

DEPARTMENT OF GOVERNMENT EXAMINATIONS, CHENNAI-6
HIGHER SECONDARY FIRST YEAR MAY-2022
CHEMISTRY ANSWER KEY

Note :

1. Answer written with Blue or Black Ink only to be evaluated.
2. Choose the most suitable answer in **PART- I** from the given alternatives and write the option code and the corresponding answer.

PART- I

TOTAL MARKS-70_Answer All

the Questions

15×1=15

Type -A			Type -B		
Q. No	Option	Answer	Q. No	Option	Answer
1	(c)	C_8H_{18}	1	(a)	$1P + 2n$
2	(b)	$-2^\circ C$	2	(c)	(1)-(iv), 2-(iii),3-(i),4-(ii)
3	(a)	$-C(CH_3)_3 > -CH(CH_3)_2 > -CH_2CH_3 > -CH_3$	3	(b)	NO
4	(b)	NO	4	(c)	$\frac{mass}{volume}$
5	(d)	Both assertion and reason are true but reason is not the correct explanation of assertion.	5	(c)	C_8H_{18}
6	(c)	$\frac{mass}{volume}$	6	(a)	Lithium
7	(b)	for a system at equilibrium Q is always less than the equilibrium constant.	7	(a)	$-C(CH_3)_3 > -CH(CH_3)_2 > -CH_2CH_3 > -CH_3$
8	(c)	(1)-(iv), 2-(iii),3-(i),4-(ii)	8	(c)	stark effect
9	(a)	Lithium	9	(b)	for a system at equilibrium Q is always less than the equilibrium constant
10	(b)	$MgCl_2$	10	(d)	tautomers
11	(a)	$1P + 2n$	10	(b)	Resonating structures
12	(a)	O_2^{2-}	11	(b)	$MgCl_2$
13	(c)	stark effect	12	(b)	$-2^\circ C$
14	(d)	near the hydrogen Chloride Bottle	13	(a)	O_2^{2-}
15	(d)	tautomers	14	(d)	Both assertion and reason are true but reason is not the correct explanation of assertion.
	(b)	Resonating structures	15	(d)	near the hydrogen Chloride Bottle

PART - II

Note: Answer any six questions. Question No.24 is compulsory 6×2=12

16	Gram equivalent mass Correct definition (or) Gram equivalent mass = $\frac{\text{molar mass}}{\text{Equivalence factor}}$	2
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17	8 $2n^2$	1	2
18	Covalent hydrides (i) electron precise (ii) electron deficient (iii) electron rich hydrides (or) any two correct (or) any one correct	1½ 1	2
19	Conditions for the Spontaneity $\Delta H < 0$ $\Delta S > 0$ $\Delta G < 0$ (or) $\Delta H = -ve$ $\Delta S = +ve$ $\Delta G = -ve$ (or) Explanation any two condition correct (or) any one condition correct	1½ 1	2
20	Sign convention of heat Surrounding $\xrightarrow{\text{heat}}$ System $q = +ve$ (or) Heat absorption System $\xrightarrow{\text{heat}}$ Surrounding $q = -ve$ (or) Heat Emission (or) any correct explanation	1 1	2
21	$4NO + 6 H_2O \rightleftharpoons 4 NH_3 + 5 O_2$		2
22	Correct definition		2
23	$CH_3CH_2Cl \xrightarrow[\text{[H]}]{Zn/HCl \text{ (or) } Ni/Pd} CH_3-CH_3$ (or) Explanation (or) Reduction	1	2
24	$C_6H_5Cl + 2 NH_3 \xrightarrow[50 \text{ atm}]{250^\circ C} C_6H_5NH_2 + NH_4Cl$ $C_6H_5Cl + 2 Na + C_6H_5Cl \xrightarrow[\Delta]{\text{ether}} C_6H_5-C_6H_5 + 2 NaCl$ (or) Aniline and Biphenyl - name (or) structure (or) formula	1 1	2

PART - III

Note : Answer any six Questions Q.No. 33 is Compulsory

6×3=18

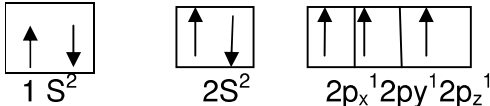
25(i)	<u>C</u> O ₂ $x - 4 = 0$			
		$x = + 4$	C = +4 (or) 4	1½
(ii)	H ₂ <u>S</u> O ₄ $2 + x - 8 = 0$			
		$x = + 6$	S = +6 (or) 6	1½
	Substitution only			1+1
26	Electron affinity Correct definition (or) $A + 1e^- \longrightarrow A^- + EA$ (or) atom + electron \longrightarrow Negative ion + Electron affinity			3
27	Dalton's law of partial pressure Correct definition (or) $P_{\text{total}} = p_1 + p_2 + p_3 + \dots$			3

28	$\frac{\Delta P}{P_A^0} = \frac{W_B \times M_A}{W_A \times M_B} \quad (\text{or}) \quad M_B = \frac{P_A^0 W_B \times M_A}{\Delta P \times W_A}$		3
29	HF- molecule formation H - electronic configuration $1s^1$ F - electronic configuration $1s^2 2s^2 2p^5$ σ - bond formation or sp overlapping (or) orbital overlapping diagram	1 1 1 3	3
30	Optical isomerism Correct definition		3
31	Nucleophile, electrophile difference Any Three differences		3
32	$\text{CH}_2 = \text{CH}_2 + \text{H}_2\text{O} \xrightarrow[\text{(O)}]{\text{Cold dil alkaline KMnO}_4} \begin{array}{c} \text{CH}_2-\text{CH}_2 \\ \quad \\ \text{OH} \quad \text{OH} \end{array}$ (or) mentioning the Correct colour change explanation only (or) ethylene glycol (or) formula		3 2
33	$K_c = \frac{[\text{NH}_3]^2}{[\text{N}_2] [\text{H}_2]^3} \quad (\text{or}) \quad \text{N}_2 + 3\text{H}_2 \xrightleftharpoons{2\text{NH}_3}$ $K_c = \frac{1.8 \times 10^{-2} \times 1.8 \times 10^{-2}}{1.2 \times 10^{-2} \times (3 \times 10^{-2})^3}$ $K_c = 1 \times 10^3 \text{ L}^2 \text{ mol}^{-2}$	1 1 $\frac{1}{2} + \frac{1}{2}$	3

PART-IV

Note : Answer all the Questions

5×5=25

34 (a)	16	2	
(i)	N- Electronic configuration $1s^2 2s^2 2p^3$ Orbital diagram for Nitrogen	1	
(ii)		2	5
(b)	Pauling method for the determination of ionic radius $d = r_{c+} + r_{A-}$ (or) Explanation $r_{c+} \propto \frac{1}{Z(\text{eff}) C^+}$ $r_{A-} \propto \frac{1}{Z(\text{eff}) A^-}$ $Z(\text{eff}) = Z - S$ $\frac{r_{C^+}}{r_{A^-}} = \frac{Z(\text{eff}) A^-}{Z(\text{eff}) C^+}$ On solving the above equation's value of r_{c+} and r_{A-} can be obtained	1 1 1 $\frac{1}{2}$ 1 $\frac{1}{2}$	5
35 (i)	Any two reasons for Anamolous behaviours of Beryllium	2×1	
(a)	(ii) Any three Properties of Beryllium which are different from other elements	3×1	5

(b)	Characteristics of internal energy any Five (i.e) extensive property, state function, $\Delta U = U_f - U_i$ $\Delta U_{\text{cyclic}} = 0$, $\Delta U = U_f - U_i = -ve$, $\Delta U = U_f - U_i = +ve$ (any five)		5
36 (a)	$m = \frac{\text{Number of moles of solute} \times 1000}{\text{Weight of solvent in grams}}$ Number of moles of solute = $\frac{W_B}{M_B}$ $m = \frac{W_B \times 1000}{M_B \times W_A}$ $\Delta T_b = \frac{K_b \times W_B \times 1000}{M_B \times W_A}$ (OR) $\Delta T_b \propto m$ (or) $\Delta T_b = K_b m$ $M_B = \frac{K_b \times W_B \times 1000}{\Delta T_b \times W_A}$	1 1 1 1	5
(b)	Bond Length Bond Angle Bond Enthalpy	2 1 2	5
37 (a)	(i) $X_A - X_B = 1.7$ 50% ionic Character (ii) $X_A - X_B > 1.7$ more than 50% ionic Character (iii) $X_A - X_B < 1.7$ less than 50% ionic Character	1 2 2	5
(b)	(i) 2 - bromo - 3 - methyl butane (ii) methoxymethane (iii) 2 - hydroxybutanal (iv) 1,3 - butadiene (or) Buta 1,3 - diene (v) 4- Chloropent - 2 yne (or) 4 - chloro 2 pentyne	5x1	5
38 (a)	(i) $C_6H_6 \xrightarrow[330K]{\text{con } HNO_3, \text{ con } H_2SO_4} C_6H_5 - NO_2 + H_2O$ explanation only	2 1	5
(ii)	$C_6H_6 \xrightarrow{\text{con } H_2SO_4} C_6H_5 - SO_3H + H_2O$ explanation only	2 1	
(iii)	$C_6H_6 + 3Cl_2 \xrightarrow{uv} C_6H_6 - Cl_6$ explanation only	1 $\frac{1}{2}$	
(b)	$CH_2 = CH_2 + HCl \longrightarrow CH_3CH_2Cl$ (A) (B) $CH_3CH_2Cl + NH_3 \longrightarrow CH_3CH_2NH_2 + HCl$ (B) (C) A -- $CH_2 = CH_2$ (or) ethylene B -- CH_3CH_2Cl (or) ethyl chloride C -- $CH_3CH_2NH_2$ (or) ethylamine (or) common name (or) IUPAC name (or) formula only	1 1 1 1 1 3	5