Roll No. of Candidate : _____

CHEMISTRY **(Intermediate Part-I, Class 11th) 322 - (IV)** **Paper I (Group – II)**

Time: 20 Minutes **OBJECTIVE ----- Code : 6488** GUJ-G2-22 **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. Attempt as many questions as given in objective type question paper and leave others blank.

1. 1 - The pH of 10^{-3} mol.dm^{-3} of an aqueous solution of H_2SO_4 is _____.
(A) 1.5 (B) 2.0 (C) 3.0 (D) 2.7

2 - _____ substance is used as decolourizing agent in crystallization process.
(A) silica gel (B) animal charcoal (C) $CaCl_2$ (D) H_2SO_4

3 - Bohr model of atom is contradicted by _____.
(A) planks quantum theory (B) dual nature of matter
(C) Heisenberg's uncertainty principle (D) all of these

4 - When water freezes at $0^{\circ}C$ its density decreases due to _____.
(A) cubic structure of ice (B) changes bond length
(C) empty spaces present in structure of ice (D) changes bond angles

5 - The largest number of molecules are present in _____.
(A) 3.6 g of H_2O (B) 4.8 g of C_2H_5OH (C) 2.8 g of CO (D) 5.4 g of N_2O_5

6 - An aqueous solution of ethanol in water may have vapour pressure _____.
(A) equal to that of water (B) more than that of water
(C) equal to that of ethanol (D) less than that of water

7 - _____ is a pseudo solid.
(A) glass (B) CaF_2 (C) NaCl (D) HCl

8 - Orbitals having same energy are called _____.
(A) degenerate orbitals (B) S and P orbitals (C) molecular orbitals (D) valence orbitals

9 - In Sp^3 hybrid orbital " S " character is _____.
(A) 25% (B) 50% (C) 75% (D) 100%

10 - Number of molecules in one dm^3 of water is close to _____.
(A) $\frac{6.02}{22.4} \times 10^{23}$ (B) $\frac{12.04}{22.4} \times 10^{23}$ (C) $\frac{18}{22.4} \times 10^{23}$ (D) $55.6 \times 6.02 \times 10^{23}$

11 - Solvent extraction is an equilibrium process and is controlled by _____.
(A) law of mass action (B) amount of solvent used (C) distribution law (D) amount of solute

12 - If the rate equation of a reaction $2A + B \longrightarrow$ products is, rate $= K[A]^{-2}[B]$ and A is present in large excess then order of reaction is
(A) 1 (B) 2 (C) 3 (D) 4

13 - The number of bonds in nitrogen molecule is _____.
(A) one σ and one π (B) one σ and two π (C) three sigma only (D) two σ and one π

14 - How many subatomic particles are thought to exist in an atom.
(A) 3 (B) 20 (C) 50 (D) 100

15 - Stronger the oxidizing agent greater is the _____.
(A) redox potential (B) E.M.F. of cell (C) oxidation potential (D) reduction potential

16 - The molar volume of CO_2 is maximum at _____
(A) STP (B) $127^{\circ}C$ and 1 atm (C) $0^{\circ}C$ and 2 atm (D) $273^{\circ}C$ and 2 atm

17 - For the reaction $NaOH + HCl \longrightarrow NaCl + H_2O$ the enthalpy change is called _____.
(A) heat of reaction (B) heat of formation (C) heat of neutralization (D) heat of combustion

CHEMISTRY **(Intermediate Part-I, Class 11th) 322** **Paper I** **(Group – II)**

Time: 2:40 Hours **SUBJECTIVE** **Marks: 68**

GUJ-92-22

Note: Section I is compulsory. Attempt any THREE (3) questions from Section II.

(SECTION – I)

2. Write short answers to any EIGHT questions. **(2 x 8 = 16)**

i - What is mass spectrum?

ii - One mole of H_2SO_4 should completely react with two moles of NaOH. How does Avogadro's number help to explain it?

iii - Define limiting reactant. Give an example.

iv - Write down the names of any four major steps involved in crystallization.

v - What is ether extraction?

vi - What is paper chromatography? Name its two types.

vii - What is mean square velocity?

viii - Where is plasma found?

ix - Derive Charle's law from kinetic molecular theory of gases.

x - What is common ion effect? Give an example.

xi - Write down the Henderson's equation to determine the pH of a buffer solution.

xii - Define solubility product. Give an example.

3. Write short answers to any EIGHT questions. **(2 x 8 = 16)**

i - Ionic crystals are highly brittle. Justify it.

ii - Cleavage of the crystals is itself anisotropic behaviour. Justify it.

iii - Diamond is hard and an electrical insulator. Justify it.

iv - Boiling needs a constant supply of heat. Justify it.

v - How the $^{65}_{29}Cu$ can be converted into $^{66}_{30}Zn$.

vi - What is Zeeman effect?

vii - Define Moseley's law and give its relationship/equation.

viii - Define Pauli's exclusion principle.

ix - Define parts per million (PPM) and give its expression.

x - Define critical solution temperature and give an example.

xi - What is catalytic poisoning? Give an example.

xii - Define catalysis and give two examples of catalysed reactions.

4. Write short answers to any SIX questions. **(2 x 6 = 12)**

i - Why the molecules of BF_3 are triangular planar?

ii - Define covalent radius. Give one example.

iii - Define shielding effect. How it varies across the period?

iv - Define coordinate covalent bond. Give one example.

v - Differentiate between endothermic and exothermic reaction.

vi - What is lattice energy? Give one example.

vii - Enthalpy of neutralization of a strong acid and a base is always –57.5 Kcal $mole^{-1}$. Why?

viii - Calculate the oxidation number of chromium in the following compounds:

a) CrO_3 b) Cr_2O_3

ix - Define oxidation state. Give example.

(Turn Over)

(SECTION – II)

Note: Attempt any THREE (3) questions from Section II.. GUJ-92-22

5. (a) Explain the concept of limiting reactant with a suitable example. Also write down steps to identify a limiting reactant. **1+1+2 (4)**

(b) Define quantum numbers and explain in detail azimuthal quantum number. **1+3 (4)**

6. (a) 250 cm^3 of the sample of hydrogen effuses four times as rapidly as 250 cm^3 of an unknown gas. Calculate the molar mass of unknown gas. **(4)**

(b) Discuss any two industrial importance of electrolytic process. **(4)**

7. (a) Explain the geometry of NH_3 using hybridization. **3+1 (4)**

(b) State and explain Hess's law of constant heat summation with an example. **1+3 (4)**

8. (a) Brief about structure of ice. **(4)**

(b) Calculate the pH of buffer solution in which 0.11 M CH_3COONa and 0.09 M CH_3COOH solutions are present while ka for CH_3COOH is 1.85×10^{-5}. **(4)**

9. (a) What is solubility curve? Discuss its types with examples. **(4)**

(b) What in catalysis? Give any three characteristics of catalyst with examples. **(4)**