

SET	A/B/C
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**INDIAN SCHOOL MUSCAT
FINAL EXAMINATION 2022
CHEMISTRY[043]**

CLASS: XII

Max.Marks: 70

MARKING SCHEME			
SET	QN.NO	VALUE POINTS	MARKS SPLIT UP
A	1	d	1
	2	c	1
	3	d	1
	4	c	1
	5	a	1
	6	b	1
	7	b	1
	8	c	1
	9	d	1
	10	a	1
	11	a	1
	12	d	1
	13	b	1
	14	a	1
	15	A	1
	16	C	1
	17	B	1

	18	E	1
	19	Correct Mechanism	2
	20	i) sp ² C, partial double bond character due to resonance, instability of phenyl carbocation, any two – 2 x ½ ii) symmetry, fits into crystal lattice	1 each
	21	i) Butanone + equation ii) propanal + equation OR a) iodoform test b) Fehlings test –Reagent, observation and inference	1 each
	22	i) Correct reaction ii) Correct structure	1 each
	23	Molar conductivity = $1.06 \times 10^{-2} \times 1000 / 0.1 = 106 \text{ S cm}^2 \text{ mol}^{-1}$ Degree of dissociation = $106 / 126.6 = 0.83$ OR $w = 63.5 \times 0.128 \times 50 \times 60 / 2 \times 96500 = 0.1263\text{g}$	1 1 1+1
	24	i) Aryl halides do not undergo nucleophilic substitution due to partial double character ii) HBF ₄ , followed by heating	1 each
	25	(i) $8\text{MnO}_4^- + 3\text{S}_2\text{O}_3^{2-} + \text{H}_2\text{O} \rightarrow 8\text{MnO}_2 + 6\text{SO}_4^{2-} + 2\text{OH}^-$ (ii) $\text{Cr}_2\text{O}_7^{2-} + 14\text{H}^+ + 6\text{Fe}^{2+} \rightarrow 2\text{Cr}^{3+} + 6\text{Fe}^{3+} + 7\text{H}_2\text{O}$	1 each
	26	i) sodium phenoxide and chloromethane + equation ii) due to + R effect/ E ⁺ finds it easy to attack e rich phenol than benzene	1 each
	27	i) phosphodiester linkages ii) one difference each OR i) definition anomers ii) one difference iii) primary structure intact, secondary and tertiary structure ruptured.	1 each
	28	i) HBr/peroxide followed by KI in dry acetone ii) AgF/Hg ₂ F ₂ /CoF ₂ , heat iii) Cl ₂ , anhydrous FeCl ₃ followed by Fittig reaction	1 each
	29	T _f =iK _f m $273 - 272.715 = 2.2 \times 1.86 \times 0.1 \times 1000 / M_b \times 21.7$ M _b =66 g/mol OR $n_{\text{pentane}} = 252 / 72 = 3.5$ $n_{\text{heptane}} = 1400 / 100 = 14$ $X_{\text{pentane}} = 0.2$ $X_{\text{heptane}} = 0.8$ $p_T = p_{\text{pentane}} + p_{\text{heptane}} = (420 \times 0.2 + 36 \times 0.8) = 112.8 \text{ mm}$	1 1 1 ½ ½ ½ ½ ½ 1
	30	i) Definition of colligative property ii) $T_b - 373 = 3 \times 0.52 \times 13.44 \times 1000 / 134.4 \times 1000 = 373.156 \text{ K}$	1 2

	31	i) A, due to lower reduction potential ii) Reaction occurs in the opposite direction (or) cell becomes electrolytic cell iii) $A(s) A^{2+}(aq)\parallel D^+(aq) D(s), E^\circ_{cell} = 3.17\text{ V}$ OR $\Delta G = -nF E^\circ_{cell}$ $= -2 \times 96500 \times 2.71$ $= -5.23 \times 110^5 \text{ J/mol}$	1 1 2 2
	32	i) A ii) Benzyl alcohol and Sodium benzoate iii) Cinnamaldehyde + reaction OR $X = (\text{CH}_3)_3\text{CCH(OH)CH}_2\text{CHO}$ $Y = (\text{CH}_3)_3\text{CCH=CHCHO}$	1 1 2 2
	33	i) Anode and cathode reactions in mercury cell – 2 marks (ii) Correct Nernst equation and substitution – $\frac{1}{2} + \frac{1}{2}$ $E_{cell} = 1.81 + 0.059/6 \log 10^{10} = 1.9\text{ V}$ – 2 marks OR i) Equations involved in rusting of iron – 2 marks (ii) Correct Nernst equation and substitution – $\frac{1}{2} + \frac{1}{2}$ $E_{cell} = 1.33 + 0.059/6 \log 2.5 \times 10^{-56} = 0.783\text{ V}$ – 2 marks	2 3 2 3
	34	i) Due to very high fourth ionisation enthalpy ii) Due to d-d transition or any other correct explanation iii) No unpaired electrons in d-orbital hence weak metallic bond iv) $2\text{KMnO}_4 \rightarrow \text{K}_2\text{MnO}_4 + \text{MnO}_2 + \text{O}_2$ v) Definition of Lanthanoid contraction OR A-manganese dioxide, MnO_2 B- potassium manganite, K_2MnO_4 C-potassium permanganate, KMnO_4 Identification – 2 Correct equations - 2 Lab preparation $2\text{Mn}^{2+} + 5\text{S}_2\text{O}_8^{2-} + 8\text{H}_2\text{O} \rightarrow 2\text{MnO}_4^- + 10\text{SO}_4^{2-} + 16\text{H}^+$ - 1	1 each
	35	i) a) Nitration followed by reduction b) $\text{H}_2\text{O}/\text{H}^+$ followed by Br_2/NaOH c) $\text{C}_6\text{H}_5\text{COCl}/\text{base}$ ii) a) Due to electron withdrawing nature of aryl group, aniline has lower K_b . b) Aniline, N-methylmethanamine, methanamine -	1 each
B	9	c	1
	11	d	1
	12	a	1
	14	c	1

	19	Correct mechanism	2
	22	i) Gattermann Koch reaction – example ii) Correct structure of hydrazone of propanone	1 1
	24	i) Azo dye test ii) ethanol (or) H_3PO_2	1 each
	25	$2\text{MnO}_4^- + \text{H}_2\text{O} + \text{I}^- \rightarrow 2\text{MnO}_2 + 2\text{OH}^- + \text{IO}_3^-$ $\text{Cr}_2\text{O}_7^{2-} + 3\text{H}_2\text{S} + 8\text{H}^+ \rightarrow 2\text{Cr}^{3+} + 3\text{S} + 7\text{H}_2\text{O}$	1 each
	34	(iv) Chromate becomes dichromate – equation - 1	
C	1	c	1
	9	a	1
	11	a	1
	14	a	1
	22	(i) HVZ reaction - Example (ii) Structure of semicarbazone of propanone	1 1