Q.No.1 You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question.

S.#	QUESTIONS	A	B	C	D
1	Empirical formula of glucose is:	CH_2O.	$C_2H_4O_2$	$C_6H_{12}O_6$	$C_3H_6O_3$
2	One mole of SO_2 contains:	6.02×10^{23} atoms of oxygen	18.1×10^{23} molecules of SO_2	4 gram atoms of SO_2	6.02×10^{23} atoms of sulphur
3	Which of the following is used as decolourizing agent in crystallization?	H_2SO_4	Graphite	Animal charcoal	H_2O
4	Pressure remaining constant at which temperature the volume of a gas will become twice of what it is at $0^\circ C$:	$200^\circ C$	$546K$.	$546^\circ C$	$273K$
5	The deviation of a gas from ideal behaviour is maximum at:	$-10^\circ C$ and 5.0atm	$-10^\circ C$ and 2.0 atm	$100^\circ C$ and 2.0 atm	$0^\circ C$ and 2.0 atm
6	Glycerin boils at $210^\circ C$ when external pressure is:	760 torr	500 torr.	100 torr	50 torr
7	Diamond is bad conductor because:	It has a tight structure	It has a high density	There are no free electron present in the crystal of diamond to conduct electric	Is transparent to light
8	Quantum number values for $2p$ orbitals are:	$n = 1, \ell = 2$	$n = 2, \ell = 1$	$n = 1, \ell = 0$	$n = 2, \ell = 0$
9	Which of the following molecule has zero dipole moment?	CO_2	H_2O	HI	CH_3Cl
10	One calorie is equivalent to:	$0.4184J$	$418.4J$	$41.84J$	$4.184J$
11	The study of heat changes accompanying a chemical reaction is known as:	Chemistry	Thermochemistry.	Physical chemistry	Biochemistry
12	The pH of $10^{-3} mol\,dm^{-3}$ of an aqueous solution of H_2SO_4 is:	3.0	2.0	2.7	1.5.
13	pH of soft drinks is approximately:	1.5	1.0	2.0	3.0
14	An aqueous solution of ethanol in water may have vapour pressure:	Equal to that of water	Equal to that of ethanol	More than that of water	Less than that of water
15	Oxidation number of all elements in free state is:	Zero	+1	+2	−1
16	If the salt bridge is not used between two half cells, then the voltage:	Decrease rapidly	Decrease slowly	Does not change	Drops to zero.
17	If the rate equation of a reaction $2A + B \rightarrow$ products is, rate = $K[A]^2[B]$ and A is present in large excess, then the order of reaction is:	01	02	03	04

INTERMEDIATE PART-I (11th Class)	2023 (Ist-A)	Roll No:
CHEMISTRY PAPER-I GROUP-I		
TIME ALLOWED: 2.40 Hours	SUBJECTIVE	MAXIMUM MARKS: 68

NOTE: Write same question number and its parts number on answer book, as given in the question paper.

SECTION-I

2. Attempt any eight parts. **8 x 2 = 16**

(i) No individual neon atom in the sample of the element has a mass of 20.18 amu.

(ii) Many chemical reactions taking place in our surrounding involve the limiting reactants. *Justify.*

(iii) 180g of glucose and 342g of sucrose have the same number of molecules but different number of atoms present in them. Why?

(iv) Justify that $1cm^3$ of H_2 and $1cm^3$ of CH_4 at STP will have same number of molecules, when one molecule of CH_4 is 8 times heavier than that of hydrogen.

(v) Why do we feel comfortable in expressing the densities of gases in the units of $g\,dm^{-3}$ rather than $g\,cm^{-3}$?

(vi) Water vapours do not behave ideally at 273K. Why?

(vii) Do you think that the size of Li^{+2} is even smaller than He^{+}? Justify it.

(viii) Distribute electrons in orbitals of $_{24}Cr$, $_{13}Al$.

(ix) The e/m value for positive rays obtained from hydrogen gas is 1836 times less than that of Cathode rays. *Justify it.*

(x) What is meant by standard enthalpy of neutralization? Give one example.

(xi) Prove that $q_v = \Delta E$

(xii) Differentiate between system and surrounding with one example for each.

3. Attempt any eight parts. **8 x 2 = 16**

(i) Write down factors affecting relative lowering of vapour pressure. 2

(ii) Define Solubility. What are Solubility Curves? Give names only. 1 + 1

(iii) In $CuSO_4.5H_2O$, four water molecules are attached with Cu^{2+} ion while one water molecule with SO_4^{2-} ion. Give reason. 2

(iv) What is Instantaneous and Average Rate of reaction? 1 + 1

(v) Write Spectrometry and Optical Rotation Method for the determination of rate of reaction. 1 + 1

(vi) Define Catalysis. Give only one characteristic of catalyst. 1 + 1

(vii) How rate of filtration can be increased? 2

(viii) What is safe and reliable method for drying the crystals? 1 + 1

(ix) Define Distribution Law. What is distribution coefficient? 2

(x) Evaporation causes cooling. Justify. 2

(xi) Why electrical conductivity of metallic solids decreases by increasing temperature? 1 + 1

(xii) What is cubic close packing and hexagonal close packing?

4. Attempt any six parts. **6 x 2 = 12**

(i) Why Helium does not exist in diatomic form?

(ii) What is Coordinate Covalent Bond? Give one example.

(iii) Justify that Covalent Bonds in directional in nature.

(iv) What is Common Ion Effect?

(v) What is Buffer Capacity?

(vi) What is pK_a? Give its significance.

(vii) Define Electrochemistry.

(viii) Calculate the oxidation number of *Mn* in $KMnO_4$.

(ix) Define Electrolytic Conduction.

SECTION-II

NOTE: Attempt any three questions. **3 x 8 = 24**

5.(a) What is stoichiometry? Give assumptions mention two important laws which help to perform the stoichiometric calculations. 4

(b) There is a mixture of hydrogen, helium and methane occupying a vessel of volume $13\,dm^3$ at $37^{\circ}C$ and pressure of 1 atmosphere. The masses of hydrogen and helium are 0.8g and 0.12g respectively. Calculate the partial pressures in torr of each gas in the mixture. 4

6.(a) What are Liquid Crystals? Give their three uses in daily life. 1 + 3 = 4

(b) State First Law of Thermodynamics. Also prove that $\Delta E = q_v$ 1 + 3 = 4

7.(a) Write down Millikan's Oil Drop Method for the measurement of charge of an electron. 4

(b) Benzoic acid, C_6H_5COOH, is a weak mono-basic acid ($K_a = 6.4 \times 10^{-5} mol\,dm^{-3}$). What is the pH of a solution containing 7.2g of sodium benzoate in one dm^3 of $0.02\,mol\,dm^{-3}$ benzoic acid? 4

8.(a) State postulates of VSEPR Theory. 4

(b) What is SHE? How it can be used to measure Electrode potential? (Construction 01 + diagram 01 + electrode potential measurement 02) = 4

9.(a) Describe in detail the Elevation of Boiling Point. 4

(b) Explain Chemical Method for the determination of rate of reaction. 4