Roll No. | | | | | | | (To be filled in by the candidate)

Chemistry SWL-11-1-23 **H.S.S.C (11th) 1st Annual 2023** Time : 20 Minutes

Paper : I | Group: I | Objective – (ii) Marks : 17

Paper Code	6	4	8	3

Note: - You have four choices for each objective type question as A, B, C and D. The choice which you think is correct; fill that circle in front of that question number in your answer book. Use marker or pen to fill the circles. Cutting or filling up two or more circles will result no mark.

SECTION-A

Q.1	Questions	A	B	C	D
1.	Splitting of spectral lines when atoms are subjected to strong electric field is called:	Zeeman effect	Photoelectric effect	Stark effect	Compton effect
2.	Which of the given molecules has zero dipole moment?	BF_3	H_2O	$CHCl_3$	NH_3
3.	For a given process, the heat changes at constant pressure (q_p) and at constant volume (q_v) are related to each other as:	$q_p = q_v$	$q_p > q_v$	$q_p < q_v$	$q_p = q_v/2$
4.	The enthalpy of solution of sodium carbonate is:	$-16.2\ KJmol^{-1}$	$+16.2\ KJmol^{-1}$	$-25.0\ KJmol^{-1}$	$-285.8\ KJmol^{-1}$
5.	For which system does the equilibrium constant, K_c has the units of $(concentration)^{-1}$?	$N_2 + 3H_2 \rightleftharpoons 2NH_3$	$H_2 + I_2 \rightleftharpoons 2HI$	$2HF \rightleftharpoons H_2 + F_2$	$2NO_2 \rightleftharpoons N_2O_4$
6.	The solution having zero pH will be:	acidic	Highly acidic	neutral	basic
7.	Which one of the given salts will not hydrolyse in water?	NaCl	$AlCl_3$	Na_2CO_3	CH_3COONa
8.	If a strip of Cu metal is placed in a solution of $FeSO_4$:	Cu will be deposited	Fe is precipitated out	Cu and Fe both dissolve	No reaction takes place
9.	During a redox reaction, an oxidizing agent:	Gains electrons	Is oxidized	Loses electrons	Is hydrolyzed
10.	If the rate equation of a reaction $2A+B \rightarrow$ Product Rate=$[A]^2[B]$, and A is present in large excess, then the order of reaction is:	2.5	3	1	2
11.	Which of the given hydrocarbons has the highest value of heat of vaporization?	CH_4	C_2H_6	C_3H_8	C_6H_{14}
12.	Ionic solids are characterized by:	Low melting points	Good conductivity in solid state	High vapour pressures	Solubility in polar solvents
13.	The density of an ideal gas at a given temperature and pressure can be calculated by employing the formula:	$d=\frac{PM}{RT}$	$d=\frac{P}{RT}$	$d=\frac{nP}{RT}$	$d=\frac{PM}{V}$
14.	Pressure remaining constant, at which temperature, the volume of a gas will become twice of what it is at $0\,^{\circ}C$:	$546\ ^{\circ}C$	$200\ ^{\circ}C$	$273\ ^{\circ}C$	$100\ ^{\circ}C$
15.	The comparative rates at which the solutes move in paper chromatography depend on:	The size of paper	R_f values of solutes	Temperature of the experiment	Size of the chromatographic tank used
16.	One dm^3 of N_2 at S.T.P contains about:	5.37×10^{22} atoms	3.01×10^{23} atoms	6.02×10^{23} atoms	2.68×10^{19} atoms
17.	The number of moles of CO_2 which contains 16g of Oxygen:	0.25	0.50	1.0	1.50

2[illegible]-323-14-17000 ★★

CANCELLED

SWL-11-1-23 Roll No. | | | | | | | (To be filled in by the candidate)

Chemistry **H.S.S.C (11th) 1st Annual 2023** Time : 2:40 Hours

Paper : I | Group: I | Subjective | Marks : 68

Note:- Section B is compulsory. Attempt any Three questions from Section C.

SECTION-B

2. Write short answers to any Eight parts. **(8 x 2 = 16)**

i. No individual Neon (Ne) atom in the sample of element has mass of 20.18 amu. Why?
ii. Calculate the number of molecules in 10g of ice.
iii. How efficiency of reaction is expressed?
iv. Derive units of 'R' in general gas equation in SI(System International) system.
v. Why normal air cannot be used in diver's tank?
vi. Prove that $d=\frac{PM}{RT}$ from ideal gas equation.
vii. State Pauli exclusion principle.
viii. Why nature of Cathode rays is independent of gas used in discharge tube.
ix. What is origion of spectrum of hydrogen?
x. Define standard enthalpy of neutralization with one example.
xi. What is state function? Give one example.
xii. Burning of candle is spontaneous process. Justify.

3. Write short answers to any Eight parts. **(8 x 2 = 16)**

i. Define analytical chemistry.
ii. Write four salient features of an ideal solvent, used in the process of crystallization.
iii. What is the difference between adsorption and partition chromatography?
iv. Write difference between evaporation and condensation.
v. Why boiling point of H_2O is higher than that of HF.
vi. Write difference between crystalline solid and amorphous solid.
vii. Define zeotropic solutions and concentrated solution.
viii. Justify that boiling points of the solvents increase due to the presence of solute.
ix. Non-ideal solutions do not obey the Raoult's law. Give reason.
x. Differentiate between homogeneous and heterogeneous catalyses.
xi. Define Enzyme catalysis. Give one example.
xii. The radioactive decay is always a first order reaction. Justify.

4. Write short answers to any Six parts. **(6 x 2 = 12)**

i. Define ionization energy with an example.
ii. Pi (π) bonds are more diffused than sigma (σ) bonds. Justify.
iii. O_2 is paramagnetic. Why?
iv. State Le-Chatelier's principle.
v. Buffers are important in many areas of Chemistry. Justify.
vi. How K_c predicts the direction of a chemical reaction.
vii. Calculate oxidation number of chromium in $Cr_2(SO_4)_3$.
viii. Define electrode potential with an example.
ix. Write down the importance of Standard Hydrogen Electrode (SHE).

CANCELLED

SECTION-C

Note: Attempt any Three questions. Each question carries Eight (08) marks. **(8x3=24)**

5. (a) What is a limiting reactant? Give example. Also write down steps to identify it. **(4)**

(b) A sample of Krypton with a volume of 6.25 dm^3, a pressure of 765 torr and a temperature of 20 °C is expanded to a volume of 9.55 dm^3 and a pressure of 375 torr. What will be its final temperature in °C ? **(4)**

6. (a) Discuss structure of sodium chloride in detail. **(4)**

(b) Differentiate between spontaneous and non-spontaneous process with examples. **(2+2=4)**

7. (a) Describe defects in Bohr's atomic model. **(4)**

(b) Calculate the pH of a buffer solution in which 0.11 molar CH_3COONa and 0.09 molar acetic acid solutions are present. K_a for CH_3COOH is 1.85×10^{-5}. **(4)**

8. (a) Define bond energy. Discuss relation between Ionic character and bond energy. **(1+3=4)**

(b) What is a Galvanic cell? Draw diagram. Explain its electrodes with reactions occuring on electrodes. **(1+1+2=4)**

9. (a) Enlist colligative properties and why some properties are colligative? Also give conditions for observing colligative properties. **(4)**

(b) Discuss any two factors affecting rate of reactions. **(4)**

Chemistry SWL-11-2-23 Roll No. | | | | | | | (To be filled in by the candidate)

H.S.S.C (11th) 1st Annual 2023

Time : 20 Minutes

Paper : I | Group: II | Objective – (iv)

Marks : 17

Paper Code	6	4	8	8

Note: - You have four choices for each objective type question as A, B, C and D. The choice which you think is correct; fill that circle in front of that question number in your answer book. Use marker or pen to fill the circles. Cutting or filling up two or more circles will result no mark.

SECTION-A

Q.1	Questions	A	B	C	D
1.	Angle in water molecule is.	104.5°	107.5°	109.5°	120°
2.	(n+l) value for 5s orbital will be.	3	5	7	9
3.	The transition temperature of KNO_3 is.	13.2 °C	95.6 °C	128 °C	32.05 °C
4.	Hydrogen bonding is maximum in.	H_2O	HCl	HBr	HI
5.	The comparative rates at which solute moves in paper chromatography depend upon.	The size of paper	R_f value of solute	Temperature of experiment	Size of chromatographic tank used
6.	A real gas obeying van der Waals equation will resemble ideal gas if.	Both (a) and (b) are large	Both (a) and (b) are small	(a) is small and (b) is large	(a) is large and (b) is small
7.	Critical temperature of water vapours is.	217.0 atm	111.5 atm	39.6 atm	73.0 atm
8.	The largest number of molecules are present in.	3.6g of H_2O	4.8g of C_2H_5OH	2.8g of CO	5.4g of N_2O_5
9.	Isotopes differ in.	Properties which depend upon mass	Arrangements of electrons in orbitals	Chemical properties	The extent to which they may be affected in electromagnetic field
10.	Which of the given statements is not correct about galvanic cell.	Anode is negatively charged	Reduction occurs at anode	Cathode is positively charged	Reduction occurs at cathode
11.	All radioactive disintegration nuclear reactions are of.	First order	Second order	Third order	Zero order
12.	Oxidation number of 'Cl' in $Ca(ClO_3)_2$ is.	-1	+1	+5	-5
13.	The molal boiling point constant is the ratio of the elevation in boiling point to.	Molarity	Molality	Mole fraction of solvent	Mole fraction of solute
14.	The ionization constant of pure water at 25 °C is.	1.8×10^{-16} moles dm^{-3}	1.6×10^{-16} moles dm^{-3}	1.0×10^{-14} moles^2 dm^{-6}	1.8×10^{-14} moles^2 dm^{-6}
15.	Which aqueous solution has highest pH.	0.1M H_2SO_4	0.1M NaOH	0.1M HCl	0.2M HNO_3
16.	Which one is not state function?	Work	Internal energy	Enthalpy	Volume
17.	At constant volume q_v is equal to.	ΔH	ΔE	ΔP	ΔV

212-323-1A-11000 ★★★★

CANCELLED

SWL-11-2-23 Roll No. | | | | | | | (To be filled in by the candidate)

Chemistry **H.S.S.C (11th) 1st Annual 2023** Time : 2:40 Hours

Paper : I | Group: II | Subjective Marks : 68

Note:- Section B is compulsory. Attempt any 3 questions from Section C.

SECTION-B

2. Write short answers to any Eight parts. **(8 x 2 = 16)**

i. 180g of glucose and 342g of sucrose have the same number of molecules but different number of atoms present in them. Give the reason.
ii. What is electrometer? Give its function in mass spectrometer.
iii. Calculate the mass in grams of 2.78×10^{21} molecules of CrO_2Cl_2.
iv. State Avogadro's law of gases. Give an example.
v. Give two characteristics of plasma.
vi. Define critical temperature. On what factors does it depend?
vii. State Pauli Exclusion Principle and Hund's rule.
viii. How is atomic emission spectrum obtained?
ix. What particles are formed by the decay of free neutron?
x. What is meant by standard enthalpy of atomization? Give an example.
xi. Differentiate between spontaneous and non-spontaneous process.
xii. Why is it necessary to mention the physical states of the reactants and products in thermochemical equation?

3. Write short answers to any Eight parts. **(8 x 2 = 16)**

i. Define non ideal solution. Give example.
ii. How do you justify that NaCl and KNO_3 are used to lower the melting point of ice?
iii. Define molality. Give its equation.
iv. Differentiate between Rate and Rate Constant of a reaction.
v. How does the increase of temperature increase the rate of the chemical reaction?
vi. Why the reaction having lower energies of activation have faster rates?
vii. Differentiate between stationary and mobile phase.
viii. Why is there a need to crystallize a crude product?
ix. Iodine is more soluble in water in the presence of KI. Give reason.
x. Define transition temperature. Give example.
xi. What are the advantages of vacuum distillation?
xii. Why are the ionic crystals highly brittle?

4. Write short answers to any Six parts. **(6 x 2 = 12)**

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i. What is meant by octet rule? Give one example.
ii. Fluoride has electron affinity less than the chloride. Give reason.
iii. Define electronegativity. Give its variation in periodic table.
iv. Enlist the ways to maximize the yield of ammonia in Haber's process.
v. Briefly give the difference between reversible and irreversible reactions.
vi. How buffer solutions are prepared?
vii. Write down the oxidation states of oxygen in peroxide and super oxides.
viii. What is meant by Ionization? Briefly explain.
ix. Write down the chemical equation for electrode processes of electrolysis of fused lead chloride.

SECTION-C

Note: Attempt any Three questions. Each question carries Eight (08) marks.

5. (a) Define STOICHIOMETRY. Write down its assumptions. **(1+3=4)**
(b) Calculate the mass of $1dm^3$ of NH_3 gas at 30°C and 1000 mm Hg pressure, considering that NH_3 is behaving ideally. **(4)**

6. (a) What are liquid crystals? Give their six uses in daily life. **(4)**
(b) Describe how is the enthalpy of combustion (ΔH_c) of a substance measured by bomb calorimeter? **(4)**

7. (a) Define quantum numbers. Explain Azimuthal Quantum number in detail. **(1+3=4)**
(b) N_2 and H_2 combine to give NH_3. The value of K_c in this reaction at 500 °C is 6.0×10^{-2}. Calculate the value of K_p for this reaction. **(4)**

8. (a) Define and explain electron affinity. Describe the factors influencing it. Also give its trends in periodic table. **(4)**
(b) Explain lead accumulator. Also illustrate its discharging process. **(4)**

9. (a) State and explain Raoult's law when one component is non-volatile. **(4)**
(b) Define order of a reaction and explain it with at least two examples. **(4)**

Roll No. | | | | | | | (To be filled in by the candidate)

Chemistry **H.S.S.C (11th)-A-2022** Time : 20 Minutes

Paper : I Group: II Objective – (i) Marks : 17

Ch-IAF Swl-Gb 22 | Paper Code | 6 | 4 | 8 | 2 |

Note: - You have four choices for each objective type question as A, B, C and D. The choice which you think is correct; fill that circle in front of that question number in your answer book. Use marker or pen to fill the circles. Cutting or filling up two or more circles will result no mark.

SECTION-A

Q.1	Questions	A	B	C	D
1.	The largest number of molecules are present in:	$3.6g$ of H_2O	$4.8g$ of C_2H_5OH	$2.8g$ of CO	$5.4g$ of N_2O_5
2.	The number of isotopes of Tin are:	9	11	6	3
3.	The drying agent used in vacuum desiccator is:	Silica gel	$NaCl$	$AgCl$	I_2
4.	Solvent extraction method is a particularly useful technique for separation when the product to be separated is:	Non-volatile or thermally unstable	Volatile or thermally stable	Non-volatile or thermally stable	Volatile or thermally unstable
5.	The deviation of a gas from ideal behaviour is maximum at:	$-10°C$ and $5.0\,atm$	$-10°C$ and $2.0\,atm$	$100°C$ and $2.0\,atm$	$0°C$ and $2.0\,atm$
6.	Equal masses of methane and oxygen are mixed in an empty container at $25°C$. The fraction of total pressure exerted by oxygen is:	$\frac{1}{3}$	$\frac{8}{9}$	$\frac{1}{9}$	$\frac{16}{17}$
7.	When water freezes at $0°C$, its density decreases due to:	Cubic structure of ice	Empty spaces present in the structure of ice	Change of bond lengths	Change of bond angles
8.	Acetone and chloroform are soluble in each other due to:	intermolecular hydrogen bonding	Instantaneous dipole	Ion dipole interaction	Dipole-dipole forces
9.	When $6d$ orbital is complete, the entering electron goes into:	$7f$	$7s$	$7p$	$7d$
10.	In the ground state of an atom, the electron is present:	In the nucleus	In the second shell	Nearest to the nucleus	Farthest from the nucleus
11.	The number of bonds in nitrogen molecule is:	One σ and one π	One σ and two π	Three sigma only	Two sigma and one π
12.	Which of the given species has unpaired electrons in anti-bonding molecular orbitals?	O_2^{2+}	N_2^{2-}	B_2	F_2
13.	The net heat change in a chemical reaction is same, whether it is brought about in two or more different ways in one or several steps. It is known as:	Henry's Law	Hess's Law	Joule's Principle	Law of Conservation of Energy
14.	An excess of aqueous $AgNO_3$ is added to aqueous $BaCl_2$ and precipitate is removed by filtration. What are the main ions in the filtrate?	Ag^+ and NO_3^- only	Ba^{2+} and NO_3^- only	Ag^+, Ba^{2+} and NO_3^-	Ba^{2+}, NO_3^- and Cl^-
15.	18g glucose is dissolved in 90g of water. The relative lowering of vapour pressure is equal to:	$\frac{1}{5}$	5.1	$\frac{1}{51}$	6
16.	If a strip of Cu metal is placed in a solution of $FeSO_4$:	Cu will be deposited	Fe is precipitated out	Cu and Fe both dissolve	No reaction takes place
17.	The rate of reaction:	Increases as the reaction proceeds	Decreases as the reaction proceeds	Remains the same as the reaction proceeds	May decrease or increase as the reaction proceeds

187 GOVT COMPREHENSIVE SCHOOL SAHIWAL (18)

Roll No. | | | | | | | (To be filled in by the candidate)

Chemistry **H.S.S.C (11th)-A-2022** Time : 2:40 Hours

Paper : I Group: II Subjective Marks : 68

Note:- Section B is compulsory. Attempt any 3 questions from Section C.

SECTION-B

2. Write short answers to any Eight parts. (8 x 2 = 16)

i. Law of conservation of mass has to be obeyed during stoichiometric calculations. Justify.
ii. What do you mean by molar volume? Give an example.
iii. What is empirical formula? Give an example.
iv. Define Solvent Extraction and Partition Law.
v. Differentiate between stationary and mobile phase.
vi. Define Sublimate. Give two examples.
vii. Explain that the process of respiration obeys the Dalton's law of partial pressure.
viii. What is Avogadro's law of gases?
ix. Derive the value of R when the pressure is in Nm^{-2} and volume in m^3.
x. What is the pH of a solution? Write formula to calculate pH of a solution.
xi. Write the effect of common ion on solubility. Give an example.
xii. Define Lowery Bronsted Concept of Acid and Base.

3. Write short answers to any Eight parts. (8 x 2 = 16)

i. What are dipole-dipole forces? Give example.
ii. Why ethane (C_2H_6) has higher boiling point than methane (CH_4).
iii. How fish and plants survive under ice for months in winter?
iv. Why evaporation causes cooling?
v. Give two properties of cathode rays.
vi. How positive rays are produced?
vii. What are slow and fast neutrons?
viii. Why Rutherford's model failed?
ix. Define Molality. Give its equation.
x. Differentiate between ideal and non-ideal solution in two aspects.
xi. Give two characteristics of enzyme catalysis.
xii. Define Auto Catalyst with an example.

4. Write short answers to any Six parts. (6 x 2 = 12)

i. Cationic radius is smaller than that of its parent atomic radius, why?
ii. Explain geometry of H_2S molecule on the basis of VSEPR theory.
iii. Define State and State Function.
iv. How electronegativity changes in a group?
v. Define Co-ordinate covalent bond with a suitable example.
vi. Burning of a candle is a spontaneous process, justify.
vii. What do you mean by enthalpy of neutralization? Give a suitable example.
viii. What is the function of salt bridge?
ix. Define Standard Electrode Potential and how it is represented?

SECTION-C

(EACH QUESTION CARRIES EIGHT (8) MARKS)

5. (a) Write a note on limiting reactant and explain by giving two examples. (2+2)

(b) Write down postulates of Bohr's atomic model. (4)

6. (a) Describe four applications of electrolysis processes of industrial importance. (4)

(b) A gas having a volume of $10\,dm^3$ is enclosed in a vessel at $0\,^\circ C$ and the pressure is 2.5 atm. This gas is allowed to expand until the new pressure is 2atm. What will be the new volume of this gas, if the temperature is maintained at 273K? (4)

7. (a) How the enthalpy of combustion is measured out by bomb calorimeter? (4)

(b) Draw out geometry of O_2, N_2 according to M.O.T. (4)

8. (a) What are liquid crystals? Give their three uses. (1+3)

(b) The solubility of PbF_2 at $25\,^\circ C$ is $0.64g\ dm^{-3}$. Calculate Ksp of PbF_2. (4)

9. (a) Explain the three statements of Raoult's law. (4)

(b) How does Arrhenius equation help us to calculate the energy of activation of a reaction? (4)

Roll No. | | | | | | | (To be filled in by the candidate)

Chemistry **H.S.S.C (11th)-A-2022** Time : 20 Minutes

Paper : I Group: I Objective – (i) Marks : 17

Ch-IAT SWL-G1-22 | Paper Code | 6 | 4 | 8 | 1 |

Note: - You have four choices for each objective type question as A, B, C and D. The choice which you think is correct; fill that circle in front of that question number in your answer book. Use marker or pen to fill the circles. Cutting or filling up two or more circles will result no mark.

SECTION-A

Q.1	Questions	A	B	C	D
1.	27g of Al will react completely with how much mass of O_2 to produce Al_2O_3.	8g of oxygen	16g of oxygen	32g of oxygen	24g of oxygen
2.	The comparative rates at which the solutes move in paper chromatography, depends on:	The size of paper	Rf Values of salutes	Temperature of the experiment	Size of the chromatographic tank used
3.	During the process of crystallization, the hot saturated solution is:	Cooled very slowly to get large sized crystals	Cooled at a moderate rate to get medium sized crystals	Evaporated to get the crystals of the product	Mixed with an immiscible liquid to get the pure crystals of the product
4.	Which of the given will have same number of molecules at STP?	$280cm^3$ of CO_2 and $280cm^3$ of N_2O	$11.2\,dm^3$ of O_2 and $32g$ of O_2	$44g$ of CO_2 and $11.2\,dm^3$ of CO_2	$28g$ of N_2 and $5.6\,dm^3$ of oxygen
5.	Acetone and chloroform are soluble into each other due to:	Intermolecular hydrogen bonding	Ion dipole interaction	Instantaneous dipole	All of these
6.	Quantum number values for $2p$ orbitals are:	$n=2,\ l=1$	$n=1,\ l=2$	$n=1,\ l=0$	$n=2,\ l=0$
7.	The type of hybridization in molecule of ethene $(CH_2=CH_2)$ is:	sp	sp^3	sp^2	dsp
8.	The change in heat energy of a chemical reaction at a constant temperature and pressure is called:	Enthalpy change	Bond energy	Heat of sublimation	Internal energy
9.	For which system, does the equilibrium constant Kc has units of (concentration)$^{-1}$?	$N_{2(g)}+3H_{2(g)} \rightleftharpoons 2NH_{3(g)}$	$H_{2(g)}+I_{2(g)} \rightleftharpoons 2HI_{(g)}$	$2NO_{2(g)} \rightleftharpoons N_2O_{4(g)}$	$2HF_{(g)} \rightleftharpoons H_{2(g)}+F_{2(g)}$
10.	Colligative properties are the properties of:	Dilute solutions which behave as nearly ideal solutions	Concentrated solutions which behave as nearly non-ideal solutions	Both A and B	Neither A nor B
11.	The cathodic reaction in the electrolysis of $dil.H_2SO_4$ with Pt electrode is:	Reduction	Oxidation	Both oxidation and reduction	Neither oxidation nor reduction
12.	The molar volume of CO_2 is maximum at:	STP	$127\,^\circ C$ and 1 atm	$0\,^\circ C$ and 2 atm	$273\,^\circ C$ and 2 atm
13.	Which of the given pair do not show isomorphism?	$NaNO_3, KNO_3$	$ZnSO_4, NiSO_4$	Cu, Ag	$NaCl, CuCl_2$
14.	Which one of the given compounds possess ionic bonding?	CaO	CH_4	CH_3Cl	C_2H_6
15.	Catalyst for a catalyst is also called:	Promotor	Inhibitor	Poisoning	Retarder
16.	The mass of one mole of electrons is:	1.008 mg	0.55 mg	0.184 mg	1.673 mg
17.	Which of the given sub-atomic particle does not show ionization?	Electron	Proton	Neutron	Alpha ray

102 GOVT. COMPREHENSIVE SCHOOL SAHIWAL (18)

Roll No. | | | | | | | (To be filled in by the candidate)

Chemistry **H.S.S.C (11th)-A-2022** Time : 2:40 Hours

Paper : I Group: I Subjective Marks : 68

Note:- Section B is compulsory. Attempt any 3 questions from Section C.

SECTION-B

2. **Write short answers to any Eight parts.** (8 x 2 = 16)

i. Define Relative Atomic Mass also give two examples.
ii. How is the law of conservation of mass obeyed during stoichiometric calculations?
iii. Why do the isotopes have same chemical but different physical properties?
iv. State Distribution Law.
v. How are coloured impurities removed from crystals?
vi. Write two uses of chromatography.
vii. Prove that $d = \frac{PM}{RT}$
viii. Calculate the value of R in SI units.
ix. Give two applications of plasma.
x. What are buffers?
xi. What is the effect of common ion on solubility?
xii. How Kc determines the direction of chemical reaction?

3. **Write short answers to any Eight parts.** (8 x 2 = 16)

i. Evaporation takes place at all temperatures. Give reason.
ii. Iodine dissolves readily in tetrachloromethane. Give reason.
iii. Define Transition Temperature. Give an example.
iv. The electrical conductivity of the metals decreases by increasing temperature. Why?
v. Why is e/m value of cathode rays just equal to that of electron?
vi. State Aufbau Principle.
vii. State Heisenberg's uncertainty principle. Give its mathematical form.
viii. Cathode rays are material particles. Justify it.
ix. The sum of mole fractions of all the components is always equal to unity for any solution. Justify it.
x. What are conjugate solutions? Give an example.
xi. What is rate determining step? Give an example.
xii. Write two characteristics of enzyme catalysis.

4. **Write short answers to any Six parts.** (6 x 2 = 12)

i. Why Helium can not exist as diatomic molecule?
ii. Draw out Lewis structures of (i) BF_3 (ii) CH_4
iii. The distinction between co-ordinate covalent bond and a covalent bond vanishes after bond formation in NH_4^+, explain.
iv. Why the dipole moment of CO_2 is zero?
v. Define Standard Enthalpy of Formation with an example.
vi. Is it true, non-spontaneous process never happens in universe?
vii. Why burning of candle is spontaneous process?
viii. Find out oxidation state of Mn in $KMnO_4$.
ix. Why a salt bridge maintains electrical neutrality in the cell?

SECTION-C

(EACH QUESTION CARRIES EIGHT (8) MARKS)

5. (a) What is yield? Write its types. How will you calculate the percentage yield? (1+1+2)
(b) What are quantum numbers? Give importance of azimuthal quantum number. (1+3)

6. (a) A gas having a volume of $10 dm^3$ is enclosed in a vessel at $0\,^\circ C$ and the pressure is 2.5 atm. This gas is allowed to expand until the new pressure is 2 atm. What will be the new volume of this gas, if the temperature is maintained at 273K? (4)
(b) Write down four applications of electrochemical series. (4)

7. (a) Define hybridization and explain sp^2 hybridization by giving the example of ethene $(CH_2 = CH_2)$ (1+2+1)
(b) How the enthalpy of a reaction can be measured by using bomb calorimeter. (4)

8. (a) What is hydrogen bonding? Explain H-Bonding in biological compounds. (1+3)
(b) The solubility of CaF_2 in water at $25\,^\circ C$ is found to be 2.05×10^{-4} mole dm^{-3}. What is the value of K_{sp} at this temperature? (4)

9. (a) What is Roult's law? Explain it by three ways. (4)
(b) Define Order of Reaction. Give examples of some reactions explaining the order of reaction. (4)

Roll No. | | | | | | | (To be filled in by the candidate)

Chemistry

Paper : I

Inter (Part-I)-A-2021

Objective – (II) SWL-21

Time : 20 Minutes

Marks : 17

Paper Code	6	4	8	3

Note: - You have four choices for each objective type question as A, B, C and D. The choice which you think is correct; fill that circle in front of that question number in your answer book. Use marker or pen to fill the circles. Cutting or filling up two or more circles will result no mark.

Q.1	Questions	A	B	C	D
1.	Mathematical expression of Raoult's law is:	$p \propto x_1$	$\Delta p \propto x_2$	$\frac{\Delta p}{p^*} = x_2$	all of these
2.	For which system does the equilibrium constant K_c has units of (concentration)$^{-1}$?	$N_{2(g)} + 3H_{2(g)} \rightleftharpoons 2NH_{3(g)}$	$H_{2(g)} + I_{2(g)} \rightleftharpoons 2HI_{(g)}$	$2NO_{2(g)} \rightleftharpoons N_2O_{4(g)}$	$2HF_{(g)} \rightleftharpoons H_{2(g)} + F_{2(g)}$
3.	The pH of $10^{-3}M$ of an aqueous solution of H_2SO_4 is:	3.0	2.7	2.0	1.5
4.	1 kilo calorie is equivalent to:	0.4184 J	4184 J	4184 KJ	4.18 J
5.	Most stable electronic configuration is of a/an:	Noble gas	Electronegative element	Alkali metal	Halogen
6.	Which one of given is a linear molecule?	H_2O	HCN	Cl_2O	C_2H_4
7.	Among the given e/m value is maximum for:	Oxygen	Nitrogen	Helium	Hydrogen
8.	Quantum number values for 2p orbitals are:	$n=2,\ l=0$	$n=1,\ l=2$	$n=2,\ l=1$	$n=1,\ l=0$
9.	Among the given H-Bonding is maximum in:	Alcohol	Benzene	Water	Diethyl ether
10.	In chloroform and acetone, how many chlorine atoms are responsible for hydrogen bonding?	1	2	3	4
11.	At what temperature does the gaseous state of any type of matter can't exist?	$-33°C$	$273.15°C$	$-273.15°C$	$-237.15°C$
12.	Density of an ideal gas can be calculated by using equation:	$PV = dRT$	$PM = dPV$	$d = \frac{RT}{MP}$	$PM = dRT$
13.	Solvent extraction is an equilibrium process and it is controlled by:	law of mass action	the amount of solvent used	distribution law	the amount of solute
14.	27g of Al reacts completely with how much mass of O_2 to produce Al_2O_3.	8g of oxygen	16g of oxygen	32g of oxygen	24g of oxygen
15.	Isotopes differ in:	properties which depends upon mass	arrangement of electrons in orbital	chemical properties	the extent to which they may be effected in electromagnetic field
16.	If rate equation of a reaction is $2A + B \rightarrow$ product, its rate equation is, rate$= k[A]^2[B]$, and A is in large excess, the order of reaction is:	1	2	3	1.5
17.	Stronger the oxidizing agent, greater is the:	Oxidation potential	Reduction potential	Redox potential	emf of the cell

Roll No. [ ] (To be filled in by the candida

Chemistry

Inter (Part-I)-A-2021

Time : 2:40 Hours

Paper : I

Subjective SWL-21

Marks : 68

Note: **Section I is compulsory. Attempt any 3 questions from Section II.**

(SECTION-I)

2. Write short answers to any Eight parts. **(8 x 2 = 16)**

i. Explain with reason N_2 and CO have the same number of electrons, protons and neutrons.
ii. Why in experimental work one or more reactants is/are deliberately used in excess quantity?
iii. Law of Conservation of Mass has to be obeyed during stoichiometric calculations. Explain.
iv. Define Distribution Coefficient.
v. What is difference between partition and adsorption type chromatography?
vi. Write quantitative definition of Charles's law.
vii. Calculate the values of R (general gas constant) in SI system.
viii. State Avogadro's law by giving example.
ix. Non-ideal solutions do not obey Raoult's law. Explain with reason.
x. Explain with reason that the relative lowering of vapour pressure is independent of temperature.
xi. Define Cryoscopic Constant.
xii. What is Future Horizon of plasma?

3. Write short answers to any Eight parts. **(8 x 2 = 16)**

i. How soaps perform their cleansing action?
ii. What are amorphous solids? Give examples.
iii. What is Anisotropy?
iv. Define Symmetry of Crystal.
v. What is principal quantum number?
vi. Define Quantum Numbers.
vii. What is azimuthal quantum number?
viii. What is basic idea of Planck's quantum theory?
ix. Define Common Ion Effect with one example.
x. Define Buffer Solutions.
xi. What is half-life period?
xii. Define Order of a Reaction.

4. Write short answers to any Six parts. **(6 x 2 = 12)**

i. Write names of factors affecting electron affinity.
ii. How does Shielding effect affect ionization energy?
iii. Define Polar Covalent Bond giving one example.
iv. Give two examples of coordinate covalent bond.
v. Define Enthalpy of atomization with one example.
vi. What is the first Law of Thermodynamics?
vii. Write reactions involved in extraction of Sodium in Down's Cell.
viii. Discuss in brief Standard Hydrogen Electrode.
ix. What is function of salt bridge?

(SECTION-II)

(Each question carries Eight (4+4=8) Marks)

5. (a) Calculate the number of grams of K_2SO_4 and water produced when 14g of KOH are reacted with excess of H_2SO_4. Also calculate the number of molecules of water produced.

(b) What are Liquid Crystals? Give their uses in daily life.

6. (a) State and explain Charles's law, alongwith its experimental verification.

(b) Explain Atomic or Line spectrum.

7. (a) Define Co-ordinate Covalent Bond and explain with two suitable examples.

(b) Describe the measurement of enthalpy of a reaction by bomb calorimeter.

8. (a) $N_2(g)$ and $H_2(g)$ combine to give $NH_3(g)$. The value of K_c in this reaction is 6.0×10^{-2} at $500°C$. Calculate the value of K_p.

(b) Explain Energy of Activation.

9. (a) What is Raoult's law? Give its three statements.

(b) Explain the term oxidation number with two examples.