

Roll No \_\_\_\_\_ (To be filled in by the candidate) (Academic Sessions 2019 – 2021 to 2022 – 2024)  
**CHEMISTRY** 223-1<sup>st</sup> Annual-(INTER PART – I) Time Allowed : 20 Minutes  
 Q.PAPER – I ( Objective Type ) GROUP – II Maximum Marks : 17

**PAPER CODE = 6484** *CHR-11-2-23*

Note : Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question.

1-1	Which of the following is a pseudo solid : (A) $\text{CaF}_2$ (B) Glass (C) $\text{NaCl}$ (D) $\text{KCl}$
2	The number of bonds in nitrogen molecule is : (A) One $\sigma$ and two $\pi$ (B) One $\sigma$ and one $\pi$ (C) Three sigma only (D) Two sigma and one $\pi$
3	Molarity of pure water is : (A) 1 (B) 18 (C) 55.5 (D) 6
4	Photochemical reactions are : (A) Zero Order Reaction (B) First Order Reaction (C) Second Order Reaction (D) Third Order Reaction
5	The largest number of molecules are present in : (A) 3.6 g of $\text{H}_2\text{O}$ (B) 4.8 g of $\text{C}_2\text{H}_5\text{OH}$ (C) 2.8 g of $\text{CO}$ (D) 5.4 g of $\text{N}_2\text{O}_5$
6	The pH of $10^{-3} \text{ mol dm}^{-3}$ of an aqueous solution of $\text{H}_2\text{SO}_4$ is : (A) 3.0 (B) 2.7 (C) 2.0 (D) 1.5
7	The comparative rates at which the solutes move in paper chromatography depend on : (A) The size of the paper (B) $R_f$ values of solutes (C) Temperature of the experiment (D) Size of the chromatographic tank used
8	The quantity of heat required to change the temperature of a body by 1 Kelvin is known as : (A) Heat energy (B) Enthalpy (C) Heat capacity (D) Heat of a reaction
9	Electroplating is done by one of the following methods : (A) Hydration (B) Hydrolysis (C) Electrolytic conduction (D) Electrolysis
10	All gases can be liquefied by the Lind's method, except : (A) $\text{N}_2$ (B) $\text{O}_2$ (C) $\text{F}_2$ (D) He
11	The number of moles of $\text{CO}_2$ which contain 8 g of oxygen : (A) 0.25 (B) 0.50 (C) 1.0 (D) 1.50
12	When 6d orbital is complete, the entering electron goes into : (A) 7f (B) 7s (C) 7p (D) 7d
13	The existence of an element in more than one crystalline forms is known as : (A) Polymorphism (B) Allotropy (C) Symmetry (D) Anisotropy
14	For a given process, the heat changes at constant pressure $q_p$ and $q_v$ at constant volume are related to each other as : (A) $q_p = q_v$ (B) $q_p < q_v$ (C) $q_p > q_v$ (D) $q_p = \frac{q_v}{2}$
15	The molar volume of $\text{CO}_2$ is maximum at : (A) S.T.P (B) $127^\circ\text{C}$ and 1 atm. (C) $0^\circ\text{C}$ and 2 atm. (D) $273^\circ\text{C}$ and 2 atm.
16	Purification of $\text{NaCl}$ by passing $\text{HCl}$ gas is the example of : (A) Filtration (B) Sublimation (C) Ionic product (D) Common ion effect
17	If the salt bridge is not used between two half cells, then the voltage : (A) Decreases rapidly (B) Decreases slowly (C) Does not change (D) Drops to zero

SECTION – I LHR-11-2-23

2. Write short answers to any EIGHT (8) questions :

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- (i) Why isotopes have same chemical properties but different physical properties?
- (ii) Define gram atom and gram molecule.
- (iii) Define stoichiometry, give its assumptions.
- (iv) Derive mathematical relationship for density of an ideal gas.
- (v) Why pilots feel uncomfortable in breathing at higher altitude?
- (vi) What are causes of deviation from ideality?
- (vii) What happens when a free neutron decay?
- (viii) Define Hund's rule and Aufbau principle.
- (ix) Define Mosley law. Give its importance.
- (x) Define enthalpy of solution. Give one example.
- (xi) Define internal energy and enthalpy.
- (xii) Why enthalpy of combustion of some compounds can not be measured directly?

3. Write short answers to any EIGHT (8) questions :

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- (i) How crystals are dried by reliable method?
- (ii) Define sublimation. Give the importance of sublimation.
- (iii) Differentiate between adsorption and partition chromatography.
- (iv) The boiling point of water is different at Murree hills and at Mount Everest. Give reason.
- (v) Describe crystallographic elements.
- (vi) The electrical conductivity of the metals decreases by increasing temperature.
- (vii)  $Na_2SO_4 \cdot 10H_2O$  shows discontinuous solubility curve. Give reason.
- (viii) Define molarity. Give one example.
- (ix) Freezing points are depressed due to the presence of solutes.
- (x) Define energy of activation. What is the affect of temperature on the activation energy of a reaction?
- (xi) What is half life period? How it is used for the determination of order of a reaction?
- (xii) The rate of a chemical reaction is an ever changing parameter under the given conditions.

4. Write short answers to any SIX (6) questions :

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- (i) On what factors bond energy depends?
- (ii) Draw molecular orbital diagram of oxygen molecule.

(Turn Over)

(2)

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4. (iii) Why ionic bonds are non-directional?
- (iv) Define buffer capacity.
- (v) State law of mass action.
- (vi) What is meant by percentage ionization of acids?
- (vii) A salt bridge maintains electrical neutrality in the cell. How?
- (viii) What is meant by electrolytic conduction?
- (ix) Calculate oxidation number of "P" in  $Na_2PO_4$ .

## SECTION – II

**Note :** Attempt any **THREE** questions.

5. (a) Define types of yield. How do we calculate the percentage yield of a chemical reaction? 4
- (b) Calculate the mass of  $1\text{ dm}^3$  of  $NH_3$  gas at  $30^\circ\text{C}$  and 1000 mm Hg pressure, considering ammonia is behaving ideally. 4
6. (a) What are metallic solids? Describe their properties. 4
- (b) Explain spontaneous and non spontaneous reactions describe four points which differentiate them. 4
7. (a) Derive the formula to calculate the energy of an electron in  $n$ th orbit using Bohr's model. 4
- (b) The solubility of  $CaF_2$  in water at  $25^\circ\text{C}$  is found to be  $2.05 \times 10^{-4}\text{ mol dm}^{-3}$ . What is the value of  $K_{sp}$  at this temperature? 4
8. (a) Explain  $sp^2$ -hybridization with suitable example. 4
- (b) Give four applications of electro-chemical series. 4
9. (a) Describe Beckmann's method for the measurement of freezing point depression with the help of diagram. 4
- (b) What is enzyme catalysis? Give one example. Also give any four characteristics of enzyme catalysis. 4