Class 10th Science

Chapter - 4

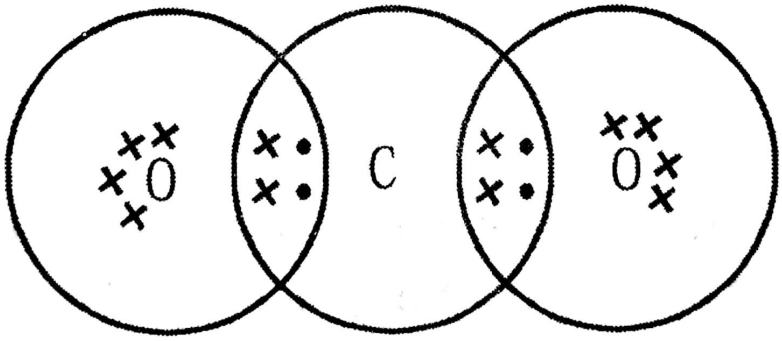
Carbon and its compounds

Textual Questions and Answers :

Page - 61

Q.1. What would be the electron dot structure of carbon dioxide which has the formula CO_2 ?

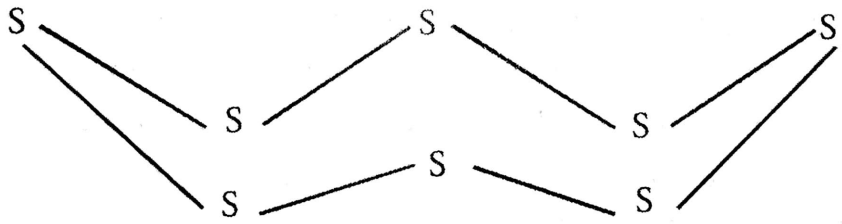
Ans :-



Carbon di-oxide

Q.2. What would be the electron dot structure of a molecule of sulphur which is made up of eight atoms of sulphur? [Hint : the eight atoms of sulphur are joined together in the form of a ring]

Ans :-



Page - 67

Q.1. Calculate the difference in the formulae and molecular masses for

(a) CH_3 OH and C_2H_5OH.

(b) C_2H_5OH and C_3H_7OH and

(c) C_3H_7OH and C_4H_9OH.

Ans :- (a) difference in formula is - CH_2 difference in molecular mass is 14 amu.

(b) difference in formula is - CH_2 difference in molecular mass is 14 amu.

(c) difference in formula is - CH_2 difference in molecular mass is 14 amu.

Q.2. Is there any similarity in these three ?

Ans :- They have similar chemical properties because they have some functional group (alcohol).

Q.3. Arrange these alcohols in the order of increasing carbon atoms to get a family. Can we call this family a homologous series ?

Ans :- CH_3OH, C_2H_5OH, C_3H_7OH, C_4H_9OH. This is a homologous series of alcohols.

Q.4. Generate the homologous series for compounds containing up to four carbons for the other functional groups given in table 4.3.

Ans :- Homologous series of Halides - CH_3Cl, C_2H_5Cl, C_3H_7Cl, C_4H_9Cl

Homologous series of Aldehydes - CH_3CHO, C_2H_5CHO, C_3H_7CHO

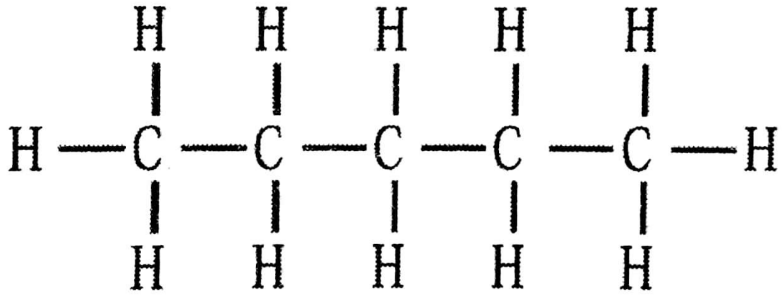
Homologous series of carboxylic acids - CH_3COOH, C_2H_5COOH, C_3H_7COOH

Page 68-69

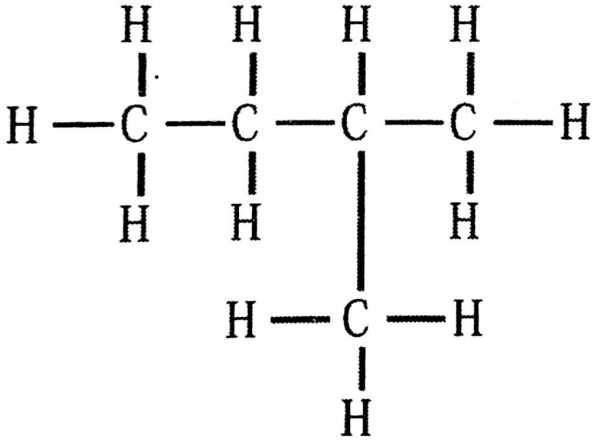
Q.1. How many structural isomers can you draw for pentane ?

Ans :- Three structural isomers of pentane are :-

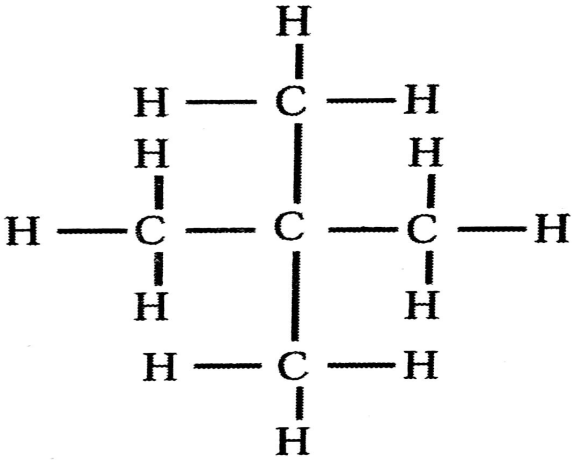
(i) n - pentane :-



(ii) Iso - Pantane :-



(iii) Neopentane :-



Q.2. What are the two properties of carbon which lead to the huge number of carbon compounds we see around us ?

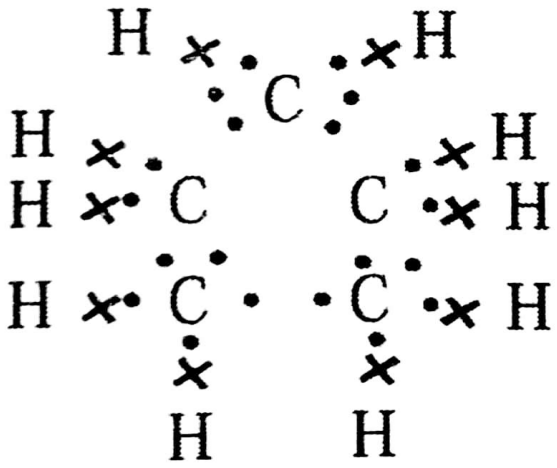
Ans :- (i) Catenation.

(ii) Tetravalency.

Q.3. What will be the formula and electron dot structure of cyclopentane ?

Ans :- The formula of cyclopentane is C_5H_{10}.

Structure : -



Q.4. Draw the structure for the following compounds :

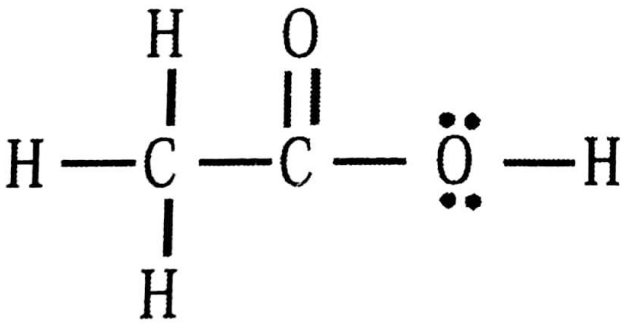
(i) Ethanoic acid.

(ii) Bromopentane.

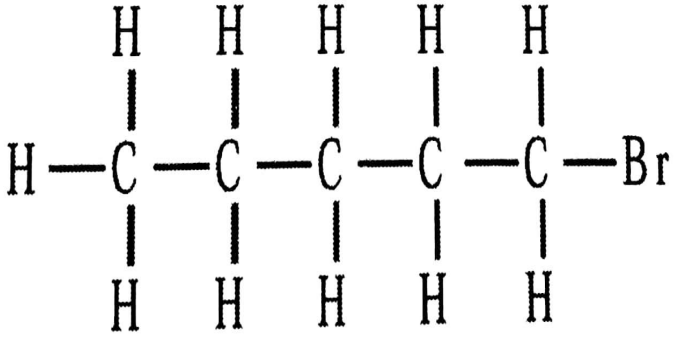
(iii) Butanone.

(iv) hexanol.

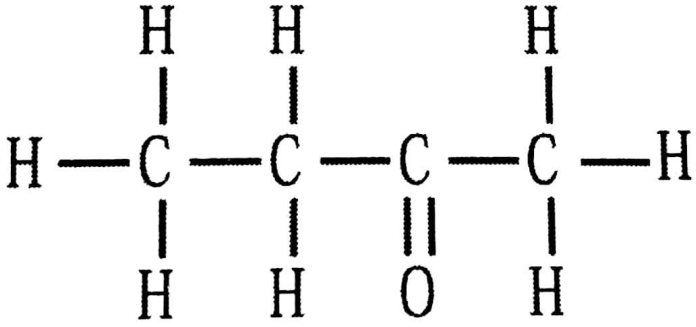
Ans :- (i) Ethanoic acid :-



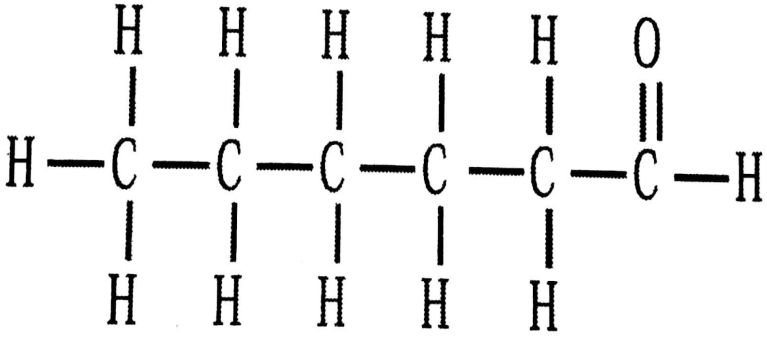
(ii) Bromopentane : -



(iii) Butanone :-

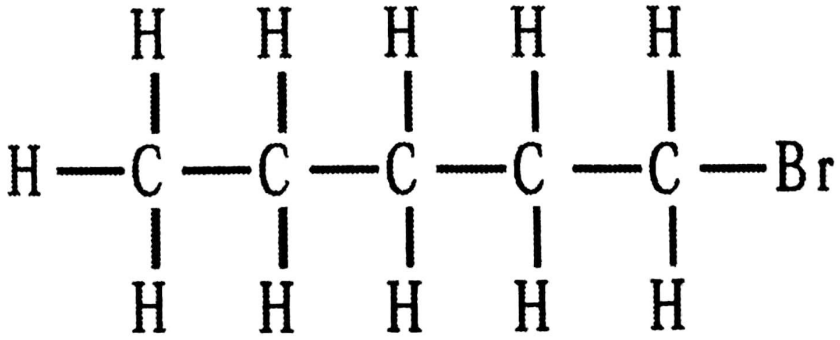


(iv) Hexanal :-

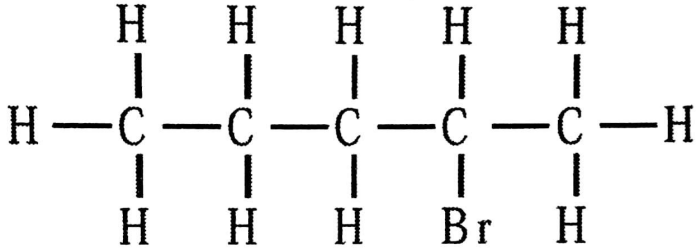


There are three structural isomers for bromopentane depending on the position of Br at carbon 1, 2, 3.

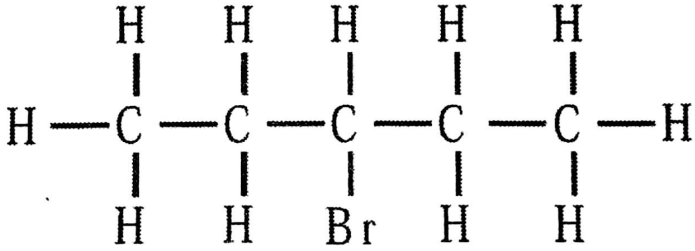
There are :-



II.



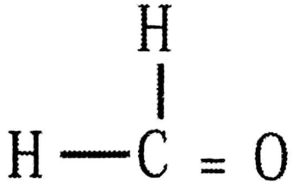
III.



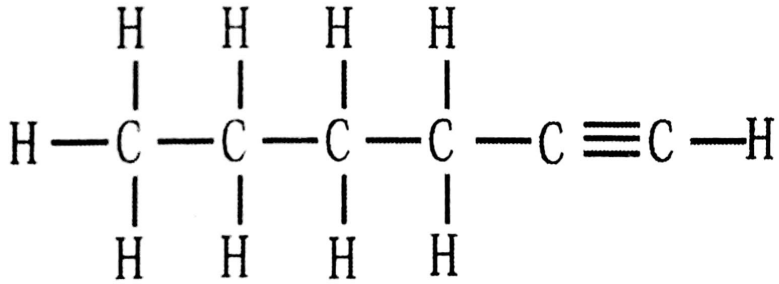
Q.5. How would you name the following compounds ?

(i) CH_3-CH_2-Br

(ii)



(iii)



Ans :- (i) Bromoethane.

(ii) Methanal.

(iii) 1, Hexyne.

Page -71

Q.1. Why is the conversion of ethanol to ethanoic acid an oxidation reaction ?

Ans :- Alkaline potassium permanganate or acidified potassium dichromate are oxidising ethanol to ethanoic acid, that is adding oxygen. So conversion of ethanol to ethanoic acid an oxidation reaction.

Q.2. A mixture of oxygen and ethyne is burnt for welding. Can you tell why a mixture of ethyne and air is not used ?

Ans :- If ethyne is burnt in air which contains nitrogen and other inactive gaseous contents, sufficient oxygen is not available for burning ethyne to give the required heat. But a mixture of ethyne and oxygen gives enough heat that can be used for welding.

Page -74

Q.1. How would you distinguish experimentally between an alcohol and a carboxylic acid ?

Ans :-

Test	Carboxylic acid	Alcohol
1. Sodium metal test	H_2 is produced but no effervescence	H_2 is produced with effer vescence
2. Litmus test	Blue litmus turns red	No change in colour
3. Sodium carbonate	Brisk effervescence is produced.	No action

Q.2. What are oxidising agent ?

Ans :- The substances which give oxygen to another substance is called oxidising agent.

Page -76

Q.1. Would able to check if water is hard by using a no. detergent ?

Ans :- Detergent is equally effective in hard water as well as soft water. So we can not check the hardness of water by using detergent.

Q.2. People use a variety of methods to wash cloths, usually after adding the soap, they 'beat' the cloths on a stone, or beat it with a paddle, scrub with a brush or the mixture is agitated in a washing machine why is agitation necessary to get clean clothes ?

Ans :- It is necessary to agitate to get clean clothes because the soap micelles which entrap oily or greasy particles on the surface of dirty cloth have to be removed from its surface. When the cloth washed in soap solution is agitated or beaten, the micelles containing ony or greasy dirt particles get removed from the surface of dirty cloth and go into water. And the dirty cloth gets cleaned.

EXERCISES

Q.1. Ethane, with the molecular formula C_2H_6 has

(a) covalent bonds.

(b) 7 covalent bonds.

(c) 8 covalent bonds.

(d) 9 covalent bonds.

Ans. (b) 7 covalent bonds.

Q.2. Butane is a four carbon compound with the fundamental group :

(a) carboxylic acid.

(b) aldehyde.

(c) ketone.

(d) alcohol.

Ans :- (c) ketone.

Q.3. While cooking, if the bottom of the vessel is getting blackened on the outside, it means that :

(a) The food is not cooked completely.

(b) The fuel is not burning completely.

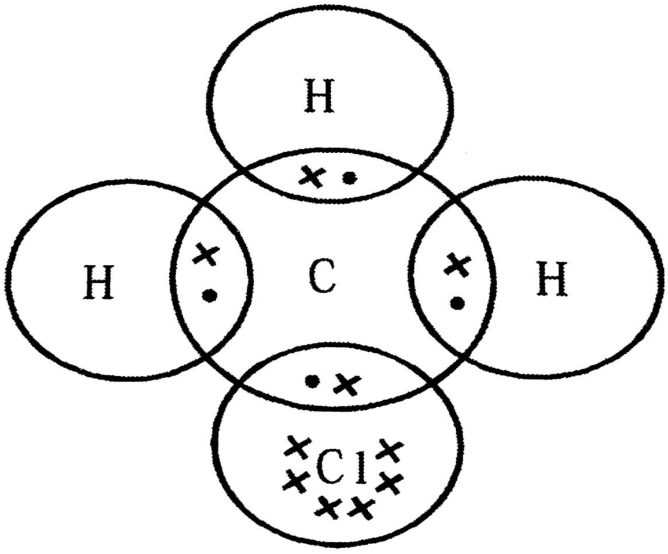
(c) The fuel is wet.

(d) The fuel is burned completely.

Ans :- (b) The fuel is not burning completely.

Q.4. Explain the nature of the covalent bond using the bond formation in CH_3Cl.

Ans :- Covalent bond is formed by sharing of electrons so that the combining atom complete their outermost shell. In CH_3Cl, this happens as follows.



There hydrogen atoms complete their outermost shells by sharing three electrons of carbon atoms. Chlorine completes its outermost shell by sharing its one out of seven electrons with one electron of carbon atom. Thus carbon atom shares in all its four electrons with three of three hydrogen atoms and one of chlorine atoms and completes its outer shell.

Q.5. Draw the electron dot structures for

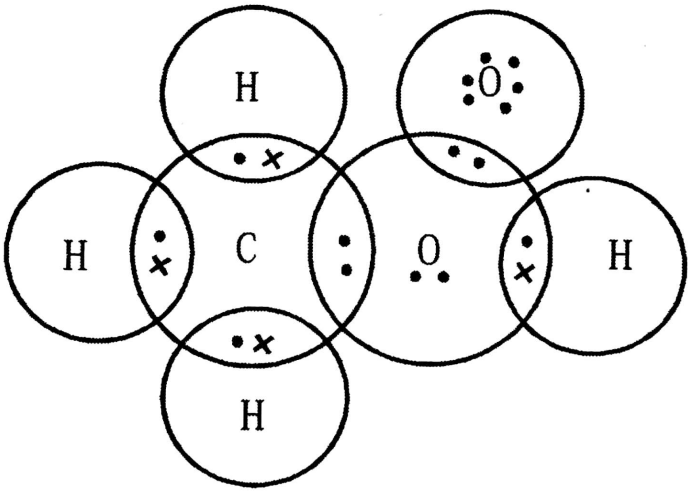
(a) ethanoic acid

(b) H_2S

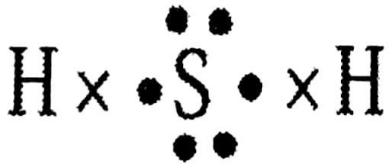
(c) propanone

(d) F_2

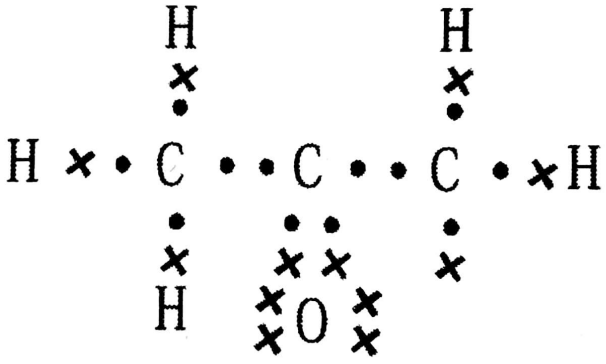
Ans :- (a) Ethanoic acid :-



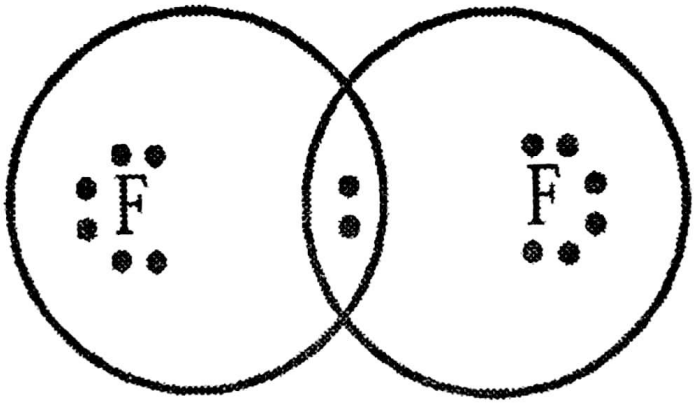
(b) H_2S



(c) Propanone



(d) F_2



Q.6. What is a homologous series ? Explain with an example.

Ans :- A homologous series is a group of organic compounds having similar structures and similar chemical properties in which the successive compounds differ by CH_2 group.

All the alkanes have similar structures with single covalent bonds and show similar chemical properties, so they can be grouped together in the form of a homologous series. The first five members of the homologous series of alkanes are Methane, Ethane, Propane, Butane and Pentane.

Q.7. How can ethanol and ethanoic acid be differentiated on the basics of their physical and chemical properties.

Ans :- (i) Ethanol has a pleasant smell whereas ethanoic acid has the smell of vinegar.

(ii) Ethanol has a burning tase whereas ethanoic acid has a sour taste.

(iii) Ethanol has no action on litmus paper whereas ethanoic acid turns blue litmus paper to red.

(iv) Ethanol has no reaction with sodium hydrogen carbonate but ethanoic acid gives brisk effervescence with sodium hydrogen carbonate.

Q.8. Why does micelle formation take place when soap add to water ? Will a micelle be formed in other solvents such as ethanol also ?

Ans :- Micelle formation takes place when soap is added to water because the hydrocarbon chains of soap molecules are hydrophobic which are insoluble in water, but the ionic ends of soap molecules are hydrophilic and hen soluble in water.

Micelle formation not take place when soap is added to organic solvents like ethanol because the hydrocarbon chains of soap molecules are soluble in organic solvents like ethanol.

Q.9. Why are carbon and its compounds used as fuels for most applications ?

Ans :- Carbon and its compounds used as fuels for most applications because they gives a large amount of heat per unit weight.

Q.10. Explain the formation of scum when hard water is treated with soap.

Ans :- Hard water contains salts of calcium and magnesium. Calcium and magnesium on reaction with soap forms insoluble substance kcalled scun.

Q.11. What change will year observe if you test soap with litmus paper (red or blue) ?

Ans :- Red litmus paper turn blue.

Q.12. What is hydrogenation ? What is its industrial application ?

Ans :- The addition of hydrogen to unsaturated hydrocarbon in the presence of catalyst is called hydrogenation.

Ghee on industrial scale is made by hydrogenation of naturally available vegetable oils.

Q.13. Which of the following hydrocarbons undergo addition reactions : C_2H_6, C_3H_8, C_3H_6, C_2H_2

Ans :- C_3H_6 and C_2H_6

Q.14. Give a test that can be used to differentiate chemically between butter and cooking oil.

Ans :- When a drop of bromine is added to cooking oil, its colour disappears whereas when a drop of bromine is added to butter, it becomes brown.

Q.15. Explain the mechanism of the cleaning action of soap.

Ans :- When soap is dissolved in water, it forms a colloidal suspension in water in which the soap molecules cluster together to form spherical micelles. In a soap micelle, the soap molecules are arranged radially with hydrocarbon ends directed towards the centre and ionic ends directed out wards.

Additional Questions :

Very short Answers type questions :

Q.1. Name the element whose one of the allotropic forms is buck minsterfullerene.

Ans :- Carbon.

Q.2. What are the two properties of carbon which lead to the formation of a large number of carbon compounds ?

Ans :- Catenation and Tetravalency.

Q.3. State whether the following statement is true of false : Diamond and graphite are the covalent compounds of carbon element.

Ans :- False.

Q.4. Name the scientist who disproved the 'vital force theory' for the formation of organic compounds.

Ans :- Friedrich wohler.

5. Name the element whose allotropic form is graphite.

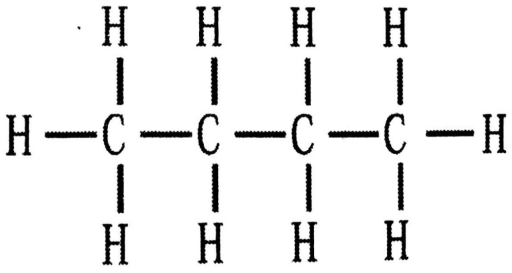
Ans :- Carbon.

Q.6. In addition to some propane and ethane, LPG cylinders contain mainly two isomers of another alkane. Name the two isomers and write their condensed structural formula.

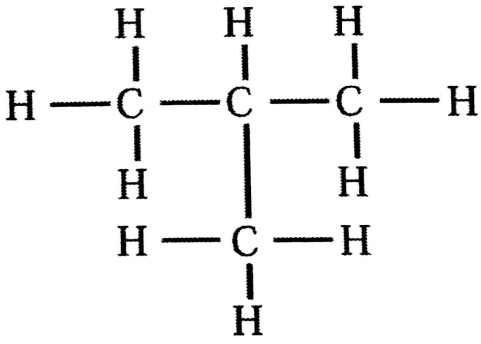
Ans :- n-butane and iso-butane.

Structural formula :-

n-butane :



Iso-butane :



Q.7. Buckminsterfullerene is a spherical molecule in which 60 carbon atoms are arranged in interlocking hexagonal and pentagonal rings of carbon atoms.

(a) How many hexagons of carbon atoms are present in one molecule of buck minsterfullerence ?

(b) How many pentagons of carbon atoms are present in one molecule of buck minsterfullerence ?

Ans :- (a) 20 hexagons.

(b) 12 pentagone.

Q.8. Name the hardest natural substance known.

Ans :- Diamond.

Q.9. Which of the following molecule is called buck minsterfullerene ? C_{90} ,C_{60} , C_{70}, $C_{12}O$

Ans :- C_{60}

Q.10. What is the next higher homologue of methanol ?

Ans :- Ethanol.

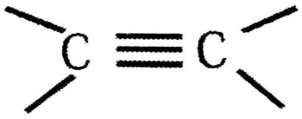
Q.11. Identify the functional group present in the following compound and name it according to IUPAC system : CH_3OH

Ans :- Alcohol group; Methanol.

Q.12. What is the common name of methanol ?

Ans :- Formaldehyde.

Q.13. Write the name of the following functional groups :

(a)  (b) 

Ans :- (a) Alkyne.

(b) Alkene.

Q.14. Which of the following will give brisk efferves cence with sodium hydrogen carbonate and why ? CH_3 COOH, CH_3 CH_2 OH

Ans :- CH_3 COOH. Being acid, it reacts with sodium hydrogen carbonate to produce carbon dioxide gas.

Q.15. Name the functional group present in an organic compound which gives brisk effervescence with $NaHCO_3$

Ans :- Carboxylic acid group (-COOH).

Q.16. Name one chemical compound which can be used to distinguish between ethanol and ethanoic acid.

Ans :- Sodium hydrogen carbonate.

Q.17. Which of the following hydrocarbons will give substitution reactions and why ? CH_4, C_3H_6, C_3H_8, C_5H_{12}, C_6H_{10}

Ans :- CH_4, C_3H_8 and C_5H_{12} All these are saturated hydrocarbons.

Q.18. Name one liquid carbon compound which is being used as an additive in petrol in some countries.

Ans :- Ethanol.

Q.19. What do you call the compounds having the same molecular formula but different structural arrangements of atoms ?

Ans :- Isomers.

Q.20. Give the IUPAC name of the following compound : C_2H_6

Ans :- Ethane.

Short Answer type Questions :

Q.1. What is allotropes ? What are the allotropes of carbon ?

Ans :- the various physical forms in which an element can exist are called allotropes of the elements.

The three allotropes of carbon are :

(i) Diamond.

(ii) Graphite. and

(iii) Buckminsterfullerene.

Q.2. Give two uses of diamond.

Ans :- (i) Diamonds are used in cutting instruments like glass cutters, saw for cutting marble and in rock drilling equipment.

(ii) Diamonds are used for making jewellery.

Q.3. Give two uses of graphite.

Ans :- (i) It is used as a lubricant for the fast moving parts of machinery.

(ii) It is used for making the cores of our pencils called 'pencil leads' and black paints.

Q.4. A boy sharpens a pencil at both the ends and then uses its back ends to complete and electric circuit. Will the current flow through the electric circuit ? Give reason for your answer. Name the black substance of the pencil.

Ans :- Yes, the current will flow through the electric circuit. This is because the black substance of a pencil is graphite and being a good conductor of electricity, the graphite core of pencil allows the electric current to flow through it.

Q.5. Define hydrocarbon. Give example.

Ans :- A compound made up of hydrogen and carbon only is called hydrocarbon.

Example :- Methane (CH_4), ethane (C_2H_6) etc.

Q.6. Write the types of hydrocarbons.

Ans :- (i) Saturated hydrocarbons.

(ii) Unsaturated hydrocarbons.

Q.7. Define saturated hydrocarbon. Give example.

Ans :- A hydrocarbon in which the carbon atoms are connected by only single bonds is called a saturated hydrocarbon.

Example :- Methane, ethane, propane, butane.

Q.8. Define unsaturated hydrocarbon. Give examples.

Ans :- A hydrocarbon in which the two carbon atoms are connected by a 'double bond' or a 'triple bond' is called an unsaturated hydrocarbon.

Examples :- Ethane; Ethyne.

Q.9. What is alkenes ? Give two examples.

Ans :- An unsaturated hydrocarbon in which the two carbon atoms are connected by a double bond is called an alkene.

Example :- Ethene and propene.

Q.10. What is alkyl group. Give examples.

Ans :- The group formed by the removal of one hydrogen atom from an alkane molecule is called an alkyl group.

Example :- methyl group (CH_3), ethyl group (C_2H_5)

Q.11. Give the general formula of "alkynes". Identify the alkynes from the following : CH_4, C_2H_6, C_2H_2, C_3H_4, C_2H_4

Ans :- The general formula of alkynes is C_nH_{2n-2} where in the number of carbon atoms in one molecule of the alkyne.

Alkynes :- C_2H_2, C_3H_4

Q.12. A hydrocarbon molecule contains 4 hydrogen atoms. Give its molecular formula, if it is an

(i) alkane.

(ii) alkene.

(iii) alkyne.

Ans :- (i) CH_4 (methane).

(ii) C_2H_4 (ethane).

(iii) C_3H_4 (Propyne).

Q.13. Write four characters of a homologous series.

Ans :- (i) All the members of a homologous series can be represented by the same general formula.

(ii) Any two adjacent homologues differ by 1 carbon atom and 2 hydrogen atoms in their molecular formula.

(iii) The difference in the molecular masses of any two adjacent homologues is 14u.

(iv) All the compounds of a homologues series show similar chemical properties.

Q.14. Differentiate between soap and detergent.

Ans :-

Soap	Detergent
1. Soaps are the sodium salts of the long chain carboxylic acids.	1. Detergents are the sodium salts of long chain benzene sulphuric acids or long chain alkyl hydrogen sulphates.
2. Soaps are not suitable for washing purposes when the water is hand.	2. Detergents can be used for washing even when the water is hard.
3. Soaps are biodegradable.	3. Some of the detergents are not biodegradable.

4. Soaps have relatively weak cleansing action.	4. Detergents have a strong cleansing action.

Q.15. Why detergents are better than soaps ?

Ans :- Detergents are better than soaps because of the following reasons :-

(i) Detergents can be used even with hard water whereas soaps are not suitable for use with hard water.

(ii) Detergents have a stronger cleansing action than soaps.

(iii) Detergents are more soluble in water than soaps.

Q.16. What is the disadvantage of detergent over soap ?

Ans :- An important disadvantage of detergents over soaps is that some of the detergents are not biodegradable, that is, they can not be decomposed by microorganisms like bacteria and hence cause water pollution in lakes and rivers.

Q.17. Which of the following will give addition reactions and why ? C_4H_{10}, C_2H_6, C_2H_4, CH_4, C_3H_8, C_3H_4

Ans :- C_2H_4 and C_3H_4 These are unsaturated hydrocarbons.

Q.18. (a) What type of compound is CH_3 COOH ?

(b) What substance should be oxidised to prepare CH_3 COOH ?

(c) What is the physical state of CH_3 COOH ?

Ans :- (a) Carboxylic acid.

(b) Ethanol, (CH_3 CH_2 OH)

(c) Liquid state.

Q.19. Why soap is not suitable for washing clothes with hard water ?

Ans :- Because :- (i) When soap is used for washing clothes with hard water, a large amount of soap is wasted in reacting with the calcium and magnesium ions of hard water to form an insoluble precipitate called scum, before it can be used for the real purpose of washing. So a large amount of soap is needed for washing clothes when the water is hand.

(ii) The scum formed by the action of hard water on soap sticks to the clothes being washed and interferes with the cleaning ability of the additional soap. This makes the cleaning of clothes difficult.

Q.20. Write the two uses of ethanoic acid.

Ans :- (i) Ethanoic acid is used for making cellulose acetate which is an important artificial fibre.

(ii) Ethanoic acid is used in the preparation of dyes, plastics and pharmaceuticals.

Q.21. (a) Give the general name of the class of compounds having the general formula C_nH_{2n-2} Write name of the first member of this homologues series.

(b) The general formula of a homologous series of carbon compound is C_nH_{2n} . Write the molecular formula of the second and fourth members of the series.

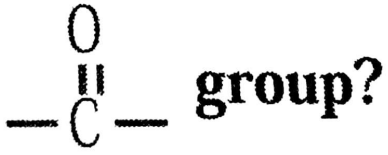
(c) Write the molecular formula of third and fifth members of homologous series of carbon compounds represented by the general formula C_nH_{2n+2}

Ans :- (a) Alkynes; Ethyne

(b) C_3H_6 ; C_5H_{10}

(c) C_3H_8 ; C_5H_{12}

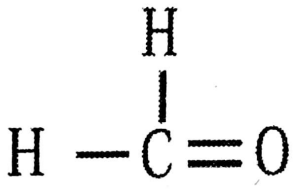
Q.22. (a) What is the general name of the organic compound Containing the



group?

(b) Which of the following compounds contains a carboxylic acid group ? CH_3OH, CH_3COOH, CH_3CHO, CH_3COCH_3

(c) How would you name the following compound ?



Ans :- (a) Ketones.

(b) CH_3COOH.

(c) Methanal.

Q.23. Fill in the blanks :

(a) The form of carbon which is known as black lead is----------.

Ans :- Graphite.

(b) Compound of carbon with hydrogen alone are called----------.

Ans :- Hydrocarbons.

(c) C_nH_{2n} is general formula of ---------- hydrocarbons.

Ans :- Alkene.

(d) The IUPAC name of acetylene is ----------.

Ans :- Ethyne.

(e) The next higher homologue of ethanol is ----------.

Ans :- Propanol.

(f) The functional group present is ethanol is ----------.

Ans :- –OH

(g) The Sodium salt of a long chain fatty acid is called----------.

Ans :- Soap .

(h) ---------- is better than soap for washing clothes when water is Hand.

Ans :- Detergent.

(i) The organic acid present in vinegar is ----------.

Ans :- Ethanoic acid.

(j) Ethene and ethyne are examples of ---------- hydrocarbons.

Ans :- Unsaturated.

Long answer type questions :

Q.1. (a) The molecular formula of an organic compound is $C_{18}H_{36}$ Name its homologous series.

(b) Select the hydrocarbons which belong to the same homologous series. Give the name of each series. CH_4, C_2H_2, C_2H_4, C_4H_{10}, C_3H_4, C_3H_6

Ans :- (a) Alkene.

(b) Alkanes :- CH_4, C_2H_6, CH_{10}

Alkenes :- C_2H_4, C_3H_6

Alkyne :- C_2H_2, C_3H_4

Q.2. You are given an organic compound having the molecular formula C_3H_8. Give the name and formula of the compound formed :

(a) When one H atom of C_3H_8, is replaced by a Cl atom

(b) When one H atom of C_3H_8 replaced by OH group

(c) When one H atom of C_3H_8 is replaced by a CHO group.

(d) When one H atom of C_3H_8 is replaced by a COOH group.

(e) When two H atoms joined to the middle carbon atom of C_3H_8 are replaced by one O atom.

Ans :- (a) Chloropropane, $CH_3\text{-}CH_2\text{-}CH_2\text{-}Cl$

(b) Propanol, $CH_3\text{-}CH_2\text{-}CH_2\text{-}OH$

(c) Butanal, $CH_3\text{-}CH_2\text{-}CH_2\text{-}CHO$

(d) Butanoic acid, $CH_3\text{-}CH_2\text{-}CH_2\text{-}COOH$

(e) Propanone, $CH_3\text{-}CO\text{-}CH_3$

Q.3. three organic compounds A, B and C have the following molecular formula :

A. $C_4H_8O_2$

B. $C_4H_{10}O$

C. C_4H_8O

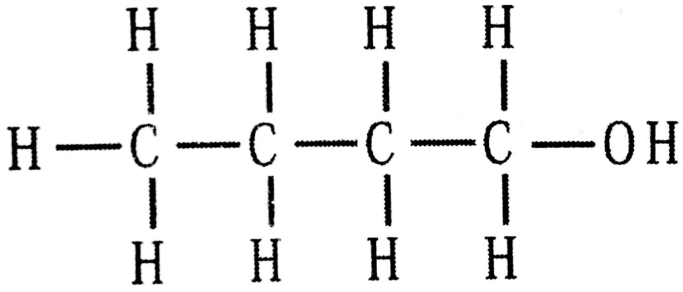
(a) Which compound contains an alcohol group ? Write its name and structural formula.

(b) Which compound contains a carboxyl group ? Write its name and structural formula.

(c) Which molecular formula can represent an aldehyde as well as a ketone ? Write the names and structural formula of the aldehyde and ketone represented by this molecular formula.

Ans :- (a) B; Butanol

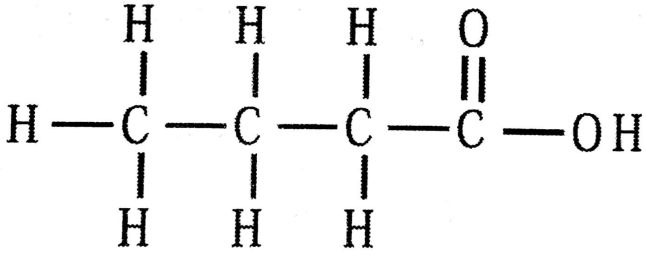
Structural formula :-



C_4H_9OH

(b) A ; Butanoic acid

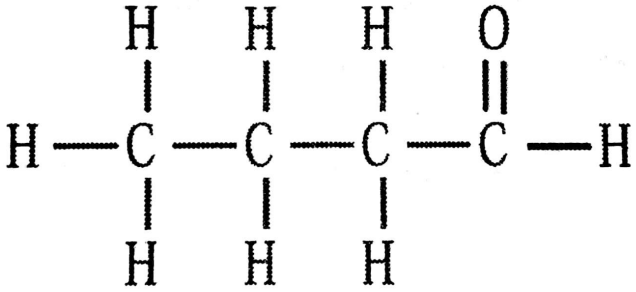
Structural formula :-



C_3H_7COOH

(c) C_4H_8O ; Aldehyde :- Butanal

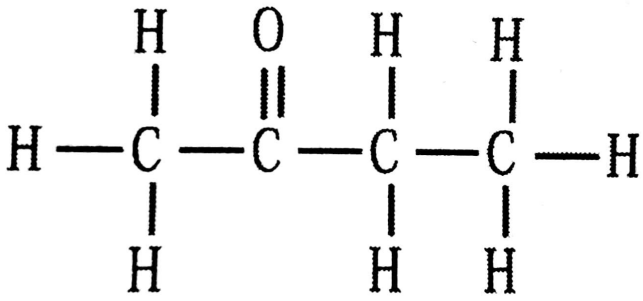
Structural formula :-



C_3H_7CHO

Ketone :- Butanone

Structural formula :-

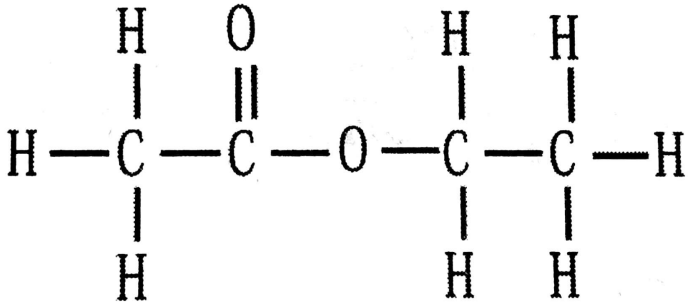


$CH_3COCH_2CH_3$

Q.4. A neutral organic compound is warmed with some ethanoic acid and a little of con, H_2SO_4. Vaporus having sweet smell are evolved, What type of functional group is present in this organic compound ?

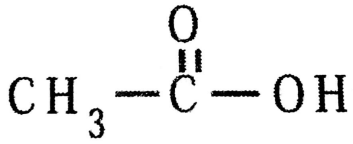
Ans :- Alcohol group, -OH

Q.5. The structured formula of an ester is :-



Write the formula of the acid and the alcohol from which it is formed.

Ans :- Acid :-



Alcohol :- CH_3-CH_2-OH

Q.6. A four carbon atoms containing neutral organic compound x reacts with sodium metal to evolve a gas which burns with a 'pop' sound. Another four carbon atoms containing carbon compound reacts with sodium hydrogen carbonate to evolve a gas which turns lime water milky. When compounds x and together in the presence of a little of concentrated sulphuric acid, then a new compound z is formed.

(a) What is compound X ? Also write its formula.

(b) What is compound Y ? Also write its formula.

(c) What is compound Z ? Also write its formula.

(d) What type of smell is given by compound Z ?

(e) What is the general name of compounds like Z ?

(f) What is the general name of the reaction which takes place between X and Y to form Z ?

Ans :- (a) X is butanol, C_4H_9OH

(b) Y is butanoic acid , C_3H_7COOH

(c) Z is butyl butanoate , $C_3H_7COOC_4H_9$

(d) Sweet - smell.

(e) Esterification .

Q.7 . Consider the following organic compounds : CH_3OH , C_2H_5OH , CH_3COCH_3 , CH_3 , COOH , C_2H_5COOH , $C_4H_9COOC_2H_5$, CH_4, C_2H_6 CH_3 CHO, HCHO Out of these compounds :

(a) Which compound is most likely to be sweet - smelling ?

(b) Which compound on treatment with con . H_2SO_4 nt 170° C forms an alkene ?

(c) Which compound on repeated chlorination forms chloroform ?

(d) Which compound is added to alcohol to denature it?

(e) Which compound is a constituent of vinegar ?

(f) Which compound is used to sterilise wounds and syringes ?

Ans :- (a) C_4H_9 $COOC_2H_5$; Easter.

(b) C_2H_5 OH ; Ethane.

(c) CH_4

(d) CH_3OH

(e) CH_3COOH

(f) C_2H_5OH

Q.8 . A hard material X which is mined from the earth is used as a household fuel and also for the generation of electricity at Thermal power stations . A soft material Y is also used as a fuel in the form of candles . A gaseous material Z which occur along with petroleum is increasingly being used as a fuel in running vehicles in its compressed form .

(a) What are materials X, Y and Z ?

(b) When material X, Y and Z are burned separately :

(i) Which materials burns by producing a yellow, luminous flame ?

(ii) Which materials ultimately burns without producing a flame ?

(iii) Which material can burns in a gas stove by producing a blue flame ?

Ans :- (a) X is coal

Y is wax

Z is natural gas

(b) (i) Y (wax)

(ii) X (coal)

(iii) Z (natural gas)

Multiple choice questions :

Q.1. Buckminsterfullerene is an allotropic form of the element :

(a) Phosphorus.

(b) Fluorine.

(c) Carbon.

(d) Sulfur.

Ans :- (C) Carbon.

Q.2. Out of the following pairs of compounds, the unsaturated compounds are :

(a) C_2H_6 and C_4H_6

(b) C_6H_{12} and C_5H_{12}

(c) C_4H_6 and C_6H_{12}

(d) C_2H_6 and C_4H_{10}

Ans :- (c) C_4H_6 and C_6H_{12}

Q.3. The number of covalent bonds in pentane is :

(a) 5

(b) 12

(c) 17

(d) 16

Ans :- (d) 16

Q.4. The properly of self - combination of the atoms of the same element to form long chains is known as :

(a) Protonation.

(b) Carbonation.

(c) Coronation.

(d) Catenation.

Ans :- (d) Catenation .

Q.5. A cyclic hydrocarbon having carbon - carbon single bonds as well as carbon - carbon double bonds in its molecule is

(a) C_6H_{12}

(b) C_6H_{14}

(c) C_6H_6

(d) C_6H_{10}

Ans :- (c) C_6H_6

Q.6. The hydrocarbon 2 - methylbutane is an isomer of

(a) N - pentane.

(b) N - butanes.

(c) Propane.

(d) Iso - butane.

Ans :- (a) N - pentane.

Q.7. An unsaturated hydrocarbon having a triple co - valent bond has 50 hydrogen atoms in its molecule . The number of carbon atoms in its molecule will be

(a) 24

(b) 25

(c) 26

(d) 28

Ans :- (c) 26

Q.8. An alkyne has seventy five carbon atoms in its molecule . The number of hydrogen atoms in its molecule will be

(a) 150

(b) 148

(c) 152

(d) 146

Ans :- (b) 148

Q.9. A diamond toothed saw is usually used for cutting

(a) Stell girders.

(b) Logs of wood.

(c) Marble slabs.

(d) Asbestos sheets.

Ans :- (c) Marble slabs.

Q.10. The organic compound prepared by Worker from an inorganic compound called ammonium cyanate was

(a) Glucose.

(b) Urea.
(c) Uric acid.

(d) Vinegar.

Ans :- (b) Urea.

Q.11. One of the following is not an allotrope of carbon . This is -

(a) Diamond.

(b) Graphite.

(c) Cumene.

(d) Buckminsterfullerene.

Ans :- (c) Cumene .

Q.12. The number of carbon atoms in the organic compound named as 2 , 2 , dimethylpropane is :

(a) Two.

(b) Five.

(c) Three.

(d) Four.

Ans :- (b) Five.

Q.13. The pair of elements which exhibits the property of catenation is

(a) Sodium and silicon.

(b) Chlorine and carbon.

(c) Carbon and sodium.

(d) Silicon and carbon.

Ans :- (d) Silicon and carbon .

Q.14. A saturated hydrocarbon has fifty hydrogen atoms in its molecule . The number of carbon atoms in its molecule will be :

(a) 25

(b) 24

(c) 26

(d) 27

Ans :- (b) 24.

Q.15 . A hydrocarbon having one double bond has 100 carbon atoms in its molecule . The number of hydrogen atoms in its molecule will be :

(a) 200

(b) 198

(c) 202

(d) 196

Ans :- (a) 200.

Q.16. The hydrocarbon which has alternate single and double 2 bonds arranged in the form of a ring is :

(a) Cyclobutane.

(b) Benzene.

(c) Butene.

(d) Hexene.

Ans :- (b) Benzene.

Q.17. Which of the following can not exhibit isomerism ?

(a) C_4H_{10}

(b) C_5H_{12}

(c) C_3H_8

(d) C_6H_{14}

Ans :- (c) C_3H_8

Q.18. The pencil leads are mainly made of :

(a) Lithium.

(b) Charcoal.

(c) Lead.

(d) Graphite.

Ans :- (d) Graphite.

Q.19. The number of isomers formed by the hydrocarbon with molecular formula C_5H_{12} is

(a) 2

(b) 5

(c) 3

(d) 4

Ans :- (c) 3.

Q.20. The number of carbon atoms joined in a spherical molecules of buckminsterfullerene is -

(a) 50

(b) 60

(c) 70

(d) 90

Ans :- (b) 60.

Q.21. The molecular formula of a homologue of butane is

(a) C_4H_8

(b) C_2H_6

(c) C_4H_6

(d) C_3H_8

Ans :- (d) C_3H_8

Q.22. One of the following molecular formula can represents two organic compounds having different functional groups . This molecular formula is :

(a) $C_5H_{12}O$

(b) $C_5H_{10}O$

(c) $C_5H_{10}O_2$

(d) $C_5 H_{12}$

Ans :- (b) $C_5H_{10}O$

Q.23. The number of carbon atoms present in the molecule of fifth member of the homologous series of alkynes is

(a) Four.

(b) Five.

(c) Six.

(d) Seven.

Ans :- (c) Six.

Q.24. One of the following burns without producing flame. This is :

(a) Wood.

(b) Charcoal.

(c) LPG.

(d) Candle.

Ans :- (b) Charcoal.

Q.25. The functional group which always occurs in the middle of a carbon chain as :

(a) Alcohol.

(b) Aldehyde group.

(c) Carboxyl group.

(d) ketone group.

Ans :- (d) ketone group.

Q.26. The molecular formula of some organic compounds are given below. Which of these compounds contains an aldehyde group ?

(a) C_3H_8O

(b) $C_3H_6O_2$

(C) C_3H_6O

(d) C_3H_7Cl

Ans :- (c) C_3H_6O

Q.27. The organic compounds which are isomeric with one another are :

(a) Alcohols and aldehydes.

(b) Aldehydes and carboxylic acids.

(c) ketenes and aldehydes.

(d) Alcohols and ketenes.

Ans :- (c) Ketones and aldehydes.

Q.28. The fuel which usually burns with a blue flame is

(a) Coal.

(b) LPG.

(c) Candle wax.

(d) kerosene (in lamp).

Ans :- (b) LPG.

Q.29. Which of the following burns by producing a yellow, luminous flame ?

(a) Natural gas.

(b) Coke.

(c) Wax.

(d) Charcoal.

Ans :- (c) Wax.

Q.30. The molecular formula of an organic compound is $C_{48}H_{94}$. This compound belongs to the homologous series of :

(a) Alkenes.

(b) Aldehydes.

(c) Alkynes.

(d) Alkaness.

Ans :- Alkynes.

Q.31. One of the following molecular formule represents as ketone . This formula is :

(a) $C_5H_{12}O$

(b) $C_6H_{12}O$

(c) $C_6H_{14}O$

(d) $C_6H_{12}O$

Ans :- (d) $C_6H_{12}O$

Q.32 . Which one of the following in not a fossil fuel ?

(a) Petrol.

(b) Coal.

(c) Charcoal.

(d) Coal.

Ans :- (c) Charcoal.

Q.33 . Butanone is a four carbon compound having the functional group :

(a) -COOH

(b) -CHO

(c) -CO-

(d) -OH

Ans :- (c) -CO-

Q.34. The molecular formula of the third member of the homologous series of ketones is :

(a) C_4H_8O

(b) C_3H_6O

(c) $C_5H_{10}O$

(d) $C_6H_{12}O$

Ans :- (c) $C_5H_{10}O$

Q.35. The functional group present in propanal is :

(a) -OH

(b) -COOH

(c) -CO-

(d) -CHO

Ans :- (d) -CHO

Q.36. While cooking , if the bottom of the utensil is getting blackned on the outside , it means that :

(a) The food is not cooked completely.

(b) The fuel is not burning completely.

(c) The fuel is wet U

(d) The fuel is burned completely .

Ans :- (b) The fuel is not burning completely.

Q.37. When ethanol is heated with alkaline potassium permanganate solution , it gets converted into ethanoic acid . In this reaction alkaline potassium permanganate bay act as :

(a) Reducing agent.

(b) Oxidising agent.

(c) Catalyst sa ozbr.

(d) Dehydrating agent.

Ans :- (b) Oxidising agent.

Q.38. When ethanol is heated with concentrated sulphuric acid at 170° C, it gets converted into ethene . In this reaction concentrated sulphuric acid acts as :

(a) Oxidising agent.

(b) Catalyst.

(c) Dehydrating agent.

(d) Reducing agent.

Ans :- (c) Dehydrating agent .

Q.39. When a vegetable oil is treated with hydrogen in the presence of nickel catalyst , it forms a fat . This is an example of :

(a) Anodising reaction .

(b) Substitution reactions.

(c) Displacement reaction.

(d) Addition reaction.

Ans :- (d) Addition reaction.

Q.40. The soap molecule has a :

(a) Hydrophilic head and a hydrophobic tail.

(b) Hydrophobic head and hydrophilic tail.

(c) Hydrophobic head and hydrophobic tail

(d) Hydrophilic head and hydrophilic tail .

Ans :- (a) Hydrophilic head and a hydrophobic tail.

Q.41. Chlorine reacts with saturated hydrocarbons at room temperature in the :

(a) Absence of sunlight.

(b) presence of sunlight.

(c) Absence of moisture.

(d) Presence of H_2SO_4

Ans :- (b) Presence of sunlight.

Q.42. In a soap micelle , the soap molecules are arranged radially with :

(a) Ionic ends directed towards the centre and hydrocarbon ends directed out wards.

(b) Hydrocarbon ends directed towards the centre and ionic ends directed outwards.

(c) Both ionic ends and hydrocarbon ends directed towards the centre.

(d) both hydrocarbon ends and ionic ends directed outwards.

Ans :- (b) Hydrocarbon ends directed towards the centre and ionic ends directed outwards.

Q.43. When ethanol reacts with sodium metal , it forms two products . These products are :

(a) Sodium ethanoate and oxygen.

(b) Sodium ethanoate and hydrogen.

(c) Sodium ethoxide and oxygen.

(d) Sodium ethoxide and hydrogen .

Ans :- (d) Sodium ethoxide and hydrogen.

Q.44. Vinegar is a solution of about

(a) 5 to 8 percent ethanoic acid in alcohol.

(b) 5 to 8 percent ethanoic acid in water.

(c) 50 to 80 percent ethanoic acid in water.

(d) 50 to 80 percent ethanoic acid in alcohol.

Ans :- (b) 5 to 80 percent ethanoic acid in water .

Q.45. One of the following substance is not added to make denatured alcohol . This is

(a) Methyl alcohol.

(b) Copper sulphate.

(c) Chloroform.

(d) Pyridine dam.

Ans :- (c) Chloroform.

Q.46. One of the following organic compounds cannot decolourise the red - brown colour of bromine water . This compound is

(a) $C_{14}H_{28}$

(b) C_7H_{12}

(c) C_6H_{14}

(d) C_9H_{16}

Ans :- (c) C_6H_{14}

Q.47. The substance which can produce brisk effervescence with baking soda solution is -

(a) Ethanol.

(b) Vegetable oil.

(c) Vinegar.

(d) Common Salt.

Ans :- (c) Vinegar.

Q.48. The chemical which is not required for the preparation of soap in the laboratory is :

(a) Vegetable oil.

(b) Baking soda.

(c) Caustic soda.

(d) Common salt.

Ans :- (b) Baking soda .

Q.49. Which of the following can damage optic nerve leading to blindness , if taken internally ?

(a) CH_3 COOH

(b) C_2H_5OH

(c) $NaHCO_3$

(d) CH_3 OH

Ans :- (d) CH_3 OH

Q.50. The usual disease caused by the excessive drinking alcohol over a long period of time is :

(a) Diabetes.

(b) Cataract.

(c) Cirrhosis.

(d) Arthritis.

Ans :- (c) Cirrhosis.

Q.51. Which of the following molecular formula corresponds to ethyl butanoate ester ?

(a) $C_5H_{10}O_2$

(b) $C_6H_{12}O_2$

(c) $C_7H_{14}O_2$

(d) $C_8H_{18}O_2$

Ans . (b) $C_6H_{12}O_2$