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ANSWER KEY

IMPROVEMENT

FIRST YEAR HIGHER SECONDARY EXAMINATION OCTOBER 2022

PART-I/H/III

SUBJECT: CHEMISTRY

CODE NO: FY 825

VERSION: _____

60 SCORES2 HOURS

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
1		Any two salient features of Rutherford's nuclear model of atom	1+1	2
2		Statement of Pauli's exclusion principle Statement of Hund's rule of maximum multiplicity	1 1	2
3		<u>O₂</u> B.O. = $\frac{1}{2} [N_b - N_a] = \frac{10 - 6}{2} = 2$ <u>O₂²⁻</u> B.O. = $\frac{1}{2} [N_b - N_a] = \frac{10 - 8}{2} = 1$ [For M.O. configurations of O ₂ & O ₂ ²⁻ ½ score each. For B.O. = $\frac{1}{2} [N_b - N_a] \rightarrow \frac{1}{2}$ score only]	1 1	2
4		Any two postulates	1+1	2
5	(i)	Cu(II)O Mn(IV)O ₂	½ ½	2
	(ii)	Oxidation number of Cr = +6	1	

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
6	(i)	CO and H ₂ or (b)	1	2
	(ii)	Any two electron rich covalent hydrides	½+½	
7		Correct reason or equation $M + (x+y) NH_3 \rightarrow [M(NH_3)_x]^+ + [e(NH_3)_y]^-$	2	2
8		Borax bead is formed / correct explanation / correct equation	2	2
9	(i)	5-Methylhexan-3-ol	1	2
	(ii)	Hex-3-en-1-oic acid	1	
10		Any one difference b/w electrophiles and nucleophiles One example each for electrophiles and nucleophiles	1 ½+½	2
11		Any two differences b/w classical Sonog and photochemical Sonog	1+1	2
12		Calculation of simplest ratio/ empirical formula - CH ₂ O Molecular formula = Empirical formula × n $n = 90/30 = 3$ Molecular formula = (CH ₂ O) × 3 = C ₃ H ₆ O ₃	1 ½ ½ 1	3

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
13	(i)	Statement of Law of Multiple proportions (Name of the law only \rightarrow $\frac{1}{2}$ score)	2	3
	(ii)	for correct definition	1	
14	(i)	Statement of Modern periodic law	1	3
	(ii)	Fluorine / F	1	
	(iii)	F^- or (a) / O^{2-} or (c)	1	
15	(i)	Correct reason	$\frac{1}{2}$	3
	(ii)	Correct reason	$\frac{1}{2}$	
16	(i)	Statement of Dalton's Law of Partial pressures / $P_{Total} = P_1 + P_2 + P_3 + \dots$ (at constant T, V)	1	3
	(ii)	$P_1 V_1 = P_2 V_2$	$\frac{1}{2}$	
		$P_2 = \frac{P_1 V_1}{V_2} = \frac{1.2 \text{ bar} \times 120 \text{ mL}}{180 \text{ mL}}$ $= 0.8 \text{ bar}$	$\frac{1}{2}$	
17	(i)	Definitions of Boyle point	1	3
	(ii)	for writing 2 wrong assumptions in kinetic theory of gases	1+1	

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
18.	(i)	Temperature or (e)	1	3
	(ii)	Definition of entropy entropy decreases	1 1	
19	(i)	$K_p = K_c (RT)$ [For $K_p = K_c (RT)^{\Delta n}$ 1/2 score]	1	3
	(ii)	Definition of buffer solution Correct example for basic buffer	1 1	
20		$\overset{+7}{\text{Mn}}\overset{-2}{\text{O}_4}^- + \overset{+2}{\text{Fe}}^{2+} \longrightarrow \overset{+2}{\text{Mn}}^{2+} + \overset{+3}{\text{Fe}}^{3+}$ $\text{Fe}^{2+} \longrightarrow \text{Fe}^{3+} + 1e^-$ $\text{MnO}_4^- + 5e^- \longrightarrow \text{Mn}^{2+}$ $\text{MnO}_4^- + 5e^- \longrightarrow \text{Mn}^{2+} + 4\text{H}_2\text{O}$ $5\text{Fe}^{2+} \longrightarrow 5\text{Fe}^{3+} + 5e^-$ $5\text{Fe}^{2+} + \text{MnO}_4^- + 8\text{H}^+ \longrightarrow \text{Mn}^{2+} + 5\text{Fe}^{3+} + 4\text{H}_2\text{O}$ <p>[For correct balanced equation only → 1 score]</p>	1/2 1/2 1/2 1/2 1/2	3
21.	(i)	Correct reason	1	3
	(ii)	For explanation of any one method or equation	2	

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
22		Correct diagrams of each conformer Staggered Conformation is more stable	1+1 1	3
23	(i) (ii)	Any one harmful effect Correct explanation of green house effect	1 2	3
24	(i) (ii)	Correct statement Correct mathematical expression 2p 3d	1 1 1 1	4
25	(i) (ii)	correct explanation of hydrogen bonding Correct example for hydrogen bonding sp^2 hybridisation structure of BF_3	1 1 1 1	4
26	(i) (ii)	Statement Required equation equation (a) x 2 equation (b) x 3	1 1 1 1	4

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Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
27	(i)	Explanation of common ion effect correct example	1 1	4
	(ii)	$pH = -\log [H^+]$ $pH = -\log [3 \times 10^{-3}] /$	$\frac{1}{2}$	
		$= 2.522$	$1\frac{1}{2}$	
28	(i)	Any two similarities	1+1	4
	(ii)	I \rightarrow e II \rightarrow d III \rightarrow b IV \rightarrow a	$(4 \times \frac{1}{2})$ $= 2$	
29	(i)	Explanation / structure of diborane	2	4
	(ii)	for correct distinction b/w silicones and silicates	2	
30	(i)	Detection of any one halogen	2	4
	(ii)	Any two types of structural isomers Example for each isomer	$\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$	
31	(i)	(a) CH_3-CH_3 or ethane (b) CH_4 or methane	1 1	4
	(ii)	Cold dilute aqueous solution of $KMnO_4$ Correct chemical equation	1 1	

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Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
		Shibu.K.R. 9447221515		
		Hari. B 9745301712		
		Manoj. A 9447248689		
		Uthilarishman. N 9497610081		
		ANIL. D 9447585458		
		SREEJA. CP 8547060481		
		YASMINI. A 9446290371		
		Sebena Bastin A 9846655323		
		ANAND. N. SATHYASEELAN 9447591178		