



Roll No _____ to be filled in by the candidate

(For All Sessions)

Time: 20 Minutes

Marks : 17

(Group-I)

Chemistry (Objective)

Pwp-11-1-23

Note: Write Answers to the Questions on the objective answer sheet provided. Four possible answers A, B, C and D to each question are given. Which answer you consider correct, fill the corresponding circle A, B, C or D given in front of each question with Marker or Pen ink on the answer sheet provided.

- 1.1 The bond order of N_2 is (A) 2 (B) 1 (C) 0 (D) 3
2. In endothermic reaction, heat content of: (A) Product is more than that of reactant (B) Reactant is more than that of product (C) Surrounding increases (D) Reactants and products are equal
3. Which of the following is not a state function: (A) Enthalpy (B) Temperature (C) Work (D) Internal energy
4. Dilution increases the degree of dissociation, is the statement of which of the following law or principle: (A) Le-Chatelier principle (B) Law of mass action (C) Ostwald dilution law (D) Hess's law
5. PH of the soft drink is: (A) 2.0 (B) 3.0 (C) 5.8 (D) 4.6
6. Molarity of pure water is: (A) 1 (B) 18 (C) 55.6 (D) 6
7. Stronger the oxidizing agent, greater is the: (A) Oxidation potential (B) Reduction potential (C) Redox potential (D) E.m.f of the cell
8. Which of the following gas is bubbled through standard hydrogen electrode at one atmospheric pressure? (A) HCl gas (B) Pure H_2 gas (C) Chlorine gas (D) O_2 gas
9. The unit of rate constant is same as that of rate of reaction in: (A) 1st Order Reaction (B) 2nd Order Reaction (C) Zero Order Reaction (D) 3rd Order Reaction
10. The mass of 10 moles of electrons is: (A) 10.08 mg (B) 5.5 mg (C) 1.84 mg (D) 16.73 mg
11. The number of moles of CO_2 which contains 16 g of oxygen: (A) 1.0 moles (B) 0.50 moles (C) 2.0 moles (D) 3.0 moles
12. A complete quantitative determination generally consists of how many steps? (A) 4 steps (B) 5 steps (C) 2 steps (D) 6 steps
13. Pressure remaining constant, at which temperature the volume of a gas will become twice of what it is at $0^\circ C$ (A) $546^\circ C$ (B) $200^\circ C$ (C) 546 k (D) 273 k
14. The scientist who identified plasma is: (A) William Crookes (B) Vander Waal (C) Rutherford (D) Boyle
15. When water freezes at $0^\circ C$, its density decreases due to: (A) Cubic structure of ice (B) Empty spaces present in the structure of ice (C) Change of bond lengths (D) Change of bond angles
16. Total number of Bravais lattices are: (A) 7 (B) 10 (C) 12 (D) 14
17. The nature of positive rays depends upon: (A) The nature of electrode (B) The nature of residual gas (C) The nature of discharge tube (D) The length of discharge tube

Chemistry (Subjective)

(GROUP-I) (For All Sessions)

Time: 2:40 hours

SECTION-I

Rwp-11-1-23

2. Write short answers of any eight parts from the following:

(8x2=16)

- Why isotopes of same element show similar chemical properties?
- Prove N_2 and CO have the same number of electrons, protons and neutron.
- Define molecular ion with examples.
- What is ΔH°_f ? Give one example.
- Why gases behave non ideally at high pressure and low temperature?
- What are the two faulty points of KMT?
- What is plasma? How it is formed?
- What is Zeeman effect?
- Why positive rays are also called as canal rays?
- The e/m value of positive rays for different gases is different? Justify it.
- Define Lattice Energy? Give example.
- What is state function? Give any two examples.

3. Write short answers of any eight parts from the following:

(8x2=16)

- Define ppm and give its mathematical formula?
- State Raoult's law.
- Elevation of boiling point is a colligative property. Justify it.
- Define half life period. Give one example.
- Give two characteristics of enzyme catalyst.
- Evaporation causes cooling. Explain with reason.
- Define homogeneous catalysis with an example.
- What do you mean by lattice energy? Give an example.
- Define Allotropy with an example.
- What is fluted filter paper?
- Write down two uses of chromatography.
- Write any two methods for drying of crystals.

4. Write short answers of any six parts from the following:

(6x2=12)

- Justify that π bond are more diffused than sigma bond.
- Write the Lewis structures for the following compound: i) N_2O_5 ii) H_3PO_4
- What is bond order? Calculate bond order for H_2 molecule.
- Why change of temperature disturbs both the equilibrium position and the equilibrium constant of a reaction.
- What is common ion effect? Give one example.
- What is PH and POH?
- SHE acts as anode when connected with Cu electrode but as cathode with Zn electrode. Give reason.
- Calculate the oxidation numbers of the elements underlined. i) $Na_3\underline{P}O_4$ ii) $H\underline{N}O_3$
- Define electrode potential.

SECTION-II

Note Attempt any three questions. Each question carries equal marks:

(8x3=24)

- Define stoichiometry. Give its assumption and mention laws obeyed during stoichiometric calculation. 4
 - Calculate the number of atoms in 20cm^3 of CH_4 at 0°C and pressure of 700 mm of Hg. 4
- Define boiling point. What is the effect of external pressure on boiling point? Give two examples. 4
 - Explain the Born-Haber cycle to calculate the lattice energy of sodium chloride. 4
- How neutron was discovered? Explain with the help of an experiment also write four properties of neutron. 4
 - The equilibrium constant for the reaction between acetic acid and ethyl alcohol is 4.0. A mixture of 3 moles of acetic acid and one mole C_2H_5OH is allowed to come to equilibrium. Calculate the amount of ethyl acetate at equilibrium state in no of moles and grams. Also calculate mass of reactants left behind. 4
- Define ionization energy, name the factors influencing the ionization energies of elements. What is a trend of ionization energy in the periodic table. 4
 - What is meant by Lead Accumulator explain it in detail, Give chemical equations of discharging and recharging. 4
- Differentiate between ideal and Non ideal solutions. 1x4=4
 - Discuss how surface area and nature of reactants affect rate of a chemical reaction. 2x2=4