



DEPARTMENT OF GOVERNMENT EXAMINATIONS – CHENNAI.6
HSC FIRST YEAR EXAMINATION MARCH/APRIL - 2023
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**Maximum Marks : 70****Answer all the questions****15×1=15**

Type – A			Type - B		
Q. No	Option	Answer	Q. No	Option	Answer
1.	(a)	Chloropicrin	1.	(c)	both (a) and (b)
2.	(a)	Kerosene	2.	(b)	Propene
3.	(a)	$\pi v = nRT$	3.	(c)	Increase in pressure
4.	(b)	hex – 4 – en – 2– ol	4.	(a)	5.6
5.	(c)	both (a) and (b)	5.	(d)	374.4 K
6.	(b)	Propene	6.	(a)	Assertion is true but reason is false
7.	(d)	374.4 K	7.	(a)	Chloropicrin
8.	(c)	frictional energy	8.	(a)	
9.	(a)	5.6	9.	(b)	112 g mol ⁻¹
10.	(a)		10.	(a)	$\pi v = nRT$
11.	(b)	9	11.	(a)	Kerosene
12.	(a)	Assertion is true but reason is false	12.	(c)	frictional energy
13.	(c)	bibibium	13.	(b)	hex – 4 – en–2–ol
14.	(b)	112 g mol ⁻¹	14.	(c)	bibibium
15.	(c)	Increase in pressure	15.	(b)	9

PART - II

Note: Answer any six questions. Question No. 24 is compulsory.

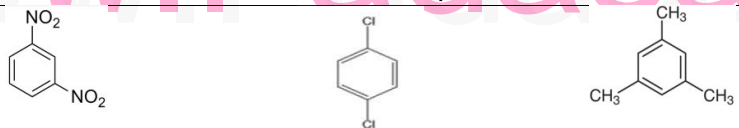
6×2=12

16.	Oxidation and reduction : Any two Points		2
17.	Heisenberg's uncertainty principle: Correct Definition (or) Mathematical Expression Explanation	1 1	2
18.	Plaster of Paris: Any two uses		2
19.	Le- Chatelier principle: Correct definition		2
20.	Osmotic pressure: Correct definition		2
21.	Lewis structure: i) $\begin{array}{c} \cdot\cdot \\ \text{H}-\text{O}-\text{H} \end{array}$ ii) $\begin{array}{c} \cdot\cdot \\ \text{H}-\text{O}-\text{N}=\text{O} \\ \\ \cdot\cdot \\ \text{:O:} \end{array}$	1 1	2
22.	Friedel Craft's reaction: Any correct equation with anhydrous AlCl_3 (or) Equation without anhydrous AlCl_3 (or) Mere explanation	2 1½ 1	2
23.	Particulate pollutants: Correct explanation Example	1 1	2
24.	$\Delta S_{\text{fusion}} = \Delta H_{\text{fusion}} / T_f$ $= 6008 / 273$ $= 22.007 \text{ JK}^{-1} \text{ moi}^{-1}$ (without unit ½ mark only)	½ ½ 1	2

PART - III

Note : Answer any Six questions. Question No. 33 is compulsory. 6×3=18

25.	(i) $\begin{array}{cccc} +7 & +4 & +4 & +6 \\ \text{KMnO}_4 + \text{Na}_2\text{SO}_3 \rightarrow \text{MnO}_2 + \text{Na}_2\text{SO}_4 + \text{KOH} \\ 2\text{KMnO}_4 + 3\text{Na}_2\text{SO}_3 + \text{H}_2\text{O} \rightarrow 2\text{MnO}_2 + 3\text{Na}_2\text{SO}_4 + 2\text{KOH} \end{array}$	½ 1	3
(ii) $\begin{array}{cccc} 0 & +5 & +2 & +4 \\ \text{Cu} + \text{HNO}_3 \rightarrow \text{Cu}(\text{NO}_3)_2 + \text{NO}_2 + \text{H}_2\text{O} \\ \text{Cu} + 4\text{HNO}_3 \rightarrow \text{Cu}(\text{NO}_3)_2 + 2\text{NO}_2 + 2\text{H}_2\text{O} \end{array}$	½ 1		

26.	Principal Quantum number Energy level n value, $2n^2$, and E_n value (or) r_n value (Any two points)	1 2	3
27.	Diagonal relationship : Correct explanation Suitable example	2 1	3
28.	Para hydrogen into Ortho hydrogen: Any three methods		3
29.	Ideal Gas equation: $V \propto 1/P$, $V \propto T$, $V \propto n$ $V \propto \frac{nT}{P}$ (or) $V = \frac{nRT}{P}$ $PV = nRT$	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ 1	3
30.	State and Path functions: State function Correct explanation example Path function : Correct explanation example	1 $\frac{1}{2}$ 1 $\frac{1}{2}$	3
31.	A \Rightarrow $\text{CH}_3\text{CH}_2\text{Cl}$ (or) Ethyl chloride (or) Chloro ethane B \Rightarrow $\text{CH}_3\text{CH}_2\text{OH}$ (or) Ethyl alcohol (or) Ethanol C \Rightarrow $\text{CH}_2=\text{CH}_2$ (or) Ethylene (or) Ethene	1 1 1	3
32.	Inductive effect: Correct explanation Suitable example	2 1	3
33.		3x1	3

PART - IV**Note: Answer all the questions.****5x5=25**

34.(a)	Tabular column with simple ratio for four elements Empirical formula = $\text{Na}_2\text{S H}_{20}\text{O}_{14}$ $n = 1$ Molecular formula = $\text{Na}_2\text{SO}_4 \cdot 10 \text{H}_2\text{O}$ (OR)	$4 \times \frac{1}{2} = 2$ 1 1 1	5
34 (b)	i) Pauli Exclusion Principle - Correct definition ii) Modern Periodic Law - Correct statement	3 2	5
35 (a)	i) Isotopes : Correct definition Isotopes of hydrogen ${}_1\text{H}^1$ (or) H (or) Protium ${}_1\text{H}^2$ (or) D (or) Deuterium ${}_1\text{H}^3$ (or) T (or) Tritium ii) Any two uses of Calcium	$1\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ 2	5

	(OR)		
35 (b)	Derivation of critical constants $\left. \begin{aligned} \left(P + \frac{an^2}{v^2}\right)(V - nb) &= nRT \\ \text{(or)} \\ \left(P + \frac{a}{v^2}\right)(V - b) &= RT \end{aligned} \right\}$ $pv + \frac{a}{v} - pb - \frac{ab}{v^2} - RT = 0$ $V^3 - \left[\frac{RT}{P} + b\right]V^2 + \left[\frac{a}{P}\right]v - \left[\frac{ab}{P}\right] = 0$ $(v - v_c)^3 = 0 \quad \text{(or)} \quad v^3 - 3v_c v^2 + 3v_c^2 v - v_c^3 = 0$ $V_c = 3b$ $P_c = \frac{a}{27b^2}$ $T_c = \frac{8a}{27Rb}$	1/2 1/2 1/2 1/2 1 1 1	5
36 (a)	Second law of thermodynamics <ul style="list-style-type: none"> • Entropy statement • Kelvin-Planck statement • Clausius statement • Efficiency explanation 	1 2 1 1	5
36 (b)	i) Law of Mass Action - correct definition (or) $\text{Rate} \propto [\text{Reactant}]^x$ Explanation of x ii) limitations of Henry's Law - any two points	3 2 1 2	5
37 (a)	Molecular Orbital theory – salient features Any Five points (OR)	5×1	5
37 (b)	i) Any Three characteristics of Organic compounds ii) Functional group A → - CHO B → - COOH C → - O- D → - NH ₂	3×1 4×1/2	5
38 (a)	Structure of Benzene: Any Four points Correct Structure of Benzene (OR)	4×1 1	5
38 (b)	i) correct equation (or) correct explanation ii) Eutrophication - correct explanation	3×1 3×1/2 2	5