

Anekant Education Society's  
Tuljaram Chaturchand College of Arts, Science and Commerce, Baramati  
(Autonomous)  
**Question Bank**

**CHEM1102: Organic and Inorganic Chemistry**

**Section I: Organic Chemistry**

**Q.1 Choose the correct answer.**

- 1) When 1-Propene adds to HCl the product is –  
a) 1-chloro propane    b) 2-chloropropane    c) Isopropane    d) propionic acid
- 2) An alkyl halide is converted into an alcohol by-  
a) Addition    b) Substitution    c) Elimination    d) Dehydration
- 3) Primary alcohol are obtained by reduction of-  
a) Ketones    b) Acids    c) Aldehydes    d) Esters
- 4) The number of isomeric alcohols possible with the formula at  $C_4H_{10}O$  are-  
a) 3    b) 4    c) 5    d) 6
- 5) A mixed and aromatic ether is-  
a) Methoxy butane    b) Anisole    c) P-Bromo phenol    d) Ethoxy phenol
- 6) The Hell-Volhard-Zelinsky reaction is used to synthesis-  
a) Aldehyde    b) Alpha-halo acids    c) ketones    d) Acide halides
- 7)  $LiAlH_4$  Converts acetic acid into-  
a) acetaldehyde    b) Ethyl alcohol    c) Methane    d) Methyl alcohol
- 8) A reaction of acetamide with  $Br_2$  and KOH gives-  
a) Ethane    b) Ethyl amine    c) methyl amine    d) Ethyl alcohol
- 9) Phenol can be prepared by-  
a) Claisen reaction    b) Dow process    c) Reimer-Tiemann reaction  
d) Cannizaros reaction
- 10) Hybridisation involves.....  
1. Excitation of electrons    2. Separation of atomic orbitals  
3. Mixing of atomic orbitals    4. Mixing of electron pairs
- 11) The Hybridisation of C atoms in C-C involves.....  
1.  $SP^3-SP^3$     2.  $SP^2-SP^2$     3.  $SP-SP^2$     4.  $SP^3-SP$
- 12) Heating a mixture of sodium acetate and sodalime gives—  
1. Calcium acetate    2. Methane    3. Sodium acetate    4. Benzene
- 13) Dehydrohalogenation of alkyl halide is an---  
1. Addition reaction    2. Substitution reaction    3. Elimination reaction  
4. oxidation reaction
- 14) 2- butyne on reaction with Lindlar catalyst gives—  
1. cis 2-butene    2. Trans 2-butene    3. Butadiene    4. n-butane
- 15) Houckel rule is related to---  
1. Acidity    2. Basicity    3. Aromaticity    4. Unsaturation
- 16) Chemically similar compounds differing by  $-CH_2-$  group are called---  
1. Isomers    2. Paraffins    3. Alkanes    4. Homologues

**Q.2. Answer the following questions**

- 1) Why do phenols dissolve in water?
- 2) How will you prepare aniline from Chlorobenzene ?
- 3) Tri ethyl amine does not react with nitrous acid. Explain?
- 4) What is the action of thionyl chloride on benzoic acid?
- 5) Explain n-butyl alcohol boils at  $118^{\circ}\text{C}$ , while propionic acid boils at  $141^{\circ}\text{C}$ .
- 6) How will you prepare diethyl ether by Williamson's synthesis?
- 7) Hexane is soluble in benzene while ethyl alcohol is soluble in water.Explain.
- 8) Tertiary alcohol do not give positive iodoform test.
- 9) How will you prepare Grignards reagent from ethyl bromide?
- 10) Hexane is soluble in water while ethyl alcohol is soluble in water, explain.
- 11) What is Lindlar catalyst?
- 12) Explain intramolecular forces with suitable example.
- 13)  $\pi$ -bond is weaker than  $\delta$ - bond, explain.
- 14) Draw the Zig-Zag structure of -2-pentene
- 15) Why Cis isomer is less stable than Trans isomer?
- 16) Why benzene shows aromaticity?

**Q.3. Write a notes on :**

- 1) Markovnikoffs rule
- 2) Saytzeffs rule
- 3) Williamsons synthesis
- 4) Friedel Craft reaction.
- 5) Oxidation of alcohol
- 6) Hydroboration Oxidation
- 7) Lucas test
- 8) continuous etherification process
- 9) Diazomethane method
- 10) Hell-volhard Zelinsky reaction
- 11) Kolbe Synthesis
- 12) Claisen ester condensation
- 13) Transesterification
- 14) Hoffmann Elimination reaction
- 15) Sandmeyers reaction
- 16) Hofmann degradation
- 17) Reimmer-Tiemann reaction
- 18) Dows process
- 19) Sulphonation of phenol
- 20) Wurtz reaction
- 21) Dipole moment
- 22) Bond length and bond angle

**Q.4. Answer the following question:**

- 1) What are phenol? Why phenols are acidic in nature?
- 2) How will you distinguish between phenol and alcohol?
- 3) What are amines? How are they classified?
- 4) What are carboxylic acids? What is the action of thionyl chloride on benzoic acid?
- 5) Ethers have low boiling point than alcohols of comparable molecular weight. Explain?
- 6) What is alcohol? How are they classified?
- 8) What is iodoform test? Which of the following compound will give positive iodoform test?  
a) Ethanol b) Methanol c) 2-Pentanol d) Acetaldehyde.
- 9) n-butane has higher B.P. than isobutane, explain.
- 10) How acetylene is obtained from calcium carbide and Methane
- 11) Conjugated dienes are more stable than isolated diene, explain.
- 12) Discuss the formation of acetylene molecule with help of hybridisation.

**Q.5. Answer the following question :**

- 1) What are alkyl halides? How are they classified? What is the action of alcoholic KOH on 2-bromobutane?
- 2) What is a Lucas reagent? How will you distinguish n-butyl alcohol, iso-butyl alcohol and tertiary butyl alcohol by this reagent ?
- 3) Give classification of carboxylic acid? Explain 2, 2-dimethyl propanoic acid does not undergo halogenation reactions with Chlorine or Bromine.
- 4) Describe the nitrous acid reaction with primary, secondary and tertiary Amines.
- 5) Give three different methods for preparation of phenol.
- 6) What is the action of following reagents on phenol?  
a)  $\text{Br}_2$  in water b) dil.  $\text{HNO}_3$  c) Conc  $\text{H}_2\text{SO}_4$  d)  $\text{Br}_2$  in  $\text{CCl}_4$ .
- 8) What are Symmetrical and unsymmetrical ether? How will you prepare Diethyl ether from ethyl chloride?
- 9) Define hybridisation. Explain formation Methane molecule with the help of hybridisation.
- 10) What is alkyne? How will you prepare propyne from- 1) 1,2-dibromopropane 2) acetylene
- 11) What are alkene? Addition of HCl on propene gives 2-chloro propane as Major product, explain.
- 12) What are diene? What is the action of following on 1, 3 butadiene-  
a)  $\text{H}_2/\text{Ni}$  b)  $\text{Br}_2$
- 13) Discuss the formation of ethene molecule with the help of hybridization.
- 14) Discuss the Nitration and sulphonation reactions of benzene.
- 15) Discuss the Hydroboration –oxidation and Ozonolysis reaction of alkene.

**Section II: Inorganic Chemistry**

**Q.1 Choose the correct answer.**

- 1) Using 18 crown 6 alkali metals ion separate -----  
a) Lithium b) Sodium c) Potassium d) Rubidium
- 2) Lithium is diagonally represent with -----  
a) Sodium b) Magnesium c) Calcium d) Aluminium
- 3) Using 15 crown 5 alkali metals ion separate -----  
a) Lithium b) Sodium c) Potassium d) Rubidium
- 4) Oxidation state of IA group element is -----  
a) +2 b) +3 c) +1 d) -1
- 5) Atomic size of IIA group from top to bottom is -----  
a) Increases b) Decreases c) Constant d) No change
- 6) Metallic character of IA group from top to bottom is -----  
a) Increases b) Decreases c) Constant d) No change
- 7) Formula of plaster of Paris is.....  
a)  $\text{CaSO}_4$  b)  $\text{CaSO}_4 \cdot \text{H}_2\text{O}$  c)  $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$  d)  $\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$
- 8) Formula of baking soda is.....

- a) KOH   b) CH<sub>3</sub>COOH   c) Na<sub>2</sub>CO<sub>3</sub>   d) H<sub>2</sub>SO<sub>4</sub>  
9) Formula of Caustic soda is.....  
a) NaHCO<sub>3</sub>   b) Na<sub>2</sub>CO<sub>3</sub>   c) HCl   d) KOH

**Q.2 Answer the following questions**

1. Draw the structure for 18 Crown 6 ether
2. Give the two applications of Alkali metals
3. Draw the structure for 15 Crown 5 ether
4. Alkali Metals show only +1 oxidation .Why?
5. Alkaline earth metals to show +2 oxidation state. Why?
6. Give the Name and Electron configuration for IA group element
7. Give the Name and Electron configuration for IIA group element
8. What are alkali metals? Why are they so called?
9. What are alkaline earth metals? Why are they so called?

**Q.3. Write a notes on :**

- 1) Ionization potential energy
- 2) Electronegativity
- 3) Crown ethers
- 4) Oxides and peroxides of IA and II A groups metals
- 5) Biological applications of IA and IIA group metals
- 6) Anomalous behavior of Beryllium
- 7) Industrial applications of IIA group elements.

**Q.4. Answer the following question:**

1. Explain the diagonal relationship between Lithium and Magnesium
2. Explain the diagonal relationship between Beryllium and Aluminium
3. Lithium shows anomalous behaviour in the family of alkali metals. Explain.
4. Beryllium shows anomalous behaviour in the family of alkaline earth metals. Explain
5. Mention oxides, hydroxides formed by S-block elements
6. Discuss the position of Hydrogen in the periodic Table
7. Describe the Separation of alkali metals using Crown ethers
8. What are the applications of alkali metals and their compounds?

**Q. 5. Answer the following question:**

1. Give outermost electronic configuration of alkali metals. Explain the following properties of alkali metals a) Ionization Potential b) Oxidation state
2. Give outermost electronic configuration of alkaline earth metals. Explain the following properties of alkaline earth metals a) Atomic and ionic radius b) Oxidation states
3. Draw a modern periodic table. Show the positions of s, p, d and f block elements. Write the electronic configuration of IA group elements
4. Draw a modern periodic table .Show the positions of s, p, d and f block elements. Write the electronic configuration of IIA group elements
5. Explain any two applications of alkaline earth metals in biology, industry and agriculture.
6. Explain any two applications Alkali metals in biology, industry and agriculture.
7. How are crown ether useful in separating alkali metals