

(INTERMEDIATE PART-I) (III)

Paper : I
Marks : 17

Chemistry (New Scheme)

(Objective)

Code : 6485

Time: 20 Minutes

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. When 6d orbital is complete, the entering electron goes into: (A) 7f (B) 7s (C) 7p (D) 7d
2. Which of the following molecules has zero dipole moment? (A) NH_3 (B) $CHCl_3$ (C) H_2O (D) BF_3
3. Which of the following species has unpaired electrons in antibonding molecular orbitals? (A) O_2^{2+} (B) N_2^{2-} (C) B_2 (D) F_2
4. For a given process the heat changes at constant pressure (q_p) and at constant volume (q_v) are related to each other as: (A) $q_p = q_v$ (B) $q_p < q_v$ (C) $q_p > q_v$ (D) $q_p = \frac{q_v}{2}$
5. Molarity of pure water is: (A) 1 (B) 18 (C) 55.5 (D) 6
6. An excess of aqueous silver nitrate is added to aqueous barium chloride and precipitate is removed by filtration. What are the main ions in the filtrate? (A) Ag^+ and NO_3^- only (B) Ag^+ and Ba^{2+} and NO_3^- (C) Ba^{2+} and NO_3^- only (D) Ba^{2+} and NO_3^- and Cl^-
7. The molal boiling point constant is the ratio of the elevation in boiling point to :- (A) molarity (B) molality (C) mole fraction of solvent (D) mole fraction of solute
8. The cathodic reaction in the electrolysis of dil. H_2SO_4 with Pt electrode is: (A) reduction (B) oxidation (C) both oxidation and reduction (D) neither oxidation nor reduction
9. 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 order of reaction is: (A) 1 (B) 2 (C) 3 (D) 4
10. The mass of one mole of electrons is: (A) 1.008 mg (B) 0.55 mg (C) 0.184 mg (D) 1.673 mg
11. The volume occupied by 1.4 g of N_2 at S.T.P is: (A) $2.24dm^3$ (B) $22.4dm^3$ (C) $1.12dm^3$ (D) $112dm^3$
12. Solvent extraction is an equilibrium process and it is controlled by: (A) law of mass action (B) the amount of solvent used (C) distribution law (D) the amount of solute
13. Pressure remaining constant, at which temperature the volume of the gas will become twice of what it is at $0^\circ C$: (A) $546^\circ C$ (B) $200^\circ C$ (C) $546k$ (D) $273k$
14. The molar volume of CO_2 is maximum at: (A) STP (B) $127^\circ C$ and 1 atm (C) $0^\circ C$ and 2 atm (D) $273^\circ C$ and 2 atm
15. When water freezes at $0^\circ C$, its density decreases due to: (A) cubic structure of ice (B) change of bond length (C) empty spaces present in the structure of ice (D) change of bond angles
16. Which of the following is a pseudo solid? (A) CaF_2 (B) Glass (C) $NaCl$ (D) $AgNO_3$
17. Splitting of spectral lines when atoms are subjected to strong electric field is called: (A) zeeman effect (B) stark effect (C) photoelectric effect (D) Compton effect

(2)

(2 x 6 = 12)

4. Write short answers to any Six parts.

- i. Why did the atomic Radii cannot be measured precisely?
- ii. In NH_3 bond angle is 107.5° but in NF_3 it is 102° . Explain it.
- iii. NH_3 can form coordinate covalent bond with H^+ . Explain!
- iv. Oxygen molecule is paramagnetic in nature. Justify!
- v. Prove that $\Delta E = q_v$.
- vi. Define the terms Heat and Work.
- vii. A salt bridge maintain the electrical neutrality in galvanic cell. Explain.
- viii. Define standard electrode potential?
- ix. Write down chemical reactions taking place in alkaline battery.

(Section – II)

Note: Attempt any three (3) questions from Section II. Each question carries 08 marks. (3 x 8 = 24)

5. (a) Define limiting reactant. Write different steps involved in the identification of limiting reactant. How does it control the yield of product formed in chemical reaction.
(b) Describe manometric method for the measurement of vapour pressure of a liquid.
6. (a) $250cm^3$ of the sample of hydrogen effuses four times as rapidly as $250cm^3$ of an unknown gas. Calculate the molar mass of unknown gas.
(b) Derive the equation for the radius of n th orbit of hydrogen atom using Bohr's model.
7. (a) Define hybridization. Explain sp^3 hybridization with the example of methane (CH_4).
(b) How enthalpy of reaction is determined by glass calorimeter?
8. (a) $N_2(g)$ and $H_2(g)$ combine to $NH_3(g)$. The value of K_c in this reaction at $500^\circ C$ is 6.0×10^{-2} . Calculate the value of K_p for this reaction.
(b) Describe the homogeneous and heterogeneous catalysis with one example of each.
9. (a) Write note on (i) Hydration (ii) Hydrates
(b) Explain the construction of fuel cell.

Chemistry (New Scheme)
Time : 2 : 40 Hours

Roll No. _____ Annual 2019
(INTERMEDIATE PART - I)

Paper : I
Marks : 68

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

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

- N_2 and CO molecules have equal number of protons and neutrons. Justify.
- Mg atom is twice heavier than C-atom. Why?
- What is justification of two strong peaks of almost equal heights in the mass spectrum for Bromine?
- How crystals are dried in vacuum desiccator?
- Why fluted filter paper is used for greater rate of filtration than ordinary cone filter paper?
- Write any two characteristics of plasma.
- Why real gases deviate from ideal behaviour?
- Define Avogadro's Law. How many molecules of an ideal gas present in 22.4 dm^3 at STP?
- -273.15°C is known to be the lowest temperature of an ideal gas. Give reason.
- Relative lowering of vapour pressure is independent of temperature. Justify this statement
- Define hydrolysis. Give chemical equation for hydrolysis of ammonium chloride.
- Define molality. Give one of its mathematical expression.

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

- Cleavage of the crystals is itself an isotropic behaviour. Justify.
- How liquid crystals are used to locate veins, arteries, infections and tumors?
- Lower alcohols are soluble in H_2O but hydrocarbons are insoluble. Give reason.
- Why graphite is good conductor of electricity but diamond is bad conductor of electricity?
- Give two importances of Moseley Law.
- State Heisenberg's uncertainty principle.
- Differentiate between orbits and orbitals.
- How the dual nature of electron was verified?
- How acidic and basic buffers are prepared? Give one example of each.
- State Law of Mass Action.
- Define activation energy and activated complex.
- How does the increase of temperature increases the rate of the chemical reaction.

(Turn Over)