Rekha V.V.I. Questions for 2023 Examination

Answer of below mentioned V.V.I. questions are present in your Rekha Examination Guide and Guess Part - I Chemistry - 1

1. Explain the following :

Group–A
PHYSICAL CHEMISTRY

1. Gaseous State

2. Solid State

3. Colloidal

Group–B
INORGANIC CHEMISTRY

1. Atomic Structure

2. Periodic Properties

3. Chemical Bonding

4. s-Block

5. p-Block

6. Air Pollution and Soap

CHEMISTRY - 1 (Hons.) (2022)

Answer five questions, selecting at least one from each group in which Question No.1 is compulsory.

1. Explain any three of the following :
   (a) Shape of XeF_4 is square planar. 101
   (b) CCl_4 does not hydrolyse whole $SiCl_4$ is hydrolysed. 15
   (c) Oxygen has higher Ionisation potential than nitrogen. 13
   (d) The size of Zirconium (Zr) is almost similar to Hafnium (Hf).
   (e) Sn^{+2} is Ionic whole Sn^{+4} is covalent.

Group–A

2. (a) Write down the postulate of kinetic theory of gas. 18
   (b) Discuss Vander Waal's equation of state. Write the relationship between critical constant and Vander Waals' constant. 20, 24
3. (a) Describe various types of solids with example. 37
   (b) Discuss crystal structure of KC*l* with neat diagram. 42
4. (a) Distinguish between Lyophilic and Lyophilic colloidss. 48
   (b) What are different applications of colloids? 51
   (c) Discuss optical and electrical properties of colloids. 48
5. Write notes on any three of the following :
   (a) Hardy Schulz Rule. 54
   (b) RMS, average and most probable velocities. 10
   (c) Miller and Weiss Indices. 40, 41
   (d) Types of Emulsions. 57
   (e) Reduced equation of states. 26

Group–B

6. (a) Describe Born-Haber cycle for the calculation of Lattice energy with an example. 85
   (b) Discuss different types of Lattice defects.
7. (a) What are quantum number ? Calculate all the four quantum number for the last-electrons in Cr(24). 62
   (b) Describe Millikan's method to determine charge on an electron. 70
8. (a) Explain hydrogen bonding and its types. 90
   (b) Write the geometry and shape of the following :
   (i) SF_6 (ii) I_3 (iii) CH_4
9. (a) What are the steps involved in extraction of lead from its ore? 99
   (b) Define carbides. Explain its types with example.
10. Write notes on any three of the following :
   (a) Types of Silicates. 108
   (b) Deadening of Tin.
   (c) Diagonal relationship of Bi and Be. 84
   (d) Fajan Rule 86
   (e) Hand's Multiplicity rule 68

CHEMISTRY - 1 (Hons.) (2021)

Answer five questions, selecting at least one from each group in which Question No.1 is compulsory.

1. Explain any three of the following:
   (a) Na^+ is smaller than Na while Cl^- is bigger than Cl in size.
   (b) Why Pb^{2+} is more stable than Pb^{+4} ?
   (c) H_2O_2 acts as both oxidizing and reducing agent. 92
   (d) BF_3 is a Lewis Acid. 12
   (e) H_2O is a liquid while H_2S is a gas. 16

Group – A

2. (a) Derive kinetic gas equation $PV = \frac{1}{3} mnc^2$. 18
   (b) Derive Avogadro's law and Grahm's law of diffusion from kinetic gas equation.
3. (a) Explain with diagram Body-Centred Cubic Unit Cell and Face- Centred Cubic Unit Cell. 38
   (b) Derive Bragg's equation.
4. (a) Distinguish true solution, colloidal solution and suspension. 46
   (b) What do you mean by stability of colloids. 49
   (c) What is difference between gels & emulsions. 56,57
5. Write notes on any three of the following:
   (a) Law of corresponding states.... 26 (b) Radius ratio rule 39
   (c) Gold number .... 52 (d) Dialysis.... 55
   (e) Co-ordination number.... 39

Group – B

6. (a) What do you mean by matter-wave duality. Derive de-Broglie's equation.
   (b) What do you mean by Aufbau principle? 71
7. (a) Explain Groups & Periods of Periodic Table.
   (b) Determine the position of following elements having atomic numbers 8, 20, 25, 27 & 30. 76
8. (a) State and explain hybridization.
   (b) Write the shape and structure of the following.
   (i) H_2O (ii) SF_4 (iii) NH_3
9. (a) How Tin is extracted from its ore.
   (b) Describe analytical test of Sn^{+2} & Sn^{+4}
10. Write notes on any three of the following :
    (a) Diborane .... 97 (b) Ozone layer (c) Acid rain
    (d) Atomic and ionic radii (e) White lead and Red lead 105, 106

CHEMISTRY - 1 (Hons.) (2020)

Answer five questions, selecting at least one from each Group in which Q. No.1 is compulsory.

1. Explain any three of the following :
   (a) Hydrogen bond 90
   (b) NaCl has FCC structure 11
   (c) NH_3 molecule is pyramidal in shape 14
   (d) van dar Waals constant "a" is the measure of cohesive force 9
   (e) Kinetic energy of one mole of an ideal gas is 3/2 RT 9

Group-A

2. (a) Explain two major defects in postulate of Kinetic Theory of gas. 20
   (b) Establish van der Waals equation of gaseous state. 20
3. (a) Differentiate between lyophilic and lyophobic colloids. 47
   (b) Explain Coagulation of Colloids and Hardy-Schulze Law. 48
4. Write notes on any three of the following :
   (a) Tyndall effect 52
   (b) Electrophoresis 53
   (c) Critical constants and van der Waals Constant 27
   (d) Miller indices 40
5. What are the relationships betwen the following :
   (i) Kp and Kc
   (ii) Differentiate among average RMS and Most probable velocities 10

Group - B

6. (a) State and explain Hesenberg uncertainty principle. Explain its significance. 61
   (b) Explain the differences between orbit and orbital. 61
7. (a) Explain Hund's rule. 68
   (b) Write down electronicv configuration of element with atomic numbers 24, 29, 18, 47, 54 and locate their position in periodic table. 76
8. (a) How will you separate nobel gases from the mixture? 100
   (b) Write the shape and structure of the following :
   (i) XeF_2 (ii) XeF_6 101
9. (a) How do atomic radii, ionisation potential and electronegativity of elements vary in periodic table? 76
   (b) State and explain Fazan's rule. 86
10. Write notes on any two of the following :
    (a) Air pollution and its control 117
    (b) Diagonal relationship 84
    (c) Structure and shape of Ozone 108
    (d) Oxygen is paramagnetic 15
    (e) CH_4 is tretrahedral in shape while H_2O is angular in shape. 14

CHEMISTRY - 1 (Hons.) (2019)

Answer five questions selecting at least one from each Group, in which Q. No.1 is compulsory.

1. Explain any three of the following :
   (a) Carbon tetrachloride is non-polar. 15
   (b) Average velocity, RMS velocity, Most probable velocity. 10
   (c) Ideal gases do not show Joule-Thomson effect 12
   (d) Lyophilic colloids are more stable than lyophobic colloids. 12
   (e) HF is liquid while HCI is gas. 14
   (f) CCI_4 does not hydrolysed but $SiCI_4$ is hydrolysed. 15

Group-A

2. (a) Explain the physical significance of van der Waals gases. 23
   (b) Establish the relationship of critical constant with van der Waals constant. 24
3. (a) How are lattice planes indexed? Explain.
   (b) Find out Bragg's equation and explain its importance.
4. (a) Write down the crystal structure of NaCl. 36
   (b) What is its Ionic radius ratio and its co-ordination number? 36
5. Write notes of any two of the following :
   (a) Electro-kinetic phenomena 55
   (b) Gold number 52
   (c) Gels 56

Group - B

6. (a) State and explain de-Broglie waves and equation and its significance. 58
   (b) Discuss diagonal relationship and anomalous behaviour of Li and Mg. 84
7. (a) Define Ionization potential, Electron affinity and Elctronegativity. 76
   (b) Ionisation potential of N-atom is greater than oxygen. Why? 13
8. (a) How H_2O_2 can be prepared in the Laboratory? Write down the structure of H_2O_2. 92
   (b) Show that H_2O_2 behaves as an oxidising agent as well as reducing agent. 92
9. (a) Give the electronic configuration of the following elements as ions:
   (i) Cu^{++} (29) (ii) Ag^{+} (47) (iii) Cr^{+3} (24) (iv) Fe^{++} (26) (v) Kr (36) 84
   (b) Sketch the shapes of s, p. d orbitals. 63
10. Write notes on any two of the following :
    (a). Air Pollution 117
    (b) Compund of Xenon 107
    (c) Chemistry of Borax Bead Test 104
    (d) CH_4 is tetrahedral and NH_3 is pyramidal in shape 16

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Rekha V.V.I. Questions for 2023 Examination

Answer of below mentioned V.V.I. questions are present in your Rekha Examination Guide and Guess Part-I Chemistry-2

Short Answer Type Questions

Group – A (Physical Chemistry)

■ Solution (Colligative Properties) ■

■ Ionic Equilibrium ■

■ Chemical Kinetics ■

Group – B (Organic Chemistry)

■ Bonding and General Concepts ■

■ Reaction Mechanism ■

■ Polyhydroxy Compound ■

■ Amines and Urea ■

■ Aldehydes and Ketones ■

■ Carboxylic Acid and Derivatives ■

CHEMISTRY - 2 (Hons.) (2022)

Answer any five questions, selecting at least one from each group in which Q.No.1 is compulsory.

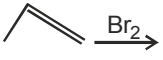
1. Explain any three of the following :
   (a) BF_3 is Lewis acid and whereas NH_3 is Lewis base. 12
   (b) Acidic hydrolysis of ester is Pseudo unimolecular reaction. 8
   (c) Chloro acetic acid is stronger acid than acetic acid. 13
   (d) Ortho nitrophenol and para nitrophenol can easily be separated by steam distillation. 11
   (e) Benzene molecular is planar in shape & structure. 10

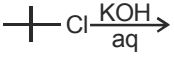
Group–A

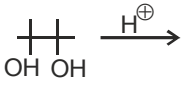
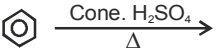
2. (a) Explain "Osmosis" & "Osmotic Pressure". 21
   (b) How can you determine the osmotic pressure of a solution? 23
   (c) Calculate the osmotic pressure of 5% urea solution.
3. (a) Differentiate order & molecularity of reaction. 46
   (b) Derive an expression for the rate constant for first order reaction. 40
   (c) How is half life of first order reaction independent of initial concentration ? 41
4. (a) Illustrate solubility & solubility product. 29
   (b) What are the applications of solubility product in salt analysis. 30
5. Write notes on any two of the following :
   (a) Abnormal colligates properties 26
   (b) Ideal and non-ideal solution 26
   (c) Ionic product of water 29

Group–B

6. (a) Explain *sp*, sp^2 & sp^3 hybridisation in organic molecules. 49,50
   (b) Explain geometrical isomeric with examples. 51
7. (a) How will you distinguish among primary, secondary and tertiary alcohols. 74
   (b) Write in brief preparation & properties of glycerol. 69,71
8. Write an account of any three of the following :
   (a) Hofmann Bromamide reaction 89
   (b) Cannizzaro reaction 96
   (c) Wolf Kishner reduction 99
   (d) Carbylamine reaction 89
9. Predict the product giving mechanic of any three of the following :

   (a) 

   (b) 

(c)  (d) 

10. Write notes on any three of the following :
    (a) Electrophiles & Nucleophiles 60
    (b) Inductive effect 61
    (c) Decarboxylation of carboxylic acids 106
    (d) Hydrogen Bond 58

CHEMISTRY - 2 (Hons.) (2021)

1. Explain any three of the following question :
    (a) What is abnormal colligative properties? 26
    (b) What is Zero order reaction. 10
    (c) Acetaldehyde undergoes Aldol condensation. 12
    (d) Dimethyl amine is more basic than trimethyl amine. 12
    (e) Formic acid is strong acid than acetic acid. 108

Group –A

2. (a) What is Raoult's law of lowering of vapour pressure ? Lowering of vapour pressure is a colligative property explain. 14
    (b) Explain the method of determination of molecular weight of non- volatile solute by lowering of vapour pressure. 16
3. (a) What is depression to freezing point ? Explain molal depression constant. 17,18
    (b) What is the method to determine molecular weight by depression of freezing point method? 19
4. (a) Explain rate constant of second order reaction in which initial concentrations are different. 44
    (b) Prove that the second order reaction reduces to first order reaction of one if the reactants is in excess. 45
5. Write notes on any two of the following:
    (a) Buffer Solution 38
    (b) pH, pOH & pKc 34
    (c) Vant Hoff's Factor 28

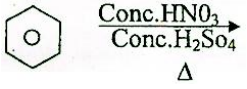
Group –B

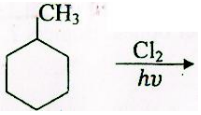
6. (a) What do you mean by optical isomers ? What are the condition for optical isomers? 51
    (b) Illustrate different optical isomers possible by tartaric acid. 56
7. Write an account of any three of the following:
    (a) Pinacol Pinacolone rearrangement 75
    (b) Diazo reaction 88
    (c) Aldol condensation 98
    (d) Hell Volhard Zelinsky reaction 108

8. Predict the product giving the mechanism of the following:

(a) 

(b) 

(c) 

(d) 

9. (a) Distinguish among primary, secondary & tertiary amines. 78
   (b) Discuss preparation, properties & uses of urea. 84, 86
10. Write notes on any three of the following: 60,66
   (a) Homolytic & Heterolytic fission. (b) Peroxide effect
   (c) Elimination reaction (d) Oxidation of glycol.

CHEMISTRY - 2 (Hons.) (2020)

Answer five questions, selecting at least one from each Group, in which Q. No.1 is compulsory.

1. Explain any three of the following :
   (a) Hydrolysis of ester shows pseudo unimolecular reaction. 8
   (b) BF_3 behaves as Lewis acid whereas NH_3 behaves as Lewis base. 12
   (c) Urea is also called carbamide. 84
   (d) Benzene is a planar molecule. 10
   (e) Formaldehyde shows Cannizzaro reaction whereas acetaldehyde shows Aldol condensation. 95

Group-A

2. (a) Differentiate Osmosis and Osmotic pressures. 21
   (b) How can you determine the osmotic presure of a solution? 23
   (c) Find out the Osmotic pressure of 5% Urea solution.
3. (a) Explain solubility and solubility product. 29
   (b) Give the applications of solubility product in qualitative analysis. 30
4. (a) Explain order and molecularity of reaction. 46
   (b) Derive the rate constant for first order reaction. 40
   (c) Half life period of First order reaction is independent of initial concentration. Justify. 41
5. Write notes on any two of the following :
   (a) Ideal and non-ideal solution .... 26 (b) Ionic product of water.... 29
   (c) Bronsted and Lewis theory 36, 37

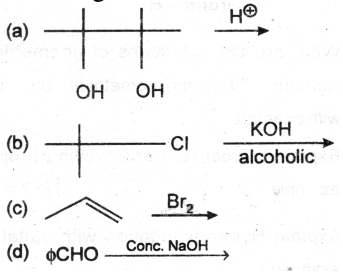
Group- B

6. (a) What are the conditions of geometrical isomerism? Explain geometrical isomerism with examples. 51
   (b) Explain optical isomerism citing proper example. 51
7. (a) Explain Hyperconjugation with suitable example. 65
   (b) Describe Inductive effect 61

(c) Explain electrophiles and nuleophiles. 60

8. Write an account of any three of the following reactions :
   (a) Diazo coupling reaction. 88
   (b) Carbylamine reaction 89
   (c) Wolf Kishner's reduction 99
   (d) Hofmann Bromamide 89

9. Predict the product giving the mechanism of any three of the following :



10. Write notes on any three of the following :
    (a) Periodic acid
    (b) Decarboxylation of carboxylic acids 106
    (c) Reactivity of aldehydes and ketones 94
    (d) Tetravalency of carbon 55

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