

FBD-11-1-23

Roll No. : \_\_\_\_\_

Objective  
Paper Code

Intermediate Part First

CHEMISTRY (Objective) GROUP - I

6481

Time: 20 Minutes

Marks: 17

Q.No.1 You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill the relevant circle in front of that question number on computerized answer sheet. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero marks in that question. Attempt as many questions as given in objective type question paper and leave other circles blank. acf

S.#	Questions	A	B	C	D
1	Which is a molecular ion?	$\text{CH}_4^+$	$\text{Al}^{3+}$	$\text{Na}^+$	$\text{Ca}^{2+}$
2	Largest number of molecules are present in:	4.8g of $\text{C}_2\text{H}_5\text{OH}$	2.8g of $\text{CO}$	5.4g of $\text{N}_2\text{O}_5$	3.6g of $\text{H}_2\text{O}$
3	Most common solvent used in solvent extraction is:	Acetone	Ethanol	Ether	Methanol
4	Equal masses of methane and oxygen are mixed in an empty container at $25^\circ\text{C}$ . The fraction of total pressure exerted by oxygen is:	$\frac{1}{9}$	$\frac{1}{3}$	$\frac{8}{9}$	$\frac{16}{17}$
5	1 atmosphere is equal to:	760mm of Hg	1000mm of Hg	760cm of Hg	20 Psi
6	Ionic solids are characterized by:	Low melting point	Solubility in polar solvents	High vapour pressure	Good conductivity in solid state
7	Liquid crystals are used in the display of:	Neon signs	Fluorescent bulbs	T.V. displays	Lightning discharge
8	In the ground state of an atom the electron is present:	In the nucleus	In second shell	Nearest to the nucleus	Farthest from nucleus
9	Bond order of $\text{N}_2$ molecule is:	01	02	03	04
10	If an endothermic reaction is allowed to take place very fast in the air, the temperature of the surrounding air:	Decreases	Increases	Remains constant	Remains unchanged
11	When a bond is formed energy is:	Absorbed	Released	Neither absorbed nor released	Remains constant
12	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:	$\text{Ag}^+$ and $\text{NO}_3^-$ only	$\text{Ba}^+$ and $\text{NO}_3^-$ only	$\text{Ba}^{2+}$ , $\text{NO}_3^-$ and $\text{Cl}^-$	$\text{Ag}^+$ , $\text{Ba}^{2+}$ and $\text{NO}_3^-$
13	A solution which resists to change its pH is called as:	Buffer solution	Acid solution	Standard solution	Basic solution
14	A solution of glucose is 10% w/v. The volume in which 1g mole is dissolved will be:	1 $\text{dm}^3$	1.8 $\text{dm}^3$	200 $\text{cm}^3$	900 $\text{cm}^3$
15	The oxidation number of O-atom in $\text{OF}_2$ molecule is:	-1	-2	-3	+2
16	In silver oxide battery cathode is made up of:	Zn metal	Silver oxide	Graphite	Potassium hydroxide
17	Which enzyme catalysis urea?	Invertase	Zymase	Urease	Lipase

1113-XI112336-48000

## SECTION - I

## 2. Write short answers of any EIGHT parts.

- (i) What are ions? Under what conditions are they produced? 16
- (ii) What is the justification of two strong peaks in the mass spectrum of bromine, while for iodine only one peak at 127amu is indicated?
- (iii) What is the atomic mass unit? Give its value in grams.
- (iv) What is the physical significance of van der Waals' constants 'a' and 'b'? Give their units.
- (v) Define pressure and give its two units.
- (vi) How absolute zero is explained by drawing graph?
- (vii) What is the origin of line spectrum?
- (viii) Define Moseley's law. Write importance of Moseley's law.
- (ix) Differentiate between Stark and Zeeman effects.
- (x) Why burning of a candle is a spontaneous process?
- (xi) Differentiate between internal energy and enthalpy.
- (xii) What is thermochemical equation? What information do they convey?

## 3. Write short answers of any EIGHT parts.

- (i) Define molarity. Give its formula. 16
- (ii) Define critical solution temperature. Give its value for water-aniline system.
- (iii) What are liquids practically immiscible? Give one example.
- (iv) Define order of reaction. Give example of second order reaction.
- (v) What is electrical conductivity and dilatometric method for determination of rate of reaction?
- (vi) What is negative catalyst and autocatalyst? Give one example of each.
- (vii) What is gooch crucible? For what type of crystals, it is used?
- (viii) What is ether extraction?
- (ix) What is partition chromatography and adsorption chromatography?
- (x) Why iodine is solid while fluorine and chlorine are gases?
- (xi) How decomposition of a sensitive liquid can be avoided?
- (xii) Define unit cell. What are unit cell dimensions?

## 4. Write short answers of any SIX parts.

- (i) Define ionization energy and electron affinity. 12
- (ii) Why the bond angle of H<sub>2</sub>O and NH<sub>3</sub> are not 109.5° like that of CH<sub>4</sub> although O and N atoms are sp<sup>3</sup> hybridized?
- (iii) What is octet rule? Give example.
- (iv) Define law of mass action.
- (v) What happens to the directions of a reversible reaction? When the ratio of concentration is less than actual K<sub>c</sub>?
- (vi) Why the solubility of glucose in water is increased by increasing the temperature?
- (vii) What is salt bridge? Give example.
- (viii) How does electrochemical series tells us the distinction between the oxidizing and reducing agents?
- (ix) Why the product of electrolysis in molten electrolyte are different from the products of electrolysis in the solution state?

## SECTION - II Attempt any THREE questions. Each question carries 08 marks.

5. (a) Write a note on limiting reactant. Explain it giving at least two examples. 02,01,01  
(b) 250cm<sup>3</sup> of the sample of hydrogen effuses four times as rapidly as 250cm<sup>3</sup> of an unknown gas. Calculate the molar mass of unknown gas. 04
6. (a) What are London dispersion forces? Give factors affecting them specially for halogens and hydrocarbons. 02,02  
(b) Describe the measurement of enthalpy of a reaction by bomb calorimeter with diagram. 03,01
7. (a) How  $\frac{e}{m}$  value of electron was measured by J.J. Thomson? 04  
(b) The solubility of PbF<sub>2</sub> is 0.64 g/dm<sup>3</sup>. Calculate K<sub>sp</sub> of PbF<sub>2</sub>. Atomic mass of Pb = 207, F = 19. 04
8. (a) Write the four postulates of "VSEPR" theory. 04  
(b) Explain four industrial applications of electrolysis. 04
9. (a) Describe Raoult's law. Explain when both the components are volatile. 04  
(b) Describe homogeneous and heterogeneous catalysis. 04

Objective

Intermediate Part First

Paper Code

CHEMISTRY (Objective) GROUP - II

6484

Time: 20 Minutes

Marks: 17



Q.No.1

You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill the relevant circle in front of that question number on computerized answer sheet. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero marks in that question. Attempt as many questions as given in objective type question paper and leave other circles blank.

S.#	Questions	A	B	C	D
1	Indicate the catalyst used for the reaction: $\text{HCOOH} \rightarrow \text{H}_2\text{O} + \text{CO}$	Cu	$\text{MnO}_2$	Pt	$\text{Al}_2\text{O}_3$
2	If the salt bridge is not used between two half cells, then the voltage:	Decreases rapidly	Decreases slowly	Does not change	Drops to zero
3	The reaction at cathode during the electrolysis of dil. $\text{H}_2\text{SO}_4$ with Pt electrodes is:	Oxidation	Reduction	Both oxidation and reduction	Neither oxidation nor reduction
4	Which solution has the highest boiling point?	5.85% solution of NaCl	18.0% solution of glucose	6.0% solution of urea	All have the same boiling point
5	When $\text{H}_2\text{S}$ is added to HCl aqueous solution, the ionization of $\text{H}_2\text{S}$ :	Increases	Remains constant	Decreases	Increases rapidly
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?	$\text{Ag}^+$ and $\text{NO}_3^-$ only	$\text{Ba}^{2+}$ and $\text{NO}_3^-$ only	$\text{Ba}^{2+}$ , $\text{NO}_3^-$ and $\text{Cl}^-$	$\text{Ag}^+$ , $\text{Ba}^{2+}$ and $\text{NO}_3^-$
7	The change in heat energy of a chemical reaction at constant temperature and pressure is called:	Internal energy change	Bond energy	Enthalpy change	Heat of sublimation
8	If an endothermic reaction is allowed to take place very rapidly in the air, the temperature of the surrounding air:	Decreases	Increases	Remains constant	Remains unchanged
9	The number of bonds in nitrogen molecule is:	One sigma and one pi	One sigma and two pi	Three sigma only	Two sigma and one pi
10	In the ground state of an atom, the electron is present:	In the nucleus	In the second shell	Nearest to the nucleus	Farthest from the nucleus
11	$\text{NaF}$ and $\text{MgO}$ are isomorphs of each other and exist in:	Tetragonal form	Rhombohedral form	Orthorhombic form	Cubic form
12	London dispersion forces are the only forces present among the:	Molecules of water in liquid state	Atoms of He in gaseous state at high temperature	Molecules of hydrogen chloride gas	Molecules of solid iodine
13	The value of R in $\text{NmK}^{-1}\text{mol}^{-1}$ is:	1.987	8.3143	0.0821	62.4
14	A real gas obeying van der Waals equation will resemble ideal gas if:	Both "a" and "b" are small	Both "a" and "b" are large	"a" is small and "b" is large	"a" is large and "b" is small
15	The stationary phase in adsorption chromatography is:	Solid	Water	Organic liquid	Gas
16	The mass of water formed when 2g of $\text{H}_2$ and 64g of $\text{O}_2$ are combined together is:	68g	36g	18g	66g
17	27g of Al will react completely with how much mass of $\text{O}_2$ to produce $\text{Al}_2\text{O}_3$ ?	32g of oxygen	24g of oxygen	16g of oxygen	8g of oxygen

1114-XI132031-4000

FBD-11-2-23

## CHEMISTRY (Subjective) GROUP - II

Time: 02:40 Hours Marks: 68

## SECTION - I

## 2. Write short answers of any EIGHT parts.

- Define gram atom. Give example.
- How many molecules are present in 3.6 gram of  $H_2O$ ?
- Mg atom is twice heavier than that of carbon atom. How?
- Define Charles's Law. Give its mathematical form.
- What is the physical significance of van der Waals' constants "a" and "b". Give their units.
- Write any two applications of plasma.
- Justify that the distance gaps between different orbits go on increasing from the lower to the higher orbits.
- Why the positive rays are called canal rays?
- Calculate mass of electron by using  $e/m$  value.
- Define exothermic reaction. Give example.
- What are spontaneous and non-spontaneous reactions? Give example.
- Prove that:  $q_p = \Delta H$

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## 3. Write short answers of any EIGHT parts.

- Give any two qualities of an ideal solution.
- Prove that:  $\frac{\Delta p}{p^\circ} = x_2$
- What is meant by liquids practically immiscible?
- What is meant by catalytic poisoning?
- Define rate of reaction. Give its units.
- How order of reaction is determined by a method of large excess?
- What is solvent extraction?
- How moderate cooling is advantageous over slow cooling in crystallization process?
- What is the significance of distribution coefficient in chromatography?
- Ice floats over water. Justify it.
- Show hydrogen bonding in alcohol and water.
- Define liquid crystals with an example.

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## 4. Write short answers of any SIX parts.

- Why 2nd ionization energy value is greater than 1st?
- Define bond energy. Give example.
- Draw molecular orbital diagram of nitrogen molecule.
- Define solubility product.
- State Le-Chatelier's principle.
- Justify that chemical equilibrium is dynamic in nature.
- Write two functions of salt bridge.
- Define electrode potential.
- What is meant by E.M.F of cell?

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## SECTION - II Attempt any THREE questions. Each question carries 08 marks.

- What is combustion analysis? How the percentages of various elements present in an organic compounds are determined? 04
  - What pressure is exerted by a mixture of 2.00g of  $H_2$  and 8.00g of  $N_2$  at 273K in a  $10dm^3$  vessel? 04
- Describe the measurement of vapour pressure by manometric method with diagram. 03,01
  - How the enthalpy of combustion of substance can be measured by bomb calorimeter. Explain with diagram. 03,01
- Define and explain: (i) Atomic emission spectrum (ii) Atomic absorption spectrum 04
  - $N_2(g)$  and  $H_2(g)$  combine to give  $NH_3(g)$ . The value of  $K_c$  in this reaction at  $500^\circ C$  is  $6.0 \times 10^{-2}$ . Calculate the value of  $K_p$  for this reaction. 04
- Define hybridization and explain hybridization in  $NH_3$ . 01,03
  - Write note on alkaline battery. 04
- Differentiate between hydration and hydrolysis. Describe with two examples in each case. 02,02
  - How does the Arrhenius equation help us to calculate the energy of activation of a reaction. 04

1114-XI123-4000