

Sig. of Supdt.

Roll No.

Fig. #

Fig. #

Total Marks: 85

CHEMISTRY
 (Part - I)
 (Fresh / New Course)

Time Allowed : 3 Hrs.

Marks: 18

Section "A"

Time : 20 Mins.

NOTE : Section-A is compulsory. All parts of this section to be answered on the questions paper itself. It should be completed in the given time and handed over to the Centre Superintendent. Deleting / Overwriting is not allowed. Do not use lead pencil.

NOTE : Insert the correct option (a, b, c, d) in the empty box opposite to each part.

Q. 1 Insert the correct option (a, b, c, d) in the empty box opposite to each part. Each part carries one mark.

- | | | |
|--------|---|----------------------------|
| i- | The molar volume of the He is 89.dm ³ at 0°C and | <input type="checkbox"/> |
| | (a) 1 atm (b) 0.5 atm (c) 0.25 atm (d) 4 atm | |
| ii- | Which of the following is not related to amu | <input type="checkbox"/> d |
| | (a) Gram (b) Kilogram (c) Microgram (d) Gram/liter | |
| iii- | CO ₂ is isostructural with | <input type="checkbox"/> d |
| | (a) S _n Cl ₂ (b) C ₂ H ₂ (c) NO ₂ (d) BeCl ₂ | |
| iv- | All of the following have crystals except | <input type="checkbox"/> c |
| | (a) Diamond (b) NaCl (c) KBr (d) CdS | |
| v- | Molar heat of vaporization for water | <input type="checkbox"/> b |
| | (a) 6 KJ/mol (b) 4.07 KJ/mol (c) 40.7 KJ (d) None of these | |
| vi- | The shape of H ₃ O ⁺ (Hydronium ion) is | <input type="checkbox"/> d |
| | (a) Planer (b) Bent (c) Trigonal planer (d) Trigonal pyramidal | |
| vii- | K _f is the molal freezing point constant also called as the constant. | <input type="checkbox"/> b |
| | (a) isotonic (b) Ebullioscopic (c) Cryoscopic (d) Lyophilic | |
| viii- | When a substance that has absorbed energy emits it in the form of radiation the spectrum obtained | <input type="checkbox"/> b |
| | (a) Continuous (b) Line (c) Emission (d) Absorption | |
| ix- | When heat is absorbed from the surrounding, the process is | <input type="checkbox"/> d |
| | (a) Reversible (b) Mechanical (c) Exothermic (d) Endothermic | |
| x- | A cation is a / an | <input type="checkbox"/> a |
| | (a) Acid (b) Base (c) Amphoteric (d) None of these | |
| xi- | In which of the following values of K _c , the reaction goes to completion in the forward direction | <input type="checkbox"/> b |
| | (a) 10 ² (b) 10 ³⁰ (c) 10 ⁻³⁰ (d) 1 | |
| xii- | Which of the following is more volatile | <input type="checkbox"/> a |
| | (a) CHBr ₃ (b) CBr ₄ (c) CHCl ₃ (d) CCl ₄ | |
| xiii- | The oxidation number of S in S ₂ O ₃ ²⁻ is..... | <input type="checkbox"/> d |
| | (a) +3 (b) 3 (c) 4 (d) +2 | |
| xiv- | The freezing point of solution as compared to the solvent is | <input type="checkbox"/> b |
| | (a) Higher (b) Lower (c) Variable (d) Remain the same | |
| xv- | Ways of expressing the concentration of a solution does not depend on temperature is | <input type="checkbox"/> b |
| | (a) Molarity (b) Molality (c) Normality (d) Formality | |
| xvi- | The strongest base among the following is | <input type="checkbox"/> c |
| | (a) Rb OH (b) KOH (c) NaOH (d) LiOH | |
| xvii- | The specific rate constant has value for all concentration of the reactants. | <input type="checkbox"/> a |
| | (a) Fixed (b) Variable (c) Negligible (d) None of these | |
| xviii- | Salt of strong acids and weak bases on Hydrolysis is produced solution which is | <input type="checkbox"/> a |
| | (a) Acidic (b) Basic (c) Neutral (d) Amphoteric | |

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CHEMISTRY
(Part - I)
(Fresh / New Course)

Total Marks : 67

Time Allowed : 2:40 Hrs.

Section - B

Marks : 40

Q. 2 Write short answers of any TEN of the following parts. Each part carries equal marks.

- (i) Explain why exothermic reactions are spontaneous?
- (ii) Explain salt hydrolysis with examples.
- (iii) Explain order of reaction.
- (iv) Differentiate between ionic and covalent solids.
- (v) What is the difference between electrolytic and electrochemical conduction?
- (vi) Derive the solubility product expression for slightly soluble Al(OH)_3 and PbCrO_4 .
- (vii) Discuss the relation between K_p and K_x .
- (viii) Discuss properties of gases on the basis of kinetic molecular theory.
- (ix) Describe the effect of temperature on rate of reaction.
- (x) How much energy is lost when an electron in hydrogen atom jumps from $n_2=3$ to $n_1=1$?
- (xi) Write note on the applications of plasma.
- (xii) Discuss the principle quantum numbers.
- (xiii) Explain the structure of acetylene, on the basis of hybridization.

Section - C

Marks : 27

NOTE : Attempt any THREE questions. Each question carries equal marks.

- Q. 3**
- (a) Explain the valence bond theory.
 - (b) Derive the expression for calculation of energy of electron in an orbit.
- Q. 4**
- (a) Explain Daniel cell in detail.
 - (b) Balance the following reaction by redox method.
$$\text{KMnO}_4 + \text{KNO}_2 + \text{H}_2\text{SO}_4 \longrightarrow \text{MnSO}_4 + \text{KNO}_3 + \text{K}_2\text{SO}_4 + \text{H}_2\text{O}$$
- Q. 5**
- (a) Discuss Linde's method for liquification of gases.
 - (b) Write down the postulates of Plank's Quantum theory.
- Q. 6.** Write short note on the following.
- (a) Characteristics of catalysts
 - (b) Hydrogen bonding and its applications