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.

1. 1 - Gooch Crucible is made up of
   (A) glass   (B) porcelain   (C) rubber   (D) plastic

2 - The pH of 10^{-3} moles/dm^3 of an aquous solution of H_2SO_4 is
   (A) 3.0   (B) 2.7   (C) 2.0   (D) 1.5

3 - Enzyme used for hydrolysis of sucrose is
   (A) invertase   (B) urease   (C) lipase   (D) zymase

4 - The partial pressure of Oxygen in lungs is
   (A) 159 torr   (B) 116 torr   (C) 130 torr   (D) 140 torr

5 - The voltage of Silver Oxide battery is about
   (A) 1.5 V   (B) 2 V   (C) 2.5 V   (D) 3 V

6 - The change in heat energy of chemical reaction at constant temperature and pressure is called
   (A) enthalpy change   (B) heat of sublimation   (C) bond energy   (D) internal energy change

7 - Allotropy is the property of
   (A) compound   (B) mixture   (C) element   (D) molecule

8 - Bond angle of NF_3 is
   (A) 102°   (B) 104°   (C) 109.5°   (D) 120°

9 - A solution of glucose is 10% w/v. The volume in which its 1g mole is dissolved will be
   (A) 1 dm^3 (B) 1.8 dm^3 (C) 200 cm^3 (D) 900 cm^3

10 - Decolourizing agent used in crystallization is
   (A) P_2O_5 (B) animal charcoal   (C) $KMnO_4$ (D) CCl_4

11 - The number of isotopes of Nickle are
   (A) 2   (B) 3   (C) 5   (D) 7

12 - Number of molecules in 1 dm^3 of water is close to
   (A) $\frac{6.02}{22.4} \times 10^{23}$ (B) $\frac{12.04}{22.4} \times 10^{23}$ (C) $\frac{18}{22.4} \times 10^{23}$ (D) $55.5 \times 6.02 \times 10^{23}$

13 - Splitting of spectral lines when atoms are subjected to strong electric field is called
   (A) Zeeman's effect   (B) Stark effect   (C) photoelectric effect   (D) Compton effect

14 - Bond order of O_2 according to MOT is
   (A) 1   (B) 2   (C) 3   (D) 4

15 - (n + ℓ) value for 4p orbital is
   (A) 4   (B) 5   (C) 6   (D) 7

16 - Which of following will have Hydrogen bonding in its molecules
   (A) C_2H_5OH (B) CCl_4 (C) I_2 (D) $NaCl$

17 - The empirical formula of glucose $C_6H_{12}O_6$ is
   (A) $C_6H_{12}O_6$ (B) CHO   (C) CH_2O (D) CH_2O_2

CHEMISTRY   Intermediate Part-I , Class 11th (1st A 324)   Paper : I   Group – I

Time: 2:40 Hours   **SUBJECTIVE**   GUJ-1-24   Marks: 68

Note: Section-I is compulsory. Attempt any THREE (3) questions from Section-II.

SECTION – I

2. Write short answers to any EIGHT questions.   (2 x 8 = 16)

   i - Why atom cannot be visualized by ordinary microscope?

   ii - Calculate number of gram atoms in 0.1 Kg of Na (At. wt of Na = 23 a.m.u)

   iii - How can limiting reactant be identified?

   iv - How can rate of filteration be enhanced?

   v - What is chromatography? Write its uses.

   vi - What is R_f value? Write its unit.

   vii - In a graph of P Vs 1/V, what is the result of increase in temperature?

   viii - Give two characteristics of plasma.

   ix - Differentiate between diffusion and effusion.

   x - What is pH of 10^{-4} M $Ba(OH)_2$ solution?

   xi - What are conjugate acids and bases?

   xii - Define law of mass action.

3. Write short answers to any EIGHT questions.   (2 x 8 = 16)

   i - Why acetone and chloroform are miscible into each other? Show with the help of structures.

   ii - Why ice floats on the surface of water?

   iii - Define symmetry. What are symmetry elements?

   iv - Define unit cell. What are unit cell dimensions?

   v - How positive rays are produced?

   vi - Define Moseley law. Write down its two important points.

   vii - What is Davisson and Germer experiment to verify the dual nature of matter?

   viii - Write down two Moseley's conclusions.

   ix - Molal aqueous solutions are more dilute than molar solutions. Justify.

   x - Write down any two characteristics of ideal solutions.

   xi - Define half-life period. Give mathematical formula of half-life period for second order and third order reaction.

   xii - What is autocatalysis? Give one example.

4. Write short answers to any SIX questions.   (2 x 6 = 12)

   i - Write down factors influencing electron affinity.

   ii - Cationic radius is less than its parent atom why?

   iii - How electronegativity changes in a group?

   iv - Bond distance is the compromise distance between two atoms. How?

   v - What are exothermic reactions? Give example.

   vi - Define enthalpy of combustion. Give example.

   vii - State first law of thermodynamics.

   viii - The Nickle Cadmium cell is called rechargeable cell. Give electrodic reactions.

   ix - Impure Cu can be purified by electrolytic process. How?

SECTION – II

5. **(a)** Differentiate the following with examples.   (2+2=4)
   - (i)   Empirical and Molecular formula
   - (ii)   Mole and Avogadro's number

   (b) Define Hydrogen Bonding and explain any three applications of it.   (4)

6. **(a)** One mole of methane is maintained at 300 K. Its volume is 250 cm^3. Calculate the pressure   (4)
   exerted by the gas when the gas is ideal

   (b) What is J.J. Thomson's experiment for determining $\frac{e}{m}$ value of electron?   (4)

7. **(a)** Explain the shapes of NH_3 and H_2O molecules according to hybridization theory.   (4)

   (b) The solubility product of Ag_2CrO_4 is 2.6 × 10^{-2} at 25°C. Calculate the solubility of the   (4)
   compound.

8. **(a)** Define 1st law of thermodynamics. Explain it in detail. Also prove that $\Delta E = q_v$ (4)

   (b) Write electrode reactions for following batteries   (4)
   - (i)   Alkaline Battery
   - (ii)   Silver Oxide Battery

9. **(a)** Derive a relationship : $M_2 = \dfrac{K_f}{\Delta T_f} \cdot \dfrac{1000\, W_2}{W_1}$ (4)

   (b) What is half-life period? Prove that $\left[t_{\frac{1}{2}}\right]_n \propto \dfrac{1}{a^{n-1}}$ (4)