

CHEMISTRY Part-I

Time: 20 Minutes

Marks: 18

Paper Code

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Roll No. of the Student

Serial No. Of the Answer Book

Multiple Choice Questions
01 Mark for each

SECTION-A

Note:

- 1) Attempting all MCQs is compulsory. This paper along with the OMR sheet must be returned to the superintendent after due time.
- 2) Fill the circle (A) (B) (C) (D), which one is correct with blue or black ball point, in this sheet as well as in separate OMR Sheet like
- 3) If more than one circle in the OMR sheet is filled then no credit will be given to such answer.

I.i. Gum in water is a type of.

- (A) A coarse mixture (B) A suspension (C) A colloidal dispersion (D) A true solution
- ii. When 1mole of solute dissolved in 500cm^3 of solution its concentration will be.
(A) 1M (B) 2M (C) 8M (D) 4M
- iii. The flow of solvent molecules to the solution is called.
(A) Reverse osmosis (B) Endo osmosis (C) Exoosmosis (D) Parallel osmosis
- iv. Which one of the following process has ΔH positive?
(A) Ionization energy (B) Electron affinity (C) Combustion (D) Exothermic reaction
- v. SHE act as Anode when coupled with elements having.
(A) Positive reduction potential (B) Negative reduction potential (C) Zero reduction potential (D) Standard reduction potential
- vi. The oxidation number of "Cl" in HClO_3 is.
(A) -1 (B) +1 (C) +3 (D) +5
- vii. The largest number of molecules are present in.
(A) 44g of CO_2 (B) 18g of H_2O (C) 360g of $\text{C}_6\text{H}_{12}\text{O}_6$ (D) 1 mole of SO_2
- viii. Which particle is 1842 times as heavy as Electron.
(A) Proton (B) Neutron (C) Photon (D) X-rays
- ix. Which set of four quantum numbers is possible for an electron in 3P orbitals.
(A) $n=3, l=2, m=1, s=+\frac{1}{2}$ (B) $n=3, l=1, m=3, s=-\frac{1}{2}$ (C) $n=3, l=1, m=3, s=+\frac{1}{2}$ (D) $n=3, l=0, m=0, s=+\frac{1}{2}$
- x. The molar volume of CO_2 gas at STP is.
(A) 44.8dm^3 (B) 22.4dm^3 (C) 60dm^3 (D) 11.2dm^3
- xi. According to Plank's Quantum theory Energy absorbed in case of light is called.
(A) Wave Packets (B) Unit Waves (C) Pulse of Energy (D) Photons
- xii. Points where the possibility of finding electron is zero is called.
(A) Node (B) Orbit (C) Orbital (D) Lobes
- xiii. An unhybridized P-orbitals overlap linearly to form.
(A) π bond (B) σ bond (C) Co-ordinate bond (D) None of these
- xiv. 22.4dm^3 of a gas at 273k & one atm pressure has 6.02×10^{23} molecules. This statement refers to.
(A) Charle's Law (B) Boyle's Law (C) Avogadro's Law (D) Ideal Gas Law
- xv. By increasing the external Pressure the boiling point of liquid will be.
(A) Increases (B) Decreases (C) Remain constant (D) Reduced
- xvi. The apparent shape of the crystal depends upon.
(A) Cleavage plane (B) Symmetry (C) Method & Conditions (D) All of them
- xvii. Bond lengths are experimentally determined by.
(A) Electron diffraction (B) x-ray diffraction (C) Spectral Studies (D) All of them
- xviii. For reaction $\text{H}_2 + \text{I}_2 \rightleftharpoons 2\text{HI}$ all of the following are true Except.
(A) $K_p = K_c$ (B) $\Delta n = 0$ (C) $RT^{\Delta n} = 1$ (D) $K_p > K_c$

CHEMISTRY Part-I

Note: Time allowed for section B and C is 2 hours and 40 minutes.

SECTION "B"

Marks: 40

I. Attempt any Ten Parts out of the following. Each Part carries equal marks.

- i. What is (n+l) rule? Write down electronic configuration of Cu=29.
- ii. Calculate the molarity of NaOH solution when 20g NaOH dissolved in 250ml water.
- iii. Balance the following equation by oxidation-reduction method.
 - i. $\text{Fe} + \text{V}_2\text{O}_3 \longrightarrow \text{Fe}_2\text{O}_3 + \text{VO}$
 - ii. $\text{MnO}_2 + \text{HCl} \longrightarrow \text{MnCl}_2 + \text{Cl}_2 + \text{H}_2\text{O}$
- iv. Give reason exothermic reactions are always spontaneous.
- v. A solution contain 2moles of Alcohols & 18g of H_2O . Calculate the mole fraction of alcohol & water.
- vi. How buffer solution resists change in PH when small amount of acid or base is added?
- vii. How K_c value can be used to predict the direction of a reaction.
- viii. Define the following terms.
 - i. Geometrical Shape.
 - ii. Anisotropy
 - iii. Cleavage Plane
 - iv. Symmetry
- ix. Discuss four factors that affects the viscosity of Liquids.
- x. Total pressure of a gaseous mixture depends upon total number of moles of mixture justify the statement.
- xi. Calculate the mass of 1dm^3 of NH_3 gas at 30°C & 1000mm Hg pressure considering NH_3 is behaving ideally?
- xii. Why oxygen molecule is Paramagnetic in nature?
- xiii. What are the short comings of Bohr's atomic model.

SECTION "C"

Marks: 27

Note: Attempt any Three questions of the following. All question carries equal Marks.

- III. (a) What are limiting & Excess reagents. 4
- (b) When steam is passed over red hot carbon it gives water gas 5
 $\text{H}_2\text{O}_{(g)} + \text{C}_{(s)} \longrightarrow \text{CO} + \text{H}_2$. Which one is limiting reagent if 49g of carbon mixed with 3.78 moles of H_2O vapours also calculate maximum amount of product formed.
- IV. (a) Calculate the energy difference between two energy levels in terms, 4
 (a) Frequency (b) Wave number
- (b) What is spectrum differentiate between continuous & line spectrum. 5
- V. (a) Define law of mass action? Derive its mathematical expression. 4
- (b) A mixture containing 1 mole of acetic acid & 3 mole of ethyl alcohol is heated 5
 up to 100°C . Calculate the mole acetate at equilibrium. $K_c=4$
 $\text{CH}_3\text{COOH} + \text{C}_2\text{H}_5\text{OH} \rightleftharpoons \text{CH}_3\text{COOC}_2\text{H}_5 + \text{H}_2\text{O}$
- VI. (a) Define the following terms. 5
 i. Rate of reaction ii. Rate law iii. Order of reaction
 iv. Activation energy v. Specific rate constant.
- (b) Discuss role of. i. Temperature ii. Catalyst on rate of reaction. 4