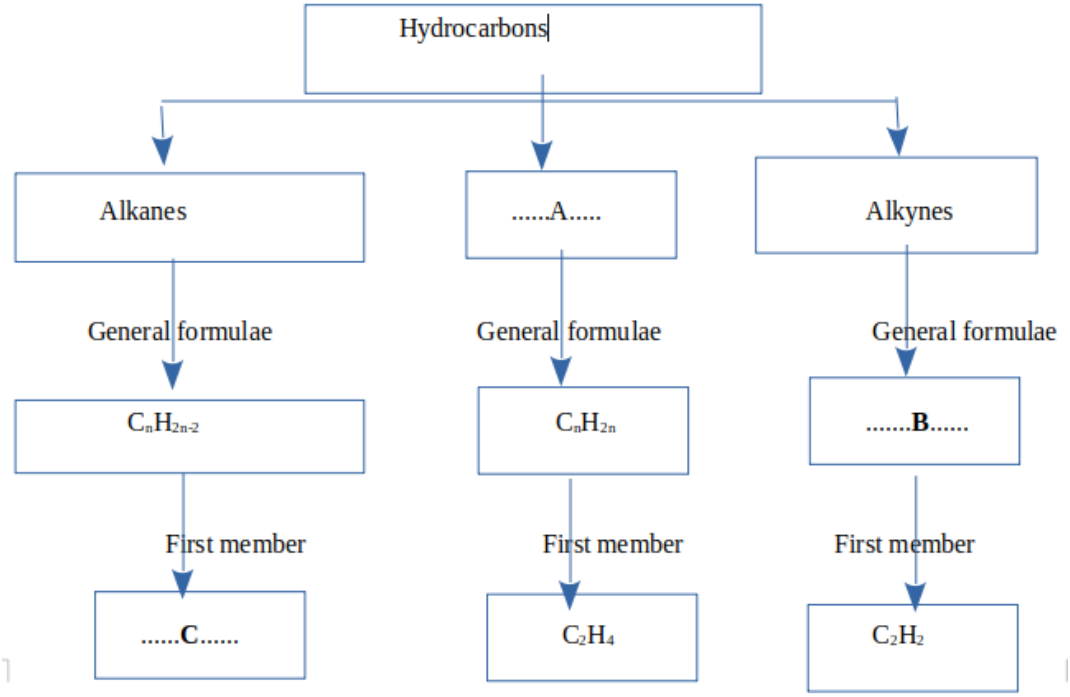
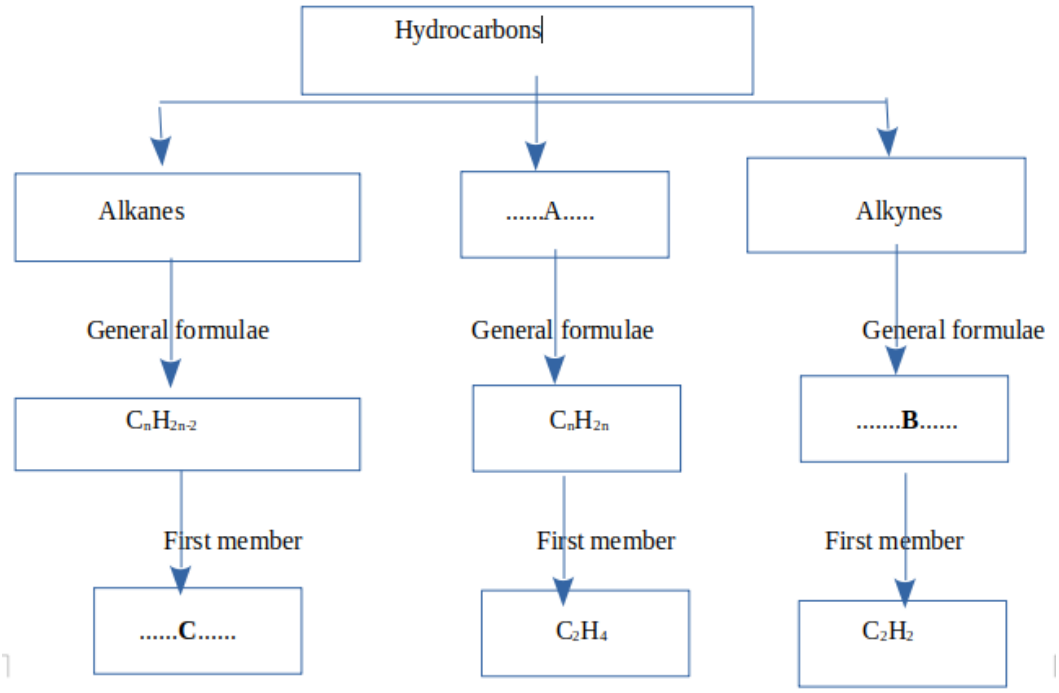
Nomenclature of Organic Compounds & Isomerism

Que 1: Complete the flow chart ***Marks :(3)***





Write A, B, and C

Ans: A - Alkenes

B - C_nH_{2n-2}

C - CH_4

B - C_nH_{2n-2}

C - CH_4

Que 2: The hints regarding a cyclic compound are given.*Marks :(4)*

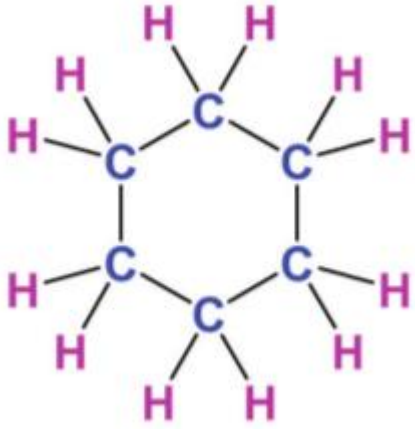
There are 6 carbon atoms.

There are 12 hydrogen atoms

1. **Write its structure**
2. **Write the molecular formula and IUPAC name of the alkane with the same number of carbon atoms**

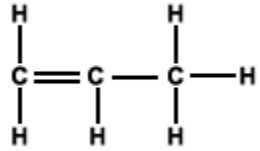
Ans:

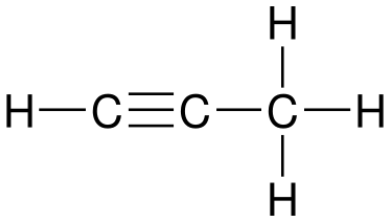
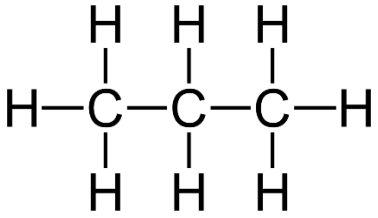
1.



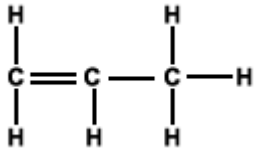
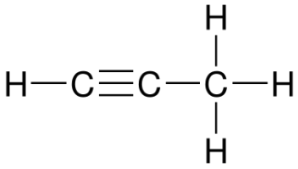
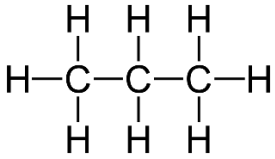
2.C_6H_{14} Hexane

Que 3: Match the following ***Marks :(3)***

A	B	C
	**Propyne**	**C_3H_8**

	**Propane**	**C_3H_6**
	**Propene**	**C_3H_4**

Ans:

A	B	C
	Propene	C_3H_6
	Propyne	C_3H_4
	Propane	C_3H_8

Que 4: Two hints regarding a hydrocarbon are given ***Marks :(4)***

There are four carbon atoms

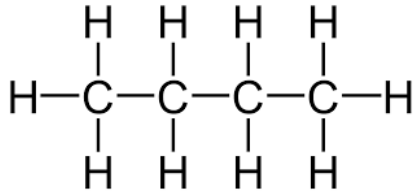
The general formula of the family of compound is C_nH_{2n+2}

1. **Give the molecular formula of this compound**
2. **Write the structure**
3. **What will be the molecular formula of the hydrocarbon with the same number of carbon atoms and having a double bond**

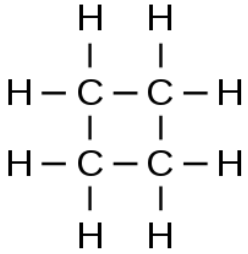
4. **Write the structure of the cyclic hydrocarbon with the same number of carbon atoms**

Ans:

1. C_4H_{10}

2. 

3. C_4H_8

4. 

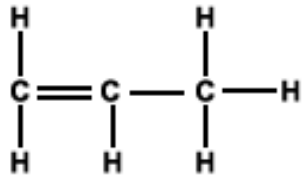
Que 5: Choose the odd one out. Give reason ***Marks :(2)***

(CH_4 , C_3H_4 , C_2H_2 , C_2H_4)

Ans: CH_4

CH_4 .is a saturated hydrocarbon where as the others are unsaturated

Que 6: The structure of a hydrocarbon is given ***Marks :(3)***



1. **Give its molecular formula**
2. **Write the IUPAC name of the compound**
3. **Write the IUPAC name of the cyclic compound with the same molecular formula**

Ans:

1. C_3H_6

2. Propene
3. Cyclopropane

Que 7: Complete this series ***Marks :(3)***

C_2H_4	C_3H_6	C_4H_8	.....a.....

CH_4	C_2H_6	.....b.....	C_4H_{10}

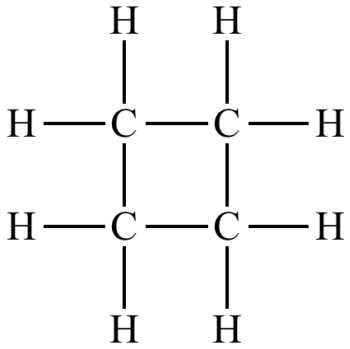
C_2H_2	..... c.....	C_4H_6	C_5H_8

Ans: a) C_5H_{10}

b) C_3H_8

c) C_3H_4

Que 8: The structure of a hydrocarbon is given ***Marks :(3)***



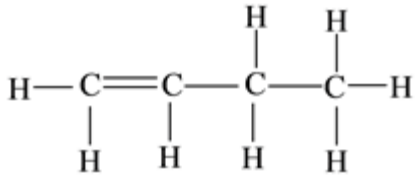
a) Give its molecular formula

b) Write its IUPAC name

c) Write the structure of the unsaturated compound with the same molecular formula

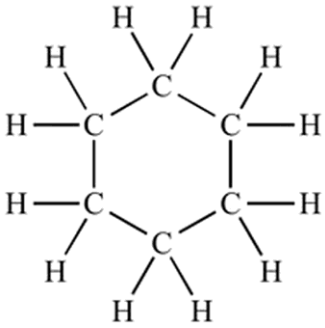
Ans: a) C_4H_8

b) Cyclobutene



c) 1-butene or CH_3-CH = CH-CH_3

Que 9: Look at the structure of the hydrocarbon



a) To which category of hydrocarbons does this compound belong?

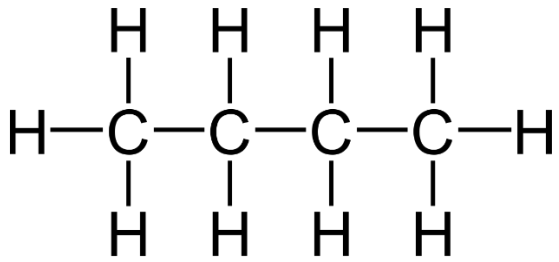
b) Give the molecular formula of this compound

c) Name this compound ***Marks :(3)***

Ans:

1. Cyclic compound
2. C_6H_{12}
3. Cyclohexane

Que 10: The structure of a hydrocarbon is given ***Marks :(3)***



a) Write its molecular formula

b) What is the word root used to represent the number of carbon atoms ?

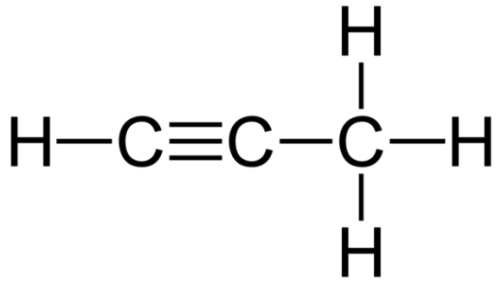
c) Write its IUPAC name

Ans: a) C_4H_{10}

b) But

c) Butane

Que 11: The structure of a hydrocarbon is given ***Marks :(3)***



a) What is the molecular formula of this compound

b) Write its IUPAC name

c) To which homologous series does this compound belong?

Ans: a) C_3H_4

b) Propyne

c) Alkyne

Que 12: To which category does CH_3-CH_2-CH_3 belong?

(Alkane, Alkene, Alkyne, Cyclo alkane) ***Marks :(1)***

Ans: Alkane

Que 13: Write the structure of C_3H_8 ***Marks :(1)***

Ans: CH_3-CH_2-CH_3

Que 14: Name the functional group of CH_3-CH_2-OH ? ***Marks :(1)***

Ans: Hydroxyl

Que 15: ***The structure of hydrocarbon is given.***

CH_3-CH_2-CH_2-CH_2-CH_2-CH_3

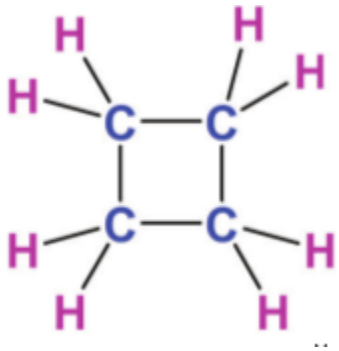
(a) Write the word root used to represent the number of carbon atoms in this compound ?

(b) Give the IUPAC name of this hydrocarbon ***Marks :(2)***

Ans: (a) Hex

(b) Hexane

Que 16: Structure of a cyclic compound is given ***Marks :(3)***



a) Write the molecular formula of the compound

b) Write its IUPAC name

c) Write the structure of an open chain hydrocarbon having the same formula

Ans:

1. C_4H_8
2. Cyclobutene
3. $CH_2 = CH- CH_2-CH_3$ / $CH_3-CH = CH- CH_3$

Que 17: Some hydrocarbons are given in the box ***Marks :(3)***

C_3H_4 , C_2H_6 , C_2H_2 , C_4H_8 , C_5H_{10}, C_3H_8

1. **Which belong to the family with the general formula C_nH_{2n+2}**
2. **Which compounds have a triple bond**
3. **Select the alkenes from the box ?**

Ans:

1. C_2H_6 , C_3H_8
2. C_3H_4 , C_2H_2
3. C_4H_8 , C_5H_{10}

Que 18: The details of the hydrocarbon P are given below ***Marks :(3)***

1. **There are 3 carbon atoms**
2. **The family of compounds with P as a member has a general formula C_nH_{2n}**
3. **The IUPAC name of P is Propene**

1. **Write the condensed formula of the compound**

2. **Write the IUPAC name of the compound which is before P in the homologous series**
3. **Give the molecular formula of the compound succeeding P in the series**

Ans:

1. $CH_2 = CH- CH_3$
2. Ethene
3. C_4H_8

Que 19: The details of the hydrocarbon P are given below ***Marks :(3)***

1. **There are 3 carbon atoms**
2. **The family of compounds with P as a member has a general formula C_nH_{2n}**
3. **The IUPAC name of P is Propene**

1. **Write the condensed formula of the compound**
2. **Write the IUPAC name of the compound which is before P in the homologous series**
3. **Give the molecular formula of the compound succeeding P in the series**

Ans:

1. $CH_2 = CH- CH_3$
2. Ethene
3. C_4H_8

Que 20: Given below is a homologous series ***Marks :(4)***

C_2H_2	**....A....**	**C_4H_6**	**....B....**

1. **What are A and B**

2. **To which family do this belong?**

   (Alkane, Alkene, Alkyne)
3. **Write the IUPAC name of A**

Ans:

1. A - C_3H_4

   B - C_5H_8

2. Alkyne
3. Propyne

Que 21: Given below is a homologous series ***Marks :(4)***

C_2H_2	....A....	C_4H_6	....B....

1. **What are A and B**
2. **To which family do this belong?**
   (Alkane, Alkene, Alkyne)
3. **Write the IUPAC name of A**

Ans:

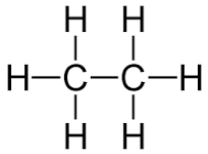
1. A - C_3H_4
   B - C_5H_8
2. Alkyne
3. Propyne

Que 22: The formulae given below are of a homologous series ***Marks :(4)***

CH_4	C_2H_6	C_3H_8

1. **To which category does this belong?**
   (Alkane, Alkene, Alkyne)
2. **Write the general formula of this family**
3. **Write the structure of C_2H_6**
4. **Write the IUPAC name of CH_4**

Ans:

1. Alkane
2. C_nH_{2n+2}
3. 
4. Methane

Que 23: The molecular formulae of some hydrocarbons are given ***Marks :(3)***

C_2H_4 , C_2H_2 , C_2H_6 , C_3H_4 , C_3H_8

1. **Which one belongs to the alkene family?**
2. **To which family does C_2H_2 belong?**
3. **Which belong to the family with general formula C_nH_{2n+2}**

Ans:

1. C_2H_4
2. Alkyne
3. C_2H_6 , C_3H_8

Que 24: Self-linking property of carbon atoms is known as ----------
Marks :(1)

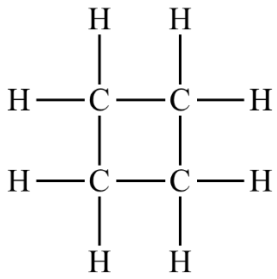
Ans: Catenation

Que 25: The molecular formula of a cyclic compound is C_4H_8.

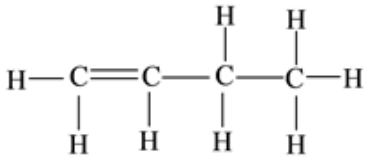
a) Write the structure of this compound

b) Write the structure of the open chain hydrocarbon having the same molecular formula. ***Marks :(3)***

Ans: a)



b)



1-butene

Que 26: What is the minimum number of carbon atoms required to form a cyclic compound.

(4 ,3, 2, 5) ***Marks :(1)***

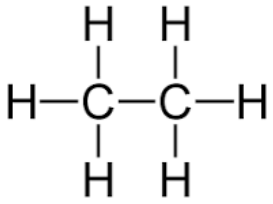
Ans: 3

Que 27: The formulae given below are of a homologous series ***Marks :(4)***

CH_4	C_2H_6	C_3H_8

1. **To which category does this belong?**
   (Alkane, Alkene, Alkyne)
2. **Write the general formula of this family**
3. **Write the structure of C_2H_6**
4. **Write the IUPAC name of CH_4**

Ans:

1. Alkane
2. C_nH_{2n+2}
3. 
4. Methane

Que 28: Match the following ***Marks :(3)***

A	B	C
Molecular formula	**Condensed formula**	**IUPAC Name**
C_3H_4	**CH_3 -CH_2 -CH_3**	**Propyne**
C_4H_8	**CH≡ C - CH_3**	**Butene**
C_3H_8	**CH_2 = CH- CH_2 - CH_3**	**Propane**

Ans:

A	B	C
Molecular formula	Condensed formula	IUPAC Name
C_3H_4	CH≡ C - CH_3	Propyne
C_4H_8	CH_2 = CH- CH_2 - CH_3	Butene

C_3H_8	$CH_3-CH_2-CH_3$	Propane

Que 29: The molecular formula of a hydrocarbon is C_2H_4

a) Name the homologous series of which this is a member

b) Write the molecular formula of the Fifth member

c) Write the structure of C_2H_4 and give its IUPAC name ***Marks :(3)***

Ans: (a) Alkene

(b) C_6H_{12}

(c) $CH_2 = CH_2$; Ethene

Que 30: The molecular formula of a hydrocarbon is C_2H_4

a) Name the homologous series of which this is a member

b) Write the molecular formula of the Fifth member

c) Write the structure of C_2H_4 and give its IUPAC name ***Marks :(3)***

Ans: (a) Alkene

(b) C_6H_{12}

(c) $CH_2 = CH_2$; Ethene

Que 31: Categorise the given hydrocarbons ***Marks :(3)***

C_2H_4 , C_3H_8 , C_4H_6 , CH_4 , C_5H_{10} , C_6H_{10}

(Hint: Hydrocarbons can be categorised as Alkanes, Alkenes, Alkynes)

Ans: Alkanes : CH_4 , C_3H_8

Alkenes : C_2H_4 , C_5H_{10}

Alkynes : C_4H_6 , C_6H_{10}

Que 32: Molecular formulae of some hydrocarbons are given in the box

C_3H_6 , C_4H_8 , C_5H_{10} , C_6H_{12}

a) To which Homologous series do these belong?

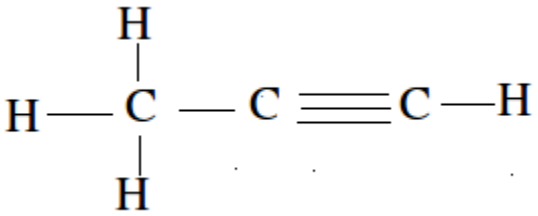
b) Give two reasons for them being homologous. ***Marks :(3)***

Ans: a) Alkene

(b) i. Immediate neighbors differ by CH_2

ii. Can be represented by a general formula **C_nH_{2n}**

Que 33: The structure of a hydrocarbon is given



a) Write the condensed formula

b) Write its molecular formula

c) Write the structure of the first member of homologous series having this one as a member and give its IUPAC name

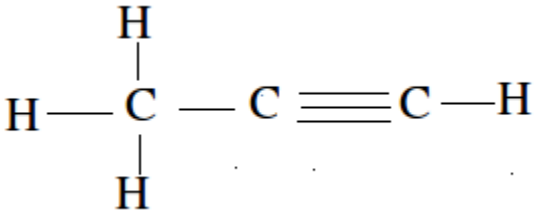
Marks :(4)

Ans: a) CH_3 - C ≡ CH

b) C_3H_4

c) CH ≡ CH Ethyne

Que 34: The structure of a hydrocarbon is given



a) Write the condensed formula

b) Write its molecular formula

c) Write the structure of the first member of homologous series having this one as a member and give its IUPAC name ***Marks :(4)***

Ans: a) CH_3 - C ≡ CH

b) C_3H_4

c) CH ≡ CH Ethyne

Que 35: C_2H_6 , C_3H_8 , ... , C_5H_{12} are the members of a homologous series

a) Write the molecular formula of the missing compound

b) What is the name of this homologous series

c) Write the structure of C_2H_6 ***Marks :(3)***

Ans: a) C_4H_{10}

b) Alkane

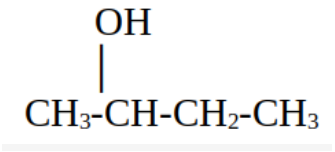
c) CH_3 - CH_3

Que 36: Name the functional group present in the compound CH_3-CH_2-CH_2-OH ? ***Marks :(1)***

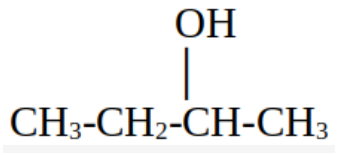
Ans: Hydroxyl

Que 37: The structures written by two students are given ***Marks :(4)***

Student 1:



Student 2 :



Write the IUPAC names and say whether these two are isomeric pairs

Ans: Student 1: Butan -2- Ol.

Student 2: Butan -2- Ol.

As both are the structure of the same compound, they are not isomeric pairs

Que 38:

C_3H_6 , C_3H_4, C_4H_8, C_4H_{10}

Of the given compounds, the name of which one ends with "-yne" ***Marks :(1)***

Ans: C_3H_4

Que 39: C_2H_6 , C_3H_8 , ... , C_5H_{12} are the members of a homologous series

a) Write the molecular formula of the missing compound

b) What is the name of this homologous series

c) Write the structure of C_2H_6 ***Marks :(3)***

Ans: a) C_4H_{10}

b) Alkane

c) CH_3 - CH_3

Que 40: Some molecular formulae are given ***Marks :(2)***

(i) C_5H_{12} (ii)C_5H_{10} (iii) C_5H_8 (iv) $C_5H_{12}O$

a) Which of the above is the molecular formula of Pent-2-ene ?

b) Write the structure of pent-2-ene.

c) Can there be a compound named pent-3-ene

Ans: (a) C_5H_{10}

(b) correct structure

(b) No

Que 41: Write the two possible structures of compounds with molecular formula C_2H_6O.Write their IUPAC names. ***Marks :(4)***

Ans: (a) CH_3-O-CH_3 Methoxymethane

(b) CH_3-CH_2-OH Ethanol

Que 42: The molecular formula of the carboxylic acid in vinegar is $C_2H_4O_2$

(a) Write the structural formula

(b) Give its IUPAC name ***Marks :(2)***

Ans: (a) CH_3-COOH

(b) Ethanoicacid

Que 43: CH_3-CH_2-CH_2-CH_2-CH_2-CH_3

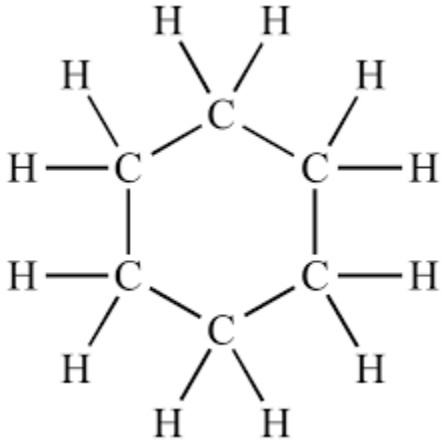
(a) Give the IUPAC name of the given open chain compound.

(b) Write the structure of the cyclic compound having the same number of carbon atoms

(c) Write the IUPAC name of this cyclic compound ***Marks :(4)***

Ans: (a) Hexane

(b)



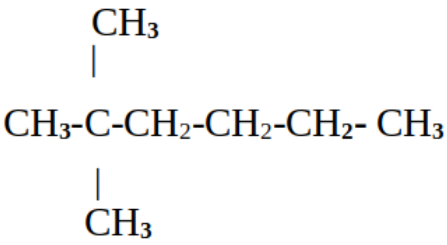
or any other correct answer

(c) Cyclohexane

Que 44: (a) Write the structure of 2,2-dimethylhexane

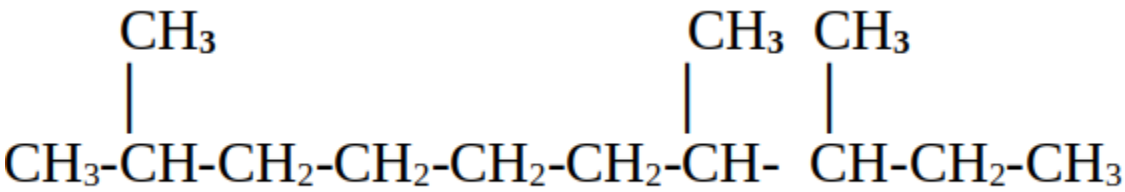
(b) Write the structure of any one its chain isomer ***Marks :(2)***

Ans:



(b) any correct one

Que 45:



The main chain consists of 10 carbon atoms and the same is represented by the word root 'dec'

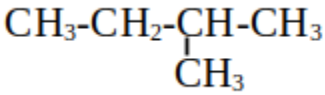
(a) Give the position of the branches

(b) Write the IUPAC name of the compound ***Marks :(2)***

Ans: (a) 2,7,8

(b) 2,7,8 – Trimethylbenzene

Que 46:



(a) How many carbon atoms are there in the main chain?

(b) Number the position of the carbon with the branch ?

(c) Name the branch?

(d) Write the IUPAC name of the compound ***Marks :(4)***

Ans: (a) 4

(b) 2

(c) Methyl

(d) 2- Methylbutane

Que 47:

(i) CH_3-O-CH_3

(ii) CH_3-CH_2-OH

(a) Write the IUPAC names of the given compounds

(b) Which type of isomers are these compounds ? ***Marks :(2)***

Ans: (a) (i) Methoxymethane

(ii) Ethanol

(b) Functional Isomers

Que 48: Look at the structure ***Marks :(3)***

CH_3-CH_2-CH_2-OH

(a) Write its IUPAC name

(b) Name its position isomer

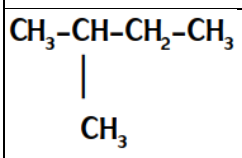
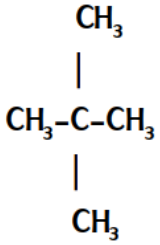
(c) Write the structure of its functional isomer

Ans: a) Propan-1-ol

b) Propan-2-ol

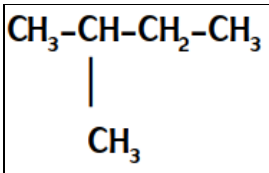
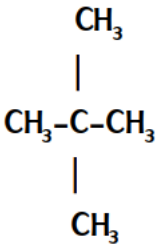
c) **CH_3-CH_2-O-CH_3**

Que 49: Match suitably ***Marks :(3)***

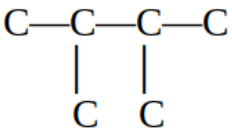
CH_3-CH_2-CH_2-CH_2-CH_3	**2,2- Dimethylpropane**
	**Pentane**
	**2- Methyl butane**

Ans:

CH_3-CH_2-CH_2-CH_2-CH_3	Pentane

	2- Methyl butane
	2,2- Di methyl Propane

Que 50: The chain of a hydrocarbon is given



(a) Complete the structure

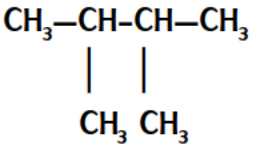
(b) How many carbon atoms are there in the longest chain

(c) Give the position of the branch

(d) Write down the IUPAC name of the compound ***Marks :(4)***

Ans:

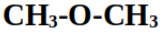
(a)



(b) 4

(c) 2,3

(d) 2,3-Dimethylbutane

Que 51: The structure of a compound is 

(a) What is the IUPAC name of the compound

(b) Write the structure of its isomer

(c) What is the IUPAC name of this isomer.

(d) What type of isomers are these compounds? ***Marks :(4)***

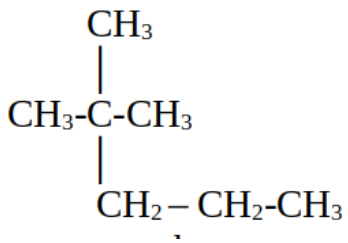
Ans: (a) Methoxy methane

(b) CH_3-CH_2-OH

(c) Ethanol

(d) Functional isomers

Que 52:



(a) How many carbon atoms are there in the longest chain of the compound given above?

(b) Give the position of the branches ?

(c) Write the IUPAC name of this compound *Marks :(3)*

Ans: (a) 5

(b) 2,2

(c) 2,2-Di methyl pentane

Que 53: See the structure given ***Marks :(4)***

CH_3-CH_2-CH_2-CH_3

(a) Write the IUPAC name of this compound

(b) Write the molecular formula of the alkene having the same number of carbon atoms

(c) Write the structures of the position isomers of this alkene.

Ans: (a) Butane

(b) C_4H_8

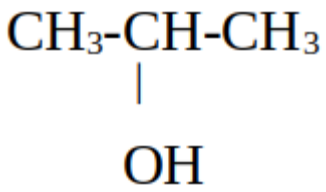
CH_2=CH-CH_2-CH_3

(c) CH_3 – CH=CH- CH_3

Que 54: a) Choose any pairs showing different types of isomerism from the structures given

CH_3-O-CH_2-CH_3

3. CH_3-CH_2-CH_2- OH



4.

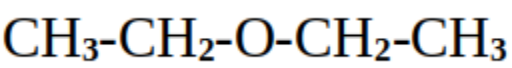
b) To which type of isomerism do these pairs belong? ***Marks :(4)***

Ans: 1. CH_3-O-CH_2-CH_3 / CH_3-CH_2-CH_2- OH

|

OH

Que 55: Examine the given structure ***Marks :(3)***



(a) Give the name of the functional group?

(b) Write the common name of the category of compounds with this functional group?

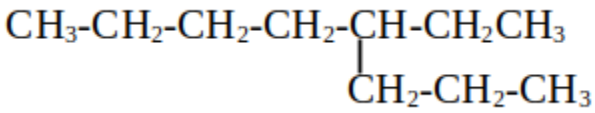
(c) Give the IUPAC name of the compound

Ans: (a)Alkoxy group OR Ethoxy

(b)Ethers

(c)Ethoxyethane

Que 56:



(a) How many carbon atoms are there in the parent chain of the above compound?

(b) What is the position of the branched carbon ?

(c) Give the name of the branch?

(d) Write the IUPAC name of the compound ***Marks :(4)***

Ans: (a) 8

(b) 4

(c) Ethyl

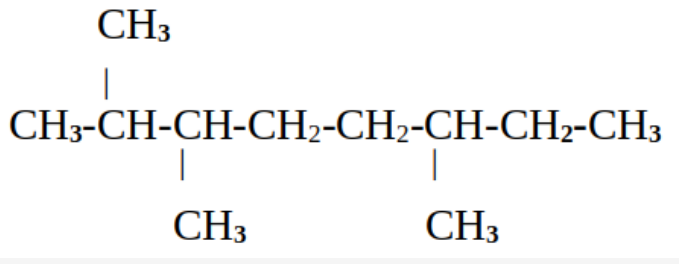
(d) 4- Ethyl octane

Que 57: To which category does the compound CH_3-CH=CH_2 belong?

(Alkane, Alkene, Alkyne, Cyclo alkane) ***Marks :(1)***

Ans: Alkene

Que 58:



(a) How many branches are there in the compound ?

(b)Give the position of the branches ?

(c) Write the IUPAC name ***Marks :(3)***

Ans: (a) 3

(b) 2,3,6

(c)2,3,6- Trimethyl octane

Que 59: Write the structure of but-2-ene ***Marks :(1)***

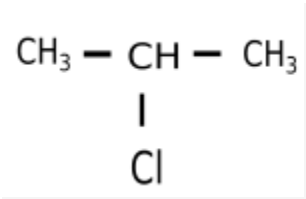
Ans: CH_3-CH=CH-CH_3

Que 60: To which category does CH≡CH belong?

(Alkane, Alkene, Alkyne, Cyclo alkane) ***Marks :(1)***

Ans: Alkyne

Que 61: Examine the given structural formula



(a) What is the molecular formula of the compound.

(b) Identify the functional group?

(c) Give the IUPAC name of the compound

(d) Write the structure of its isomer ***Marks :(4)***

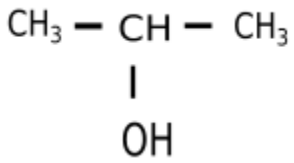
Ans: (a) C_3H_7Cl

(b) chloro / -Cl

(c) 2- chloropropane

(d) CH_3-CH_2-CH_2-Cl

Que 62:



(a) Name the functional group in this compound ?

(b) What is the common name of compounds with this functional group ?

(c) Give the IUPAC name of the compound ***Marks :(3)***

Ans: (a) Hydroxyl

(b) Alcohols

(c) Propan -2-ol

Que 63: The IUPAC name of a compound is *Pent-2-yne*

(a) To which category of hydrocarbons does this belong ?

(Alkane, Alkene, Alkyne,)

(b) Give the structure of the compound

(c) What is its molecular formula ? ***Marks :(3)***

Ans: (a) Alkyne

(b) CH_3-C≡C-CH_2 -CH_3

(c) C_5H_8

Que 64: The structure of a compound is CH_3-C≡C-CH_3

(a) What is its molecular formula

(b) To which category of hydrocarbon does this hydrocarbon belong

(Alkane, Alkene, Alkyne)

(c) Give the IUPAC name of this compound ***Marks :(3)***

Ans: (a) C_4H_6

(b) Alkyne

(c) But -2-yne

Que 65: *The IUPAC name of a compound is* Pent-2-yne

(a) To which category of hydrocarbons does this belong ?

(Alkane, Alkene, Alkyne)

(b) Give the structure of the compound

(c) What is its molecular formula ? ***Marks :(3)***

Ans: (a) Alkyne

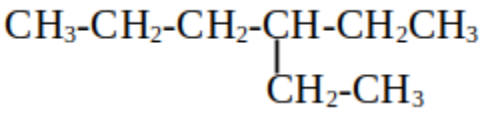
(b) CH_3-C≡C-CH_2 -CH_3

(c) C_5H_8

Que 66: Write the structure of

3- Ethyl hexane ***Marks :(1)***

Ans:



Que 67: CH_2=CH-CH_2-CH_3

(a) Write the IUPAC name of the compound

(b) What will be the IUPAC name of the compound, if the double bond were in between the second and third carbon atoms? ***Marks :(2)***

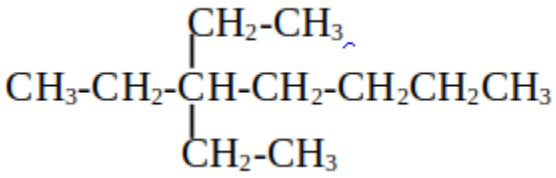
Ans: (a)But-1-ene

(b)But -2-ene

Que 68: Write the structure of ***Marks :(1)***

3,3 – Diethyl heptane

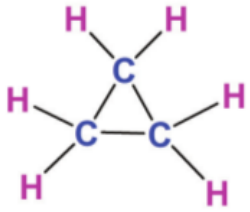
Ans:



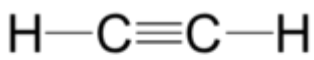
Que 69: Some carbon compounds are given

i) CH_2=CH_2

ii)



iii)



ethyne
(acetylene)

iv) CH_3-CH_2-CH_3

a) Categorise the above as alkane, alkene, alkyne and cyclic compound

b) Most of the compounds in nature contains carbon. Do you agree with this statement? Justify ***Marks :(4)***

Ans: i) Alkene

ii) Cyclic compounds

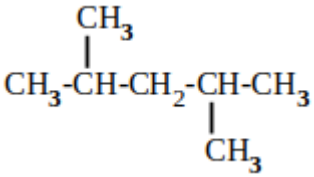
iii) Alkyne

iv) Alkane

b) Agree.

Carbon forms extremely large number of compounds. Compounds with single, double, and triple bonds between carbon atoms can be formed. Has self-linking property catenation to form chains and rings

Que 70:



(a) How many carbon atoms are there in the main chain ?

(b)Give the position of the branches?

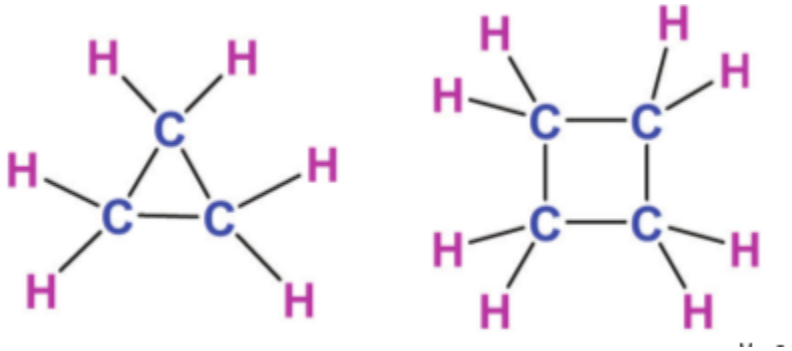
(c) Write the IUPAC name ***Marks :(3)***

Ans: (a) 5

(b) 2,4

(c)2,4- Dimethyl pentane

Que 71: A few structures are given

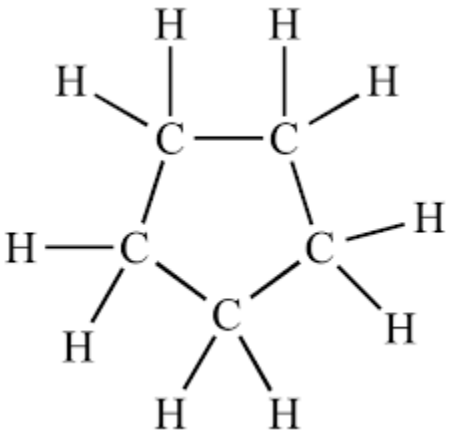


a) By which name are these compounds known?

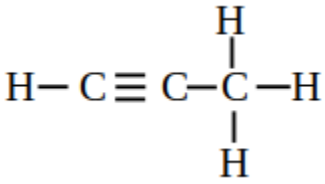
b) How many hydrogen atoms will be there in such a compound with five carbon atoms. Write the structure and give its IUPAC name ***Marks :(4)***

Ans: a) Cyclic compounds

b) 10 atoms, Cyclopentane



Que 72: The structure of a hydrocarbon is given



1.Write the IUPAC name of this compound

2.Write the general formula of the family having this one as a member

(C_nH_{2n+2}, C_nH_{2n}, C_nH_{2n-2})

3.Write the molecular formula of the compound after this one in the homologous series. ***Marks :(3)***

Ans:

1. Propyne
2. C_nH_{2n-2}
3. C_4H_6