Class:-8

Hydro Carbons

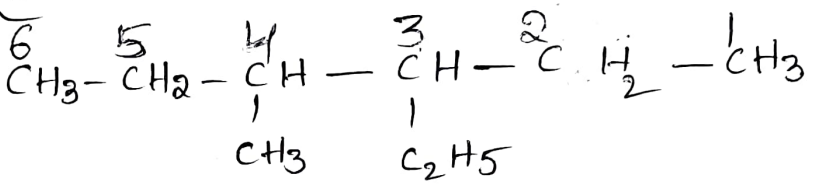
Teaching Task

JEE Main Level Questions

Q1) Ans:- B.

Solution:- $CH_3-CH_2-CH(CH_3)-CH(C_2H_5)_2$

Expansion:-

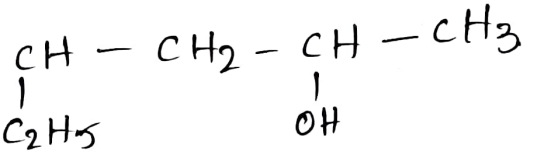


$C_2H_5 \rightarrow$ Ethyl $CH_3 \rightarrow$ Methyl.

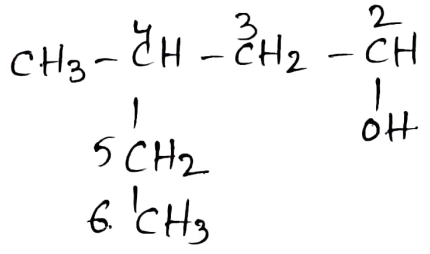
3-Ethyl-4-methyl hexane.

Q2) Ans:- B

Solution:-



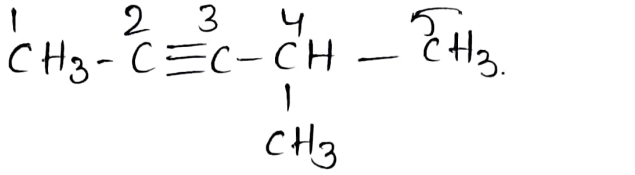
Expansion:-



4-Methyl-2-hexanol.

Q3) Ans:- A.

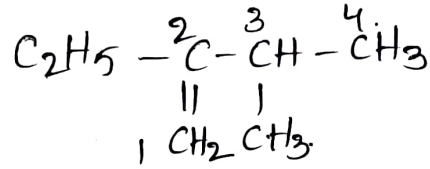
Solution:- $CH_3-C\equiv C-CH(CH_3)_2$



4-Methyl-2-pentyne

Q4) Ans:- 2.

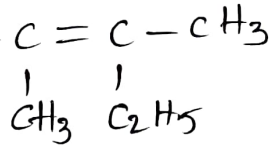
Solution:-

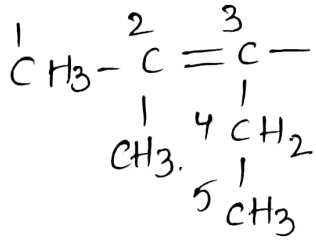


2-Ethyl-3-methyl butene-1.

Q5) Ans:- 4.

Solution:-

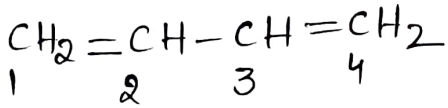




2,3-dimethyl pent-2-ene

Q6) Ans:- 2

Solution:-



1,3-Butadiene

Q7) Ans:- 2.

Solution:- $CH_2=CH-\underset{3}{CH}(\underset{4}{CH_3})-CH_3$.
1 2 3 4.

3-Methyl-1-Butene

Q8) Ans:- 4.

Solution:- $(CH_3)_3-C-CH_3$.

$CH_3-\underset{2}{C}(CH_3)_2-\underset{3}{CH_3}$

2,2-Dimethylpropane.

Q9) Ans:- 1

Solution:- $\overset{5}{CH_3}-\overset{4}{CH_2}-\overset{3}{CH_2}-\overset{2}{CH}(\overset{1}{CH_3})=\overset{1}{CH_2}$

2-Methyl pentene-1

Q10) Ans:- 2

Solution:- 4-methyl pent-2-ene

$\overset{5}{CH_3}-\overset{4}{CH}(\overset{1}{CH_3})-\overset{3}{CH}=\overset{2}{CH}-\overset{1}{CH_3}$.

Q11) Ans:- 2

Solution:- $CH_3-\overset{2}{CH}(\overset{1}{C_2H_5})-CH_2-\overset{4}{CH}(\overset{1}{C_2H_5})-CH_3$

$CH_3-\overset{3}{CH}(\overset{2}{CH_2}\overset{1}{CH_3})-\overset{4}{CH_2}-\overset{5}{CH}(\overset{6}{CH_2}\overset{7}{CH_3})-CH_3$

3,5-dimethyl heptane

Advanced level Questions

Q12) Ans:- A, B, C, D.

Solution:-

→ Hydrocarbons which contain single bonds are saturated, they are called paraffins or alkanes.

→ General formula for alkanes is C_nH_{2n+2}

→ Compounds with '=', '≡' bond are called unsaturated hydrocarbons.

Q13) Ans:- 1.

Solution:- When 2 or more substituents are present, the parent chain should be numbered to give the lowest set of locants based on lowest locant rule.

Q14) Ans:- 1.

Solution:- $\overset{5}{C}H_3-\overset{4}{C}H=\overset{3}{C}H-\overset{2}{C}\equiv\overset{1}{C}H$

pent-3-en-1-yne

lowest locant rule for the multiple bond

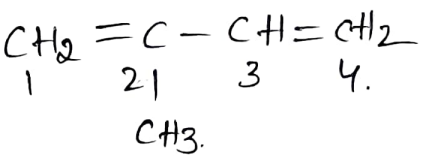
Q15) Ans:- 1

Solution:- $\overset{1}{C}H_3-\overset{2}{C}\equiv\overset{3}{C}-\overset{4}{C}H_2-\overset{5}{C}H(\overset{1}{C}H_3)-\overset{6}{C}H_3$

5-Methyl-2-hexyne.

Q16) Ans:- 2

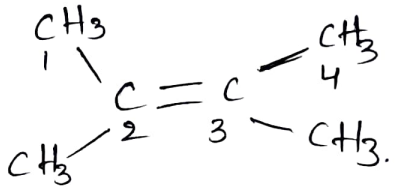
Solution:-



2-methyl buta-1,3-diene.

Q17) Ans:- 2.

Solution:-



2,3-dimethyl but-2-ene

Integer Type.

Q18) Ans:- 1

Solution:- Alkane → C_nH_{2n+2}.

Alkyl group → C_nH_{2n+1}.

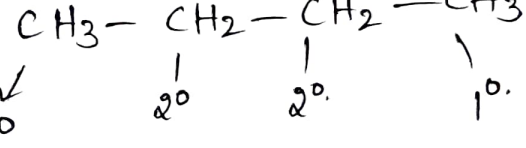
Difference is 1 hydrogen atom.

Q19) Ans:- 2.

Solution:- Structure of n-butane

$CH_3-CH_2-CH_2-CH_3$.

Primary Carbon (1°) → These are carbons bonded to only one other carbon atom.



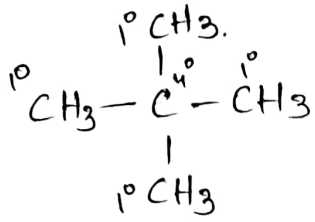
2 - primary Carbons

Matrix Matching

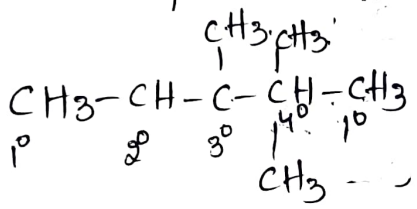
Q20) Ans:- A) 4 B) 3 C) 2 D) 5

Solution:-

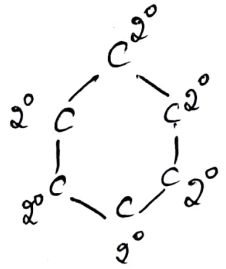
A) Neopentane → 4) 1° and 4° Carbons.



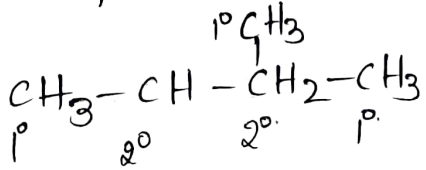
B) 2,2,3-Trimethyl pentane → 3) 1°, 2°, 3°, 4°- Carbons



C) Cyclohexane → 2) All are 2° Carbons.



D) Isopentane → 5) 1° and 2° Carbons



Learners Task.

Q1) Ans:- 1

Solution:- When a hydrogen atom is removed from an alkene, the resultant residue is called an alkenyl group

Q2) Ans:- 2.

Solution:- Alkenes are unsaturated hydrocarbons that contain at least one C=C.

Q3) Ans:- D.

Solution:- Acetylene is the common name for the simplest alkyne, which has a carbon-carbon triple bond (≡)

→ The IUPAC name for acetylene is Ethyne

$$H-C\equiv C-H$$

Q4) Ans:- C.

Solution:- Ethyne (C_2H_2) ⟶ $H-C\equiv C-H$

Triple bond b/w carbon-carbon [C≡C]. → 1

Q5) Ans:- B.

Solution:- General formula for Alkynes is C_nH_{2n-2}.

Q6) Ans:- D.

Solution:- Compared to alkenes (C_nH_{2n}), alkynes (C_nH_{2n-2}) have two fewer hydrogen atoms

Q7) Ans:- C

Solution:- General formula for Alkane series → C_nH_{2n+2}

Q8) Ans:- 4.

Solution:- Primary suffix is used to indicate the type of bond in a hydrocarbon.

→ ane (—) → Saturated.

→ ene (=) → Unsaturated

→ yne (≡) → Unsaturated

Alkenes & Alkynes are unsaturated.

Q9) Ans:- 4.

Solution:- Alkanes (single bonds only) → suffix-ane.

Alkenes (Atleast one = bond) → suffix — ene.

Alkynes (Atleast one ≡ bond) → suffix - yne.

Q10) Ans:- 2, 3.

Solution:- Alkene & Alkyne are unsaturated hydrocarbon

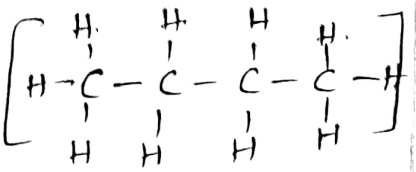
JEE Main Level Questions

Q11) Ans:- B.

Solution:- Alkenes are characterized by Carbon-Carbon double bonds (C=C)

Q12) Ans:- C.

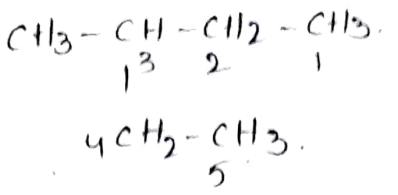
Solution:- $\overset{1}{C}H_3-\overset{2}{C}H_2-\overset{3}{C}H_2-\overset{4}{C}H_3$



4 Carbons, all are single bonds → Butane.

Q13) Ans:- D.

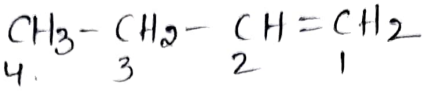
Solution:-



3-methyl pentane.

Q14) Ans:- A

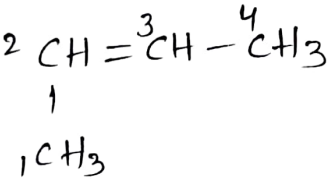
Solution:-



IUPAC Name → Butene.

Q15) Ans:- C

Solution:-



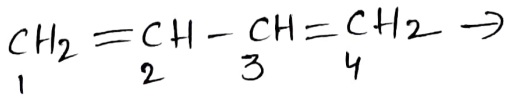
But-2-ene → 4 Carbons & double at 2nd carbon.

Q16) Ans:- 3.

Solution:- Secondary prefix + Rootword + Primary prefix + primary suffix + Secondary suffix.

Q17) Ans:- B

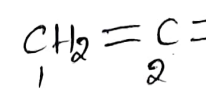
Solution:-



→ 1,3-Butadiene.

Q18) Ans:- A

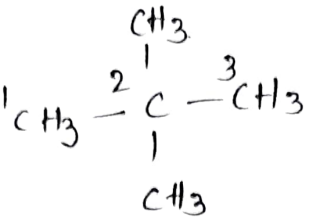
Solution:-



1,2-propadiene & propadiene

Q19) Ans:- 3.

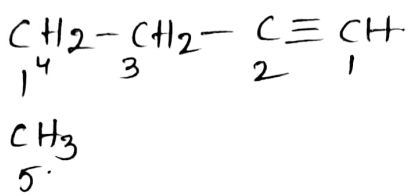
Solution:- Neo-pentane is a branched isomer of pentane.



2,2-dimethyl propane

Q20) Ans:- A

Solution:-



Pent-1-yne. or Pentyne.

Advanced Level Questions

Q21) Ans:- 1,2,3,4.

Solution:-

→ Alicylic compound is saturated cyclic hydrocarbons.

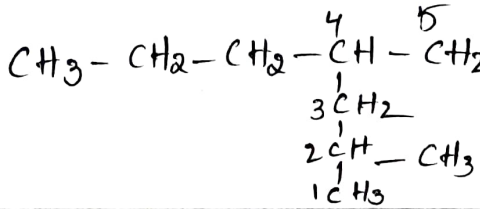
→ Aromatic compounds are unsaturated cyclic hydrocarbons.

→ Ethyne's (C_2H_2) trivial name is acetylene.

→ Propyne's (C_3H_4) trivial name is methyl acetylene.

Q22) Ans:- A

Solution:-



2-methyl-4-propyl heptane.

Q23) Ans:- 1

Solution:- 2-methyl-2-butene.

But → 4 Carbon methyl → CH_3.

$$\overset{1}{CH_3}-\overset{2}{\underset{\displaystyle CH_3}{\underset{|}{C}}}=\overset{3}{CH}-\overset{4}{CH_3}$$

Integer Type.

Q24) Ans:- 6.

Solution:- 6 carbon in root word Hex.

Matrix Matching.

Q25) Ans:- i) q ii) r iii) s iv) p.

Solution:-

	Alkyl group
i) CH_4 (Methane) →	q) Methyl
ii) C_2H_6 (Ethane) →	r) Ethyl.
iii) C_3H_8 (propane) →	s) Propyl.
iv) C_4H_{10} (Butane) →	p) Butyl.