

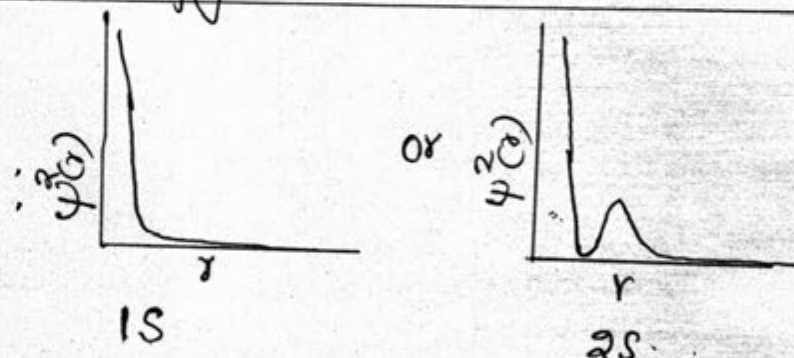
FIRST YEAR HIGHER SECONDARY EXAMINATION MARCH 2018

SUBJECT: CHEMISTRY

CODE. NO: 116

Qn No	Sub Qns	Answer Key/Value Points	Score	Total
1.		Classical smog/Reducing smog/London smog	1	1
2.		Square Planar or diagram	1	1
3.		a) Cl_2O_7	1	1
4.		3 or 1	1	1
5.		Graphite	1	1
6.		O_2	1	1
7.		$30 \times N_A$ or $30 \times 6.022 \times 10^{23}$ or $5 \times 6 \times N_A$ or 30 moles	1	1
8.		sp^3 hybridisation Angular / Bent / V shape or diagram or correct explanation with structure definition of hybridisation Electronic configuration of oxygen	1 1 2 1 1	2
9.	a) b)	3-Ethyl-1,1-dimethylcyclohexane 3-Bromo-3-chloroheptane	2 2	2
10.		Dry cleaning of clothes / bleaching of Paper/ Synthesis of chemical/reduction of byproducts/maximum yield or any correct application Definition of green chemistry	2 1	2
11.		Low Temp. favours forward reaction High Pressure favours forward reaction or correct explanation based on colour or backward reaction	1 1 2	2

(1/6)

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
12.		Layer Structure / diagram $H_3BO_3 / B(OH)_3$ Lewis acid / does not release H^+ accepts electron pair from $\bar{O}H$ / accepts $\bar{O}H$ ion	2 1 2	2
13.		Molecular Formula = $n \times$ Empirical Formula Calculation of $n = 6$ Molecular Formula = C_6H_6	1 1 2	2
14.	a) b)	Measure of degree of disorder/ randomness of a system a) Entropy decreases b) Entropy increases	1 1 1	2
15.			2	2
16.		$PV = nRT$ $PV = \frac{w}{M} RT$ $M = \frac{w RT}{V P}$ $M = \frac{d RT}{P}$	1 1 1 1	2

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
17.		Definition or equation or any correct example.	2	2
18.		Definition of buffer solution Correct example of acidic buffer or blood Example of buffer	2 2 1	2
19.		Yes / Aromatic Huckel rule / $(4n+2)$ π electron / delocalisation of π electron	1 1	2
20.		$6C_{(s)} + 3H_{2(g)} \rightarrow C_6H_6(l); \Delta_f H^\circ = +49 \text{ kJ/mol}$ Equation without physical state	2 1	2
21.	a) b) c)	a) Stable configuration / Octet of electron / noble gas / correct explanation b) Small size of F / high interelectronic repulsion in F / correct explanation c) For isoelectronic species, size of ion decreases with increase in nuclear charge / atomic number or Cation has a smaller size than anion	2 2 2	3
22.		X \rightarrow $CH_3-CH=CH_2$ / Propene Y \rightarrow $CH_3-CH \begin{array}{l} \diagup O \diagdown \\ \diagdown O \diagup \end{array} CH_2$ / ozonide Z \rightarrow CH_3CHO / Ethanol / Acetaldehyde	$1\frac{1}{2}$ $1\frac{1}{2}$ $1\frac{1}{2}$	3

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
23.		$\text{Molarity} = \frac{\text{no. of moles of solute} \times 1000}{\text{Vol. of solution in ml}}$ or any correct Equation correct substitution 3.15 g only Molecular mass of oxalic acid = 126	1/2 1/2 1 1	3
24.		Assigning oxidation number to all atoms decreases by 2 OR $\overset{+6}{\text{Cr}}_2\text{O}_7^{2-} + \overset{+4}{\text{S}}\text{O}_3^{2-} \rightarrow \overset{+3}{\text{Cr}} + \overset{+6}{\text{S}}\text{O}_4^{2-}$ increases by 6 OR $\text{Cr}_2\text{O}_7^{2-} + 6e^- \rightarrow 2\text{Cr}^{3+}$ $\text{SO}_3^{2-} \rightarrow \text{SO}_4^{2-} + 2e^-$ $\text{Cr}_2\text{O}_7^{2-} + 3\text{SO}_3^{2-} + 8\text{H}^+ \rightarrow 2\text{Cr}^{3+} + 3\text{SO}_4^{2-} + 4\text{H}_2\text{O}$	1/2 2 1 1 1/2	3
25.		Any one correct method of Preparation/ Equation Explanation of structure of diborane/ Diagram	1 2	3
26.		Extent of reaction or direction of reaction $K_c > 10^3$, reaction proceeds to completion	1/2	

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
		$K_c < 10^{-3}$, reaction proceeds <i>rarely</i> $Q_c > K_c$, backward reaction $Q_c < K_c$, forward reaction $Q_c = K_c$, no net-reaction occurs <i>or</i> at equilibrium	$1\frac{1}{2}$ $1\frac{1}{2}$ $1\frac{1}{2}$ $1\frac{1}{2}$	3
27.	a) b)	H_2O_2 decomposes in the presence of light/alkali content in glass/ to prevent decomposition wastage of soap/skum or ppt formation or no lather with soap/correct eqn.	2 1	3
28.		no. of moles of $N_2 = \frac{3.5}{28} = 0.125$ <i>or</i> no. of moles of $O_2 = \frac{16}{32} = 0.5$ $\therefore P_{N_2} = \frac{n_{N_2} RT}{V} = \frac{0.125 \times 0.083 \times 300}{2}$ <i>or</i> $= 1.56$ $P_{O_2} = \frac{n_{O_2} RT}{V} = \frac{0.5 \times 0.083 \times 300}{2}$ $= 6.22$ Total pressure = $P_{N_2} + P_{O_2} = 1.56 + 6.22$ $= 7.78$ <i>or</i> Total pressure = $\frac{(n_{N_2} + n_{O_2}) RT}{V}$ $= \frac{(0.125 + 0.5) \times 0.083 \times 300}{2}$ $= 7.78$	1 1 1 1 1 1 1 1	3

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
29.		$\Delta H = \Delta U + \Delta n_g RT$ $\Delta H = -7.42 \times 10^3 + (-0.5) \times 8.314 \times 298$ $\Delta H = -743938 \text{ J/mol or}$ -743.938 kJ/mol Calculation of $\Delta n = -0.5$	1 1 1 1	3
30.		M.O. configuration of N_2 / diagram M.O. Configuration / diagram of O_2 Equation of Bond Order B.O of N_2 B.O of O_2 N_2 is stable than O_2 N_2 is diamagnetic O_2 is paramagnetic	1 1 1 1 1 1 1	4
31.		Description of any three techniques Example of any one technique	3 1	4
32.		Any two postulates of Bohr model Two merits Two demerits/limitation	2 2 2	4
33.	a) b) c) d)	Due to ammoniated electron/solvated e^- Similar size or similar electronegativity of Li and Mg / Diagonal relationship Formation of NaOH / it is a salt of strong base and weak acid $\Delta_{hyd} H > \Delta_{lattice} H$ or explanation	2 2 2 2	4

chemistry - I yr

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