Dharkeynley Primary & Secondary School

# Chemistry 12

## *Questions and answers*

## *Chapter one:*

## Introduction to Organic Chemistry

1. QU: What is organic chemistry?
   **ANS:** = Organic chemistry is defined as the study of hydro carbons and their derivates.
2. QU: Why carbon is unique element?
   **ANS:** = Because of its unique electron dot configuration.
3. QU: What is hybridization?
   **ANS**: =Hybridization is the process of combining orbitals to create new orbitals.
4. QU: Mention the three forms of carbon?
   A**NS:** =They are: Diamond, Graphite, and Bucky ball.
5. QU: What property of carbon atom makes it unique?
   **ANS**: = First: carbon has four bonding electrons that are capable of being localized or delocalized.
   Second: carbon can form strong single, double and triple bonds with other carbon atoms in the chain.
6. QU: What are localized electrons?
   **ANS**: = electrons that are stationary between the bonds called Sigma bond
7. QU: What is the highest melting point of tipping of diamond?
   **ANS**: = Diamond has the highest melting point of tipping or measuring scale of 3,830 Kelvin or 3,547$c^0$.
8. QU: What is delocalized electron?
   **ANS**: = electrons that are free to move between the bonds is called Pi bonds
9. QU: What are allotropes?

**ANS**: = Allotropes are different forms of the same element based on their bonding respectively.

10. QU: Mention the synonyms of alkane, alkenes and alkynes?

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**ANS**: = The synonyms are: paraffin, olefin and acetylene.

11. QU: What are hydrocarbons?

**ANS:** = Hydrocarbons are compounds that made up of carbon and hydrogen only.

12. QU: What are the classifications of hydrocarbons?

**ANS:** =The classifications of hydrocarbons are: Aromatic hydrocarbons and aliphatic hydrocarbons.

13. QU: Explain the different between alkane, alkene and alkyne.

**ANS:**

- Alkanes are saturated compounds and have a single bond.
- Alkenes are unsaturated compounds and have briefly double bonds.
- Alkynes have triple bonds and are unsaturated compounds.

14. QU: Mention all the general formula of alkane, alkene and alkyne?

**ANS:** the general formula of alkane is: $C_nH_2n+2$

the general formula of alkene is: $C_nH_2n$

the general formula of alkyne is: $C_nH_2n-2$

15. QU: What are alkanes?

**ANS:** = alkanes are saturated compounds containing carbon and hydrogen and all are involved in single bonding.

16. QU: What are alkenes?

**ANS:** =Alkenes are unsaturated compounds containing hydrogen and carbon but contain at least double bonds.

17. QU:17 What are alkynes?

**ANS:** = Alkynes are organic compounds containing carbon and hydrogen and least triple bonds.

18. QU: What is the structural formula?

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**ANS:** =Structural formula is the formula showing how the bonded atoms are A arranged in the molecule.

19. QU: What are structural isomers?

**ANS:** =Structural isomers are molecule s that have the same formula but D\S

20. QU: What are saturated compound?

**ANS:** =Saturated compounds are organic compounds containing all single bonds.

21. QU: Explain unsaturated compounds?

**ANS:** =Unsaturated compound are compound containing carbon and hydrogen, at least triple bonds.

22. QU: What does mean Aromatic?

**ANS:** = Aromatic means compounds containing one or more benzene rings.

23. QU: What is benzene ring?

**ANS:** =Benzene is an organic structure that containing six carbon ring with alternating double bonds.

24. QU: What is aromaticity?

**ANS:** = Aromaticity is defined as unsaturated compound containing at least one benzene ring.

25. QU: When is the benzene ring referred to as phenyl group?

**ANS**: =When there are more than two carbon atoms in alkyl branch attached to benzene ring.

26. QU: What is functional group?

**ANS:** =Functional group is group of atoms which determines the characteristics of the compound.

27. QU: What are the six parts of functional groups?

**ANS**: = They are: alcohols aldehydes, ketones, ethers, esters and organic acid.

28. QU: What is general formula alcohol?

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**ANS:** =Alcohols have general formula of OH called hydroxyl group.

29. QU: What are the three parts of alcohols?

**ANS:** = They are: primary alcohols, secondary alcohol and tertiary alcohol.

30. QU: What is carbonyl group?

**ANS:** = A carbonyl group is carbon atom double bonded to oxygen atoms and the carbon is also bonded to two other atoms or groups.

31. QU: What is the different between aldehydes and ketones?

**ANS:** = In aldehydes, the carbonyl group is always on the end carbon while ketones the carbonyl group is never on the end.

32. QU: What is the different between carbonyl and hydroxyl groups?

**ANS:** A carbonyl group is carbon atoms double bonded to oxygen atom while hydroxyl group is single bonded hydrogen atom or alkyl group.

33. QU: What is the primary alcohol ($1^0$)?

**ANS:** = Primary alcohols are ones where the carbon atom is attached to the hydroxyl group and one alkyl group.

34. QU: What is the secondary alcohol ($2^0$)?

**ANS:** = Secondary alcohols are ones where the carbon atom is attached to the hydroxyl group and the two alkyl group.

35. QU: What is the general formula of aldehydes?

**ANS:** =The general formula of aldehydes is $R\text{-}C^{=}{}_{\text{-}H}{}^{0}$

36. QU: In aldehydes, what does R capital stands for?

**ANS:** = R stands for Hydrogen or any alkyl group.

37. QU: What is the general formula of ketones?

**ANS**: =The general formula of ketones is $R - C^{=O} – R$.

38. QU: Explain the name pent anal?

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**ANS:** =Pentanal has the prefix penta –meaning it has five carbon atoms.

39. QU: In ketones, what does Rand R stands for?

**ANS:** =Rand R stands for both alkyl group and can be the same side or different sides.

40. QU: Where ketones are present in?

**ANS:** = Ketones are present in the body when fat is broken down for energy.

41. QU: Explain how do know these; Alcohol, aldehydes and ketones respectively?

**ANS:** = Alcohol: in alkenes the last(E) is omitted in to (ol) methanol

aldehydes: in alkenes' the last(e) is omitted in to (al) methanol
Ketones: in alkenes' the last(e) is omitted in to (one ) methanone

42. QU: What are the two phases of alcohol?

**ANS**: = Primary alcohol monohydric alcohol
secondary alcohol OR Di hydria alcohol
Tertiary alcohol: trihydric alcohol

# *Chapter two:*

## FUNCTIONAL GROUPS

1. QU: State the functional group of alcohol?

- **ANS:** = Functional group of alcohol is the hydroxyl group.

2) QU: What is the general formula of saturated monohydric alcohol?

- **ANS:** = The general formula of saturated monohydric alcohol is $c_nH_2n+1$ OH.

3) QU: What are the alcohols?

- **ANS:** = Alcohols are hydroxyl derivatives of hydro carbons that can be obtained by replacing one or more hydrogen atoms of the saturated hydrocarbons with hydroxyl group.

4) QU: Illustrate each part molecular of alcohols?

- **ANS:** = Hydrophobic group (water-heating) and hydrophilic group (water-loving group).

5) QU: What is the functional group?

- **ANS:** = Functional group is the part of molecules or groups, which determines Physical and chemical properties of compound.

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6) QU: List classification alcohols and differentiate?
   - **ANS:** =

   Monohydric alcohol containing one hydroxyl group.
   Di hydric alcohol containing two hydroxyl group
   Polyhydric alcohol containing many hydroxyl group
7) QU: List types of monohydric alcohols?
   - **ANS:** =

   Types of monohydric alcohols are

   primary alcohol,
   secondary alcohol
   Tertiary alcohol.
8) QU: Suggest two methods, which we can prepare alcohol?
   **ANS:**
   By hydration of alkenes by reduction of aldehydes and ketons.
9) QU: What are physical properties of alcohol?
   - **ANS:** = The lower members are liquid and the higher members are solids alcohol are colorless natural substance the solubility's of alcothols decrease with increase carbon number.
10) QU: What other name of methanol and ethanol and suggest one method that can be prepared for each?
   - **ANS**: = The other name of methanol is wood alcohol, and the other name of ethanol grain alcohol.

   *Methanol can be prepared by reduction of water gas.*
   *Ethanol can be prepared by hydration of ethane.*
*11) QU: What is fermentation?*
   - **ANS***: =Fermentation is the slow decomposition of complex organic compounds into simple one through agency of enzymes.*
*12) QU: What is phenol?*
   - **ANS***: =I the compound containing hydroxyl group attached directly to benzene ring.*
*13) QU: What are the physical properties and uses phenol?*
   - **ANS***:=physical properties are colorless, crystalline deliquescent solid it is used antiseptic (materials control) the growth of bacteria also manufacture of aspirin, dyes, detergent and plastic*
*14) QU: What is the other name of phenol?*
   - **ANS:** *=The other name of phenol is carbolic acid.*
*15) QU: What is the etherification reaction?*

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- **ANS**: *=The etherification reaction is a reaction between alcohol and organic acid which produce ester and water.*

16) *QU: Define formalin?*

- **ANS:** *=Formalin is aqueous solution of methanol.*

17) *QU: State the general formula of aldehydes and ketones?*

- **ANS:** *=the general formula of aldehydes and ketones are:*

  *R-C-O-H*

  *R-C$^{=O}$-R*

18) *QU: What is the structural difference between aldehydes and ketones?*

- **ANS:** *= In the aldehydes the remaining one valence electron of carbon atoms are shared either by hydrogen or hydrocarbon while ketones the remaining two valences are shared by hydrocarbon.*

19) *QU: What are physical properties and uses of aldehydes and ketones?*

- **ANS**: *=*
  - ✓ *The physical properties and uses of aldehydes and ketones are:*
  - ✓ *The lower aldehydes and ketones are volatile liquids except from aldehydes while higher members are solids.*
  - ✓ *The solubility decrease with increasing carbon number.*
  - ✓ *Aldehydes have unpleasant smell.*

20) *QU: Tell the other name of carboxylic acid?*

- **ANS**: *=The other name of carboxylic acid is fatty or organic acid.*

21) *QU: What is the functional group of organic acid?*

- **ANS:** *=The functional group of organic acid is: -COOH.*

22) *QU: What are the functional group ethers?*

- **ANS** *=The functional group of ethers is R-O-R.*

23) *QU: Ethers are soluble in water while hydrocarbons don't why?*

- **ANS:** *=Because ethers are polar while hydrocarbons are non polar.*

24) *QU: List the properties and uses of the ether?*

- **ANS:** *=Aliphatic ether of higher molecular mass are liquids and aromatic ethers; ethers are used as solvent many organic compounds also used as anesthesia.*

25) *QU: Describe lipids?*

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**ANS:** *=Lipids refer to the certain plants and animal products which are soluble in non polar solvent.*

*26) QU: Differentiate between hard soap and soft soap?*

- **ANS***: =Soaps that are sodium salts are called hard soap while that potassium salts are called soft soap.*

*27) QU: What is the different between soapy and soap less?*

- **ANS:** *= Soap detergents are produced from vegetables oil and other fats*
  *Soap less detergents are produced from by the products of petroleum.*

*They are insoluble i water but soluble in non-polar solvent. the lower member are liquids which higher or solids they used as a solvent for fats, resins, and iodine.*

# Chapter three

## *BIO CHEMISTRY*

1. QU: what bio chemistry?

- **ANS**: = the study of chemical compounds found in living organisms and reaction in which they take part is called biochemistry. OR
- **ANS:** = biochemistry is study chemical process and substances occurring in the living thing.

2. QU: what are the main organic compounds found in living organisms?

- **ANS =** the main organic compounds found in living organisms are: Carbohydrates, lipids mean fats and oil, protein, nucleic acids and vitamins.

3. QU: what is carbohydrate?
**ANS**: = carbohydrates are compounds that contains carbon hydrogen and oxygen
**ANS:** = carbohydrate are nutrients that also supply you with energy.

4. QU: what are lipids?

- **ANS:** =lipids are members of large class of water in soluble organic compounds; fats oils and waxes are lipids

5. QU: = what is protein?

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- **ANS:** = proteins are nutrients that are used to build and repair body parts.
- **ANS:** = a protein is a combination of these polypeptides or long chains of amino acids.

6. QU: what is best known of lipids?

- **ANS:** = the best known of lipid is cholesterol which is used in the body to construct cell membranes.

7.QU: mention the parts of lipids?

- **ANS:** = the mean categories of lipids are:
- 1: fatty acids 2: steroids 3: phospholipids

8.QU: what is fatty acids?

- **ANS:** = fatty acids are molecules with a carboxylic acids group at one end while the remainder of the molecule is hydrocarbon chain having 4to 36 carbon atoms.

9. QU: what are steroids?

**ANS:** = steroids are compounds where four carbon ring are bonded together and with branches and functional groups bonded to ring.

10. QU: what are phospholipids?

ANS: = phospholipids are a combination of fatty acids glycerol and phosphate group joined together.

11. QU: what is the advantage of phospholipids?

- **ANS:** = phospholipids play a major role in cell membrane.

12. QU: how many parts can be classified carbohydrates?

- **ANS:** = carbohydrates can be divided in to three parts namely

Monosaccharide

Disaccharide

Polysaccharide

13. QU: what is monosaccharide?

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- **ANS:** = monosaccharides are poly hydroxyl aldehydes or ketones which can't be hydrolyzed in to simpler sugar
- ANS: = monosaccharide' are carbohydrates consisting of one sugar unit; it's called simple sugar (glucose) "CH2O".

14. QU: what is disaccharide?

- **ANS:** = disaccharides are sweet tasting crystalline water soluble substance. (SUCROSE); C HO

15. QU: what is polysaccharide?

**ANS:** = polysaccharides are polymers of monosaccharide's; and its general formula is "C HO" (STRACH)

16. QU: identify the general formula of monosaccharides of the three sugars?

**ANS:** = 1) The general formula monosaccharide's is C H O

2) The general formula of disaccharide is C H O
3) The general formula of polysaccharide is C H O

17. QU: give examples of monosaccharide's clearly.

- **ANS:** = they are: glucose, fructose means "fruit sugar "and galactose means "milk sugar".

18. QU: give examples of disaccharides clearly.

- **ANS:** = they are: sucrose, lactose and maltose.

19. QU:116 what is the also known as glucose?

- **ANS:** = glucose {C H O} is also known as dextrose "the commercial name "or grape fruit".

20. QU: what are most important of polysaccharides?

- **ANS:** = the most important of polysaccharides are starch and cellulose.

21. QU: what is starch? and state it's sources.

- **ANS:** = starch is a white amorphous substance with no taste or smell. it is found in wheat, corn, rice, nuts and potatoes.

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22. QU: What is cellulose?

- **ANS:** = cellulose is large polymer than starch.

23.QU: where cellulose is found in?

- **ANS**: =cellulose is found in all plants and it is the most abundant of all carbohydrates.

24. QU: what is sucrose?

- **ANS:** = sucrose is disaccharides formed when two monosaccharide's means "glucose and fructose "join.

25. QU: what is advantage of glycogen?

- **ANS:** = glycogen is important as a source of energy storage in both the liver and muscles

26. QU: what glycogen is made up of approximately?

- **ANS**: = glycogen in animal is made up of about 60,000 glucose unit.

27. QU: what is a polymer?

- **ANS:** = polymer is a large organic molecule that contains hundreds or even thousands of atoms.

28. QU: what does contain protein that are essential to our life?

- **ANS:** = proteins that are essential to our life include: keratin, collagen, acting myosin and hemoglobin.

28) QU: what does contain hair and nails?

- **ANS:** = hair and nails contain keratin.

29) QU: what are made from tooth enamel and bones?

- **ANS**: =tooth enamel and bones are made from collagen.

30) QU: what does contain muscle tissues?

- **ANS:** = muscle tissues contain acting myosin.

31) QU: identify the term of hemoglobin?

- **ANS:** = hemoglobin is the most complex of human proteins and is used to form part oxygen in the blood.

32) QU: mention the four different types of proteins form in the body?

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- **ANS:** = the four different types of proteins from in the body are:

✓ Primary structure protein
✓ Secondary structure protein
✓ Tertiary structure protein
✓ Quaternary structure protein

33) QU: what is primary structure?

- **ANS:** = primary structure are linear chains of amino acids together in long chains or sheets

34) QU: what is used enzyme?

- **ANS:** = the enzye is used in digestion to converts starch to sugar in the body.

35) QU: what is the one of the ear list known enzymes?

- **ANS:** =the one of the ear list known enzyme is amylase

36) QU: what are the four nitrogen base of DNA?

- **ANS**: they are: adenine, thymine, guanine and cytosine:

37) QU: what are enzymes?

- **ANS:** enzymes are especial types of protein that speed up chemical reaction and acts as catalysts.

38) QU: what is DNA?

**ANS:** = DNA is genetic information code.

39) QU: what is the function of DNA?

- **ANS:** = it is function is to store and transmit the genetic information materials.

40) QU: what is amino acids?

- **ANS**: =amino acids are molecules that contain amino group and carboxyl group

41) QU: what is the function of the lipids?

- **ANS:** =lipids are used for storage of the energy.

# Chapter Four

## Oxidation-Reduction Reactions (Redox)

1. QU: what is the oxidation?

**ANS:** = oxidation is the loss of elections or gain in oxidation number

2. QU: what is reduction?

**ANS:** =reduction is the gain of elections or a decrease in oxidation number.

3. QU: what is the oxidizing agent.

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**ANS:** = The oxidizing agent is the substance causing oxidation and therefore the oxidizing agent itself is reduced.

4. QU: what is the reducing agent?

**ANS:** = reducing agent is the substance causing reducing and therefore the reducing agent it is oxidized.

5. QU: How oxidation and reducing occur?

- **ANS**: = oxidation and reducing always occur simultaneously.

6. QU: what is the oxidation –reduction or redox reaction?

- **ANS** = a reaction involving the again and loss of elections is called an oxidation – reduction redox react ion.

7. QU: what is the oxidation number of uncombined element?

- **ANS**: = the oxidation number of uncombined element is zero.

8. QU: what is combustion?

- **ANS**: = combustion is a group of chemical reactions in which the reactions are fuel and oxygen gas.

9. QU: what is phlogiston?

- **ANS**: =phlogiston is fire substance from formal theory of combustion.

10. QU: differentiate b\w oxidizing and reducing agents?

- **ANS**: = oxidation agents in substance which accepts electrons while reduction agents is substance which loss of electron.

11. QU: what are used to oxidation number?

- **ANS:** =oxidation number are used for assigning names to compound of element which have more than one oxidation number.

12. QU: define displacement reaction?

- **ANS**: displacement reaction takes place when more reactive element takes the place of another which loss the reactive in compound.

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13. QU: what is the electro motive force?

- **ANS:** = the different b\w the electrode potential of two electrodes is called electro motive force.

14. QU: what are measured electro motive force?

- **ANS**: = Electro motive force is measured volt meter.

14. QU: what are the uses of dry cell?

- **ANS:** dry cell is used in a wide range of electrical appliances such as radio 'watch 'clocks & etc.

15. QU: distinguish b\w secondary and primary cells?

- **ANS**: =secondary cell is a cell that can be recharged and reused while primary cell is a cell which is not recharged.

16. QU: what is the electro planting?

- **ANS:** is the electro planting process of using electricity to coat one metal with another

17. QU: where electricity energy is stored?

- **ANS:** electricity is stored in electro chemical cells like dry cells and accumulators.

18. QU: what is electro chemistry?

- **ANS:1** electro chemistry is the study of chemical properties and election involving ions in solution. OR
- **ANS:2** electro chemistry is the study of relationships b\w the electric energy and chemical reaction.

19. QU:87 what are the two types electro chemical cells?

- **ANS:** = the two types electro chemical cells are: - voltic cell and electrolytic cell.

20. QU: what is electrode?

- **ANS**: =electrode is a conducting element in electric cell.

21. QU: distinguish the terms anode and cathode?

- **ANS:** anode is the positive electrode in electric cell, while cathode?

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22. QU: what is the electrolyte?

- **ANS:** =electrolyte is substance whose solution conducts an electric current.

23. QU: state the faradays first law of electrolysis?

**ANS:** = faradays first law of electrolysis state that the mass of an element liberated during the electrolysis is directly proportional to the quantity of charge that passes.

24. QU: what is electrolysis?

- **ANS:** electrolysis is a process in which electrical energy is used to bring about a chemical change.

25. QU: what is electrolytic cell?

- **ANS:** electrolytic cell is an electro chemical cell used to cause a chemical change through the application of electrical energy.

26. QU: what is the electrical potential?

- **ANS:** = the electrical potential is the ability of a voltic cell to produce an electric current.

27. QU: what is strong electrolyte?

- **ANS:** is strong electrolyte is solution in which a large portion of solute exist as ions

42) QU: what is weak electrolyte?

- **ANS:** = weak electrolyte is a solution in which only fraction of the solute exists as ions.

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The end