

## CHEMISTRY

## GROUP : SECOND

## OBJECTIVE

TIME: 20 MINUTES

MARKS: 17

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.

## QUESTION NO. 1

22-92-22

- 1 The mass of one mole of electrons is  
(A) 1.008 mg (B) 0.55 mg (C) 0.184 mg (D) 1.673 mg
- 2 Number of isotopes of calcium are  
(A) 02 (B) 03 (C) 05 (D) 06
- 3 Comparative rates at which the solute moves in paper chromatography depends upon  
(A) Size of paper (B) R<sub>f</sub> value of solute (C) Temperature of experiment (D) Size of chromatographic tank
- 4 Rate of filtration can be increased by using  
(A) Suction flask (B) Desiccator (C) Glass funnel (D) Cold finger
- 5 Pressure remaining constant at which temperature the volume of the gas will become twice of what it is at 0 °C  
(A) 546 °C (B) 200 °C (C) 546 k (D) 273 k
- 6 The deviation of gas from ideal behavior is maximum at  
(A) - 10 °C and 5.0 atm (B) - 10 °C and 2.0 atm (C) 100 °C and 2.0 atm (D) 0 °C and 2.0 atm
- 7 Acetone and chloroform are soluble to each other due to  
(A) Ion dipole interaction (B) Instantaneous dipole (C) Intermolecular hydrogen bonding (D) Debye forces
- 8 Amorphous solids  
(A) Have sharp melting point (B) Undergo clean cleavage when cut with knife (C) Have perfect arrangement of atoms (D) Can possess small regions of orderly arrangement of atom
- 9 When 6 d orbital is complete, the entering electron goes into  
(A) 7 f (B) 7 s (C) 7 p (D) 7 d
- 10 Velocity of photon is  
(A) Independent of its wavelength (B) Depends on its wavelength (C) Equal to square of its amplitude (D) Depends upon its source
- 11 Which of the following hydrogen halide has the highest percentage of ionic character?  
(A) HCl (B) HF (C) HBr (D) HI
- 12 In sp hybrid orbital percentage of s-character is  
(A) 100 % (B) 25 % (C) 75 % (D) 50 %
- 13 In endothermic reaction the heat content of the  
(A) Product is more than reactants (B) Reactants is more than products (C) Both have equal heat contents (D) Both a and b are correct
- 14 The solubility product of AgCl is  $2.0 \times 10^{-10} \text{ mol}^2 \text{ dm}^{-6}$ . The maximum concentration of Ag<sup>+</sup> ions in solution is  
(A)  $2.0 \times 10^{-10} \text{ mol dm}^{-3}$  (B)  $1.41 \times 10^{-5} \text{ mol dm}^{-3}$  (C)  $1.0 \times 10^{-10} \text{ mol dm}^{-3}$  (D)  $4.0 \times 10^{-20} \text{ mol dm}^{-3}$
- 15 Molarity of pure water is  
(A) 01 (B) 18 (C) 55.5 (D) 6
- 16 The cathodic reaction in the electrolysis of dil H<sub>2</sub>SO<sub>4</sub> with Pt. electrode is  
(A) Reduction (B) Oxidation (C) Both oxidation and reduction (D) Neither oxidation nor reduction
- 17 The unit of rate constant is the same as the rate of reaction in  
(A) First order reaction (B) Second order reaction (C) Third order reaction (D) Zero order reaction



CHEMISTRY  
GROUP : SECOND

SUBJECTIVE  
SECTION-I

TIME : 2:40 HOURS  
MARKS : 68

QUESTION NO. 2 Write short answers of any Eight (8) parts of the following

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- i 23 g of sodium and 238 g of uranium have equal number of atoms in them. Give the reason
- ii Calculate the number of water molecules in 10 g of ice
- iii What is the principle of mass spectrometry ?
- iv Give the main uses of paper chromatography
- v Write down the four characteristics of the solvent used for crystallization
- vi Define sublimation with an example
- vii Gases deviate more significantly from ideal behaviour at high pressure and low temperature. Why ?
- viii How do you differentiate between effusion and diffusion of the gases ?
- ix Prove that  $d = \frac{PM}{RT}$
- x How does the equilibrium constant of a reaction tell us the direction of a chemical reaction ?
- xi How can NaCl be purified by common ion effect ?
- xii What is pka ? How is it show the strength of an acid ?

QUESTION NO. 3 Write short answers of any Eight (8) parts of the following

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- i What are dipole – dipole forces ?
- ii What do you mean by intermolecular forces ?
- iii Hydrogen bonding is present in chloroform and acetone. Justify it
- iv One feels sense of cooling under the fan after bath. Justify
- v What is the reason for the production of positive rays ?
- vi What happen when a free neutron decays ?
- vii Define frequency and wave number
- viii What is continuous spectrum ?
- ix What is percentage weight/weight ?
- x Define Molarity. Give its equation
- xi Define rate of reaction. Give its units
- xii Define velocity constant and give equation

QUESTION NO. 4 Write short answers of any Six (6) parts of the following

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- i Why anionic radius is larger than parent atom ?
- ii Draw molecular orbital picture of He molecule
- iii Define Dipole moment and give its unit
- iv Explain angle in water is  $104.5^\circ$  instead of  $109.5^\circ$
- v What is spontaneous and non-spontaneous process. Explain with example
- vi Define standard enthalpy of reaction. Give one example
- vii What is state function ? Give two examples
- viii What is the oxidation number of neutral molecule. Give one example
- ix Lead accumulator is a chargeable battery. Give reason

### SECTION-II

Note: Attempt any Three questions from this section

Q.5 (A)	Describe combustion analysis to determine mass percentage of 'C', 'H' and 'O' in an organic compound	4
(B)	Write four defects in Bohr's atomic model	1 × 4
Q.6 (A)	Describe the construction and working of fuel cells	2+1+1
(B)	A sample of nitrogen gas is enclosed in a vessel of volume $380 \text{ cm}^3$ at $120^\circ \text{C}$ and pressure of $101325 \text{ Nm}^{-2}$ . This gas is transferred to a $10 \text{ dm}^3$ flask and cooled to $27^\circ \text{C}$ . Calculate the pressure in $\text{Nm}^{-2}$ exerted by the gas at $27^\circ \text{C}$	4
Q.7 (A)	Discuss structure of Ethyne ( $\text{C}_2\text{H}_2$ ) w.r.t $\text{sp}$ hybridization	4
(B)	Define enthalpy and also explain pressure – volume work	4
Q.8 (A)	What is vapour pressure. Discuss manometric method to measure the vapour pressure of liquid	1+3
(B)	Calculate the pH of a buffer solution in which 0.11 molar $\text{CH}_3\text{COONa}$ and 0.09 molar acetic acid solution are present. $K_a = 1.85 \times 10^{-5}$ for $\text{CH}_3\text{COOH}$	1+3
Q.9 (A)	Differentiate between ideal and non-ideal solutions	1 × 4 = 4
(B)	How order of reaction can be found by half life method ?	4