1124 **Warning:- Please write your Roll No. in the space provided and sign** Roll No----------

(Inter Part – I) **(Session 2020-22 to 2023-25)** **Sig. of Student** ----------

Chemistry (Objective) **(Group - I)** **Paper (I)** SGD-I-24

Time Allowed:- 20 minutes **PAPER CODE 2485** Maximum Marks:- 17

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. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question. Write **PAPER CODE, which is printed on this question paper**, on the both sides of the Answer Sheet and fill bubbles accordingly, otherwise the student will be responsible for the situation. Use of Ink Remover or white correcting fluid is not allowed.

Q. 1

1) The Cathodic reaction in the electrolysis of dil. H_2SO_4 with Pt electrode is
(A) Reduction (B) Oxidation (C) Both reduction and Oxidation (D) Neither oxidation nor reduction

2) Catalyst for a catalyst is also called
(A) Promotor (B) Inhibitor (C) Poisoning (D) Retarder

3) 27 g of Aℓ will react completely with how much mass of O_2 to produce $A\ell_2O_3$
(A) 8 gm of oxygen (B) 16 gm of oxygen (C) 32 gm of oxygen (D) 24 gm of oxygen

4) The mass of one mole of electron is
(A) 1.008 mg (B) 0.55 mg (C) 0.184 mg (D) 1.673 mg

5) The comparative rates at which the solute moves in paper chromatography, depends on
(A) The size of paper (B) R_f values of solute (C) Temperature of the experiment (D) Size of chromatographic tank used

6) During the process of crystallization, the hot saturated solution
(A) Is cooled very slowly to get large size crystals (B) Is cooled at a moderate rate to get medium sized crystals (C) Is evaporated to get the crystals of the product (D) Is mixed with an immiscible liquid

7) The molar volume of CO_2 is maximum at
(A) STP (B) 127°C and 1atm (C) 0°C and 2atm (D) 273°C and 2atm

8) Which of the following will have same number of molecules at STP
(A) 280 cm^3 of CO_2 and 280 cm^3 of N_2O (B) 11.2 dm^3 of O_2 and 32g of O_2 (C) 44g of CO_2 and 11.2 dm^3 of CO_2 (D) 28g of N_2 and 5.6 dm^3 of oxygen

9) Acetone and chloroform are soluble into each other due to
(A) Intermolecular hydrogen bonding (B) Ion dipole interaction (C) Instantaneous dipole (D) Hydrolysis

10) Which of the following pair do not show isomorphism
(A) $NaNO_3$, KNO_3 (B) $ZnSO_4$, $NiSO_4$ (C) Cu , Ag (D) NaCl , $CuCl_2$

11) Which of the following sub-atomic particle do not show ionization
(A) Electron (B) Proton (C) Neutron (D) Alpha ray

12) When 6d orbital is complete, the entering electron goes into
(A) 7f (B) 7s (C) 7p (D) 7d

13) The type of hybridization in molecule of ethene ($CH_2 = CH_2$) is
(A) sp (B) sp^3 (C) sp^2 (D) dsp

14) Which of the following compounds possess ionic bonding
(A) CaO (B) CH_4 (C) CH_3Cl (D) C_2H_6

15) The change in heat energy of a chemical reaction at a constant temperature and pressure is called
(A) Enthalpy change (B) Bond energy (C) Heat of sublimation (D) Internal energy

16) For which system, does the equilibrium constant (K_c) has units of $(Concentration)^{-1}$
(A) $N_2 + 3H_2 \rightleftharpoons 2NH_3$ (B) $H_2 + I_2 \rightleftharpoons 2HI$ (C) $2NO_2 \rightleftharpoons N_2O_4$ (D) $2HF \rightleftharpoons H_2 + F_2$

17) Colligative properties are the properties of
(A) Dilute solutions which behaves as nearly ideal solutions (B) Concentrated solutions which behaves as nearly non-ideal solutions (C) Both A and B (D) Neither A nor B

1124 (Inter Part - I) **Warning**:- Please, do not write anything on this question paper except your **Roll No.**

Chemistry (Subjective) **(Session 2020-22 to 2023-25) Group (I) Paper (I)**

Time Allowed: 2.40 hours **Section ---------- I** **Maximum Marks: 68**

2. Answer briefly any Eight parts from the followings:- **8 × 2 = 16**

(i) Calculate percentage of phosphorus and Nitrogen in $(NH_4)_2HPO_4$

(ii) 10g of Magnesium and 5g of Carbon have equal number of atoms. Justify.

(iii) Define Stoichiometry. Give its basic conditions.

(iv) Differentiate between Qualitative and Quantitative analysis.

(v) Write down method to separate iodine from its aqueous solution.

(vi) How cooling can be done for Crystallization? (Any two methods)

(vii) Water vapours don't behave ideally at 273 K . Explain with reason.

(viii) Calculate the value of "R" in ideal gas equation. (Any units)

(ix) Give characteristics of Plasma. **(x)** Calculate the pH of 10^{-4}mol.dm^{-3} of $Ba(OH)_2$

(xi) Write down K_c units for the following reaction $PCl_{5\,(g)} \rightleftharpoons PCl_{3\,(g)} + Cl_{2\,(g)}$

(xii) Explain that a Mixture of NH_4OH and NH_4Cl gives us a basic buffer.

3. Answer briefly any Eight parts from the followings:- **8 × 2 = 16**

(i) Why diamond is hard and electrical insulator.

(ii) Heat of sublimation of substance is greater than it's heat of vaporization, give it's reason.

(iii) What are Debye forces. **(iv)** What is effect of temperature and surface area on evaporation.

(v) Calculate mass of electron from it's charge and e/m value.

(vi) How does neutron interact with $^{14}_{7}N$ and $^{65}_{29}Cu$

(vii) e/m value of positive rays depends on nature of gas which is used in discharge tube, explain it.

(viii) Differentiate between Zeeman effect and Stark effect.

(ix) Differentiate between molarity and molality. **(x)** Justify that aqueous solution of NaCl is neutral.

(xi) What is catalytical poisoning. **(xii)** Differentiate between homogenous catalysis and heterogenous catalysis.

4. Answer briefly any Six parts from the followings:- **6 × 2 = 12**

(i) Write down the cause of chemical combination. **(ii)** Why atoms have no sharp boundary?

(iii) Why lone pair of electrons occupies more space than a bond pair?

(iv) Bond angle in NF_3 shrinks to 102° why? **(v)** What is meant by internal energy?

(vi) Define standard enthalpy of formation. Give example.

(vii) Define standard enthalpy of reaction. Give example.

(viii) Calculate oxidation number of Cr in Cr_2O_3.

(ix) A porous plate or a salt bridge is not required in lead storage cell. Why?

Section -------- II

Note: Attempt any three questions. **(8 × 3 = 24)**

5. **(a)** What is Stoichiometry? Give its assumptions? Mention two important Laws, which help to perform the Stoichiometric calculations?

(b) Define ionic solids. Discuss Any six properties of ionic solids in detail.

6. **(a)** 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

(b) Explain Millikan's oil drop experiment to determine the charge of an electron.

7. **(a)** Discuss sp^2-hybridization with example of ethene.

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

8. **(a)** Define Hess's law of constant heat summation. How the enthalpy of formation of CO can be calculated with it.

(b) Describe fuel cell in detail with diagram.

9. **(a)** Explain the terms Molarity and Molality with their formulas.

(b) Write four characteristics of Enzyme catalysis.

1134 - 1124 -- 18000