IMPORTANT QUESTIONS IN CHEMISTRY XI STD

LESSON - 1

BOOK BACK QUESTIONS:

- 1. Define relative atomic mass
- 2. Define equivalent mass
- 3. Distinguish between oxidation and reduction.
- 4. What is the difference between molecular mass and molar mass?
- 5. What is the empirical formula of the following?
- i) Fructose ($C_6H_{12}O_6$) found in honey
- ii) Caffeine ($C_8H_{10}N_4O_2$) a substance found in tea.
- 6. How many moles of ethane is required to produce $44 \text{ g of } (\Omega_{2} \text{ (g) after combustion})$
- 44 g of CO_2 (g) after combustion.
- 7. Balance the equations by oxidation number method.
- 8. Explain the term oxidation number
- 9. What do you understand by the term mole. 10. Problems to determine Emprical formula
- 10. Problems to determine Emprical forr 11. Problems to find molar mass

12. Calculate the oxidation number of underlined

elements.

- **BOOK INTERIOR:** 1. Define Avogadro Number.
- 2 What is meant by limiting room
- 2. What is meant by limiting reagent? 3. What is combination reaction? Give even
- 3. What is combination reaction? Give example.
- 4. What is disproportionation reactions? Give example.

LESSON -2

BOOK BACK QUESTIONS:

- 1. How many orbitals are possible for n =4?
- 2. How many radial nodes for 2s, 4p, 5d and 4f orbitals
- exhibit? How many angular nodes?
- 3. State and explain Pauli's exclusion principle.
- 4. Define orbital? What are the n and I values for $3p_x$ and $4 d_{x y}^{2}$ electron?
- 5. Determine the values of all the four quantum numbers of the 8th electron in O atom and 15^{th} electron in Cl atom and the last electron in chromium.
- 6. Give the electronic configuration of Mn^{2+} and Cr^{3+}

7. Describe the Aufbau principle.

- **BOOK INTERIOR:**
- 1. State Heisenberg's uncertainity principle.
- 2. What are quantum numbers?
- 3. State Hund's rule of maximum multiplicity.
- 4. What are the limitations of Bohr's atom model?
- 5. Explain Davisson and Germer experiment
- 6. Write a note about principal quantum number.
- 7. Describe about Bohr atom model.
- 8. Explain about the significance of de Broglie equation.

9. Calculate the total number of angular nodes and radial nodes present in 3d and 4f orbitals.

LESSON - B

BOOK BACK QUESTIONS:

- 1. Define modern periodic law.
- 2. What are isoelectronic ions? Give examples.
- 3. What is effective nuclear charge ?
- 4. Define electronegativity.
- 5. In what period and group will an element with Z = 118 will be present?
- 6. Justify that the fifth period of the periodic table
- should have 18 elements on the basis of quantum numbers.
- 7. Give the general electronic configuration of lanthanides and actinides?

8. Mention any two anomalous properties of second period elements.

9. Explain the pauling method for the determination of ionic radius.

- 10. Explain the periodic trend of ionisation potential.
- 11. Explain the diagonal relationship.
- **12.** Explain the following, give appropriate reasons.
- (i) Ionisation potential of N is greater than that of O

(ii) First ionisation potential of C-atom is greater than that of B atom, where as the

reverse is true is for second ionisation potential

- 13. What is screening effect?
- 14. Why halogens act as oxidising agents?
- 15. State the trends in the variation of
- electronegativity in group and periods.

BOOK INTERIOR:

1. Ionization energy of beryllium is greater than the ionization energy of boron. Why?

2. Explain about the factors that influence the ionization enthalpy.

3. Distinguish between electron affinity and electron negativity.

4. Define ionization energy.

LESSON -4

BOOK BACK QUESTIONS:

- 1. Discuss the three types of Covalent hydrides.
- 2. Do you think that heavy water can be used for
- drinking purposes ?
- What is water-gas shift reaction ?
 Justify the position of hydrogen in the periodic table

4. What are isotopes? Write the names of isotopes of hydrogen.

- 5. Give the uses of heavy water.
- 6. Explain the exchange reactions of deuterium.
- 7. How do you convert para hydrogen into ortho hydrogen ?
- 8. Mention the uses of deuterium.
- 9. Compare the structures of H_2O and H_2O_2 .

BOOK INTERIOR:

1. Explain the different methods of preparation of Tritium.

2. What is temporary hardness of water? How is it removed?

- 3. What arc the different types of hydrides?
- 4. What is hydrogen bonding?
- 5. What are the types of hydrogen bonding? Give example.

6. Explain about the exchange reactions of deuterium oxide.

- 7. What are the uses of hydrogen peroxide?
- 8. What are intra molecular hydrogen bonding?
- Explain with an example.
- 9. Explain ortho and para hydrogen.

LESSON -5

BOOK BACK QUESTIONS:

1. Write the chemical equations for the reactions involved in solvay process of preparation of sodium carbonate.

3. Discuss briefly the similarities between beryllium

4. Give the systematic names for the following: i) milk

of magnesia ii) lye iii) lime iv) caustic potash

- 2. Write balanced chemical equation.
- (i) Lithium metal with nitrogen gas (ii) Heating solid sodium bicarbonate

(iii) Rubidium with oxygen gas

and aluminium.

v) washing soda

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- 5. Mention the uses of plaster of paris
- 6. Beryllium halides are covalent whereas magnesium halides are ionic why?
- 7. Discuss the similarities between beryllium and aluminium.
- 8. Why alkaline earth metals are harder than alkali metals.
- 9. How is plaster of paris prepared?
- 10. Give the uses of gypsum.
- 11. Describe briefly the biological importance of
- Calcium and magnesium.
- 12. Write balanced chemical equation for the following
- processes:(a) heating calcium in oxygen

(b) heating calcium carbonate

- BOOK INTERIOR:
- 1. Write about the uses of strontium.
- 2. What are the uses of calcium hydroxide?
- 3. Mention the uses of sodium chloride.
- 4. Write about the uses of sodium bicarbonate.

LESSON -6

BOOK BACK QUESTIONS:

- 1. State Boyle's law.
- 2. What are ideal gases? In what way real gases differ from ideal gases.
- 3. Can a Van der Waals gas with a = 0 be liquefied? Explain.
- 4. Distinguish between diffusion and effusion.
- 5. Write the Van der Waals equation for a real gas.
- 6. When ammonia combines with HCl, NH₄ Cl is formed as white dense fumes. Why do more funies appear
- near HCI? 7. Derive the values of critical constants from the Van der Waals constants.
- 8. Explain why aerated water bottles are kept under water during summer?

BOOK INTERIOR:

- 1. State Charles' law.
- 2. Define Dalton's law of partial pressure.
- 3. Define Graham's law of diffusion.
- 4. What is compression factor?
- 5. What is meant by Joule-Thomson effect?
- 6. Derive ideal gas equation.
- 7. Explain the different methods used for liquefaction of gases.
- 8. State Gay-Lussac's law.

LESSON -7

BOOK BACK QUESTIONS:

- 1. State the first law of thermodynamics.
- 2. Define Hess's law of constant heat summation.
- 3. Explain intensive properties with two examples.
- 4. Define Gibb's free energy.
- 5. Define molar heat capacity. Give its unit.
- 6. What is lattice energy?
- 7. What are state and path functions? Give two examples.
- 8. State the third law of thermodynamics.
- 9. Write down the Born-Haber cycle for the formation of CaCl₂
- 10. List the characteristics of internal energy.
- 11. Derive the relation between ΔH and ΔU for an ideal gas.
- 12. List the characteristics of Gibbs free energy. **BOOK INTERIOR:**
- 1. Define Zeroth law of thermodynamics
- 2. What is sublimation?

LESSON -8

BOOK BACK QUESTIONS:

- 1. What is the relation between $K_{\rm p}$ and $K_{\rm c}.$ Give one
- example for which K_p is equal to K_c .
- 2. State Le Chatelier principle.
- 3. State law of mass action.
- 4. Explain how will you predict the direction of an equilibrium reaction.
- 5. Derive a general expression for the equilibrium
- constant K_p and K_c for the reaction.
- $3H_2(g) + N_2(g) \rightleftharpoons 2NH_3(g)$
- 6. Derive the relation between K_p and K_c .
- 7. Deduce the Vant Hoff equation
- 8. What is the effect of added inert gas on the reaction at equilibrium at constant volume
- at equilibrium at constant volume
- 9. Write a balanced chemical equation for an equilibrium reaction for which the equilibrium
- constant is given by expression.

BOOK INTERIOR:

- 1. Derive the values of K and K for the synthesis of HI.
- 2. Derive the values of K and K for dissociation of $\ensuremath{\mathsf{PCI}}\xspace_{\ensuremath{\mathsf{s}}\xspace}$
- 3. What is reaction quotient?

LESSON -9

BOOK BACK QUESTIONS:

- 1. Define i) Molality ii) Normality
- 2. State and explain Henry's law.
- 3. State Raoult law and obtain expression for lowering
- of apour pressure when nonvolatile solute is dissolved in solvent
- 4. What is osmosis?
- 5. Define the term isotonic
- 6. Explain the effect of pressure on the solubility

BOOK INTERIOR:

- 1. Define mole fraction.
- 2. What are ideal solution? Give example.
- 3. What are colligative properties? Give example.
- 4. Define osmotic pressure.
- 5. Define Van't Hoff factor.
- 6. Define freezing point and depression in freezing point.

7. Explain about the factors that are responsible for deviation from Raoult's law.

LESSON -10

BOOK BACK QUESTIONS:

1. Define the following i) Bond order ii) Hybridisation iii) σ - bond iv) π -bond

2. Explain sp² hybridisation in BF₃.

3. Draw the M.O diagram for oxygen molecule and calculate its bond order and show that O_2 is paramagnetic.

4. Discuss the formation of N_2 molecule using MO Theory.

5. What is dipole moment?

9. Define bond energy.

11. Explain VSEPR theory.

order? N_2 , N_2^+ or N_2^- ? 14. Describe Fajan's rule.

square planar.

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- 6. Draw the Lewis structures for the following species.
- i) NO_3^- ii) SO_4^{2-} iii) HNO_3 iv) O_3
- 7. Explain the bond formation in BeCl₂ and MgCl₂.
 8. Which bond is stronger or π? Why?

10. What type of hybridisations are possible in the

following geometeries? i) octahedral ii) tetrahedral iii)

12. CO₂ and H₂O both are triatomic molecules but their

dipole moment values are different. Why? 13. Which one of the following has highest bond 15. Draw the lewis structures for i) Nitrous acid (HNO₂) ii) Phosphoric acid iii) Sulphur troxide (SO₃) **BOOK INTERIOR:**

1. State octet rule.

- 2. Define bond length and bond angle.
- 3. Lithium chloride is more covalent than sodium
- chloride. Justify this statement.
- 4. Define coordinate covalent bond.

LESSON -11

BOOK BACK QUESTIONS:

1. Give the general characteristics of organic compounds.

2. Describe the classification of organic compounds based on their structure.

3. Write a note on homologous series.

4. What is meant by a functional group?

5. Describe the reactions involved in the detection of nitrogen in an organic compound by Lassaigne method.

6. Explain paper chromatography.

7. Describe optical isomerism with suitable example.

8. Briefly explain geometrical isomerism in alkenes by considering 2- butene as an example.

9. IUPAC NAME

10. Find out he functional groups.

BOOK INTERIOR:

1. Trans isomer is more stable than cis isomer. Justify this statement.

2. Differentiate between the principle of estimation of nitrogen in an organic compound by i) Dumas method ii) Kjeldahl's method.

3. What are various methods for chromatography.

LESSON - 1 2

BOOK BACK QUESTIONS:

1. Write short notes on:

(a) Resonance (b) Hyper conjugation

2. What are electrophiles and nucleophiles? Give

suitable examples for each.

3. Explain inductive effect with suitable example.

4. Explain electromeric effect.

5. Give examples for the following types of organic reactions i) β - elimination ii) Electrophilic substitution.

LESSON -1 B

BOOK BACK QUESTIONS:

1. How does Huckel rule help to decide the aromatic character of a compound?

2. Suggest a simple chemical test to distinguish propane and propene.

3. What happens when isobutylene is treated with

- acidified potassium permanganate?
- 4. Explain Markovnikoffs rule with suitable example.
- 5. What happens when ethylene is passed through
- cold dilute alkaline potassium permanganate.
- 6. Describe the mechanism of Nitration of benzene.
- 7. How will you convert ethyl chloride in to –

i) Ethane ii) n – butane BOOK INTERIOR:

- 1. What is Wurtz reaction?
- 2. What is Wurtz-fitting reaction?
- 3. What is BHC? How will you prepare BHC? Mention its uses.
- 4. Explain the structure of benzene.
- 5. How ozone reacts with 2-methyl propene?
- 6. Friedel craft's reaction.

LESSON -14

BOOK BACK QUESTIONS:

- Why chlorination of methane is not possible in dark?
 How does chiorobenzene react with sodium in the processor of other? What is the process of the possible in dark?
- presence of ether? What is the name of the reaction? 3. What happens when chloroform reacts with oxygen
- in the presence of sunlight?
- 4. Compare S_N^1 and S_N^2 reaction mechanisms.
- 5. What are Freons? Discuss their uses and environmental effects.
- 6. Explain the mechanism of S_N^1 reaction by
- highlighting the stereochemistry behind it.
- 7. Write short notes on Raschig, Dows & Darzens process.

8. Starting from CH₃MgI. How will you prepare the following? i) Acetic acid ii) Acetone iii) Ethyl acetate iv) Isopropyl alcohol

9. Explain the preparation of the following compounds: i) DDT ii) Chloroform iii) Biphenyl iv) Chloropicrin v) Freon-12

10. An organic compound (A) with molecular formula C_2H_5CI reacts with KOH gives compounds (B) and with alcoholic KOH gives compound (C). Identify (A), (B) and (C)

11. Simplest alkene (A) reacts with HCl to form compound (B).Compound (B) reacts with ammonia to form compound (C) of molecular formula C_2H_2N . Compound (C) undergoes carbylarmine test. Identify (A), (B), and (C).

BOOK INTERIOR:

1. How methane reacts with Cl_2 in the presence of light?

2. Explain-Finkelstein reaction and Swatrz reaction

- 3. Explain Williamson's synthesis.
- 4. What is Grignard reagent? How is it prepared from ethyl bromide?
- 5. Explain Sandmeyer's reaction.
- 6. Explain Wurtz-fitting reaction.
- 7. Mention the uses of chloroform.
- 8. What are the uses of carbon tetrachloride?

9. Explain S_N^2 mechanism with suitable examples. 10. Explain E_2 and E_1 reaction mechanism with a suitable example.

11. What are the uses of Freons and DDT.

LESSON -15

BOOK BACK QUESTIONS:

1. What would happen, if the greenhouse gases were totally missing in the earth's atmosphere?

2. Define smog.

3. Which is considered to be earth's protective umbrella? Why?

4. What are bio-degradable and non-biodegradable pollutants?

5. What is green chemistry?

6. Explain how does greenhouse effect cause global warming.

- 7. What are particulate pollutants? Explain any three.
- 8. How is acid rain formed? Explain its effect.
- 9. Differentiate the following: i) BOD and COD ii)
- Viable and non-viable particulate pollutants.

10. Explain how oxygen deficiency is caused by carbon monoxide in our blood? Give its effect.