File Revison Date : 7 July 2019
CBSE Objective Questions Exam 2019-2020
CLASS : 10th
SUB : Science
For 15 Years Exams Chapter-wise Question Bank

CHAPTER 4

Carbon and Its Compound

1. OBJECTIVE QUESTIONS

1. Which of the following gases is called 'marsh gas'-
(a) H_2 (b) CH_4
(c) C_2H_4 (d) C_2H_2

Ans : (b) CH_4

2. Which of the following will contain covalent double bond between its atoms?
(a) H_2 (b) O_2
(c) NaCl (d) Cl_2

Ans : (b) O_2

Oxygen atom has six (6) valence electrons. Thus, to complete its octet, it forms double bond with another oxygen atom to get O_2 molecule.

3. Which of the following can show addition reaction?
(a) C_2H_4 (b) C_2H_6
(c) C_2H_5OH (d) $CH_3CH_2CH_3$

Ans : (a) C_2H_4

Presence of double bond between two carbon atoms is the necessary condition to show addition reaction. Thus, only $C_2H_4(CH_2 = CH_2)$ can show the addition reaction.

4. Which of the following is not the property of homologous series?
(a) They differ by-CH_2 units
(b) They differ by-14 units by mass
(c) They all contain double bond
(d) They can be represented by a general formula

Ans : (c) They all contain double bond

It is not necessary for a homologous series that it must contain the double bond.

5. Which of the following is not a property of carbon?
(a) Carbon compounds are good conductor of heat and electricity
(b) Carbon compounds are poor conductor of heat and electricity
(c) Most of the carbon compounds are covalent compounds
(d) Boiling and melting point of carbon compounds are relatively lower than those of ionic compounds

Ans : (a) Carbon compounds are good conductor of heat and electricity

Carbon compounds are covalently bonded and are poor conductor of heat and electricity. Due to covalent bonds, their boiling and melting points are relatively lower than those of ionic compounds.

6. Correct formula for propanoic acid is
(a) CH_3COOH
(b) $CH_3 - CH_2 - COOCH_3$
(c) $HOOCCH_2CH_3$
(d) CH_3COOCH_3

Ans : (c) $HOOCCH_2CH_3$

The correct formula for propanoic acid is a follows:

$$CH_3 - CH_2 - \underset{\underset{O}{\|}}{C} - OH$$

7. The final product of chlorination of methane in the sun light is-
(a) CH_3Cl (b) CH_2Cl_2
(c) $CHCl_3$ (d) CCl_4

Ans : (d) CCl_4

8. Oils on treating with hydrogen in the presence of palladium or nickel catalyst form fats. This is an example of
(a) addition reaction (b) substitution reaction
(c) displacement reaction (d) oxidation reaction

Ans : (a) addition reaction

9. Carbon exists in the atmosphere in the form of
(a) carbon monoxide only
(b) carbon monoxide in traces and carbon dioxide
(c) carbon dioxide only
(d) coal

Ans : (b) carbon monoxide in traces and carbon dioxide

10. The number of oxygen molecules used in the combustion of 1 molecule of ethanol is-
(a) 1 (b) 2
(c) 3 (d) 4

Ans : (c) 3

11. General formula of alkyne is-
(a) C_nH_{2n+2} (b) C_nH_{2n}
(c) C_nH_{2n-2} (d) C_nH_n

Ans : (c) C_nH_{2n-2}

12. Consider the following statements related to diamond and graphite.
1. Both diamond and graphite are used as abrasives.
2. Diamond and graphite have different arrangements of carbon atoms.
3. The carbon atoms in graphite have a different number of neutrons from those in diamond.
4. The carbon atoms in both graphite and diamond have four single covalent bonds.

The incorrect statement(s) is/are
(a) 1 and 3 (b) 2 and 4
(c) 1, 3 and 4 (d) All of these

Ans : (c) 1, 3 and 4

Diamond has a tetrahedral arrangement whereas graphite has a hexagonal planar arrangement of carbon atoms. In each case, C – C bond is covalent.

Diamond is used as an abrasive, but graphite does not. Diamond and graphite differ in the number and arrangement of carbon atoms but not in the nature of carbon atoms. Graphite also has double bonds along with single bonds.

13. What would happen if graphene is heated in sufficient supply of air?
(a) It aggregates to form graphite
(b) It gets converted into diamond
(c) Carbon dioxide gas is released
(d) It becomes a non-conductor

Ans : (c) Carbon dioxide gas is released

Graphene is an allotrope of carbon and all the allotropes exhibit similar chemical properties. So, when heated in excess of air, it gives carbon dioxide gas.

14. C^{4+} does not exist but Pb^{4+} exists although both belong to the same group. This is because
1. size of carbon is much smaller than Pb.
2. large amount of energy is needed in case of carbon.
3. nucleus cannot hold such a large number of electrons.
4. nucleus cannot hold such a large number of electrons.

The correct statement(s) is/are
(a) Only 1 (b) 1 and 2
(c) Only 3 (d) 2, 3 and 4

Ans : (b) 1 and 2

Size of C is much smaller as compared to Pb and from a nucleus having 6 protons, it is very difficult to remove 4 electrons as a large amount of energy is required for this purpose.

15. Methane, ethane and propane are said to form a homologous series because all are-
(a) hydrocarbons
(b) saturated compounds
(c) aliphatic compounds
(d) differ from each other by a CH_2 group

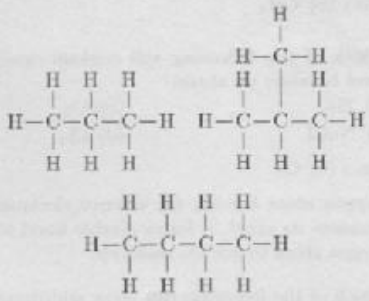
Ans : (d) differ from each other by a CH_2 group

Methane (CH_4), Ethane (H_3CH_3) and propane ($CH_3CH_2CH_3$) differ from each by a CH_2 group. Hence, these are said to form a homologous series.

16. When methane is burnt in an excess of air, the products of combustion are-
(a) C and H_2O (b) CO and H_2O
(c) CO_2 and H_2 (d) CO_2 and H_2O

Ans : (d) CO_2 and H_2O

17. The structures of three hydrocarbons are given below.

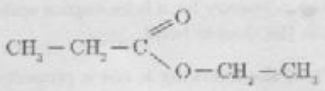


Which statement is correct for all the above three compounds?
(a) They are isomers of each other
(b) They have the same general formula
(c) They have the same physical properties
(d) They react with aqueous bromine

Ans : (b) They have the same general formula

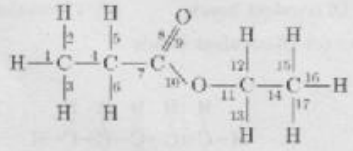
All the given compounds have only C – H and C – C single bonds and hence belongs to the same homologous series, i.e. their general formula is same.
Note: These compounds belong to alkane series, general formula of which is C_nH_{2n+2}.

18. The diagram shows the molecule, ethyl propanoate.



How many bonding pairs of electrons are there in the molecule?
(a) 13 (b) 16
(c) 17 (d) 20

Ans : (c) 17



19. Which compound has an addition reaction with chlorine?

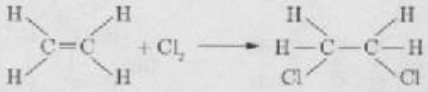
(a) C_2H_4 (b) C_2H_5OH

(c) C_2H_6 (d) CH_3CO_2H

Ans : (a) C_2H_4

Only unsaturated compound, i.e. compound with general formula C_nH_{2n} or C_nH_{2n-2} show addition reaction with chlorine. Thus, $C_2H_4(C_nH_{2n})$ gives an addition reaction with chlorine.

$$C_2H_4 + Cl_2 \longrightarrow C_2H_4Cl_2$$



20. Which one is an example of substitution reaction?

(a) $CH_2 = CH_2 + H_2 \xrightarrow{-h\nu} CH_3 - CH_3$

(b) $CH_3CH_2OH \xrightarrow{KMnO_4(alk.)} CH_3COOH$

(c) $CH_4 + Cl_2 \xrightarrow{h\nu} CH_3Cl + HCl$

(d) $CH \equiv CH + H_2 \xrightarrow{h\nu} CH_2 = CH_2$

Ans : (c) $CH_4 + Cl_2 \xrightarrow{h\nu} CH_3Cl + HCl$

When one atom or group of atoms is replaced by some other atom or group of atoms, it is known as substitution reaction.

Option (c) is an example of substitution reaction, in which one of the hydrogen atom is replaced by chlorine (Cl) atom.

21. The number of 4° carbon atoms in 2, 2, 4, 4-tetramethyl pentane is-

(a) 1 (b) 2

(c) 3 (d) 4

Ans : (b) 2

22. Which of the following is not the use of graphite?

(a) It is used as lubricant

(b) It is used in manufacturing of lead-pencils

(c) It is used in manufacturing of artificial diamond

(d) It is used for making insulated plates

Ans : (d) It is used for making insulated plates

Graphite can not be used for making insulated plates, as it is a good conductor of electricity.

23. Which of the following is the purest form of carbon-

(a) charcoal (b) coal

(c) diamond (d) graphite

Ans : (c) diamond

Diamond is the purest form of carbon.

24. Buckminister fullerene is an allotropic form of

(a) phosphorus (b) sulphur

(c) carbon (d) tin

Ans : (c) carbon

25. One mole of a hydrocarbon X reacted completely with one mole of hydrogen gas in the presence of a heated catalyst.

What could be the formula of X?

(a) C_2H_6 (b) C_8H_{10}

(c) C_9H_8 (d) C_7H_{16}

Ans : (b) C_5H_{10}

Since, the compound reacts completely with one mole of hydrogen; it should be an alkane with one degree of unsaturation. The general formula for alkenes is C_nH_{2n}.

If $n = 5$, C_5H_{10}

Thus, C_5H_{10} is X.

26. Organic compounds will always contain-

(a) carbon (b) hydrogen

(c) nitrogen (d) sulphur

Ans : (a) carbon

27. Compound X is a six carbon compound. When it is burnt, light is fenerated. Here, the colour of the flame is yellow because of the presence of carbon particles. Compound X cannot be

(a) C_6H_{12} (b) C_6H_{14}

(c) C_6H_6 (d) C_7H_{16}

Ans : (b) C_6H_{14}

C_6H_{14} is a saturated hydrocarbon, so colour of the flame during its combustion will be blue. Thus, C_6H_{14} cannot be X.

28. A reaction scheme is shown below.

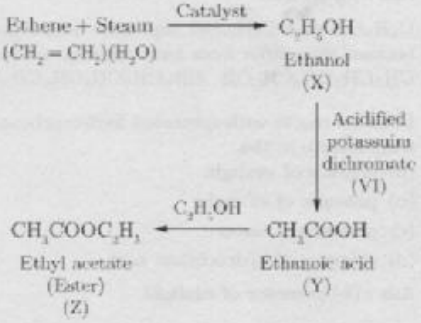
Ethene + Steam $\xrightarrow{\text{Catalyst}} X \xrightarrow[\text{(VI)}]{\text{Acidified potassium dichromate}} Y \xrightarrow{X} Z$

What is the final product Z?

(a) A carboxylic acid (b) An alcohol

(c) An alkene (d) An ester

Ans : (d) An ester



29. Which is a general formula of alkenes-
(a) C_nH_{2n+2} (b) C_nH_{2n}
(c) CnH_{2n-2} (d) None of the above
Ans : (a) C_nH_{2n+2}

30. The functional group represent alcohol is-
(a) $-OH$ (b) $-CHO$
(c) $-COOH$ (d) $> C = O$
Ans : (a) $-OH$

$-OH$	⇒	alcohol
$-CHO$	⇒	aldehyde
$-COOH$	⇒	Carboxylic acid
$>C=O$	⇒	Ketone

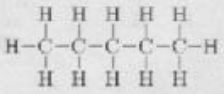
31. When ethane is burnt in excess of air, the products of combustion are-
(a) C and H_2O (b) CO and H_2O
(c) CO_2 and H_2 (d) CO_2 and H_2O
Ans : (d) CO_2 and H_2O
CO_2 and H_2O are produced when ethane is burnt in excess of air.

32. When vanaspati oil reacts with hydrogen then it convert into vanaspati ghee. In this process catalyst used is:
(a) Fe (b) Mo
(c) V (d) Ni
Ans : (d) Ni
Catalysts like Pd, Pt, or Ni are used in hydrogenation process.

33. Observe the following pairs of organic compounds
1. C_4H_9OH and $C_5H_{11}OH$
2. $C_7H_{15}OH$ and $C_5H_{11}OH$
3. $C_6H_{13}OH$ and C_8H_7OH
Which of these pair is a homologous series according to increasing order of carbon atom.
(a) (III) only (b) (II) only
(c) (I) only (d) All of these
Ans : (c) (I) only
C_4H_9OH and $C_5H_{11}OH$ represent homologous series because they differ from each other by a CH_2 group.
$CH_3CH_2CH_2CH_2OH$, $CH_3CH_2CH_2CH_2CH_2OH$

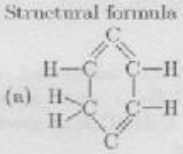
34. Chlorine reacts with saturated hydrocarbons at room temperature in the
(a) absence of sunlight
(b) presence of sunlight
(c) presence of water
(d) presence of hydrochloric acid
Ans : (b) presence of sunlight

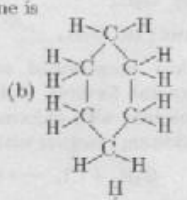
35. Pentane has the molecular formula C_5H_{12}. It has
(a) 5 covalent bonds (b) 12 covalent bonds
(c) 16 covalent bonds (d) 17 covalent bonds
Ans : (c) 16 covalent bonds

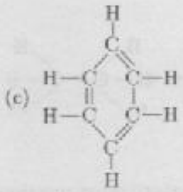


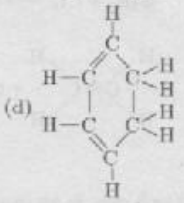
Pentane has 16 covalent bonds (12 C-H and 4 C-C bonds)

36. Structural formula of benzene is


(a)


(b)


(c)


(d)

Ans : (c)

2. FILL IN THE BLANK

1. The soft crystalline form of carbon is .....
Ans : Graphite

2. ..... and ..... are the two allotropes of carbon.
Ans : diamond, graphite

3. Next homologue of ethane is .....
Ans : Propane

4. Valency of carbon in ethylene is .....
Ans : 4

5. Ethylene burns in air to form CO_2 and .....
Ans : Water

6. The molecular mass of any two adjacent homologous differ by ..... amu.
Ans : 14

7. Vinegar is ..... % solution of ethanoic acid in water.
Ans : 5 to 8%

8. The purest form of carbon is .....
Ans : Diamond

9. The general formula of alcohols is .....
Ans : $C_nH_{2n+1}OH$

10. C_nH_{2n} is the general formula of .....
Ans : alkenes

11. The ability of carbon to form chains rise to a ..... series of compounds.
Ans : Homologous

12. Hydrogenation of vegetable oil is ..... reaction.
Ans : addition

13. Newly discovered allotrope of carbon is .....
Ans : Fullerene

14. ..... hydrocarbons decolourise brown colour of bromine water.
Ans : unsaturated

15. Soaps react with hard water to form .....
Ans : scum

16. The functional group present in carboxylic acids is .....
Ans : $-COOH$

17. Detergents causes ..... pollution.
Ans : water

3. TRUE/FALSE

1. Unsaturated hydrocarbons normally undergo addition reactions.
Ans : True

2. Unsatnrated hydrocarbons give addition reactions.
Ans : True

3. By hydrogenation, vegetable oils into vanaspati ghee
Ans : True

4. Carbon forms covalent bonds with itself and other elements such as hydrogen, oxygen, sulphur, nitrogen and chlorine.
Ans : True

5. Carbon and its compounds are some of our major sources of fuels.
Ans : True

6. The functional group of chloro alkane is $-Cl$.
Ans : True

7. Carbon is a versatile element.
Ans : True

8. The first member of alkyne homologous series is ethyne.
Ans : True

9. When hydrocarbons burn in air, carbon dioxide and hydrogen are produced with heat energy.
Ans : False

10. The next higher homologue of ethanol is pentanol.
Ans : False

11. If a hydrocarbon has double or triple covalent bond, it is saturated.
Ans : False

12. Graphite is a good conductor of electricity.
Ans : True

13. The simplest saturated hydrocarbon is methane.
Ans : True

14. Ethanol is the first member of the alcohol homologons series.
Ans : False

15. Diamond is a good conductor of electricity.
Ans : False

16. Heating ethanol at 443K with excess of conc. H_2SO_4 results in the dehydration of ethanol to give molecules.
Ans : False

17. Graphite is nsed in pencils.
Ans : True

18. Carbon has the nniqne ability to form bonds with other atoms of carbon, giving rise to large molecules.
Ans : True

19. Invertase and amylase are two enzymes involved in fermentation of ethanol from sugar.
Ans : False

4. MATCHING QUESTIONS

DIRECTION : Each question contains statements given in two columns which have to be matched. Statements (A, B, C, D) in column-I have to be matched with statements (p, q, r, s) in column II.

1.

Column I		Column II	
(A)	Combustion reaction	(p)	$C_2H_6 + Cl_2 \xrightarrow{U.V.\ light} C_2H_5Cl + HCl$
(B)	Oxidation reaction	(q)	$CH_2 = CH_2 + H_2 \xrightarrow{Ni/Pt} CH_3 - CH_3$
(C)	Addition reaction	(r)	$2CH_3OH + O_2(g) \xrightarrow[\text{Molybdenum oxide}]{300-400^\circ C} 2HCHO + 2H_2O$

Column I		Column II	
(D)	Substitution reaction	(s)	$C_2H_5OH + 3O_2 \longrightarrow 2CO_2 + 3H_2O$

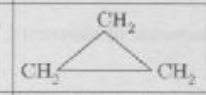
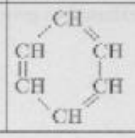
Ans : A-s, B-r, C-q, D-p

2.

Column I		Column II	
(A)	$-CHO$	(p)	Azo Compounds
(B)	$-CONH_2$	(q)	Aldehydes
(C)	$-NH_2$	(r)	Acid amides
(D)	$-N=N-$	(s)	Amines

Ans : A-q, B-r, C-s, D-p

3.

Column I		Column II	
(A)	$CH_2=CH_2$	(p)	Saturated
(B)		(q)	Unsaturated
(C)	$CH_3-CH_2-CH_3$	(r)	Acyclic
(D)		(s)	Cyclic

	A	B	C	D
(a)	q, r	p, s	p, r	q, s
(b)	p, q	q, s	r, s	q, p
(c)	q, s	r, p	q, p	q, r
(d)	p, r	p, q	r, s	r, q

Ans : (a) A-q, r, B-p, s, C-p, r, D-q, s

4.

Column I		Column II	
(A)	Halogentation	(p)	SO_3 + conc. H_2SO_4 Copper
(B)	Brass	(q)	$HI + HIO_3$
(C)	Bronze	(r)	Cl_2 + UV light
(D)	Magnalium	(s)	Fuming nitric acid

	A	B	C	D
(a)	q, r	s	p	q
(b)	q, s	p, r	q	r
(c)	r	p, s	q	s
(d)	p, q	r, s	p	r

Ans : (a) A-q, r, B-s, C-p, D-q

DIRECTION : Match the words/statements in Column A with words/statements in Column B.

5.

	Column A		Column B
(A)	$CH_3OH + CH_3COOH \xrightarrow{H^+} CH_3COOCH_3 + H_2O$	(p)	Addition reaction
(B)	$CH_2=CH_2 + H_2 \xrightarrow{Ni} CH_3-CH_3$	(q)	Substitution reaction
(C)	$CH_4 + Cl_2 \xrightarrow{Sunlight} CH_3Cl + HCl$	(r)	Neutralisation reaction
(D)	$CH_3COOH + NaOh \longrightarrow CH_3COONa + H_2O$	(s)	Esterification reaction

Ans : A-s, B-p, C-q, D-r

5. ASSERTION AND REASON

DIRECTION : In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

(e) Both Assertion and Reason are false.

1. **Assertion :** Graphite is slippery to touch.
Reason : The various layers of carbon atoms in graphite are held together by weak van der Wall's forces.
Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
A graphite crystal consists of various layers of carbon atoms in which each carbon atom is joined to three other atoms by strong covalent bonds. The various layers of carbon atoms in graphite are held together by weak van der Wall's forces making it slippery to touch.

2. **Assertion :** Diamond and graphite are allotropes of carbon.
Reason : Some elements can have several different structural forms while in the same physical state. These differing forms are called allotropes.
Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

3. **Assertion :** Third member of alkane is propane (C_3H_8).
Reason : It is obtained from general formula C_nH_{2n+2}.
Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion

(A).

C_3H_8 can be obtained from general formula, C_nH_{2n+2}

4. **Assertion :** Carbon shows maximum catenation property in the periodic table.
Reason : Carbon has small size and thus, forms strong C – C bond.
Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
Catenation is the bonding of atoms of the same element into a series, called as Chain. Catenation occurs more readily with carbon, which forms strong covalent bond with other C-atoms to form long chains and structures.

5. **Assertion :** Hydrogenation is the process of converting an oil into a fat, called vegetable ghee.
Reason : Hydrogenation is carried out in presence of a catalyst usually finely divided nickel.
Ans : (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

6. **Assertion :** Carbon monoxide is extremely poisonous in nature.
Reason : Carbon monoxide is formed by complete combustion of carbon.
Ans : (c) Assertion (A) is true but reason (R) is false.

7. **Assertion :** When ethanol is heated at 443 K with exces conc. H_2SO_4, ethene is obtained.
Reason : Conc. H_2SO_4 acts as a dehydrating agent.
Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
When ethanol is heated with conc. sulphuric acid $[H_2SO_4]$ at 443 K, dehydration takes place and ethene is obtained. In this, conc. H_2SO_4 acts as a dehydrating agent.

8. **Assertion :** CH_3Cl is obtained from CH_4 by the action of Cl_2 in the presence of sunlight.
Reason : It is obtained by addition reaction.
Ans : (c) Assertion (A) is true but reason (R) is false.
CH_3Cl is obtained from CH_4 by substitution reaction by the action of Cl_2 in the presence of sunlight.

9. **Assertion :** In esterification, carboxylic acid and alcohol reacts in the presence of acid to give ester.
Reason : Esterification is the reverse of saponification.
Ans : (c) Assertion (A) is true but reason (R) is false.
In estrification, RCOOH, -H is replaced by -R' of R'OH in the presence of acid to form RCOOR'.

10. **Assertion (A) :** Iso-butane is the isomer of C_4H_{10}
Reason (R) : Iso-butane has four C and ten-H atom.
Ans : (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

$CH_2-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH_3$ is the structural isomer of butane.

11. **Assertion :** The most of carbon compounds are good conductors of electricity.
Reason : They do not dissociate to form ions and remain as molecules.
Ans : (d) Assertion (A) is false but reason (R) is true.
Carbon compounds are mainly poor conductors of electricity.

12. **Assertion :** Cyclopropane is heterocyclic compond.
Reason : Cyclopropane comes into category of those compounds in which complete ring is formed by carbon atoms only.
Ans : (d) Assertion (A) is false but reason (R) is true.

13. **Assertion :** Acetic acid has six single bond and one double bond.
Reason : It is unsaturated organic compound.
Ans : (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

14. **Assertion :** Carbon has ability to form long carbon chains.
Reason : Carbon has a unique property of ability to form long straight and branched chains called catenation.
Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

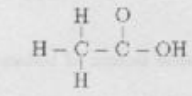
15. **Assertion :** Alcohols have similar chemical properties.
Reason : All alcohols contains similar hydroxy (-OH) functional group.
Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

16. **Assertion :** Propene reacts with HBr to give isopropyl bromide.
Reason : Addition of Br_2 to alkene place faster in presence of ionishing substance.
Ans : (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
Addition of unsymmetrical addendum on unsymmetrical alkene takes place according to Markownikoff's rule. The negative part of the addendum goes on to less hydrogenated carbon atom.

$$CH_3CH=CH_2 + HBr \longrightarrow \underset{\displaystyle Br}{\underset{|}{CH_3-CH-CH_3}}$$

Isopropyl bromide

Acetic acid has structure which has six single bond and only one double bond. It is an unsaturated organic compound.



17. Assertion : C_3H_8 and C_4H_{10} are the successive members of homologous series of methane.
Reason : Any two successive members in a homologous series differ in their molecular formula by $\alpha - CH_3$ unit.
Ans : (c) Assertion (A) is true but reason (R) is false.
Assertion is correct but reason is false. Any two successive members in a homologous series differ in their molecular formula by $-CH_2-$ unit.

18. Assertion : Carbon compounds can form chain, branched and ring structures.
Reason : Carbon exhibits the property of catenation.
Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

19. Assertion : Soaps are not suitable for washing purpose when water is hard.
Reason : Soaps have relatively weak cleansing action.
Ans : (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

20. Assertion : Carbon monoxide is extremely poisonous in nature.
Reason : Carbon monoxide is formed by complete combustion of carbon.
Ans : (c) Assertion (A) is true but reason (R) is false.

21. Assertion : Acetic acid is less acidic than alcohol.
Reason : The ion formed after the removal of proton from acetic acid is less stable.
Ans : (e) Both Assertion and Reason are false.
Both Assertion and Reason are false. Acetic acid is more acidic than alcohol because of the more stability of ion formed after the removed of a proton.

22. Assertion : Diamond and graphite are allotropes of carbon.
Reason : Some elements can have several different structural forms while in the same physical state. These forms are called allotropes.
Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

23. Assertion : Cooking oil decolourises bromine water.
Reason : Cooking oil is a saturated compound.
Ans : (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

24. Assertion : Soap has good cleansing action.
Reason : Soap has short chain of hydrocarbon. Which acts as hydrophobic and long ionic part which acts as hydrophilic.
Ans : (c) Assertion (A) is true but reason (R) is false.
Soap has long chain of hydrocarbon and short chain of ionic part.