

INDIAN SCHOOL MUSCAT

SECOND PRE-BOARD EXAMINATION
CLASS - XII
FEBRUARY 2020

SET A

Q.NO.	Answers	Marks
1.	$\text{MnO}_2 + 4\text{HCl} \rightarrow \text{MnCl}_2 + \text{Cl}_2 + 2\text{H}_2\text{O}$	1
2.	$\text{XeOF}_4 / \text{XeO}_2\text{F}_2$	1
3.	XeF_4	1
4.	$2\text{Fe}^{3+} + \text{SO}_2 + 2\text{H}_2\text{O} \rightarrow 2\text{Fe}^{2+} + \text{SO}_4^{2-} + 4\text{H}^+$	1
5.	Square pyramidal, Bp=5,lp=1	1
6.	Overpotential	1
7.	$x / m = kp^{1/n}$	1
8.	Anomers	1
9.	$\text{C}_6\text{H}_5\text{CHO} \& \text{CH}_3\text{CHO}$	1
10.	Dysidazirine	1
11.	b	1
12.	a	1
13.	c	1
14.	c	1
15.	b	1
16.	B	1
17.	A	1
18.	B	1
19.	A	1
20.	A	1
21.	$W = \frac{\text{RAM} \times I \times t}{nF}$ $I = 2.68 \text{ A}$	1+1
22.	$E_{\text{cell}}^\circ = \frac{0.059}{2} \log 10$ $E_{\text{cell}}^\circ = 0.0295 \text{ V}$	1+1
23.	a) Tetraamminechloridonitrito-N-cobalt (III)chloride b) $\text{K}_2[\text{Ni}(\text{Cl})_4]$	1+1
24.	a) Toluene b) The presence of nitro group at o-and p-positions withdraws electrons from the benzene ring and thus, facilitates the attack of the nucleophile on haloarenes	1+1
25.	a) gas (B) being less soluble, would have a higher K_H value. b) Anoxia	1+1
26.	a) To remove FeS b) Cu 25-30%, Zn 25-30%, Ni 40-50%. OR $\text{Al}_2\text{O}_3 + 2\text{NaOH} + 3\text{H}_2\text{O} \rightarrow 2\text{Na}[\text{Al}(\text{OH})_4]$ The aluminate in solution is neutralised by passing CO ₂ gas and seeded with	1+1 1

	<p>freshly prepared samples of Al₂O₃ which induces the precipitation of Al₂O₃.</p> $2\text{Na}[\text{Al(OH)}_4] + \text{CO}_2 + x\text{H}_2\text{O} \rightarrow \text{Al}_2\text{O}_3 \cdot x\text{H}_2\text{O} + 2\text{NaHCO}_3$ $\text{Al}_2\text{O}_3 \cdot x\text{H}_2\text{O} \text{ (1470 K)} \rightarrow \text{Al}_2\text{O}_3 + x\text{H}_2\text{O}$	1
27.	<p>c) Metal hydroxides are not soluble but hydrogen carbonate is very much soluble and its excess can make the stomach alkaline and it can produce even more acid inside the stomach</p> <p>d) Aspartame is unstable at temperatures</p> <p style="text-align: center;">OR</p> <p>Drugs compete with the natural substrate for their attachment on the active sites of enzymes</p> <p>drugs binding at the allosteric site changes the shape of the active site in such a way that substrate cannot recognise it</p>	1 1
28.	<p>a) Ethanol, water ,Phenol, p-nitro phenol</p>	1 2
29.	<p>a) Dialysis</p> <p>b) Electrophoresis</p> <p>c) Zeta potential</p>	1x3
30.	$p_{\text{total}} = p_A^0 \chi_A + p_B^0 \chi_B$ $600 = 450(\chi_A) + 700(1-\chi_A)$ $\chi_A = 0.4$ $\chi_B = 0.6$ $y_A = p_A^0 \chi_A / P_{\text{total}}$ $= 0.4 \times 450 / 600 = 0.3$ $y_B = 0.7$ <p style="text-align: center;">OR</p> $= K_f \times m$ $M_B = \frac{K_f}{\Delta T_f} \times \frac{w_B}{w_A} \times 1000$ $M_{AB2} = 110.87 \text{ g/mol}$ $M_{AB4} = 196.15 \text{ g/mol}$ $A + 2B = 110.87$ $A + 4B = 196.15$ $A = 25.59$ $B = 42.64$	1 1 1 1 1 1 1 1 1
31.	<p>a) Treat with Ammonia followed by Hofmanns bromamide reaction</p> <p>b) Br₂ in acetic acid followed by hydrolysis</p> <p>c) Diazotization followed by reaction with water</p>	1+1+1
32.	<p>a. Ni(CN)₄²⁻-square planar ,dsp2,diamagnetic</p> <p>b. [Co(NH₃)₃Cl₃]-Mer and Fac isomers</p>	1+1 $\frac{1}{2}+\frac{1}{2}$

33.	<p>a) Homopolymer b) (i) Novolac is linear but Bakelite is cross linked (ii) Buna S is formed by addition polymerization ,Terylene is formed by condensation polymerization</p> <p style="text-align: center;">OR</p> <p>a) Monomers should possess more than one functional group. b) Glycol & Terephthalic acid c)</p> $\begin{array}{c} \text{OH} \\ \\ \text{CH}_3-\text{CH}-\text{CH}_2-\text{COOH} \end{array} + \begin{array}{c} \text{OH} \\ \\ \text{CH}_3-\text{CH}_2-\text{CH}-\text{CH}_2-\text{COOH} \end{array}$	1 1 1 1 1
34.	<p>a) Globular protein – Insulin Fibrous protein – Keratin</p> <p>b) α-D Glucose & β-D-fructose,Sucrose is not a reducing sugar because reducing groups of glucose and fructose are involved in glycosidic bond formation</p>	1x3
35.	<p>A : KMnO_4 B : K_2MnO_4 C : MnO_2 D : MnCl_2</p> $\text{KMnO}_4 \xrightarrow{\Delta} \text{K}_2\text{MnO}_4 + \text{MnO}_2 + \text{O}_2$ <p>(A) (B)</p> $\text{MnO}_2 + \text{KOH} + \text{KNO}_3 \rightarrow \text{K}_2\text{MnO}_4$ <p>(C) (B)</p> $\text{MnO}_2 + \text{NaCl} + \text{conc. H}_2\text{SO}_4 \rightarrow \text{MnCl}_2$ <p>(C) (D)</p> <p style="text-align: center;">OR</p> <p>a)</p> <p>(i) The chromates and dichromates are interconvertible in aqueous solution depending upon pH of the solution.</p> <p>(ii) Lanthanoid contraction</p> <p>b)</p> <p>(i) Cr^{3+} half filled t_{2g} (ii) Mn^{3+} Mn^{2+} has d^5 config which is more stable (iii) Ti^{4+}-no d-d transition</p>	1 1 1 1 1

36.	<p>a) It is due to improper orientation (i) Zero order (ii) Derive $t = \frac{[R]_0 - [R]}{k}$, on completion of reaction $[R] = 0$ $t = \frac{[R]_0}{k}$ (iii) Slope = $-k$</p> <p style="text-align: center;">OR</p> <p>(1) $\text{H}_2\text{O}_2 + \text{I}^- \rightarrow \text{H}_2\text{O} + \text{IO}^-$ a) (2) $\text{H}_2\text{O}_2 + \text{IO}^- \rightarrow \text{H}_2\text{O} + \text{I}^- + \text{O}_2$ (fast) b) When $t = 100$ s, $t = 3 \times 60 \text{ min} = 180 \text{ min}$ $[R]_0 = 0.1 \text{ M}$</p> <p>Substituting these values in the equation</p> $t = \frac{2.303}{k} \log \frac{[R]_0}{[R]}$ <p>We get, $180 \text{ min} = \frac{2.303}{5.1 \times 10^{-3} \text{ min}^{-1}} \log \frac{0.1}{[R]}$</p> $\log \frac{0.1}{[R]} = \frac{180 \text{ min} \times 5.1 \times 10^{-3} \text{ min}^{-1}}{2.303} = 0.398$ $\frac{0.1}{[R]} = \text{Antilog } 0.398 = 2.50$ $[R] = 0.1/2.5 = 0.04 \text{ M}$	2 1 1 1 2 1 1 1 1
37.	<p>a)</p> <ul style="list-style-type: none"> (i) Stephen reaction (ii) Hell-Volhard-Zelinsky reaction (iii) Decarboxylation <p>b) 3-Bromophenylethanoic acid</p> <p>c) C₆H₅CH₂CH₃ is formed</p> <p style="text-align: center;">OR</p> <p>a) CH₃OH, HCOONa b) Hex-2-en-4-yneoic acid correct structure c)</p> <ul style="list-style-type: none"> (i) C₆H₅COCl (ii) CH₃COOH (iii) CHI₃+(CH₃)₃CCOONa 	1x5 1x5