

## CHEMISTRY (XII) CHAPTER 1 (Periodic Classification of elements)

### Short Questions (2010-2022 Lahore Board):

1. Why ionic radii of negative ions are larger than parent atoms? **2021**
2. What are alkali metals? Give names of alkali metals. **2021**
3. What do you know about period 6 of the periodic table. **2021**
4. Why  $\text{Na}^+$  ion is smaller than  $\text{Na}$  atom? **2021**
5. Define Periodic table. How many groups and periods are in it? **2019**
6. Give two defects of Mendeleev's periodic table. **2012**
7.  $\text{Zn}, \text{Cd}, \text{Hg}$  were placed along with alkaline earth metals in Mendeleev's periodic table. How was this confusion removed in Modern periodic table? **2014**
8. What is Lanthanide contraction? How does it control the atomic sizes of elements of 6<sup>th</sup> and 7<sup>th</sup> periods? **2016, 2022, 2022**
9. Define Mendeleev's and modern periodic law. **2012, 2014, 2019**
10. Give four improvements made in Mendeleev's periodic law. **2012** configuration. **2011**
11. Write name and symbol of an element from s block that has zero oxidation state. Also write its electronic
12. Discuss the trend of ionization energy in the periodic table. **2012**
13. Why do ionization energies decrease down the group and increase left to right? **2018**
14. Define electron affinity. Discuss its trend in the periodic table. **2013**
15. Why the oxidation states of noble gases are usually zero? **2014, 2018**
16. Oxidation states vary in a period but remain same in a group. **2016, 2022**
17. Why  $\text{PbCl}_2$  is ionic but  $\text{PbCl}_4$  is fairly covalent compound? **Additional**
18. Why metallic character increases from top to bottom in a group of metal? **2014, 2015**
19. Why do metals conduct electricity? **2014**

OR

20. Why the metals are good conductors? **2017**
21. Why diamond is a non-conductor and graphite fairly a good conductor of electricity? **2013, 2013, 2018, 2019, 2021**
22. What happens when acidic and basic oxides combine with each other? **Additional**
23. Why melting and boiling points of elements belonging to groups VA to VIIA are lower? **2011**
24. Explain the variation in melting points along the short periods. **2022**
25. What is hydration energy? Give an example. **2019**
26. Hydration energies of ions are in the following order.  $\text{Al}^{+3} > \text{Mg}^{+2} > \text{Na}^{+1}$  justify it. **2018**
27. Why alkali metals give ionic hydrides? **2015**
28. What are hydrides? What is the trend of boiling points of hydrides of group VI down the group? **2010**
29. Name various classes of hydrides. **2016**
30. What are amphoteric oxides? Give an example. **2017**
31. Give any two resemblances of hydrogen with IVA elements. **2016**
32. How do you justify the position of hydrogen at the top of alkali metals (group IA)? **2013**
33. How does hydrogen resemble with alkali metals? **201**
34. Why hydrogen can be placed over group IVA of the periodic table? **2010**

### LONG QUESTIONS

1. What were the improvements made in Mendeleev's periodic table? **2022**
2. Define ionization energy. Give its units. Discuss the effects of three factors on the ionization energy values of elements. **2018**
3. Explain variation of following along groups and periods of periodic table: **2013**
  - a. Ionization potential
  - b. Electrical conductivity
4. Explain periodic trends in the following properties. **2011**
  - a. Atomic radius
  - b. Electron affinity
5. Define hydration energy. Explain it with suitable example. **2010**
6. What are hydrides? Describe different types of hydrides. **2014, 2019**
7. What are halides? Give their types and properties. **2013**
8. What are halides? Classify them on the basis of nature of Bonding. Discuss covalent halides in details. **2014**
9. Write two similarities and two differences of hydrogen with IA group elements (alkali metals). **2016**

- 10.** Write two similarities and two differences of hydrogen with IVA group elements. **2016**
- 11.** Discuss the position of hydrogen in Group IVA of the periodic table. **2012,2021**
- 12.** Discuss the position of hydrogen in Group IA of the periodic table. **2021**
- 13.** Justify the position of hydrogen at the top of group IA and VIIA of the periodic table. **2012,2018**
- 14.** Write two points of similarities and two points of differences between hydrogen with halogens. **2019,2022**

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## CHEMISTRY (XII) CHAPTER 2 (s-Block Elements)

### Short Questions (2010-2022 Lahore Board):

1. Give chemical formulae of mica and bauxite. **2021**
2. Give chemical formulae of kaolin and Feldspar. **2021**
3. Give two differences between lithium and other alkali metals. **2021**
4. Differentiate between alkali and alkaline earth metals. Give one example in each case. **2019**
5. Why is the aqueous solution of  $\text{Na}_2\text{CO}_3$  alkaline in nature? **2010,2018,2021,2022**
6. How  $\text{LiNO}_3$  and  $\text{NaNO}_3$  differ in application of heat. Give corresponding equations. **2010,2021**
7. What happens when  $\text{LiOH}$  is heated to red hot? **2022**
8. Solution of  $\text{Na}_2\text{O}$  in water is alkaline. Justify the statement. **2011**
9. Why 2% gypsum is added into the cement? **2016,2022**
10. What happens when:?  
**2016**
  - a.  $\text{Li}_2\text{CO}_3$  is heated
  - b.  $\text{Na}_2\text{CO}_3$  is heated
11. Give formulae of Natron and Halite. **2016**
12. Write two points of difference of Beryllium with its family members. **2016**
13. Prove that decomposition of lithium nitrate gives different products than nitrates of other alkali metals? **2015**
14. How lime and sand are used to make glass? **2015,2019**
15. Why lime is added to acidic soil? **2014**
16. What is the action of litmus with aqueous solution of  $\text{Na}_2\text{CO}_3$ ? **2014**
17. What is Plaster of Paris? **2013**
18. What is Plaster of Paris? Give its two applications. **2013**
19. Why lime water turns milky by passing  $\text{CO}_2$  gas but becomes clear with excess of  $\text{CO}_2$ ? **2013,2018**
20. Why  $\text{KO}_2$  is used in breathing equipment used by mountaineers and astronauts? **2012,2013,2017**
21. Give four points in which lithium differs from its own family members? **2013**
22. Reaction of alkali metal with water is acid-base reaction and not an oxidation-reduction reaction. Justify. **2013**
23. Give two major problems that may arise in Nelson's cell. **2012,2012**
24. Give advantages of Down's Cell. **2012,2022**
25. Why alkali and alkaline earth metals are the most reactive elements of the periodic table? **2012**
26.  $\text{BeO}$  is Amphoteric. Prove it. **Additional**
27. What is lime water and milk of magnesia? **Additional**
28. How gypsum is converted into plaster of Paris? **2017**
29. What is lime mortar? How is it formed? **Additional**

### LONG QUESTIONS

1. Discuss the commercial preparation of sodium by Down's cell. What are the advantages of this process? **2010,2014,2018,2021**
2. Write eight points to describe the role of lime in industries. **2011,2016,2019**
3. Complete and balance the following equations. **2019**
  - a.  $\text{Be} + \text{NaOH} \longrightarrow$
  - b.  $\text{Be} + \text{O}_2 \longrightarrow$
  - c.  $\text{SiO}_2 + \text{Ca(OH)}_2 \xrightarrow{\text{heat}}$
  - d.  $\text{Mg(NO}_3)_2 \longrightarrow$
4. Complete and balance the following equations. **2016**
  - a.  $\text{Li}_2\text{O} + \text{H}_2\text{O} \longrightarrow$
  - b.  $\text{Na}_2\text{O}_2 + \text{H}_2\text{O} \xrightarrow{\text{heat}}$
  - c.  $\text{Mg(OH)}_2 \xrightarrow{\text{heat}}$
  - d.  $\text{NaNO}_3 \longrightarrow$
5. Describe the role of gypsum in agriculture. **2012**
6. Explain Peculiar behaviour of beryllium. **2015,2014,2018**

7. Write commercial method for the preparation of NaOH. **2015,2013,2012**
8. Show four reactions in which lithium behaves differently from its own group. **2013**
9. Write eight properties of lithium in which it behaves differently from its group members. **2021,2022**
10. Discuss hard finish plasters and cement plasters. **2022**

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## CHEMISTRY (XII) CHAPTER 03 (Group IIIA and IVA Elements)

### Short Questions (2010-2022 Lahore Board):

1. How does orthoboric acid react with; **2019**
  - a. Sodium hydroxide
  - b. Ethyl alcohol
2. How does boric acid react with **(a)** Ethyl alcohol **(b)** sodium carbonate. **2022**
3. Write the formulas of borax and colemanite. **2019**
4. How would you prepare borax from colemanite? **2021**
5. What is boric acid? Give its uses. **2010**
6. Why carbon behaves differently from other members of its group? **2010**
7. How weathering phenomenon converts potassium feldspar into clay? **2010**
8. Give uses of lead sub oxide. **2011**
9. Show that  $H_3BO_3$  is a monobasic acid. **2011**
10. How Al finds its uses in metallurgy and photoflash bulbs? **2011**
11. Why  $CO_2$  is a gas while  $SiO_2$  is a solid at room temperature? **2012, 2012, 2014, 2019**
12. Why are Borate glazes better than silicate glazes? Explain. **2012, 2019**
13. Write two principal uses of Borax? **2012**

**OR**

Write four uses of Borax? **2012, 2021**

14. Give four differences of Boron from other elements of group IIIA. **2013, 2021**
15. Write down formulas of Bauxite and corundum. **2013**
16. Explain chemistry of Borax bead test? **2013, 2013, 2022**
17. How will you convert boric acid into borax and vice versa? **2013**
18. Write four uses of sodium silicate. **2014, 2016**
19. Write the reactions of boric acid with **i.** Ethyl alcohol **ii.** NaOH **2014, 2015, 2017, 2018**
20. What is meant by chemical garden? **2014, 2017, 2018, 2019**
21. Give the formulae of four boric acids. **2014**
22. What is the action of heat on orthoboric acid? **2014**
23. Why aqueous solution of borax is alkaline? **2015, 2016**
24. Explain structure of  $CO_2$ . **2015**
25. How aqueous solution of Borax is alkaline? **2015**
26. Give two similarities between carbon and silicon. **2015**
27. Why liquid silicones are preferred over ordinary organic lubricants? **2017**
28. Give two uses of silicones. **2022**
29. Discuss any four uses of silicates. **2022**
30. Write down chemical formulae of colemanite and bauxite. **2017**
31. Write any four uses of Aluminium. **2018, 2021**
32. What is vitreous silica? Give its two uses. **2018**
33. Write two reactions for the preparation of Borax. **2018**
34. Define semiconductor. Write its properties. **2018**

### Long Questions (2010-2022 Lahore Board):

1. What are silicates. How is sodium silicate prepared? Give its two uses. **2022**
2. Give one method for the preparation of  $H_3BO_3$ . How does it react with ? : **2022**
  - a. NaOH
  - b.  $Na_2CO_3$
  - c.  $C_2H_5OH$

## CHEMISTRY (XII) CHAPTER 04 (Group VA and VIA Elements)

### Short Questions (2010-2022 Lahore Board):

1. Draw structural formulas of dinitrogen pentoxide and dinitrogen oxide. **2021**
2. Write four differences of nitrogen from its family. **2019**
3. Justify that conc.  $\text{H}_2\text{SO}_4$  is a dehydrating agent. **2010**
4.  $\text{H}_2\text{SO}_4$  is a powerful dehydrating agent. Prove it by two examples. **2019,2021**
5. Name three allotropic forms of phosphorus. **2011**
6. Name three allotropic forms of phosphorus. How red phosphorous is prepared? **2022**
7. Give the reactions of phosphorous with: **2022**
  - a. Thionyl chloride
  - b.  $\text{Cl}_2$  gas
8. How does aqua regia dissolve gold and platinum? **2011, 2017, 2019,2019,2022**
9. How  $\text{NO}_2$  is prepared from: **2010**
  - a. Lead nitrate
  - b.  $\text{Cu}+\text{HNO}_3$
10. How does  $\text{HNO}_2$  act as reducing agent? **2012**
11. How does  $\text{P}_2\text{O}_5$  react with water in cold and hot state? **2012,2015**
12. Why  $\text{SO}_3$  is dissolved in sulphuric acid and not in water? **2012**
13. Give two reactions which show oxidizing behaviour of NO. **2012**
14. Give two methods for the preparation of  $\text{PCl}_3$ . **2013**
15. Write two points of dissimilarities of oxygen and Sulphur. **2013,2014,2017,2019**
16. Write two similarities and two dissimilarities of oxygen and Sulphur. **2019**
17. Why the elements of VIA other than oxygen show more than two oxidation states? **2013**
18. Give the names of four elements which do not react with nitric acid. **2013**
19. Explain the structure of  $\text{HNO}_2$  and  $\text{HNO}_3$ . **2013**
20. Describe Ring test for the confirmation of presence of nitrate ions in the solution. **2022**
21.  $\text{P}_2\text{O}_5$  is powerful dehydrating agent. Give two examples. **2014**
22. Write any four uses of Nitric acid. **2014,2015**
23. Write four uses of Sulphuric acid. **2021**
24. What happens when  $\text{NO}_2$  is dissolved in water? **2014**
25. Write two reactions of preparation of nitrous acid. **2018**
26. What is the action of heat on orthophosphoric acid? Write chemical equation also. **2018**
27. Write any four properties of sulphuric acid. **2018**
28.  $\text{NO}_2$  is a strong oxidizing agent. Prove with the help of two examples. **2018**
29. Give two reactions of sulphuric acid which show its oxidizing behaviour. **2018**
30. Give four dissimilarities of Oxygen with Sulphur. **2018**
31. What is aqua regia? **2014**
32. Justify that sulphuric acid is king of chemicals. **2014**
33. Justify that NO acts as an oxidizing agent? **2015**
34. How does  $\text{HNO}_2$  act as reducing agent? **2015**
35. Write down two chemical reactions which show that sulphuric acid is a dehydrating agent? **2016**
36. Complete and balance the following chemical equation. **2016**  
 $\text{KMnO}_4 + \text{FeSO}_4 + \text{H}_2\text{SO}_4 \rightarrow$

### BISE Long Questions and anticipated Questions:

1. Write a note on the manufacture of Nitric acid through Birkland and Eyde's Process.
2. How does Nitric acid react with Cu, Zn, Mg and Sn? **2021**
3. How does Nitric acid react with Cu, Hg, Zn and Sn? **2021**
4. Give suitable examples to explain that sulphuric acid is good acid, oxidizing agent and dehydrating agent.
5. How does oxygen resemble sulphur?  
**OR**  
Differentiate between oxygen and sulphur.  
**OR**  
Compare oxygen with sulphur.
6. Explain the contact process for the manufacture of sulphuric acid.
7. Exercise Questions # 11, 12

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## CHEMISTRY (XII)

### CHAPTER 05 (Halogens and Noble gases)

#### Short Questions (2010-2022 Lahore Board):

1. Write any two uses of bleaching powder. **2021, 2021**
2. What is structural formula of Teflon? Mention its two uses. **2010**
3. The elements of group VIIIA are called Nobel gases. Comment. **2011**
4. How are halogen acids ionized in water? **2011**
5. Arrange the following oxy acids in the increasing order of acid strength.  $\text{HClO}_4$ ,  $\text{HClO}_3$ ,  $\text{HClO}_2$ ,  $\text{HOCl}$  **2012**
6. Why bleaching powder shows bleaching action? **2012**
7. Write four uses of halogens. **2013**
8. What is disproportionation reaction. Give an example. **2021,2022**
9. Write disproportionation reaction of chlorine. **2013**
10. Write the reaction of NaOH with  $\text{Cl}_2$  in cold state. **2014**  
**OR**  
How NaOH reacts with  $\text{Cl}_2$  in cold and hot state? **2018**  
**OR**  
Write down reactions of chlorine with cold and hot NaOH. **2018**
11. Why HF is a weaker acid than other halogen acids? **2014**  
**OR**  
Why HF is a weaker acid than other HCl? **2015,2021,2022**
12. Why solubility of noble gases increases down the group? **2015**
13. What are Freons and Teflon? **2015,2016,2022,2022**
14. Describe two uses of helium. **2016**  
**OR**  
Write two uses of each helium and argon. **2018**
15. Give four applications of Noble gases. **2019**
16. Write any two uses of krypton? **2016**
17. Why the elements of VIA other than oxygen show more than two oxidation states? **2016**
18. What is iodized salt? **2016,2019**  
**OR**  
What is iodized salt? Write its function. **2018**
19. On what basis perchloric acid is considered a valuable analytical reagent? **2017**
20. Why iodine has metallic luster? **2017, 2018,2019**
21. Give peculiar behaviour of fluorine? **Additional**
22. What is meant by Available chlorine? How is quality of bleaching powder tested? **Additional**
23. Oxidizing power of halogens depends on which factors? **2021**
24. What is iodox and tincture of iodine? **Additional**

### CHAPTER 15 (Common Chemical Industries in Pakistan)

#### Short Questions (2010-2022 Lahore Board):

1. How paper industry can be made progressive in Pakistan? **2010**
2. Give any four important (essential) qualities of a good fertilizer. **2010,2017**
3. Classify elements essential for plant growth. **2011**
4. Give significance of potash fertilizer? **2018,2021**
5. Enlist the steps involved in the manufacture of urea. **2011,2021**
6. Write a note on diammonium phosphate. **2011**
7. Give preparation of Portland cement as carried out by Joseph Aspdin, Why it is named so? **2012**
8. Distinguish micronutrients and macronutrients for plants. **2012,2012**
9. What are micronutrients? **2015**
10. Give reactions of preparation of urea by using  $\text{NH}_3$  and  $\text{CO}_2$ . **2012**
11. Write down four essential qualities of a good fertilizer. **2012,2019**
12. What are essential nutrient elements? Why are they needed? **2013**
13. How is ammonium nitrate prepared? Describe the process. **2013**



- 14.** Give the important qualities of fertilizer. **2013**
- 15.** Give different zones in the rotary kiln and their temperature ranges. **2013**
- 16.** What is clinker formation? **2018**
- 17.** What are fertilizers? **2014**
- 18.** Why is there a need for fertilizers? **2015,2016**
- 19.** Give any four important qualities of fertilizers. **2015**
- 20.** Name the essential constituents of cement? **2014**
- 21.** Why wet cleaning is done in paper manufacture. **2014**
- 22.** Write down two woody and two non-woody raw materials for paper pulp manufacture. **2015**
- 23.** Name two woody and two non-woody raw materials. **2018**
- 24.** Which types of woody raw materials are used in paper industry? **2016**
- 25.** What reactions take place in decomposition zone during manufacturing of cement? **2016**
- 26.** Discuss the reactions taking place in the first 24 hours of setting of cement. **2022**
- 27.** What do you mean by prilling of urea? **2016**
- 28.** What are the raw materials for the manufacture of cement? **2019**
- 29.** What do you mean by setting of cement? **2017,2021**
- 30.** Why is cement known as Portland cement? **2018**
- 31.** Write down digestion process for the preparation of pulp. **2018,2022**
- 32.** Define DAP. Write reaction for its preparation. **2018**
- 33.** What is the chemical composition of a good Portland cement? **2022**
- 34.** What are phosphatic fertilizers. Give an example. **2022**
- 35.**
- 36.** Why is lignin removed from pulp? **Additional**
- 37.** What are the prospects of paper industry in Pakistan? **Additional**

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## CHEMISTRY (XII) CHAPTER 6 (TRANSITION ELEMENTS)

### Short Questions (2010-2022 Lahore Board):

1. What is anode coating? **2021**
2. What is chromyl chloride test? Give chemical equation. **2010,2013,2016,2016,2022**
3. How  $\text{KMnO}_4$  can be prepared by electrolytic method? **2010**
4. Write formulas of chromate and dichromate ions. In which colour they usually exist? **2011**
5. Give coordination number and oxidation number of iron (Fe) in  $\text{K}_4[\text{Fe}(\text{CN})_6]$  **2012**
6. What are chelates? Give an example. **2012,2014, 2018**
7. Why does damaged tin plated iron get rusted quickly? **2013,2014,2021**
8. Give the prevention of metals from corrosion. **2021**
9. What are typical and non-typical transition elements? **2014**
10. Give reason for the development of colours in the transition metal complexes. **2014,2017**
11. Give formulas of Magnetite and Haematite. **2015**
12. Write carbon content in pig iron and cast iron. **2015**
13. What is the %age of carbon in different types of steel? **2018**
14. Why transition elements have variable oxidation states? **2014**
15. What is ligand? Give types of ligands. **2015**

**OR**

Define Ligand with an example. **2018**

16. Complete and balance the following chemical equation? **2016**  
 $\text{KMnO}_4 + \text{FeSO}_4 + \text{H}_2\text{SO}_4 \rightarrow$
17. Define sacrificial corrosion. **2016**
18.  $\text{KMnO}_4$  acts as oxidizing agent. Show with two examples. **2018**
19. What is Stadelers process? **Additional**
20. What are chromates and dichromates? **Additional**
21. How entrapped bubbles of air removed from molten steel? **Additional**
22. What are interstitial compounds? **2019,2021**
23. What are interstitial compounds and substitutional alloys? **2022**
24. Write down any two uses of potassium dichromate. **2022**
25. What is meant by interstitial compound and substitutional alloy? **Additional**
26. Briefly discuss the property of paramagnetism in transition elements compounds. **2022**
27. Define Paramagnetism, diamagnetism and Ferromagnetism. **Additional**
28. What is meant by outer transition metals and inner transition metals? **Additional**
29. Why d and f block elements are called transition elements? **Additional**
30. What is galvanizing? How it is done? **Additional**

### LONG QUESTIONS:

1. What is Corrosion? How is a metal protected from Corrosion? **2021**
2. Define corrosion. Explain electrochemical theory of corrosion. **2019**
3. Explain Bessemer's process for formation of steel. **2011,2012,2014,2019,2022**
4. Explain the following terms by giving examples. **2010, 2012**
  - a. Ligands
  - b. Coordination number
  - c. Chelates
  - d. Coordination sphere
5. Explain the following properties of transition elements. **2010, 2012, 2018**
  - a. Colour
  - b. Chelates formation
6. How does electronic configuration of valence shell affect the following properties of transition elements. **2013**
  - a. Paramagnetism
  - b. Oxidation states
7. Discuss the following properties of transition elements: **2022**
  - (i) Paramagnetism
  - (ii) Colour
8. Describe following general characteristics of transition metals. Binding energies and Paramagnetism. **2021**

- 9.** Write down any four properties of transition elements. **2013**  
**10.**  $\text{KMnO}_4$  acts as oxidizing agent. Give four reactions in support of your answer. **2014**  
**11.** Describe the manufacture of wrought iron from cast iron. **2018**

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# BISE LAHORE PAST PAPERS QUESTIONS OF CHEMISTRY (F.SC. PART 2)

## CHAPTER 7: (Fundamental Principles of Organic Chemistry)

### FULL SYLLABUS

#### Long Questions (2010-2022):

1. Define organic compound. Give any three features of organic compounds. **2021**
2. Write a note on classification of organic compounds. **2013**
3. Differentiate between homocyclic and heterocyclic compounds with two examples in each case. **2018**
4. What do you know about Cracking of petroleum? **2015**
5. Define cracking and give its types. **2018**
6. Explain reforming of petroleum with the help of suitable examples. **2017**
7. Define  $sp^3$  and  $sp^2$  Hybridization. Give one example in each case. **2012, 2016**
8. Explain  $sp^2$  Hybridization along with describing structure of Ethene. **2012, 2022**
9. What is orbital Hybridization? Explain  $sp^3$  hybridization with an example. **2014, 2019**
10. What is orbital Hybridization? Explain  $sp$  hybridization with an example. **2019**
11. What is  $sp$  Hybridization? Explain the structure of acetylene according to this theory. **2014, 2022**
12. Explain the structure of Ethene on the basis of  $sp^2$  Hybridization. **2016**.
13. Define isomerism. Explain the term Metamerism by giving two examples. **2013**
14. Explain any four types of structural isomers by giving one example in each case. **2021**

#### Short Questions (2010-2022):

1. Define organic chemistry.
2. Define homologous series.
3. What is carbonization or destructive distillation of coal? **2022, 2022**
4. What is steam cracking? **2022**
5. What is thermal cracking?
6. What is octane number and how it can be improved?
7. How does cracking and reforming differ from each other?
8. Define reforming of petroleum.
9. Give an idea about the knocking in the internal combustion engine.
10. Define homocyclic compounds. Give examples.
11. What are alicyclic compounds? Give two examples.
12. What are alicyclic and aromatic compounds? Give one example in each case.
13. Differentiate between homocyclic and heterocyclic compounds.
14. What are fused ring aromatic compounds?
15. Branched hydrocarbons are better as a fuel as compared to straight chain. Explain.
16. What are aromatic hydrocarbons? Give two examples.
17. What are heterocyclic compounds? Give names and formulas of two heterocyclic compounds.
18. What are homocyclic and heterocyclic compounds? Give one example of each. **2021, 2021**
19. Write the structures of two possible isomers of  $C_4H_{10}$ . **2021**
20. Define catalytic cracking. **2021**
21. Mention shapes and angles of Ethene and Ethyne.
22. Define functional group. Give two examples of functional groups containing oxygen.
23. Define functional group isomerism. Give one example. **2022**
24. Write the functional group of aldehyde and ketone. Give one example.
25. Define Metamerism with an example.
26. Define tautomerism. Give an example.
27. Explain cis-trans isomerism. Give an example.
28. 2-Butene shows geometric isomerism but 1-Butene does not. Why?
29. 1-Alkynes behave as weak acids. Give reason **2022**
30. Why is there no free rotation around a double bond but free rotation around a single bond?

## BISE LAHORE PAST PAPERS QUESTIONS OF CHEMISTRY (F.Sc. Part 2)

### CHAPTER 8: (ALIPHATIC HYDROCARBONS)

#### Short Questions (2010-2022):

- Write down structural formulas of the following: **2019**
  - 2-Methyl propane
  - Neopentane
  - 3-Ethylpentane
  - 2,2-Dimethyl pentane
- How would you establish that benzene is a polymer of acetylene? **2010**
- How do you distinguish between 1-Butyne and 2-Butyne? **2010**
- Mention four uses of ethene. **2011**
- Why is sigma bond inert? **2021, 2021, 2022**
- Sigma bond is inert. Justify it. **2011**
- Why alkanes are less reactive organic compounds? **2018**
- Define hydrogenolysis. Give one example. **2021**
- Discuss hydroxylation of ethene. **2022**
- How is water added to propyne? **2022**
- How Ammoniacal solution of  $\text{AgNO}_3$  can be used to distinguish between 1-Butyne and 2-Butyne. **2012**
- State Markownikov's rule. Give example. **2012, 2013, 2016, 2016, 2018**
- Write mechanism for Kolbe's electrolytic method for preparation of an alkane. **2012**
- Convert methane into **i.** Formaldehyde **ii.** Nitromethane **2013**
- Prepare Ethane from **i.** Ethyl alcohol **ii.** Ethyl chloride **2013**
- Write the chemical equation when alkaline  $\text{KMnO}_4$  reacts with ethyne. **2013**
- Alkanes are less reactive than alkenes. Comment. **2014, 2017**
- Ethene can be converted to ethyl alcohol. Write equation. **2014, 2015**
- How is Methane converted to Ethane? **2021**
- Give four uses of Methane. **2014, 2019**
- What is Baeyer's test? What is its use? **2014, 2017**
- Ozonolysis of alkene is used to locate the position of double bond. Comment. **2021**
- How cis and trans alkenes are prepared from alkyne? **2015, 2021**
- How will you synthesize following compounds from ethyne (acetylene). **2015, 2016**
  - Benzene
  - Chloroprene

OR

- Convert **(i)** acetylene to benzene **(ii)** vinyl acetylene to chloroprene **2018**
- Convert ethyne into acetaldehyde. **2016**
  - What happens when vicinal dihalide is treated with Zinc dust? **2018**
  - How can you convert methane to ethane? **2022**
  - Write the mechanism of Kolbe's electrolysis for the preparation of ethane. **2022**
  - Why are alkanes called Paraffins and alkenes as Olefins? **Additional**

#### Long Questions (2010-2022):

- How can following conversions be carried out. **2019**
  - Ethane to Methane
  - Methane to ethane
- How would you prepare alkane from carbonyl compounds? **2019**
- Give one method of preparation of each of Ethane, Ethene and Ethyne. **2010**
- Explain acidic nature of alkynes with at least two examples. **2012, 2016, 2021**
- Convert **(i)** acetic acid into methane **(ii)** 1-Propanol to 1-Chloro-2-propanol. **2012**
- How can you convert **2013**
  - 2,3-Dibromo butane into 2-Butene
  - Acetone into propane
  - Acetylene into vinyl acetylene
  - Acetylene into Disilver acetylide
- Convert acetylene to: **2022**
  - Vinyl acetylene
  - Divinyl acetylene

- vii. Benzene  
viii. Acetaldehyde
- 8.
9. How can you convert **2011**  
a. Propyne into acetone b. Ethyne into oxalic acid
10. Discuss acidic behavior of alkynes. What are the main uses of alkynides? **2013**
11. How will you distinguish between Ethane, Ethene and Ethyne? **2014**  
Give comparison of reactivity of alkane, alkene and alkyne. **2014**
12. Prepare Ethane from Kolbe's electrolysis? **2015**
13. How is ethene prepared by Kolbe's electrolytic method? Write its mechanism. **2018**
14. Write a note on Halogenation of alkanes. **2015**
15. Give the chemical reactions of Ethene with the following. **2022**  
i.  $\text{H}_2\text{SO}_4$  ii.  $\text{Br}_2$  iii.  $\text{O}_3$  iv. HOX
16. Write chemical reactions of Ethene with the following. **2016**  
i. HCl ii.  $\text{Br}_2$  iii.  $\text{O}_3$  iv. HOX
12. Why are some hydrocarbons called saturated and others unsaturated? Write down their characteristic reactions. **2017**
13. What are the rules for naming alkynes? Give suitable examples. **2018**
14. Write a note on polymerization of alkynes. **2021**

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## CHEMISTRY CHAPTER 9(XII) (Aromatic Hydrocarbons)

### Short Questions (2010-2022 Lahore Board):

1. What happens when; **2019**
  - a. benzene is heated with conc.  $\text{H}_2\text{SO}_4$  at  $250^\circ\text{C}$ .
  - b. Chlorine is passed through benzene in sunlight
2. Write general mechanism of electrophilic substitution reactions in benzene. **2010,2012**

**OR**

- Give general pattern of reactivity of benzene towards electrophiles. **2017**
3. Benzene has three pi bonds. Prove it by two points. **2010**
  4. What are fused ring aromatic compounds? Give examples. **2011**
  5. Write structural formulas of two fused ring aromatic hydrocarbons. **2022**
  6. Predict major product of the bromination of benzene. Also give equation. **2011**
  7. Benzene can be prepared commercially from acetylene. Give reaction with conditions. **2012, 2016**
  8. How Hexane and Heptane can give Benzene and Toluene respectively? **2010, 2012**
  9. How Benzene can be converted to Acetophenone? Give mechanism. **2012**
  10. Convert benzene into: **2012**
    - i. Cyclohexane
    - ii. Maleic anhydride
  11. Give two reactions that rule straight chain structures of benzene. **2012**
  12. What are polycyclic aromatic hydrocarbons? Give examples. **2012,2021,2022**
  13. What information do we get from X-rays studies of benzene. **2013, 2016,2021**
  14. Define Resonance and write down resonance structures of benzene. **2013,2014**
  15. How will you prepare following compounds from benzene in two steps? **2013,2013**
    - i. m-Chloronitrobenzene
    - ii. P-Chloronitrobenzene
  16. Prove that Benzene has cyclic structure. **2013, 2017**
  17. What is Wurtz-Fittig reaction? Give an example. **2013, 2014,2022,2022**
  18. What are aromatic hydrocarbons? Give two examples. **2014**
  19. Define Aromatic hydrocarbons. How are they classified? **2019**
  20. Define resonance energy. Give resonance energy of benzene. **2014**
  21. What is aromatization? **2015**
  22. Give reaction of benzene with  $\text{SO}_3$ . **2015**
  23. How will you synthesize benzene from Ethyne? **2015**
  24. Write down mechanism for Halogenation of benzene. **2015**
  25. Give mechanism for nitration of benzene. **2016 OR** What is meant by nitration of benzene? **2018**
  26. Give reaction of benzene with ozone **2016**
  27. How benzene is converted into Maleic acid by catalytic oxidation? **2016, 2021**
  28. What happens when benzene is burnt in free supply air? Give equation. **2018**
  29. Give four examples of ortho-para directing groups. **2021**

### LONG QUESTIONS:

1. Draw structural formulae of following compounds: **2019**
  - i. m-Chlorobenzoic acid
  - ii. 2,4,6-Trinitrotoluene
  - iii. P-Dibenzylbenzene
  - iv. P-Nitroaniline
2. Discuss atomic orbital treatment to explain the structure of benzene. **2019,2022**
3. Write three methods of preparation of benzene. **2010**
4. What is meant by orientation in Benzene? Why certain substituents are ortho-para directive and others meta directive? Give one example of each. **2012, 2013**
5. Describe the structure of Benzene on the basis of resonance method. **2012**
6. Write a note on Friedal-crafts reactions. **2011, 2013,2014,2015**
7. What are Friedel-Craft's reactions? Give example and mechanism of Friedel -Craft's Acylation. **2021**
8. What happens when toluene is reacted with
  - i.  $\text{Cl}_2$  in sunlight
  - ii.  $\text{KMnO}_4$  in presence of  $\text{H}_2\text{SO}_4$ .**2014**
9. Convert benzene into: **2015**
  - i. Cyclohexane
  - ii. Maleic acid
  - iii. Glyoxal
  - iv. Benzene sulphonic acid
10. Give the mechanisms of following reactions of benzene
  - i. Nitration
  - ii. Sulphonation**2016,2022**

- 11.** Write down four chemical methods for the preparation of benzene. **2016**
- 12.** Write down the classification of aromatic hydrocarbons giving one example in each. **2018**
- 13.** Write down two reactions in which benzene behaves as saturated hydrocarbon and two reactions in which as unsaturated hydrocarbon. **2018**
- 14.** Discuss the general pattern of reactivity of benzene towards electrophiles with reference to halogenation. **2021**

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**CHEMISTRY CHAPTER 10(XII) (Alkyl Halides)****Short Questions (2010-2022 Lahore Board):**

1. Define Grignard reagent. Give one example. **2019**
2. Define alkyl halide. What are primary alkyl halides? Give example. **2019**
3. Write IUPAC names of: **2010**
  - a. Carbon tetrabromide
  - b. Chloroform
  - c. Methylene chloride
  - d. Methyl iodide
4. Discuss E<sub>2</sub> mechanism. **2011**
5. What are elimination reactions? Give example of E1 reaction. **2012**
6. How will you convert CH<sub>3</sub>—CH<sub>3</sub> to (CH<sub>3</sub>-CH<sub>2</sub>)<sub>4</sub>NBr? **2012**
7. Give two preparation methods of alkyl halides from alcohols. **2010,2012**
8. Convert Ethyl bromide into: **2012**
  - i. Ethane
  - ii. n-Butane
9. Write reactions of Ethanol with **i) PBr<sub>3</sub> ii) PCl<sub>3</sub> 2013**
10. Define Nucleophile and electrophile. Give one example in each. **2013**
11. Differentiate between electrophile and nucleophile. **2021**
12. How can 1-Chloropropane be converted to Propene? **2022**
13. What is Wurtz's synthesis? **2013**
14. Why dry ether is used for the prepared of Grignard's reagent? **2022**
15. Using Ethyl bromide as starting material, how would you prepare? **2013**
  - i. Propanoic acid
  - ii. Ethane
16. What is the nature of C-Mg bond in R-Mg-X? **2014**
17. During S<sub>N</sub>1 reaction, what is the significance of first step? **2014**
18. What is leaving group and substrate? **2015**
19. Prepare from Ethyl bromide : **2015**
  - i. Ethyl thioalcohol
  - ii. Ethyl acetate
20. Differentiate between E1 and E2 reactions with two points. **2022**
21. What are primary and tertiary alkyl halides? Give one example in each. **2015**
22. SOCl<sub>2</sub> is the best reagent to get alkyl halide from alcohol. Write equation including solvent also. **2015**

**OR**

Describe the best method for the preparation of alkyl halides. **2018**

23. Give reaction of Grignard's reagent with CO<sub>2</sub> followed by hydrolysis in acidic medium. **2016**
24. Give mechanism of SN1. **2016**
25. Give four differences between SN1 and SN2. **2021**
26. Starting from ethyl bromide how will you prepare Ethane and Ethene. **2016**
27. How will you prepare diethyl amine from ethyl bromide? **2016**
28. Define tertiary alkyl halide. Give example. **2017**
29. Prepare following compounds from ethyl magnesium bromide. **2017**
  - a. 1-Propanol
  - b. Propanoic acid
30. What do you mean by leaving group? Give an example. **2018**
31. How are tetraethyl lead and tetramethyl lead prepared? **2021**
32. How is tetraethyl lead prepared? Give its application. **2021**
33. How tetraethyl lead and tetra methyl lead are prepared. **2022**
34. What is meant by the term 'Steric hindrance'? **Additional**

**LONG QUESTIONS:**

1. Define β-Elimination reactions. Discuss in detail E1 reaction. **2019**
2. What are β-Elimination reactions. Differentiate between E1 and E2 reactions. **2021**
3. Prepare Ethyl chloride from alcohols by using three different reagents. **2010**
4. Convert ethyl bromide into: **2022**
  - a. Ethane
  - b. Propane
  - c. Ethyl alcohol
  - d. n-Butane
5. Give all methods of preparation of alkyl halides. **2021**
6. Write reactions of Grignard's reagent with following. **2012**
  - a. Water
  - b. Ammonia
  - c. CO<sub>2</sub>
  - d. Alcohol
7. Write products are formed when following compounds are treated with ethyl magnesium bromide followed by hydrolysis in the presence of acid. **2012**
  - a. HCHO
  - b. CH<sub>3</sub>-CHO
  - c. (CH<sub>3</sub>)<sub>2</sub>CO
  - d. Cl-CN

8. How does ethyl magnesium bromide react with; **2019**  
a.  $\text{CO}_2$       b.  $\text{CH}_3\text{-CHO}$       c.  $\text{H}_2\text{O}$       d.  $\text{CH}_3\text{OH}$
9. Describe briefly the two possible mechanisms of E-Elimination reactions. **2013,2014,2016,2022**
10. Discuss  $\text{S}_{\text{N}}2$  mechanism of alkyl halide in detail. **2014,2016**
11. Describe  $\text{S}_{\text{N}}1$  reaction of alkyl halide in detail. **2015**
12. What are  $\text{S}_{\text{N}}$  reactions? Differentiate between  $\text{S}_{\text{N}}1$  and  $\text{S}_{\text{N}}2$  reactions. **2011**
- OR**
- Give four points of difference between  $\text{S}_{\text{N}}1$  and  $\text{S}_{\text{N}}2$  reactions. **2018**
13. How does Ethyl magnesium bromide react with the following. **2015**  
a.  $\text{CO}_2$       b.  $\text{CH}_3\text{-CO-CH}_3$
14. How will you bring about the following conversions from an alkyl halide? **2018**  
a. Diethyl ether      b. Ethyl thioalcohol  
b. Ethyl acetate      c. Nitroethane

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**CHEMISTRY(XII)****CHAPTER 11 (Alcohols, Phenols and Ethers)****Short Questions (2010-2022 Lahore Board):**

1. Ethanol reacts with sulphuric acid and gives different products at different temperatures. Comment. **2021**
2. Define Absolute alcohol, methylated spirit, Rectified Spirit, Denaturing of alcohol. **2019**
3. How is ethyl alcohol prepared from molasses.? Write equations. **2019,2022**
4. How will you distinguish between primary secondary and tertiary alcohols by Lucas test?**2010**
5. Picric acid is a phenol which behaves like an acid. Justify. **2011**
6. Why ethers are referred to as inert compounds. **2011**
7. Compare the reaction of conc.H<sub>2</sub>SO<sub>4</sub> with (i) ethyl alcohol and (ii) phenol. **2010**
8. Give preparation of methanol by the reaction between CO and H<sub>2</sub> (i.e. water gas). **2012,2013**
9. Distinguish ethanol and tertiary butyl alcohol by Lucas Test. **2012**
10. Prepare Phenol from Chlorobenzene by Dow's method. **2012, 2012**
11. How Will you convert: **2013**
  - i. Methanol into Ethanol
  - ii. Ethanol into Methanol
12. Write structural formulas of : **2013**
  - i. Methoxy ethane
  - ii. Ethoxy benzene
13. What are alcohols? How are they classified? **2012**
14. Why absolute alcohol can't be prepared by fermentation? **2012,2015,2017**
15. What are primary and secondary alcohols? Give one example of each. **2013**
16. Give any four uses of Methyl alcohol. **2014**
17. Write two uses of each of methanol and ethanol. **2011**
18. How does phenol react with alkali? **2014**
19. How is Methylated spirit prepared? **2014**
20. Why Phenol is acidic in nature? **2015**
21. Write two methods of preparation of Phenol. **2021,2022**
22. Write structural formulas of: **2015**
  - i. Carbolic acid
  - ii. Glycerol
23. Convert acetone into ethyl alcohol. **2016**
24. Water has higher boiling point than Ethanol. Explain. **2016**
25. Why ethanol has higher boiling point than diethyl ether? **2022**
26. How will you distinguish between methanol and ethanol by one test? **2011, 2016,2017**
27. Write any four uses of ethyl alcohol. **2016,2021**
28. What is denaturing of alcohols? **2018,2021**
29. How is Lucas test used to distinguish between primary secondary and tertiary alcohols? **2018**
30. How phenol can be converted to benzene? **2018**
31. How does phenol react with bromine water? **2018**
32. Convert phenol into (a) 2,4,6-Trbromophenol (b) Cyclohexanol **2022**
33. What is Williamson's synthesis? **Additional**

**LONG QUESTIONS:**

1. Write industrial preparation of Methanol. **2021**
2. Write the two reactions of alcohols in which O-H bond breaks. **2022**
3. Discuss the acidic behavior of phenol. **2019,2022**
4. How can ethers be prepared by Williamsons synthesis and from Ag<sub>2</sub>O? **2019**
5. Write two methods of preparation of Phenol. How does Phenol react with: **2014**
  - a. Conc. HNO<sub>3</sub>
  - b. Bromine Water
6. How is ethyl alcohol prepared by the fermentation of molasses and Starch? **2014,2021**
7. Give two methods of preparation of Phenol. **2015, 2018**
8. Convert phenol into: **2015**
  - a. Picric acid
  - b. Cyclohexanol
  - c. Bakelite
9. Write the chemical reaction of phenol with following: **2016**
  - i. NaOH
  - ii. Zn
  - iii. CH<sub>3</sub>-COCl
  - iv. H<sub>2</sub>
10. Give the reactions of Phenol with: **2016**

- a.  $\text{HNO}_3$     b.  $\text{CH}_3\text{-CO-CH}_3$     c.  $\text{CH}_3\text{-COCl}$
11. Write down Dow's method for the preparation of Phenol. What is the action of following on phenol? **2018**
- a. Bromine water    b. Nitric acid at different temperatures

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## CHEMISTRY (XII) CHAPTER 12 (Aldehydes and Ketones)

### Short Questions (2010-2022 Lahore Board):

1. How will you distinguish between ethanal and benzaldehyde? **2019**
  2. What are aldehydes and ketones? Give examples. **2018**
  3. How formalin (formaldehyde) is prepared on commercial (large) scale? **2013, 2016, 2018**
  4. How Iodoform is prepared from? **a. Ethanol b. Acetaldehyde 2010**
  5. Compare oxidation of Ethanal and Butanal by oxidizing agent  $K_2Cr_2O_7$ . **2010**
  6. How acetone would be changed to propane and tertiary butyl alcohol? **2010**
  7. Give reaction for the formation of acetal. **2011**
  8. Give reaction for the formation of formaldehyde from methyl alcohol. **2011**
  9. Give reactions to produce  $\alpha$ -Hydroxy acid (Lactic acid) from aldehyde. **2012, 2015**
- OR** How will you convert acetaldehyde (Ethanal) to Lactic acid. **2015, 2019**
10. Fehling's solution reacts with aldehydes to produce red ppt. justify it. **2012**
- OR** What is Fehling's solution test to identify the aldehyde? **2016**
11. Give two tests for distinguishing between aldehyde and ketone. **2012**
  12. Write equations for the reactions of acetaldehyde with: **i.  $NaHSO_3$  ii. HCN 2012, 2021**
  13. How aldehyde reacts with phenyl hydrazine. Give its mechanism? **2013**
  14. How the reduction process of aldehydes and ketones gives alcohols? **2013**
  15. Justify that Cannizzaro's reaction is self oxidation-reduction reaction. **2013**
  16. Addition of HCN on aldehydes and ketones is a base catalyzed reaction. Explain. **2013**
  17. Explain oxidation of aldehyde. **2013**
  18. How acetaldehyde is distinguished from Formaldehyde? **2013, 2021**
  19. Write down four uses of formaldehyde. **2014, 2017**
  20. Write down four uses of Acetaldehyde. **2018**
  21. Write the names of weak oxidizing agents which can oxidize aldehydes but not ketones. **2014**
  22. What is Iodoform test? **2022**
  23. How Iodoform is obtained from: **2014**  
**i. Acetaldehyde ii. Ethyl alcohol**
  24. What is silver mirror's test? What is its importance? **2014, 2021** **OR** Tollen's test is also called silver mirror test. Justify it. **2016**
- OR** What is Tollen's test? Illustrate your answer with chemical equation. **2013**
25. How formaldehyde and acetaldehyde undergo polymerization. **2014**
  26. Give formulae of formaldehyde and acetaldehyde. **2015**
  27. Prepare acetone from calcium acetate? **2015**
  28. What is difference between aldehyde and ketone? **2015**
  29. Give industrial preparation of formaldehyde. **2015**
  30. Write the reaction of phenyl hydrazine with acetaldehyde and acetone. **2016**
  31. Convert acetone into 2-Propanol. **2017**
  32. How Iodoform test can be used to distinguish between methyl ketones and other ketone? **2018, 2021**
  33. How does acetaldehyde react with: **2022**  
**i)  $C_2H_5MgI$  b)  $K_2Cr_2O_7/H_2SO_4$**

### LONG QUESTIONS:

1. Write a note on oxidation of aldehydes and ketones? **2019**
2. What types of aldehydes give Cannizzaro's reaction? Give its mechanism. **2010, 2018, 2018**  
**a. Discuss the reaction of Ethanal and Propanone with: a. Hydroxyl amine b. Phenyl hydrazine 2011**
3. Distinguish: **2012**  
**a. Acetaldehyde and propanone b. Formaldehyde and acetaldehyde**
4. Discuss Haloform reaction with one example. **2012**
5. Describe the mechanism of reaction of sodium bisulphite with acetone. **2013, 2021**
6. Prepare following compounds from carbonyl compounds: **2013**  
**a. Lactic acid b. Paraldehyde c. Ethanal Oxime d. Croton aldehyde**

- i. Discuss oxidation of aldehydes with: **2015**      i.  $K_2Cr_2O_7/H_2SO_4$     ii. Tollen's reagent
7. How does acetaldehyde react with following reagents: **2015**  
a.  $C_2H_5MgI$     b.  $HCN$       c.  $NaHSO_3$       d.  $I_2/NaOH$
8. What are Aldols? Explain Aldol condensation reaction mechanism for condensation of Ethanal. **2016,**
9. Describe with mechanism aldol condensation. **2019,2021**
10. Write any four uses of acetaldehyde. **2016**
11. Describe these tests: Fehling Solution Test , Benedict's Test **2022**
12. Describe any four tests for the identification of carbonyl compounds. **2022**

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## CHEMISTRY (XII) CHAPTER 13 (Carboxylic acids)

### Short Questions (2010-2022 Lahore Board):

1. Why first four members of aliphatic carboxylic acids are soluble into water? **2021**
2. What are fatty acids? How acid chlorides are made by them? **2010**
3. How carboxylic acid can be obtained from alkene? **2018**
4. Why do mostly carboxylic acids exist as dimers? **2018**
5. Differentiate between acidic and basic amino acids. **2011**
6. Write structural formulae of Phthalic acid and Malonic acid. **2012,2013**
7. Convert acetylene into acetic acid. **2022**
8. Prepare ethane from acetic acid by reduction. **2012**
9. Write reactions of acetic acid with: **2012**
  - i. HI/Red Phosphorus
  - ii.  $\text{NH}_3$ , Heat
10. How carboxylic acids are prepared by the oxidative cleavage of alkenes? **2013, 2021**
11. Write two reactions of carboxylic acids in which hydrogen atom of carboxyl group is involved. **2021**
12. How will you convert acetic acid into methane and acetic anhydride? **2013, 2021**
13. How acetic acid is converted into methane? **2019**
14. How will you convert acetic acid into acetamide? **2015**
15. What happens when following compounds are heated: **2013**
  - i. Sodium formate and Soda lime
  - ii. Ammonium acetate
16. What happens when following compounds are heated: **2015**
  - i. Calcium acetate
  - ii. Ammonium acetate **2017**
17. What is peptide bond? Write formula of a dipeptide. **2015**
18. Define neutral amino acids with example. **2015,2016**
19. Define amino acid. Give two examples. **2019**
20. Write formulae of Glycine and Alanine. **2016,2017,2022**
21. How amino acid is prepared by Strecker's synthesis? **2016,2022**
22. How carboxylic acids are converted into  $\alpha$ -amino acids? **2016**
23. How acetic acid is prepared from methyl nitrile? **2022**
24. What is difference between essential and non-essential amino acids? **2018**
25. How acetic acid reacts with? **2018**
  - a.  $\text{PCl}_3$
  - b.  $\text{SOCl}_2$
26. Define Zwitter ion or internal salt? **Additional**
27. What is meant by Glacial acetic acid? **Additional**

### Long Questions:

1. Complete the following reactions of acetic acid with: **2010**
  - a.  $\text{SOCl}_2$
  - b. HI/P
  - c.  $\text{Na}_2\text{CO}_3$
2. Define Zwitter ion. Discuss effect of acidic and basic medium on the dipolar ionic structure of amino acid. **2011**
3. Convert acetic acid into **i. Methane ii. Acetyl chloride** **2014**
4. Write a short note on acidic and basic character of amino acids. **2014**

## CHAPTER 14 (Macromolecules)

### Short Questions (2010-2022 Lahore Board):

1. How is Polyvinyl chloride (PVC) prepared and give its uses? **2019**
2. What is function of DNA and RNA? **2019**
3. How is Nylon-6,6 prepared? **2019**
4. Justify by writing the structural formulas that amylose is condensation polymer of  $\alpha$ -D-Glucose but cellulose is polymer of  $\beta$ -D glucose. **2010**
5. Define enzymes. Write their two properties. **2011**
6. Discuss Saponification number. **2012,2012,2016**
7. Discuss Saponification number and give example. **2016**
8. Define Saponification and Iodine number. **2014**
9. Define Iodine number. **2011,2016**
10. What are differences between DNA and RNA? **2012,2014,2016,2022,2022**
11. What is difference between fat and oil? **2012, 2018**

- 12.**In what way fats and oils are different? **2011,2015,2017**
- 13.**What are lipids? Give two physical properties. **2014**
- 14.**Define polymerization. Explain the term degree of polymerization. **2013**
- 15.**Define acid number. What is rancidity? **2013**
- 16.**What is acid number? **2018**
- 17.**Write the structure of starch. **2013**
- 18.**Give classification of macromolecules. **2013**
- 19.**Define polysaccharides. Give examples. **2022**
- 20.**What are carbohydrates? Why are they called so? **2014**
- 21.**What are thermoplastic and thermosetting polymers? **2014**
- 22.**What are thermosetting polymers? **2018**
- 23.**What is difference between glucose and fructose? **2014**
- 24.**What is rancidity of fats and oils?**2015,2016**
- 25.**Write structure of cholesterol.**2015, 2017**
- 26.**What are polymers? Give two examples.**2015**
- 27.**Define with example condensation polymerization.**2016**
- 28.**Give four properties of enzymes. **2017**
- 29.**Write a note on condensation polymer. **2018**
- 30.**Define iodine number and acid number. **2018,2022**
- 31.**What is denaturation of proteins? **2018**
- 32.**Define copolymer. Give four examples. **2022**
- 33.**What is meant by hardening of oil? **2022**
- 34.**Briefly describe the two factors which affect activity of enzymes. **Additional**

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## CHEMISTRY (XII)      CHAPTER 16 (Environmental Chemistry)

### Short Questions (2010-2022 Lahore Board):

1. How acid rains and temporary acid rains are produced? How they pollute water bodies? **2010**
2. What is smog? **2010**
3. What is acid rain? Give one of its harm to buildings. **2011**
4. Write four harmful effects of acid rain. **2022**
5. What are leachates and what they contain? **2012**
6. What are leachates? **2012,2015**
7. Explain the term BOD OR what is B.O.D? **2013, 2018**
8. What is meant by dissolved oxygen or D.O to check the quality of water? **2018**
9. What are the secondary pollutants? **2014**
10. How the gases in the atmosphere absorb? **2014**
11. What are ecosphere and hydrosphere? **2014**
12. What is biosphere? **2014**
13. What is effect of aeration on quality of raw water? **2014**
14. Define Environmental chemistry. Name components of environment. **2019**
15. Name the components of environment. **2015,2015,2018**
16. What do you know about chemical oxygen demand (C.O.D)? **2015,2016,2017**
17. What is the role of chlorofluorocarbons in destroying ozone? **2016, 2017, 2018**
18. What is depolymerization of plastic? Where it is used? **2016**
19. Write a note on hydrosphere. **2017**
20. How is oil spillage affecting the marine life? **2022**
21. How detergents are threat to aquatic life? **2022**
22. How is water purified by aeration? **2022**
23. What are the side effects of incineration? **Additional**
24. CO is primary air pollutant. Write its poisoning effect on humans. **Additional**
25. What are Landfills? **Additional**

### LONG QUESTIONS:

1. How water is disinfected by Chlorine? Write down harmful effects of chlorination of water. **2019**
2. What will happen when the concentration of ozone will decrease? **2010**
3. Explain the process of incineration of industrial wastes. **2011, 2018**
4. What is acid rain? How does it affect our environment? **2012,2013**
5. Write methods for the purification of water. Explain the process of disinfection of water by chlorine. **2012**
6. Discuss the term acid rain along with its effect on environment. **2013**
7. What is Acid Rain, how does it affect our environment? **2019**
8. Write a note on smog? **2014**
9. Name the components of the environment. Give approximate composition of atmosphere and lithosphere. **2014**
10. Describe the natural and human sources of Nitrogen oxides and sulphur oxides. **2018**