Note: - You have four ch... fill that circle in front of that question n... filling up two or more circles will result no mark.

SECTION-A

	Questions	A	B	C	D
1.	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
2.	Which one of the given salts will not hydrolyse in water?	NaCl	$AlCl_3$	Na_2CO_3	CH_3COONa
3.	The solution having zero pH will be:	acidic	Highly acidic	neutral	basic
4.	For which system does the equilibrium constant, K_c has the units of $(concentration)^{-1}$?	$N_2 + 3H_2 \rightleftharpoons 2NH_3$	$H_2 + I_2 \rightleftharpoons 2HI$	$2HF \rightleftharpoons H_2.F_2$	$2NO_2 \rightleftharpoons N_2O_4$
5.	The enthalpy of solution of sodium carbonate is:	$-16.2\ KJmol^{-1}$	$+16.2\ KJmol^{-1}$	$-25.0\ KJmol^{-1}$	$-285.8\ KJmol^{-1}$
6.	For a given process, the heat changes at constant pressure (q_p) and at constant volume (q_v) are related to each other as:	$q_p = q_v$	$q_p > q_v$	$q_p < q_v$	$q_p = q_v/2$
7.	Splitting of spectral lines when atoms are subjected to strong electric field is called:	Zeeman effect	Photoelectric effect	Stark effect	Compton effect
8.	Which of the given molecules has zero dipole moment?	BF_3	H_2O	$CHCl_3$	NH_3
9.	Which of the given hydrocarbons has the highest value of heat of vaporization?	CH_4	C_2H_6	C_3H_8	C_6H_{14}
10.	Ionic solids are characterized by:	Low melting points	Good conductivity in solid state	High vapour pressures	Solubility in polar solvents
	The density of an ideal gas at a given temperature and pressure can be calculated by employing the formula:	$d=\frac{PM}{RT}$	$d=\frac{P}{RT}$	$d=\frac{nP}{RT}$	$d=\frac{PM}{V}$
	Pressure remaining constant, at which temperature, the volume of a gas will become twice of what it is at $0\ ^\circ C$:	$546\ ^\circ C$	$200\ ^\circ C$	$273\ ^\circ C$	$100\ ^\circ C$
	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 ta used
	One dm^3 of N_2 at S.T.P contains bout:	$5.37x10^{22}$ atoms	$3.01x10^{23}$ atoms	$6.02x10^{23}$ atoms	$2.68x10^{19}$ atom
	he number of moles of CO_2 which ntains 16g of Oxygen:	0.25	0.50	1.0	1.50
	he rate equation of a reaction +B → Product Rate=$[A]^2[B]$, A is present in large excess, n the order of reaction is:	2.5	3	1	2
	ng a redox reaction, an izing agent:	Gains electrons	Is oxidized	Loses electrons	Is hydrolyzed

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.

SWL GRP-1

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

i. Define ionization energy with an example.
ii. P_i (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).

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. (4)

7. (a) Describe defects in Bohr's atomic model. (2+2=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. (4)
(b) What is a Galvanic cell? Draw diagram. Explain its electrodes with reactions occuring on electrodes. (1+3=4)

9. (a) Enlist colligative properties and why some properties are colligative? Also give conditions for observing colligative properties. (1+1+2=4)
(b) Discuss any two factors affecting rate of reactions. (4)