Note:– C की valency 4 होती है। covalent bond, और कारण इसकी covalency 4 होती है।

Vital Force theory :– (scientist → Brezellies) :–
Organic comps are those comps which are syntiside (synthesise) living body and can't be synthiside out side the living body or labotory.

Felour of vital Force theory (sc. F. wholer) :–
F. wholer Face VFT by preparing urea (an organic comp.) by heating NH_4CNO in the labotory.

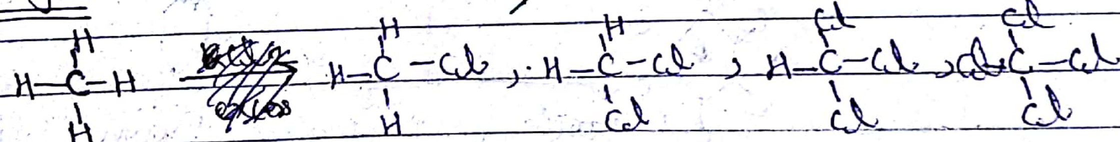
$NH_4Cl + K^+CNO \longrightarrow NH_4CNO$

NH_4CNO (Amonium cynate) $\xrightarrow[\text{Heat}]{\text{Reasrangment}}$ $NH_2-\overset{O}{\overset{\|}{C}}-NH_2$ (Urea)

New concept of organic compounds :– Carbon and its derivative are the organic comp. which may be syntetes inside the living body and outside the living body.

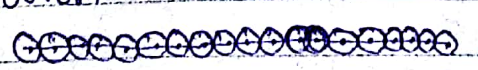
property :– ① covelency →

Ex.→



② **Catanation** → Self linking or self combining property of an atom.

Ex.→ in C



in Si

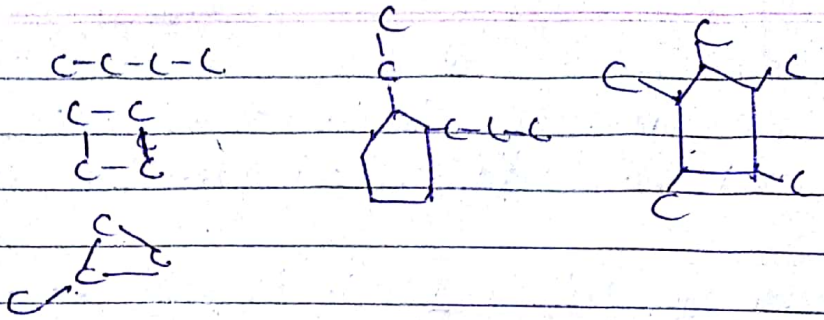
③ **Multiple bonding :–**

C–C
C=C
H–C≡C–H

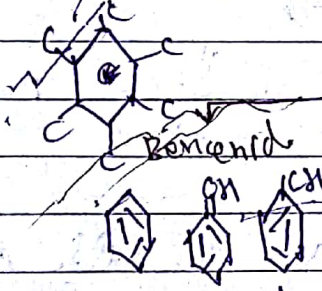
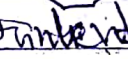
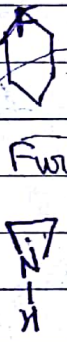
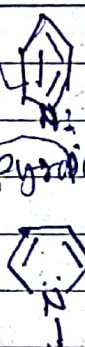
C=O
C=N–
C=S
C≡N

–N–N–
–N=N–
–N=N–
N=O

C=C–C=C–C=C–C

④ Cyclisation → C-C-C C-C-C-C 

Organic compound

- open chain or, Aliphatic comp.
  - Hydrocarbon
    - Saturated → Alkane C_nH_{2n+2}
    - Unsaturated
      - Alkene, C_nH_{2n}
      - Alkyne, C_nH_{2n-2}
- closed chain or, cyclic comp.
  - Homocylic
    - Homo-alicylic
    - Aromatic → Benzenoid (), non benzenoid ()
  - Hetro cyclic
    - Alicyclic → Furan ()
    - Aromatic → pyridine (), pyrrole ()

Hydrocarbon

- Saturated → Alkanes, C_nH_{2n+2} (C–C)
- Unsaturated
  - Alkene, C_nH_{2n} (C=C)
  - Alkyne, C_nH_{2n-2} (C≡C)

All = no. of carbon

n = 1 → Meth	7 → Hept
2 → eth	8 → Oct
3 → prop	9 → None
4 → but	10 → Dec
5 → pent	11 → Undec
6 → Hex	12 → dodec

*Alkane (C_nH_{2n+2}) (C–C)

n=1 ⇒ CH_4 → Methane	n=3 ⇒ C_3H_8 → propane
n=2 ⇒ C_2H_6 → Ethane	n=4 ⇒ C_4H_{10} → Butane

* Alkene (C_nH_{2n}) → (C=C)
$n \neq 1$

n=2 ⇒ C_2H_4 ⇒ Ethene

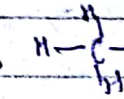
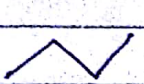
n=3 ⇒ C_3H_6 ⇒ propene

* Alkyne (C_nH_{2n-2}) → (C≡C)
$n \neq 1$

n=2 ⇒ C_2H_2 ⇒ Ethyne

n=3 ⇒ C_3H_4 ⇒ propyne

formula

	Methane	Ethane	propane	Butane
* Molecular formula →	CH_4	C_2H_6	C_3H_8	C_4H_{10}
Structural formula →				
Condensed formula →	CH_4	CH_3-CH_3	$CH_3-CH_2-CH_3$	$CH_3-CH_2-CH_2-CH_3$
Bond line formula →	—			

Ex(i) C_2H_4 C_3H_6 C_4H_8 C_2H_2 C_8H_{14}

$CH_2=CH_2$

Ex(ii)

(3) Nomenclature of Organic Comp.:—

→ Trivial Name. } Local
→ Common name. }

→ I.U.P.A.C Nomenclature

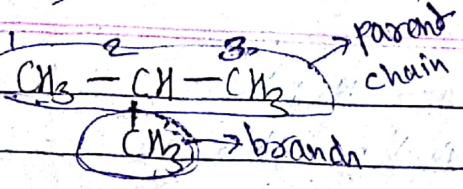
CH_4 (Methane)	HCOOH	CH_3-OH	COOH / COOH
→ Marsh gas	→ Formic acid	→ wood spirit	→ oxalic acid
→ Natural gas (CNG)	→ Formica	(Destructive distillation of wood)	→ Oxidus
→ Bio gas	↓		
→ Fire damp.	Red Ant		

→ Lactic acid → Curd → ~~Lacto~~ $\left(CH_3-\underset{OH}{CH}-COOH\right)$ or

→ Tulic → Phenol → Phene → Carbolic acid → phenic acid → phenylic acid
→ Hydroxy-benzene

* Alkane, i- (i) CH_4 — Methane.
(ii) CH_3-CH_3 — Ethane.
(iii) $CH_3-CH_2-CH_3$ — propane.
(ix) $CH_3-CH_2-CH_2-CH_3$ — n-Butane.
I- Butane.

→ Find out the longest chain

(v) 

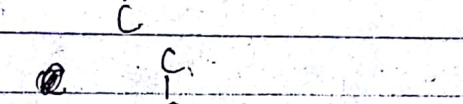
→ C = iso-butane
I = 2-Methyl propane

(vi) $CH_3-CH_2-CH_2-CH_2-CH_3$ → C = n-pentane
I = pentane

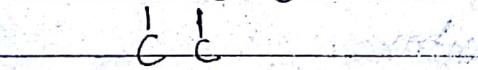
(vii) $CH_3-CH(CH_3)-CH_2-CH_3$ → C = iso-pentane
I = 2-Methyl butane

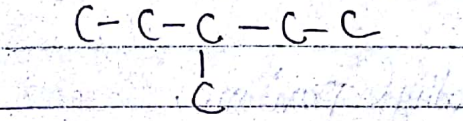
(viii) $CH_3-C(CH_3)_2-CH_3$ → C = neo-pentane
I = 2,2-Dimethyl propane

(ix) C-C-C-C-C-C → C = n-Hexane
I = Hexane

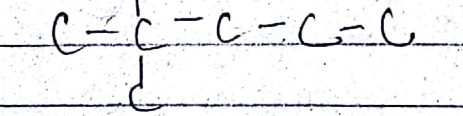
(x)  → C = iso-Haxane
I = 2 Methyl pentane

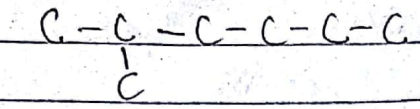
(xi) → C = Neo-Hexane
I = 2,2 dimethyl butane

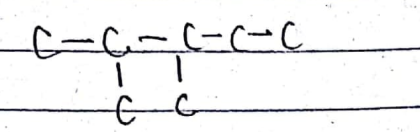
(xii)  → I = 2,3 dimethyl butane

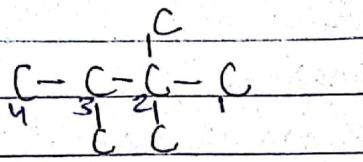
(xiii)  → I = 3 Methyl pentane

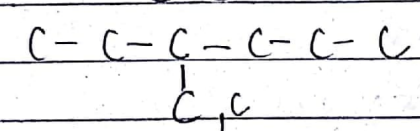
(xiv)  → C = n-Heptane
I = Heptane

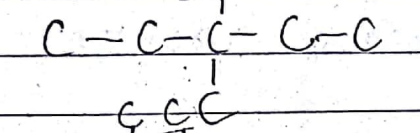
(xv)  → C = neo-Heptane
I = 2,2 dimethyl pentane

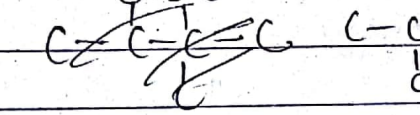
(xvi)  → C = iso - Heptane
→ I = 2 Methyl, Hexane

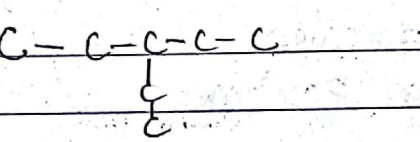
(xvii)  → I = 2,3 dimethyl, Pantane

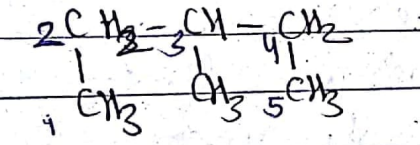
(xviii)  → I = 2,2,3 dimethyl, butane

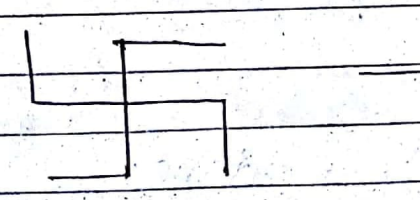
(xix)  → I = 3 Methyl, Hexane

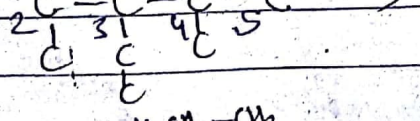
(xx)  → I = 3,3 dimethyl, Pantane

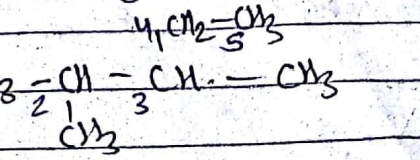
(xxi)  → I = 2,4 dimethyl, pantane

(xxii)  → I = 3 ethyl, pantane

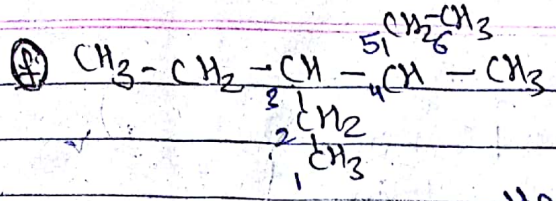
Q.1? (a)  → I = 3 methyl, pantane,

(b)  → 3,3 diethyl, pantane,

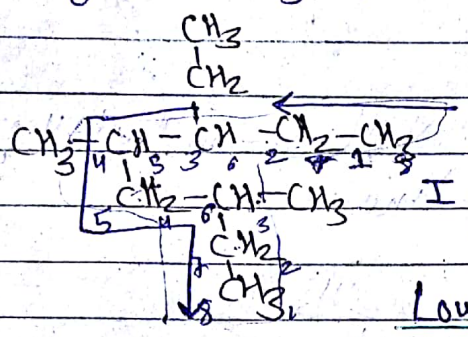
(c)  → 3-Ethyl-2,3-dimethyl pantane

(d)  → 2,3-dimethyl, pantane

(e) → 3,4-dimethyl ~~pantane~~ Hexane

(G) 

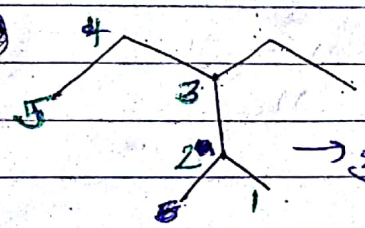
→ 3-Ethyl-4-methyl Hexane ~~Pentane~~

(H) 

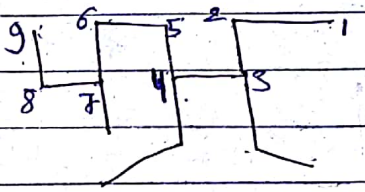
→ 3 Ethyl 2,4 dimethyl Hexane

I → 3 Ethyl-4,6-dimethyl Octane

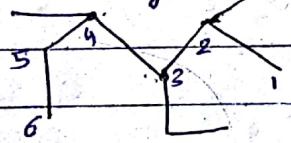
Lowest sum Rule 3+4+6 = 13 ✓ 3+5+6 = 14

(I) 

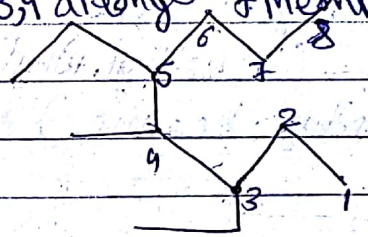
→ 3 ~~Ethyl~~ 2-methyl pentane

(J) 

→ 3-Ethyl-4-methyl pentane

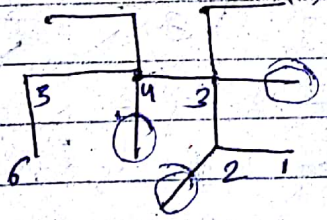
(K) 

→ 3 Ethyl 2,4 dimethyl Hexane

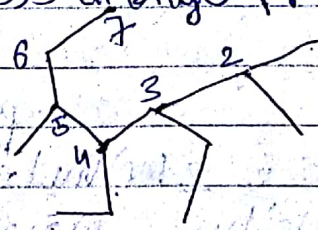
(L) 

→ 3,4 diethyl-7 Methyl Nonane

→ 3,5 diethyl-4-methyl Octane

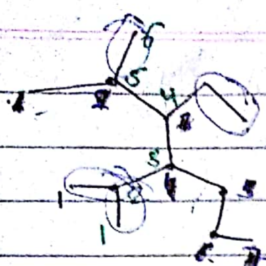
(M) 

→ 3,4 diethyl-2 Methyl Hexane

(N) 

→ 3,4 diethyl-2,5-dimethyl Heptane

(M)

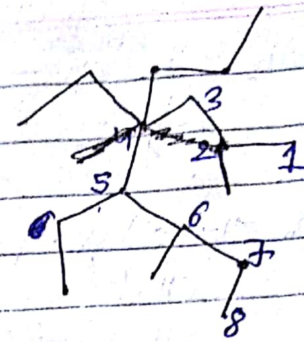


सिर्फ संख्या C है
तो कम No. मिलना
चाहिए।

→ ~~3,4,4 triethyl-2-methyl Heptane~~

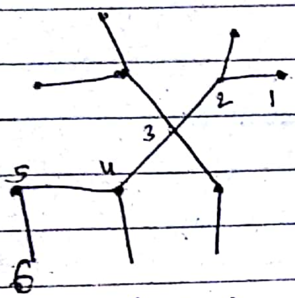
→ 4-ethyl-2,5-dimethyl-3-propyl hexane

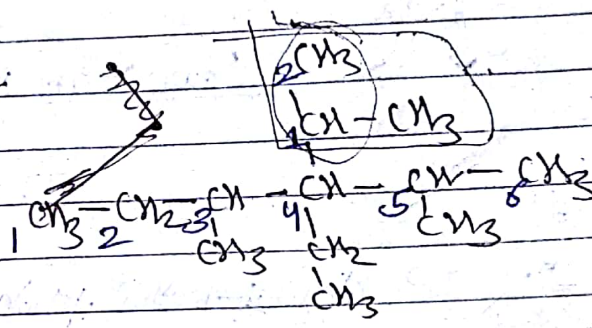
(N)



→ 4,5 diethyl-6-methyl-4-propyl octane

(O)

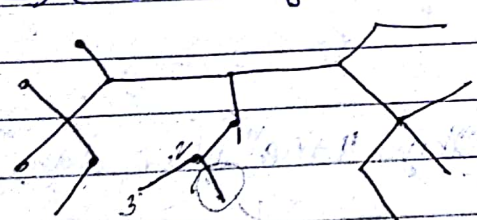


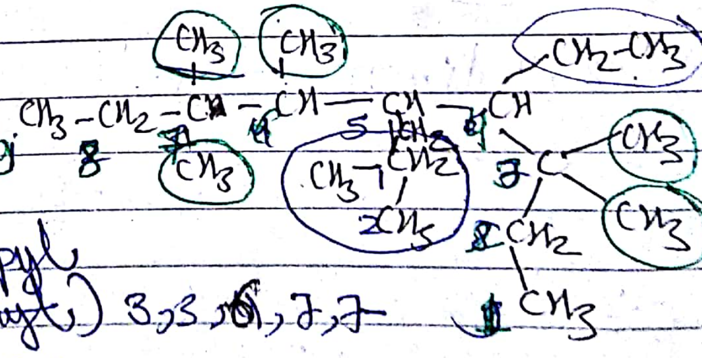
→ 

→ ~~3 ethyl (isopropyl) 3 ethyl 2,4 dimethyl hexane~~

→ 3 ethyl-3-(1-methyl ethyl)-2,4-dimethyl hexane)

(P)

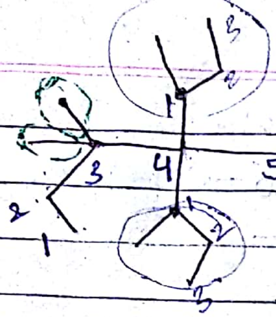


→ 

→ 4 ethyl-5 (2 methyl ~~ethyl~~ propyl) 3,3,6,7,7 penta methyl Nonane

→ 5 (2-methyl propyl)-4-ethyl-3,3,6,7,7-penta methyl nonane

Q.



Rule :- दो complex substituense हो तो
2 → bis
3 → tris
4 → tetrakis

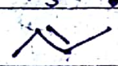
→ 4,4-bis (1-methyl propyl)
3,3,5,5 - tetra methyl heptane

II → Alkene :→ {C_nH_{2n}} ⇒ [C=C]

Ex.→ C_2H_4
- M.F. → C_2H_4
- S.F. → H-C(H)=C(H)-H
- C.F. → $CH_2=CH_2$
- B.L.F. → =

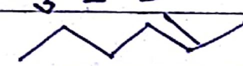
Q.

(i) C_4H_8
- M.F. → C_4H_8
- S.F. → H-C(H)(H)-C(H)=C(H)-C(H)(H)-H
- C.F. → $CH_3-CH=CH-CH_3$
- B.L.F. →



(ii) C_5H_{10}
- → C_5H_{10}
- → -C-C-C=C-C-
- → $CH_3-CH_2-CH_2=CH-CH_3$
- →

(iii) C_6H_{12}
- → C_6H_{12}
- → -C-C-C-C=C-C-
- → $CH_3-CH_2-CH_2-CH=CH-CH_3$
- →



Q.(a) $CH_3-CH_2-CH=CH-CH_2-CH_2-CH_3$ → Hept-3-ene
(b) $CH_2=CH-CH_2-CH_2-CH_2-CH_3$ → Hex-1-ene
(c) $CH_3-CH=CH-CH_2-CH_2-CH_2-CH_2-CH_3$ → Oct-2-ene
(d) $\overset{1}{C}H_2=\overset{2}{C}H-\overset{3}{C}H=\overset{4}{C}H_2$ → But-1,3-Diene ✗

Imp. Note → यदि दो या दो से अधिक (=) bond या (≡) आ जाए तो But का Buta लिखेंगे।

→ Buta-1,3-diene ✓

(E) $\overset{1}{CH_3}-\overset{2}{CH}=\overset{3}{CH}-\overset{4}{CH}=\overset{5}{CH}-\overset{6}{CH_3}$ → Hexa-2, 4-diene

(F) $\overset{8}{CH_3}-\overset{7}{CH}=\overset{6}{CH}-\overset{5}{CH}=\overset{4}{CH}-\overset{3}{CH_2}-\overset{2}{CH}=\overset{1}{CH_2}$ → octa-1, 4, 6-triene

(G) $\overset{11}{CH_3}-\overset{10}{CH_2}-\overset{9}{CH}=\overset{8}{CH}-\overset{7}{CH}=\overset{6}{CH}-\overset{5}{CH}=\overset{4}{CH}-\overset{3}{CH}=\overset{2}{CH}-\overset{1}{CH_3}$ → ~~Und~~

→ Undeca 2, 4, 6, 8 - tetraene

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

→ 3 Methyl but-1-ene

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

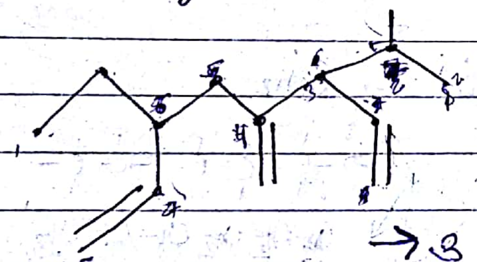
→ 3 methyl Hexa 1, 4-diene

(J) $\overset{1}{CH_3}-\overset{2}{C}(CH_3)=\overset{3}{CH}-\overset{4}{CH}=\overset{5}{CH}-\overset{6}{CH_3}$

→ 2 Methyl Hexa 2, 4-diene

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

→ 4, 6 dimethyl Hepta-2, 4-diene

(L) 

→ $\overset{8}{CH_2}=\overset{7}{CH}-\overset{6}{CH}(CH_2CH_3)-\overset{5}{CH_2}-\overset{4}{C}(=CH_2)-\overset{3}{C}H(CH(CH_3)-CH_3)-\overset{2}{CH}=\overset{1}{CH_2}$

(complex substituent)

→ 3 (1 methyl Ethyl) - 6 ethyl - 4 methenyl - octa 1, 7-di...

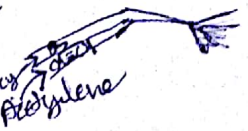
यहाँ (Complex) ~~...~~

Note:-

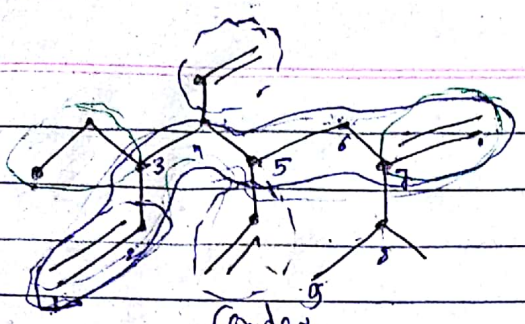
- $-CH=CH_2$ → Ethenyl (vinyl group)
- $-C\equiv CH$ → Ethynyl
- $=CH_2$ → Methenyl
- $\equiv CH$ → Methynyl
- $-\overset{1}{CH_2}-\overset{2}{C}\equiv\overset{3}{CH}$ → prop-2-yn-1-yl
- $-\overset{1}{C}\equiv\overset{2}{C}-\overset{3}{CH_3}$ → propynyl
- $-\overset{1}{CH_2}-\overset{2}{CH}=\overset{3}{CH_2}$ → prop-2-en-1-yl
- $-\overset{1}{CH}=\overset{2}{CH}-\overset{3}{CH_3}$ → propenyl

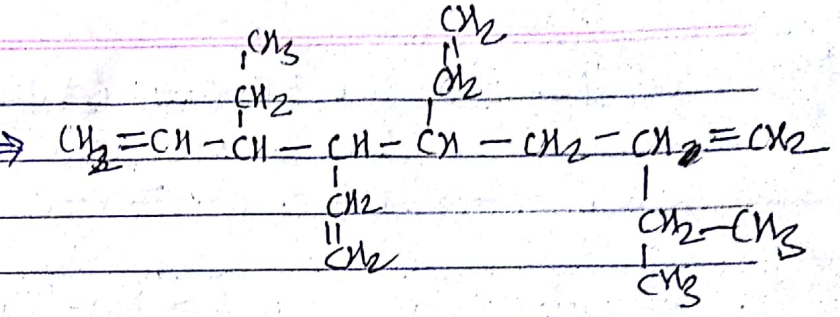
Scanned by CamScanner

Use → C_2H_2 → oxy-Acetylene gas welding



(M)

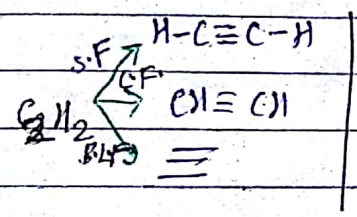


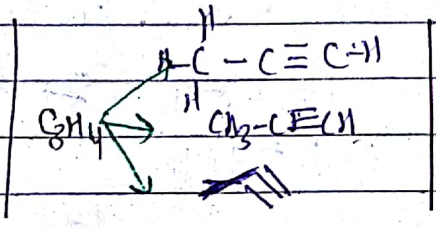


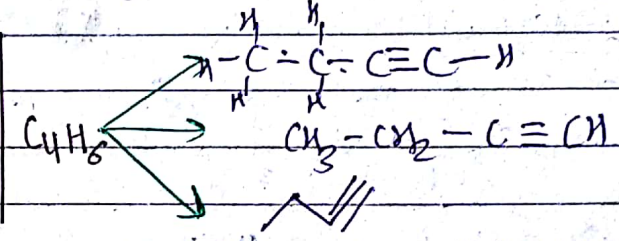
(III) Alkyne :- (C_nH_{2n-2}) → $[C\equiv C]$

$C_n \neq 1$

$[C\equiv C]$ → C_2H_2 → Ethyne → (Acetylene) $\xrightarrow{\text{use}}$ oxy-Acetylene gas welding







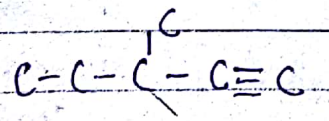
Q. $CH_3-CH_2-CH_2-C\equiv CH$ → pentyne

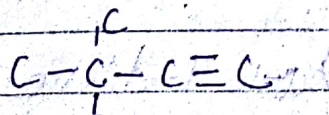
$CH_3-CH_2-C\equiv C-CH$ → pent-2-yne

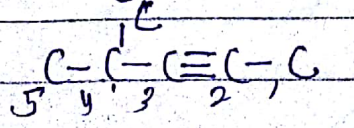
Q.1) C_6H_{10} → $\cdots C-C-C-C-C\equiv C$ → Hex-1-yne

→ $C-C-C-C\equiv C-C$ → Hex-2-yne

→ $C-C-C\equiv C-C-C$ → Hex-3-yne

→  → 3 Methyl, pentyne

→  → 3,3 dimethyl, butyne

→  → 4 methyl, -pen-2-yne

Q.2) C_7H_{12} → C−C−C−C−C−C≡C
→ C−C−C−C−C≡C−C
→ C−C−C−C≡C−C−C

(A) $^1CH_3 = {}^2CH = {}^3C \equiv {}^4CH$ → but-1-en-3-yne
(B) $^5CH_3 - {}^4CH = {}^3CH - {}^2C \equiv {}^1CH$ → pent-3-ene-1-yne
(C) $^5CH_3 - {}^4C \equiv {}^3C - {}^2CH = {}^1CH_2$ → pent-1-ene-3-yne
(D) $^1CH_3 - {}^2CH = {}^3CH - {}^4C \equiv {}^5C - {}^6CH_3$ → Hex-2-ene-4-yne

Lowest some sum rule

As:- $^5CH_2 = {}^4C(CH_3) - {}^3CH_2 - {}^2C \equiv {}^1CH$

1+2+4 = 7 ✓
1+4+4 = 9

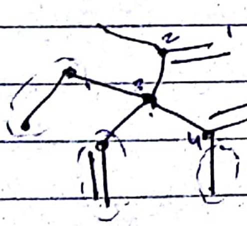
2 methyl pent-1-ene-4-yne

(A) $^1CH_3 - {}^2CH(CH_3) = {}^3C - {}^4C(CH_2CH_3) = {}^5CH - {}^6CH_2 - {}^7C \equiv {}^8CH$ → ~~5 ethyl -6 methyl Octa-4,6-ene-1yne~~

2+3+... = 10
1+4+5+6+6 = ...

→ 4 ethyl -3- methyl octa -2,4 -diene-7-yne

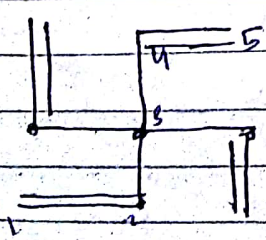
(B)



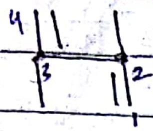
⇒ $CH_2 = CH - C(CH_2CH_3)(CH_3) - C(CH_3) = CH_2$ with $C = CH_2$

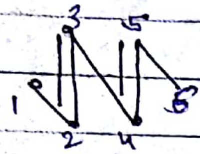
→ 3-ethenyl-3-ethyl-2,4-dimethyl Pent-1,4-diene

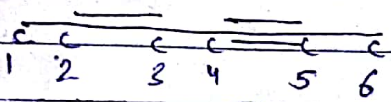
(C)

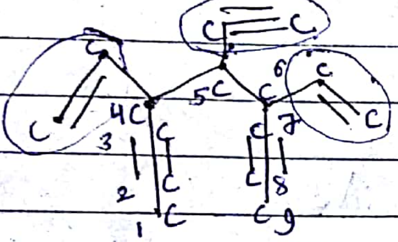


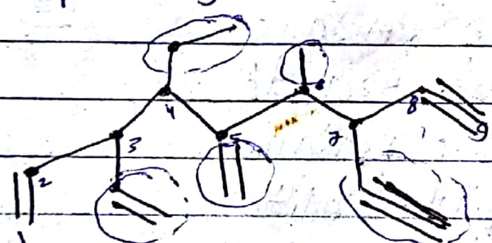
→ 3,3 di ethenyl Penta-1,4-diene

(D)  → 2,3 dimethyl buta-1,4-diene

(E)  → Hexa-2,4-diene

(F)  → Hex-2-ene-4-yne

(G)  → 4,6 Diethenyl 5-ethynyl - Nona-2,7 diyne

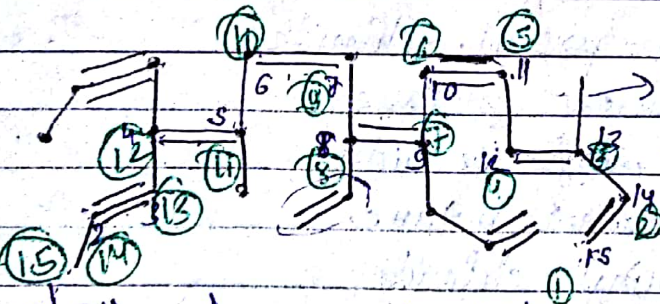
(H)  → 3 Ethenyl -4-ethyl - 7 - Ethynyl -5-methenyl -6-methyl - None -1-ene-8yn

1+3+3+5+7+8+9+11+11+12+13 PMEPM

~~2+4+4+5+6+~~

~~4+5+8+9+13~~

~~2+3+3+8+11+12~~

(I)  → Branch नहीं है।

→ 8 Ethenyl, ~~5,13~~-dimethyl, 4-propynyl, 9 prop-2-yn-yl - penta - 4,6,8,10, 12, 14-ene - 2-yne

→ 8 Ethenyl -3,11 dimethyl -12- propynyl - 7 -prop-2-yn-yl - pentadec-1,3,5,7,9,11 -ene - 13-yne

$O^{-2}, Cl^{-}, N^{-3}, Br^{-}, S^{-2}$

Helogen X_2 | Halide X^-
F_2 → Floorine | F → Floride
Cl_2 | Cl → chloride
Br_2 | Br → Bromide
I_2 | I → Iodide

IUPAC
Cl → chloro
Br → Bromo
F → Floro
I → Iodo

(IV) Alkyl Halide :— (R − X)

→ I.U.P.A.C. → Halo Alkane

Ex. (i) CH_3-Cl → C = methyl chloride
I = chloro Methane

(ii) CH_3-CH_2-Cl → C = Ethyl chloride
I = chloro Ethane

(iii) $CH_3-CH_2-CH_2-I$ → C = Propyl Iodide
I = Iodo propane

Q. (A) $CH_3-CH_2-CH_2-CH_2-CH_2-Cl$ → C = pentyl chloride
I = chloro pentane

(B) $Br-CH_2-CH_2-CH_2-CH_2-CH_3$ → C = pentyl Bromide
I = Bromo pentane

(C) $I-CH_2-CH_2-CH_2-CH_2-CH_2-CH_2-CH_3$ → C = Heptyl Iodide
I = Iodo Heptane

(D) $CH_3-CH(Cl)-CH_3$ → C = iso-propyl-chloride
I = 2 chloro propane

(E) $\overset{4}{CH_3}-\overset{3}{CH_2}-\overset{2}{CH}(Br)-\overset{1}{CH_3}$ → C = iso butyl Bromide
I = 2 Bromo butane

(F) $\overset{4}{CH_3}-\overset{3}{CH_2}-\overset{2}{CH}(Cl)-\overset{1}{CH_3}$ → C = iso butyl chloride
I = 2 chloro butane

(G) $\overset{1}{CH_3}-\overset{2}{CH_2}-\overset{3}{CH}(Cl)-\overset{4}{CH_2}-\overset{5}{CH_3}$ → common name नहीं लिखते
I = 3 chloro pentane

(H) $\overset{6}{CH_3}-\overset{5}{CH_2}-\overset{4}{CH_2}-\overset{3}{CH_2}-\overset{2}{CH}(I)-\overset{1}{CH_3}$ → C = Iso Hexyl Iodide
I = 2 Iodo Hexane

(I) $\overset{1}{CH_3}-\overset{2}{CH_2}-\overset{3}{CH_2}-\overset{4}{CH}(Br)-\overset{5}{CH_2}-\overset{6}{CH_2}-\overset{7}{CH_2}-\overset{8}{CH_3}$ → C = X
I = 4 Iodo octane

Scanned by CamScanner

Note :- क्रमांक पर C को लिखे।

Q.(A) Dihalide :- $\overset{1}{C}H_2(Cl) - \overset{2}{C}H_2(Cl)$ → C = vicinal dihalide (vic)

I = 1,2 dichloro Ethane

(B) $\overset{3}{C}H_3 - \overset{2}{C}H(Cl) - \overset{1}{C}H_2(Cl)$ → C = X

I = 1,2 dichloro propane

(C) $\overset{1}{C}H_3 - \overset{2}{C}H(Cl) - \overset{3}{C}H(Cl) - \overset{4}{C}H_3$ → I = 2,3 dichloro butane

(D) $\overset{2}{C}H_3 - \overset{1}{C}H(Cl)(Cl)$ → C = Geminal dihalide (Gem) (एक ही C पर दो halide)

→ I = 1,1 dichloro Ethane

(E) $\overset{1}{C}H_3 - \overset{2}{C}H(Cl)(Cl) - \overset{3}{C}H_3$ → I → 2,2 dichloro propane

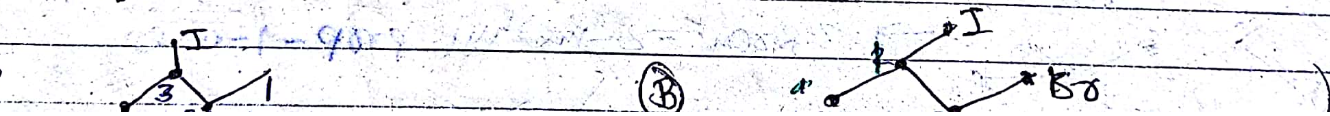
(F) $\overset{1}{C}H_3 - \overset{2}{C}H_2 - \overset{3}{C}(Cl)(Cl) - \overset{4}{C}H_2 - \overset{5}{C}H_2 - \overset{6}{C}H_3$ → I = 3,3 dichloro Hexane

(G) $\overset{1}{C}H_2(Cl) - \overset{2}{C}H_2 - \overset{3}{C}H_2(Cl)$ → 1,3 dichloro propane

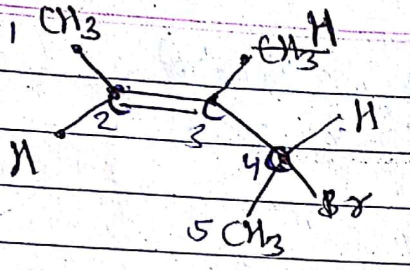
(H) $\overset{1}{C}H_2(Br) - \overset{2}{C}H_2 - \overset{3}{C}H_2(Cl)$ → 1 Bromo 3 chloro propane

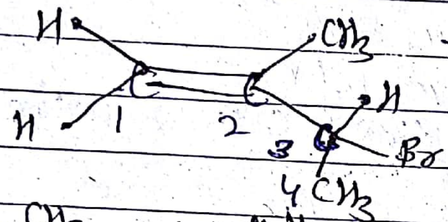
(I) $\overset{3}{C}H_3 - \overset{2}{C}H(Br) - \overset{1}{C}H_2(Cl)$ → 2 Bromo - 1 chloro propane

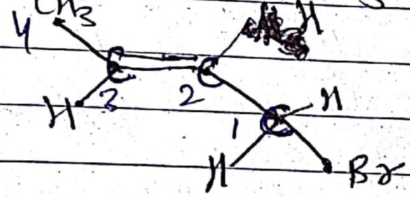
Q.(B)

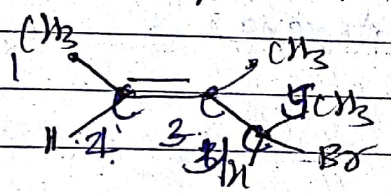


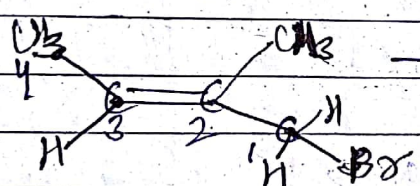
Note :– यदि यौगिक में = और Halide दोनों हों तो –
→ यदि same position में हों तो (=) bond को वरीयता देंगे।
→ यदि अलग-2 जगह हों तो समूह, या (=) bond or (≡) bond जहाँ नज़दीक हो तो वहाँ से No. करेंगे।

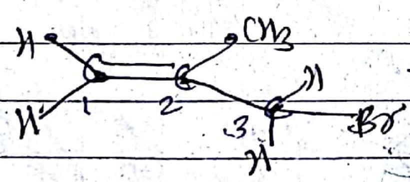
(D)  → 4 Bromo – pent-2-ene

(E)  → 3 Bromo 2 Methyl but-1-ene

(F)  → 1 Bromo but-2-ene

(G)  → 4 Bromo-3-methyl pent-2-ene

(H)  → 1 Bromo-2 methyl but-2-ene

(I)  → 3 Bromo-2-methyl prop-1-ene

(V) Alcohols :→ (R – OH)

C = Alkyl alcohol
↓
Alkan(e) + suffix = ol
↓
I = **Alkanol**

suffix – ol
prefix = hydroxy

Astrejink → [illegible]

* CH_3-OH ⟶ C = Methyl alcohol
  I = Methanol
  ↳ poisonous alcohols

* CH_3-CH_2-OH → C = Ethyl alcohol
  I = Ethanol

* [Denatured alcohol] → [$CH_3-CH_2-OH + CH_3-OH$]
  → [$CH_3-CH_2-OH + CuSO_4$]
  ↓
  [unfit for drinking]

Monohydric alcohol →

Ex. (a) $CH_3-CH_2-CH_2-OH$ I → propanol
C → propyl alcohol

(b) $CH_3-\underset{OH}{CH}-CH_3$ → C → iso-propyl alcohol
I → propan-2-ol

(c) $CH_3-\underset{OH}{CH}-CH_2-CH_3$ → C = iso butyl alcohol
I = But-2-ol

Q.(a) $CH_3-\underset{OH}{CH}-CH_2-CH_2-CH_3$
C = iso-pentyl alcohol, I = Pent-2-ol

(b) $CH_3-CH_2-\underset{OH}{CH}-CH_2-CH_3$
I = Pent-3-ol

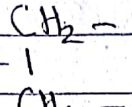
(c) $CH_3-CH_2-\overset{OH}{CH}-CH_2-CH_2-CH_2-CH_3$
→ Hept-3-ol

(d) $CH_3-CH_2-\underset{OH}{CH}-CH_2-CH_2-CH_3$
→ Hex-3-ol

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

→ 2 methyl Hex-4-ol

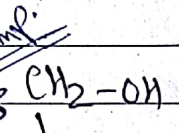
Dihydric alcohol → Vicinal



C = Ethylene glycol

I = Ethan-1,2-diol

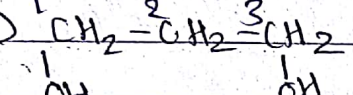
Trihydric → Vicinal



C = glycerol

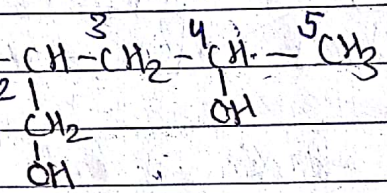
I = propan-1,2,3-triol

Q.1 (a)



I = propan-1,3-diol

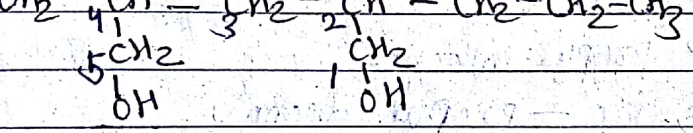
(b)



~~I = 4 Hydroxy-2-Methyl, Pentanol~~

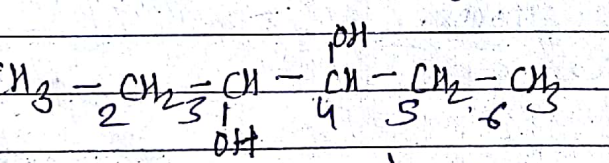
I = 2Methyl pent-1,4-diol

(c)



I = 4 Ethyl-2-propyl pent-1,5-diol

(d)

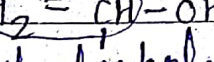


→ Hex-3,4-diol

→ vinyl carbon

→ Allyl carbon

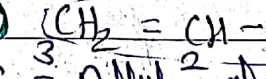
Q.2 (a)



C = vinyl alcohol

→ Eth-1-ene-1-ol

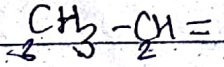
(b)



C = Allyl alcohol

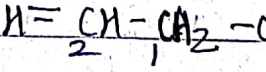
→ Prop-2-ene-1-ol

(c)



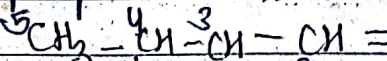
→ prop-1-ene-1-ol

(d)



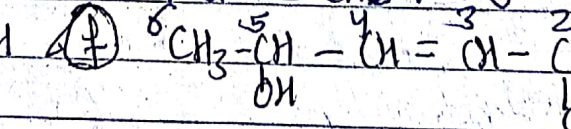
→ but-2-ene-1-ol

(e)



→ ~~Pe~~ 3,4 Dimethyl pent-1-ene-1,3-diol

(f)



→ 2Methyl Hex-3-ene-1,5-diol

(g) $\overset{5}{C}H_3 - \overset{4}{C}H(OH) - \overset{3}{C}H(CH_2CH_3) - \overset{2}{C}H(OH) - \overset{1}{C}H_3$ → 3 Ethyl ~~2,4~~ pent-2,4-diol

(h) $\underset{5}{C}H_3 - \underset{4}{C}H(CH_3) - \underset{3}{C}H(OH) - \underset{2}{C}H = \underset{1}{C}H - OH$ → 4 Methyl pent-1-en-1,3-diol

Q.3. (a) $\underset{1}{C}H_2 = \underset{2}{C}H - \underset{3}{C}H(OH) - \underset{4}{C}H_3$

→ But-1-en-3-ol

(b) $\underset{1}{C}H_2 = \underset{2}{C}H - \underset{3}{C}H(OH) - \underset{4}{C}H(CH_3) - \underset{5}{C}H_3$

→ ~~pe~~ 4 methyl pent-1-en-3-ol

(c) $\overset{2}{C}H(Cl) = \overset{1}{C}H(OH)$

→ 2 chloro Eth-1-~~en~~ en-1-ol

(d) $\underset{1}{C}H_2(Cl) - \underset{2}{C}H = \underset{3}{C}H - \underset{4}{C}H(OH) - \underset{5}{C}H_3$

→ 1 chloro pent-2-en-4-ol

(e) $\overset{5}{C}H_3 - \overset{4}{C}H(Br) - \overset{3}{C}H = \overset{2}{C}H_2 - \overset{1}{C}H_2 - OH$

→ 4 Bromide pent-2-en-1-ol

(f) $\overset{6}{C}H_3 - \overset{5}{C}H(Cl) - \overset{4}{C}H = \overset{3}{C}H - \overset{2}{C}H(OH) - \overset{1}{C}H_2 - OH$

→ 5 chloro Hex-3-en-1,2-diol

(g) $\overset{3}{C}H_2 = \overset{2}{C}H - \overset{1}{C}H_2(OH)$ → prop-2-ene-1-ol

VII Ether (R - O - R)

C = Dialkyl Ether

I = Alkoxy Alkane

Note :- जो Alkyl छोटा होगा उसके साथ O को लेंगे।

Ex.

(i) $CH_3 - O - CH_3$ → C = Dimethyl Ether

I = Methoxy Methane

(ii) $CH_3 - CH_2 - O - CH_3$ → C = Ethyl methyl ether

I = Methoxy Ethane

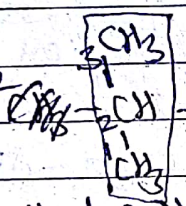
ii) $CH_3-CH_2-O-CH_2-CH_3$ → C = Diethyl ether
I = Ethoxy ethane
↓
Local Anesthetic (बेहोश करने की दवा)

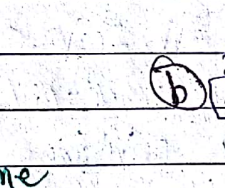
Q.1. ⓐ $CH_3-CH_2-CH_2-O-CH_3$ → propyl methyl ether
→ methoxy propane

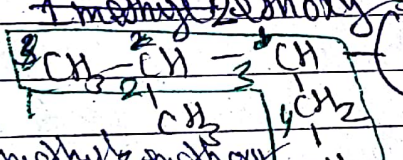
ⓑ $CH_3-CH_2-CH_2-O-CH_2-CH_3$ → propyl ethyl ether
→ ethoxy propane

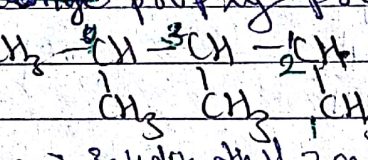
ⓒ $CH_3-CH_2-CH_2-CH_2-O-CH_2-CH_3$ → butyl ethyl ether
→ ethoxy butane

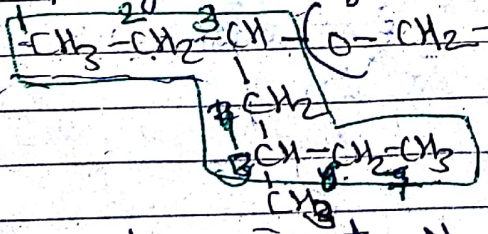
ⓓ $CH_3-CH_2-CH_2-O-CH_2-CH_2-CH_3$ → butyl ethyl ether
→ propxy butane

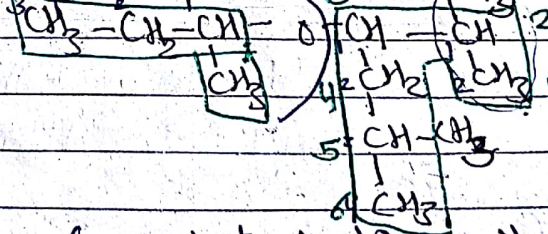
Q.2. ⓐ 
→ 1 methyl 2 ethoxy propane

ⓑ 
→ 2 methyl propxy propane

ⓒ 
I = 2 methyl 3 methoxy pentane
→ 1 ethyl 2 methyl methoxy propane

ⓓ 
→ 3, 4 dimethyl 2 methoxypentane

ⓔ 
→ 1 ethyl 3 methyl ethoxy pentane

ⓕ 
→ 1, 2, 3 Trimethyl methoxy butane
→ 1 (1 methyl ethyl) 3 methyl

→ 3 + 5 methyl 3 methoxy ethoxy heptane
→ 2, 5 dimethyl 3-iso butoxy Hexane
→ 2, 5 dimethyl 3-(2 butoxy) hexane

M. Imp. ⇒ Suffix = al
⇒ prefix = aldo
= formyl
= carbaldehyde
= oxo

(VII) Aldehyde $R-\overset{O}{\overset{\|}{C}}-H$ / $R-CHO$ → Terminating functional group

↓ Functional group

I = Alkan(e) → al = Alkanal

Ex: (i) $H-\overset{O}{\overset{\|}{C}}-H$ → Formyl
I = Methanal
C = Formaldehyde

(ii) $CH_3-\overset{O}{\overset{\|}{C}}-H$ → Acetyl or Acyl (AC)
→ I = Ethanal
C = Acetaldehyde

(iii) CH_3-CH_2-CHO → I = propanal, C = propanaldehyde

(iv) $CH_3-CH_2-CH_2-\overset{O}{\overset{\|}{C}}-H$ → I = butanal

(v) $CH_3-CH_2-CH_2-CH_2-\overset{O}{\overset{\|}{C}}-H$ → I = pentanal

Q.1. (a) $\overset{4}{CH_3}-\overset{3}{CH_2}-\overset{2}{CH}(\overset{1}{CHO})-CH_3$
→ 2 methyl butanal

(b) $\overset{5}{CH_3}-\overset{4}{CH_2}-\overset{3}{CH}(\overset{1}{CH_2}\overset{1}{CH_3})-\overset{2}{CH_2}-\overset{1}{C}(=O)-H$
→ 3 ethyl Pentanal

(c) $CH_3-\overset{2}{C}(\overset{3}{CH_2}\overset{4}{CH_3})(\overset{1}{C}(=O)H)-CH_2-CH_3$
→ 2 ethyl-2-methyl butanal

(d) $\overset{4}{CH_3}-\overset{3}{CH}(\overset{1}{CH_3})-\overset{2}{CH}(\overset{1}{CH_3})-\overset{1}{C}(=O)-H$
→ 2,3 dimethyl butanal

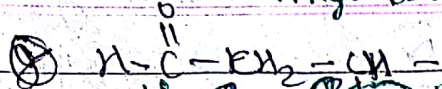
(e) $\overset{2}{CH}(\overset{1}{CHO})_2$
~~1,2 dieth~~ ethan-1,2-dial

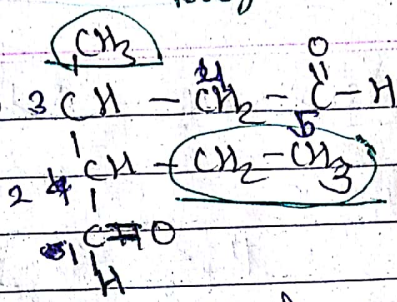
(f) $\overset{1}{H}-\overset{O}{\overset{\|}{\overset{1}{C}}}-\overset{2}{CH_2}-\overset{O}{\overset{\|}{\overset{3}{C}}}-\overset{3}{OH}$
→ ~~propan~~ propan-1,3-dial

α, β unsaturated carbonyl compounds

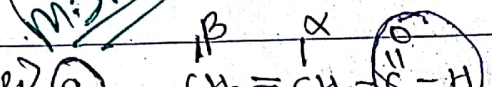
(a) $CH_3=CH-CHO$
C = Acraldehyde
C = Vinyl Aldehyde

(b) $CH_3-CH=CH-CHO$
C = Crotonaldehyde
C = Allyl Aldehyde

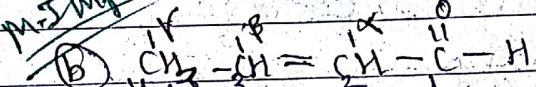
(g) 
→ 2 Methyl but-1,4-dial

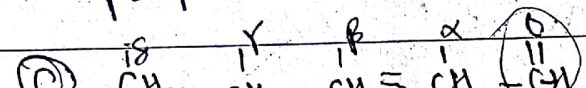
(h) 
→ 2 ethyl 3 Methyl pent-1,5-dial

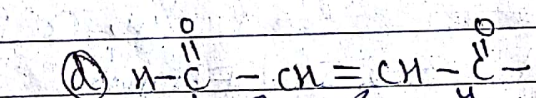
M.Imp.

Q.2.) (a) 
→ prop-2-en-1-al

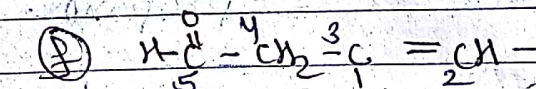
M.Imp.

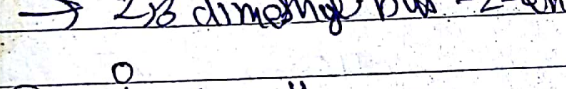
(B) 
→ but-2-en-1-al

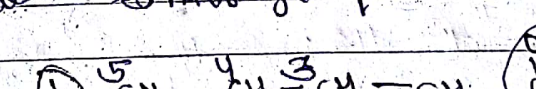
(c) 
→ pent-2-en-1-al

(d) 
→ but-2-en-1,4-dial

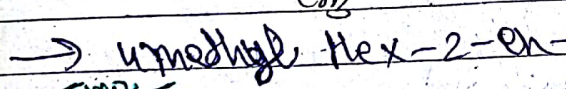
(e) 
→ 2,3 dimethyl but-2-en-1,4-dial

(f) 
→ 3 methyl pent-2-en-1,5-dial

(g) 
→ 4 methyl Hex-2-en-1,6-dial

(h) 
→ 3 methyl pent-4-en-1-al

M.Imp.

(i) 
→ propan-1,2,3-tricarbaldehyde
→ 1,2,3-tricarbaldehyde propane

3 ~~but-1,5-dial~~

Carbonyl group containing compound → {ई}
Keto पहले carbon पर नहीं आ सकता & नहीं तो aldehyde हो जाएगा।

(VIII) Ketone :- $R-\overset{O}{\overset{||}{C}}-R$ / $R-CO-R$ / $-\overset{O}{\overset{||}{C}}-$ / $-CO-$

Suffix = one
prefix = keto
oxo

I = Alkan(e) → one = Alkanone

Ex. (1) $CH_3-\overset{O}{\overset{||}{C}}-CH_3$ (O → Acetyl)
→ I = propanone
→ C = Acetone
→ C derived = Dimethyl Ketone

(ii) $CH_3-CH_2-\overset{O}{\overset{||}{C}}-CH_3$ → I → butanone ; C = ethyl methyl ketone

(iii) $CH_3-CH_2-CH_2-\underset{O}{\underset{||}{C}}-CH_3$ → I = pent-2-one

(iv) $CH_3-CH_2-\underset{O}{\underset{||}{C}}-CH_2-CH_3$ → I = pent-3-one ; C = Diethyl ketone

Q.1. (a) $\overset{5}{C}H_3-\overset{4}{C}H_2-\underset{3}{\overset{O}{\overset{||}{C}}}-\overset{2}{C}H(CH_3)-\overset{1}{C}H_3$
→ 2 methyl pent-3-one

(b) $\overset{5}{C}H_3-\overset{4}{C}H(CH_3)-\underset{3}{\overset{O}{\overset{||}{C}}}-\overset{2}{C}H(CH_3)-\overset{1}{C}H_3$
→ 2,4 dimethyl pent-3-one

(c) $\underset{6}{C}H_3-\underset{5}{C}H_2-\underset{4}{\overset{O}{\overset{||}{C}}}-\underset{3}{C}H_2-\underset{2}{C}H(CH_3)-\underset{1}{C}H_3$
→ 2 methyl Hex-4-one

(d) $\underset{6}{C}H_3-\underset{5}{C}H_2-\underset{4}{\overset{O}{\overset{||}{C}}}-\underset{3}{C}H-\underset{2}{\overset{O}{\overset{||}{C}}}-\underset{1}{C}H_3$
→ Hex-2,4-dione

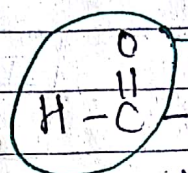
(e) $\underset{7}{C}H_3-\underset{6}{C}H_2-\underset{5}{\overset{O}{\overset{||}{C}}}-\underset{4}{\underset{O}{\underset{||}{C}}}-\overset{3}{C}H_2-\overset{2}{C}H(CH_3)-\overset{1}{C}H_3$
→ 2 methyl Hept-4,5-dione

(e) $\overset{4}{C}H_2=\overset{3}{C}H-\overset{O}{\overset{||}{C}}-\overset{1}{C}H_3$ → Ketone के लिए पहला position
→ but-1-en-3-one
→ But-3-en-2-one

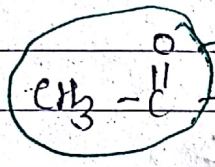
(f) $\underset{1}{C}H_3-\underset{2}{C}H(CH_3)-\underset{3}{C}(=O)-\underset{4}{C}(=O)-\underset{5}{C}H_2-\underset{6}{C}H_3$
→ 2-methyl Hex-3,4-dione

(IX) Carboxylic Acid :- $R-\overset{O}{\overset{\|}{C}}-OH$ / $R-COOH$ / RCO_2H

Suffix = oic acid
prefix = Carboxy
= Carboxylic Acid

Ex (i)  → Formyl

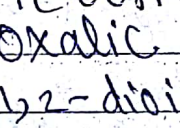
I = Methanoic acid
C = Formic acid

(ii)  → Acetyl

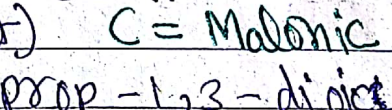
I = Ethanoic acid
C = Acedic Acid / ~~Vinegar~~ (सिरका)

(iii) CH_3-CH_2-COOH → I = propanoic acid

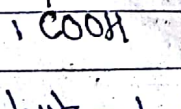
(iv) $CH_3-CH_2-CH_2-COOH$ → I = Butanoic acid

Q.1.) (a) 

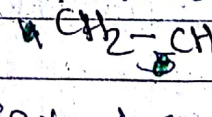
→ C = Oxalic acid (oxilus plant)
→ Eth-1,2-dioic acid

(b) 

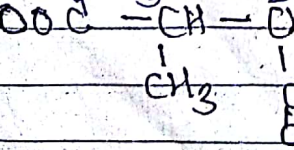
C = Malonic acid
→ prop-1,3-dioic acid

(c) 

→ but-1,4-dioic acid

(d) 

→ Hex-1,3-dioic acid

(e) 

→ 2-ethyl-3-methyl but-1,4-dioic acid

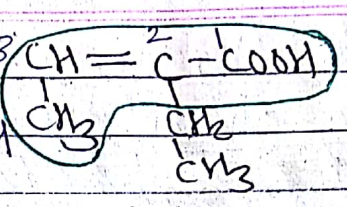
(f)

→ prop-2-en-1-oic acid
→ propenoic acid
→ C = Acrylic acid

(a) $CH_3-CH=CH-C(=O)-OH$

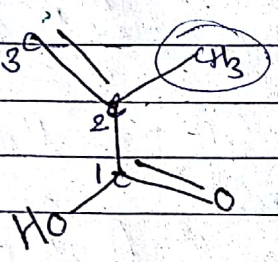
→ but-2-en-1-oic acid

C = crotonic acid

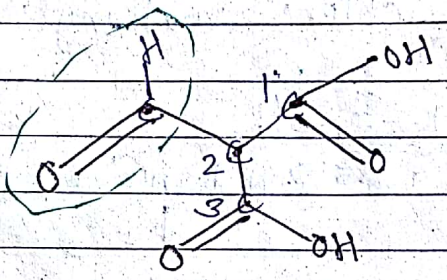
(b) 

→ 2 ethyl but-2-ene-1-oic acid

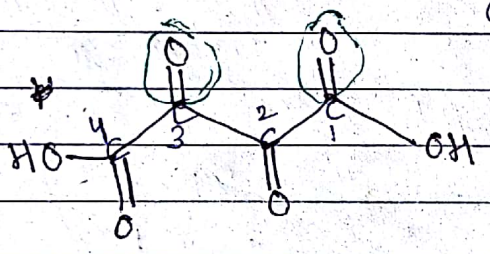
C = 2-ethyl crotonic acid

Q.2.) (a) 

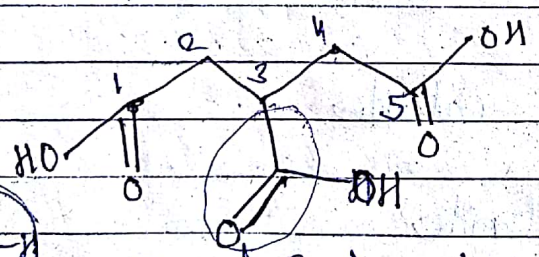
→ ~~2~~ 2 Methyl prop-2-en-1-oic acid

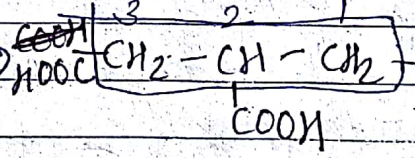
(b) 

→ 2-formyl prop-1,3-dioic acid

(c) 

→ 2,3-dioxo-but-1,4-dioic acid

(d) 

→ 

→ prop-1,2,3 tri carboxylic acid

→ 3 Formyl Pent-1,5-dioic acid

Amine → $R-NH_2$

Ammine → (NH_3) complex comp. ex. $[Cr(NH_3)_6]^{+3}$

4° → quadenary

(X) Acid Halide → $R-\overset{O}{\overset{\|}{C}}-X$

Acid chloride → $R-\overset{O}{\overset{\|}{C}}-Cl$

Suffix = oyl halide / oyl chloride

Prefix = Carbonyl chloride
= chloro carbonyl

Ex.) I = $R-\overset{O}{\overset{\|}{C}}-Cl$

→ Alkane → suffix = oyl chloride

↓

Alkanoyl chloride

Ex.) (i) $CH_3-\overset{O}{\overset{\|}{C}}-Cl$ → Acetyl

I = Ethanoyl chloride

C = Acetyl chloride

(ii) $CH_3-CH_2-CH_2-\overset{O}{\overset{\|}{C}}-Cl$ → Butanoyl chloride

(iii) $CH_3-CH_2-\overset{O}{\overset{\|}{C}}-Cl$ → propanoyl chloride

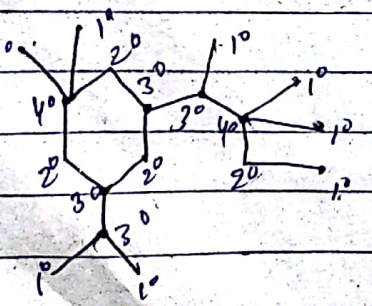
(XI) Amines :-

1°, 2°, 3°, 4° (quadenary) carbon →

suffix - Amine

Prefix - Amino

Ex.)



→ 1° → 8

→ 2° → 4

→ 3° → 4

→ 4° → 2

Note:— सबसे बड़ी C Chain को consider करेंगे।

1° Amine	2° Amine	3° Amine	4° Amine
$R-NH_2$	$R-NH-R$	$R-\underset{\mid\atop R}{N}-R$	$R-\overset{R}{\underset{R}{N^{\oplus}}}-R$

Ex→ (i) CH_3-NH_2
C = Methyl amine
I = Methanamine

(ii) $CH_3-CH_2-NH_2$
C = Ethyl amine
I = Ethanamine

~~(iii) CH_3~~

(iii) $CH_3-NH-CH_3$
C = Dimethyl amine
I = Methyl Methanamine

(iv) $CH_3-CH_2-NH-CH_3$
~~C = N~~
I = N-Methyl ethanamine

(v) $CH_3-CH_2-NH-CH_2-CH_3$
C = Dimethyl amine
I = N-Ethyl ethanamine

(vi) $CH_3-CH_2-NH-CH_2-CH_2-CH_3$
I = N ethyl propanamine

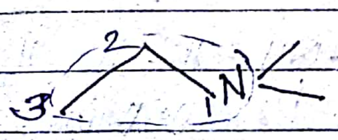
(vii) $CH_3-\underset{\mid\atop CH_3}{N}-CH_3$
C = N,N,N-trimethyl amine
I = N-N-Dimethyl ~~am~~ Methanamine

(viii) $CH_3-CH_2-\underset{\mid\atop CH_3}{N}-CH_3$
I = N,N-dimethylethanamine

(ix) $CH_3-CH_2-\underset{\mid\atop CH_2-CH_3}{N}-CH_3$
I = N-Ethyl-N-methyl ethanamine

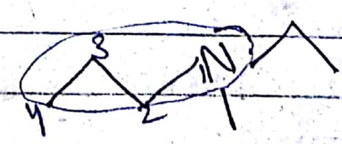
(x) $CH_3-CH_2-\underset{\mid\atop CH_3}{N}-CH_2-CH_2-CH_3$
I = N ethyl N methyl Propanamine

Q.1.> (a)



I = N,N dimethyl propanamine

(b)



I = N-ethyl-N-methyl butanamine

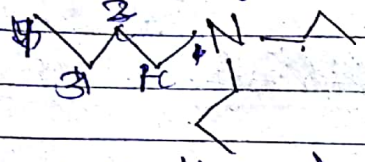
$-\overset{|}{C}-\overset{|}{N}-$	$-\overset{\|\|}{C}-\overset{|}{N}-$
Amine	Amide

(c) 

I = N,N diethyl butanamine → propanamine

(d) 

I = N ~~dipro~~ ethyl N propyl propanamine

(e) 

I = N,N dipropyl ~~pentanamine~~ butanamine

XII **Acid Amide :-** $\left(R-\overset{\|\|}{C}-NH_2\right)$ / $\left[-\overset{\|\|}{C}-N-\right]$ (Amides)

[prefix = Carbamoyl]

1° Amide, 2° Amide, 3° Amide

$R-\overset{\|\|}{C}-NH_2$	$R-\overset{\|\|}{C}-NH_2-R$	$R-\overset{\|\|}{C}-\underset{R}{N}-R$
	N-Alkyl Alkanamide	N,N dialkyl Alkanamide

Ex.> (i) $H-\overset{\|\|}{C}-NH_2$ → ~~Ac~~ Formyl

I = Methanamide

C = Formamide

(ii) $CH_3-\overset{\|\|}{C}-NH_2$ → Acetyl

C = Acetamide

I = Ethanamide

(iii) $CH_3-CH_2-\overset{\|\|}{C}-NH_2$ → I = propanamide

(iv) $H-\overset{\|\|}{C}-NH-CH_3$

C = N methyl Formamide

I = N-methyl Methanamide

(v) $CH_3-\overset{\|\|}{C}-NH-CH_3$

C = N-methyl Acetamide

I = N-methyl Ethanamide

(vi) $CH_3-\overset{\|\|}{C}-NH-CH_2-CH_3$

C = N-ethyl Acetamide , I = N-ethyl ethanamide

Q. 1) (a) $CH_3-\overset{\|\|}{C}-NH-CH_2-CH_2-CH_3$

C = N-propyl Acetamide

I = N-propyl Ethanamide

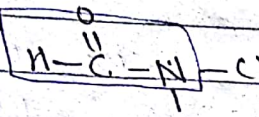
(b) $CH_3-CH_2-\overset{\|\|}{C}-NH-CH_2-CH_2-CH_3$

I = N-propyl propanamide

(c) 

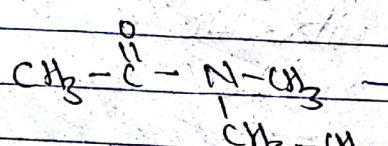
C = N butyl Formamide

I = N butyl Methanamide

Ex.) (i)  → I = N,N Dimethyl Methanamide

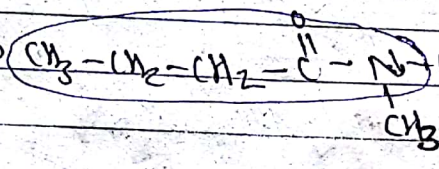
C = N-N Dimethyl Formamide

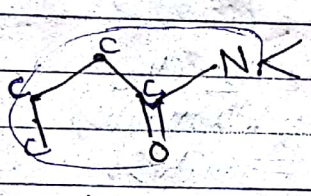
~~D.F.A~~ & D.m.F.A

(ii)  → I = N ethyl, N methyl, ethanamide

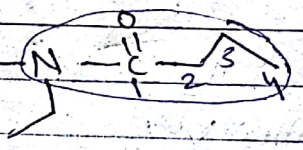
C = N-ethyl N methyl Acetamide

E.M.AC

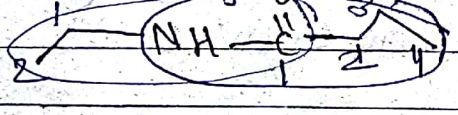
(iii)  → I = N,N dimethyl, butanamide

Q.2.) (a) 

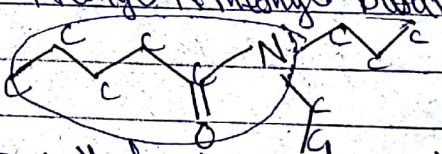
I = N,N dimethyl butanamide

(b) 

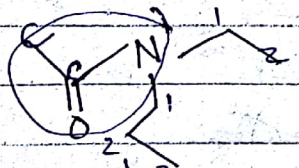
I = N ethyl N methyl butanamide

(c) 

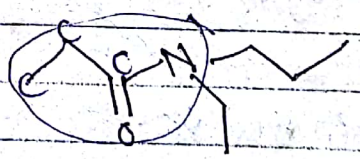
I = N ethyl butanamide

(d) 

I = N ethyl N propyl pentanamide

(e) 

I = N ethyl N propyl ethanamide

(f) 

I = N ethyl N prople propanamide

EAA → Ethyl Aceto Acetate
AAE → ~~Ethyl~~ f. Aceto Acetate Ester

(XIII) Ester :- $R-\overset{O}{\overset{\|}{C}}-O-R$ / R-COOR / RCO_2R

Alkan(e) → Alkyl oate

Suffix = oate
prefix = Alkoxy Carbonyl

I = Alkyl Alkanoate

Ex. (i) $H-\overset{O}{\overset{\|}{C}}-O-CH_3$
I = methyl metanoate
C = methyl Formate

(ii) $CH_3-\overset{O}{\overset{\|}{C}}-O-CH_3$
I = methyl ethanoate
C = Methyl Acetate

(iii) $CH_3-\overset{O}{\overset{\|}{C}}-O-CH_2-CH_3$
I = ethyl ethanoate
C = ethyl Acetate

Q.1) (a) $H-\overset{O}{\overset{\|}{C}}-O-C_2H_5$
I = ethyl methanoate
C = ethyl Formate

(b) $H-\overset{O}{\overset{\|}{C}}-O-CH_2-CH_2-CH_2-CH_3$
I = butyl methanoate
C = butyl Formate

(c) $CH_3-CH_2-CH_2-\overset{O}{\overset{\|}{C}}-O-CH_2-CH_2-CH_3$
I = propyl butanoate

(d) $CH_3-CH=CH_2-\overset{O}{\overset{\|}{C}}-O-CH_2-CH_3$
I = ethyl but-2-en-1-oate

(e) $(CH_3)_2CH-\overset{O}{\overset{\|}{C}}-O-CH_3$ → I = Methyl (2-methyl propanoate)

Q.2) (a) Ethyl Aceto Acetate

→ $CH_3-\overset{O}{\overset{\|}{C}}-O-CH_2-CH_3$ (C=O, CH_3)

EAA

$CH_3-\overset{O}{\overset{\|}{C}}-O-CH_2-CH_3$ (C=O, CH_3)