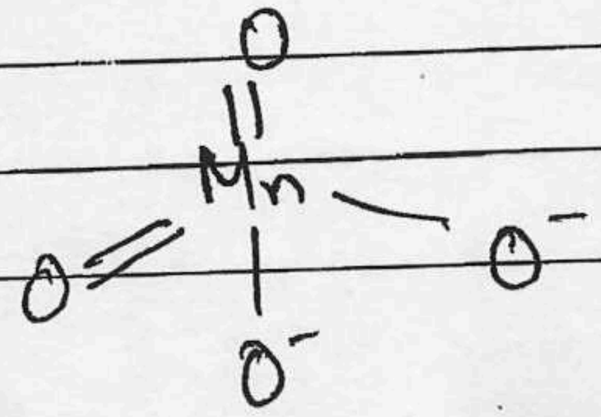
$\frac{760 - 750}{760} = x_{solute}$

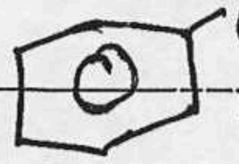
$x_{solute} = \frac{10}{760} = 0.01315$ — 1/2

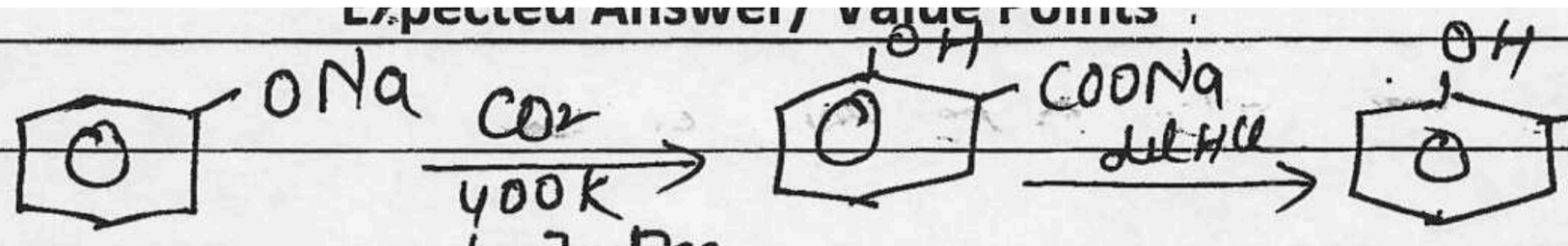
$Molality = \frac{x_{solute} \times 1000}{(1 - x_{solute}) \times M}$ — 1/2

$= \frac{0.01315 \times 1000}{0.98685 \times 180}$

Molality = 0.740 molal — 1/2 + 1/2

Q.No.:		
32(a)	(i) because of no of unpaired e^- Increases b/l Mn and then pairing starts	1
	(ii) Cupric chloride is blue as it has unpaired electrons that enable d-d transition whereas cuprous chloride has completely filled d orbitals	1
	(iii) Transition metals have their valence electrons in two diff. sets of orbitals ie. (n-1)d and ns. Since there is very little difference in the energies of these orbitals, both energy levels can be used for bond formation	1
(b)	$MnO_4^{2-} \xrightarrow{H^+} MnO_4^-$ Manganate Permanganate 	1 1

Q.No.:	Expected Answer/ Value Points	Distribution of Marks
(a)(i)	Lanthanoids have general electronic configuration as $[Xe]\,4f^{1-14}\,5d^{0-1}\,6s^2$ where actinoids have $[Rn]\,5f^{1-14}\,6d^{0-1}\,7s^2$	1/2 + 1/2
(ii)	Typical oxidation state of lanthanoids is +3 whereas actinoids not only show +3 state but also show oxidation state upto +7.	1/2 + 1/2
(iii)	Most of the ions of lanthanoids are colourless whereas Most of the ions of actinoids are coloured	1/2 + 1/2
(b)(i)	$Cr_2O_7^{2-} + 14H^+ + 6I^- \rightarrow 2Cr^{3+} + 7H_2O + 3I_2$	1
(ii)	$2MnO_4^- + 16H^+ + 10Fe^{2+} \rightarrow 2Mn^{2+} + 8H_2O + 10Fe^{3+}$	1
33(a) (i)	$CH_3CH_2OH + CH_3Br \rightarrow$	1/2 + 1/2
(ii)		1/2 + 1/2
(iii)	$CH_3-\underset{CH_3}{\overset{CH_3}{C}}-Br + CH_3CH_2-OH$	1/2 + 1/2

Q.No..	Expected Answer/ Value Points	No. of Marks
(b)(i)		1
		1
(ii)	$CH_3CH=CH_2 \xrightarrow[THF]{BH_3} (CH_3CH_2CH_2)_3B \xrightarrow[H_2O]{OH^-,} CH_3CH_2CH_2OH + H_3BO_3$	
	Or	
(a)	A = CH_3OH	1
	B = CH_3Cl	1
	C = CH_3MgCl	1
	$CH_3OH + PCl_5 \rightarrow CH_3Cl + POCl_3$	
	$CH_3Cl + Mg \rightarrow CH_3MgCl$	
	$CH_3MgCl + CH_3-\underset{\underset{O}{\|}}{C}-H \rightarrow CH_3CH(OMgCl)-CH_3 \xrightarrow{H_2O,\ H^+} CH_3CH(OH)CH_3$	

(b)(i)	1-Phenylethanol will react with NaOH + I_2 to give pale yellow crystals of iodoform whereas 2-Phenylethanol will not react Or any other suitable test	1
(ii)	Phenol will give violet colouration with $FeCl_3$ solution while Methanol does not. Or any other suitable test	1