Homologous Series

Course on Nomenclature of Organic Compounds for Class XI

SURENDRA K MISHRA • Lesson 6 • June 26, 2021

HW discussion :

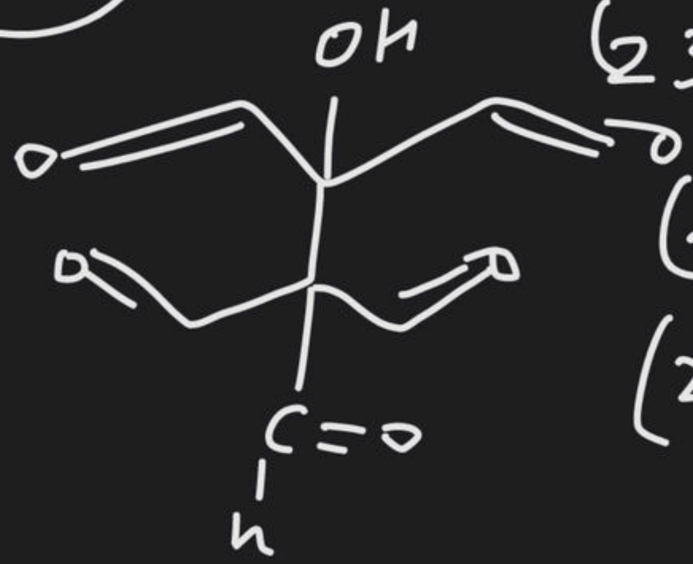
(16) DBE = 8

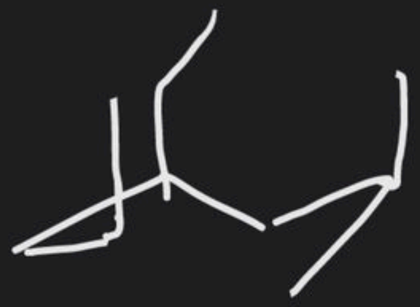
(17) DBE = 10

(18) DBE = 5

(19) 11

(20) 3





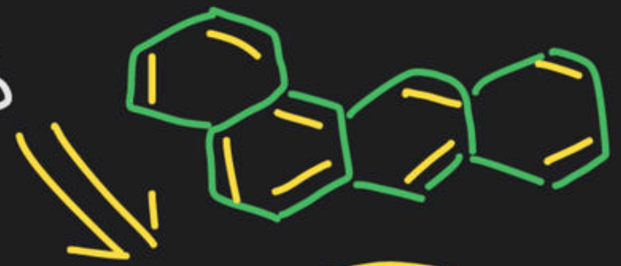
(21) 9

(22) 13

(23) 11

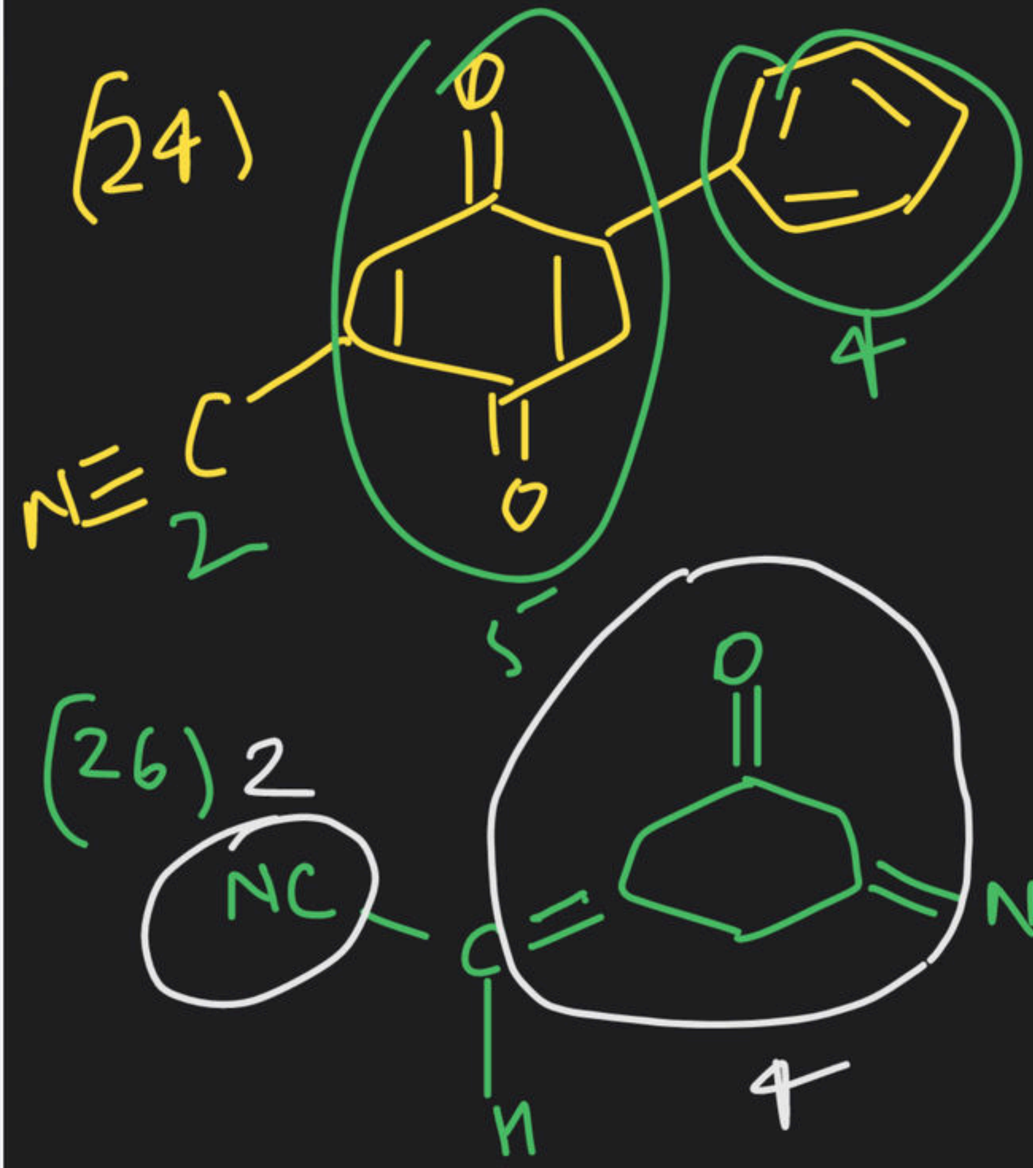
(24) 11

(25) ✓



9+4

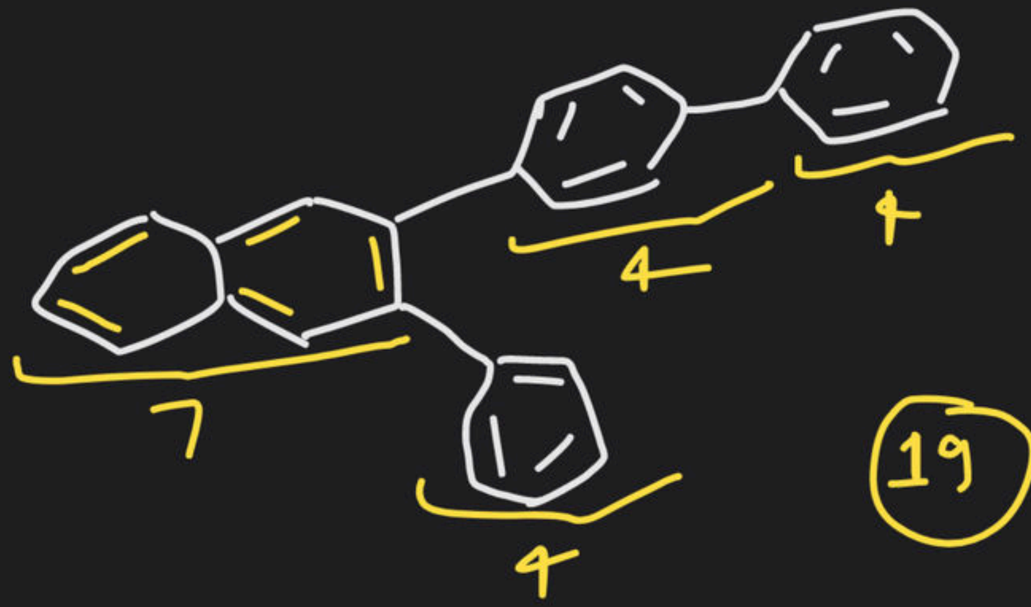
(24)



(26) 2

10

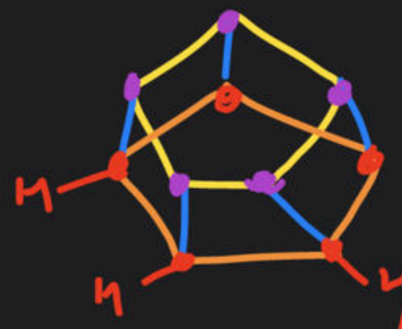
(27)



19

(28) 5

(29) 6



$C_{10}H_{22}$

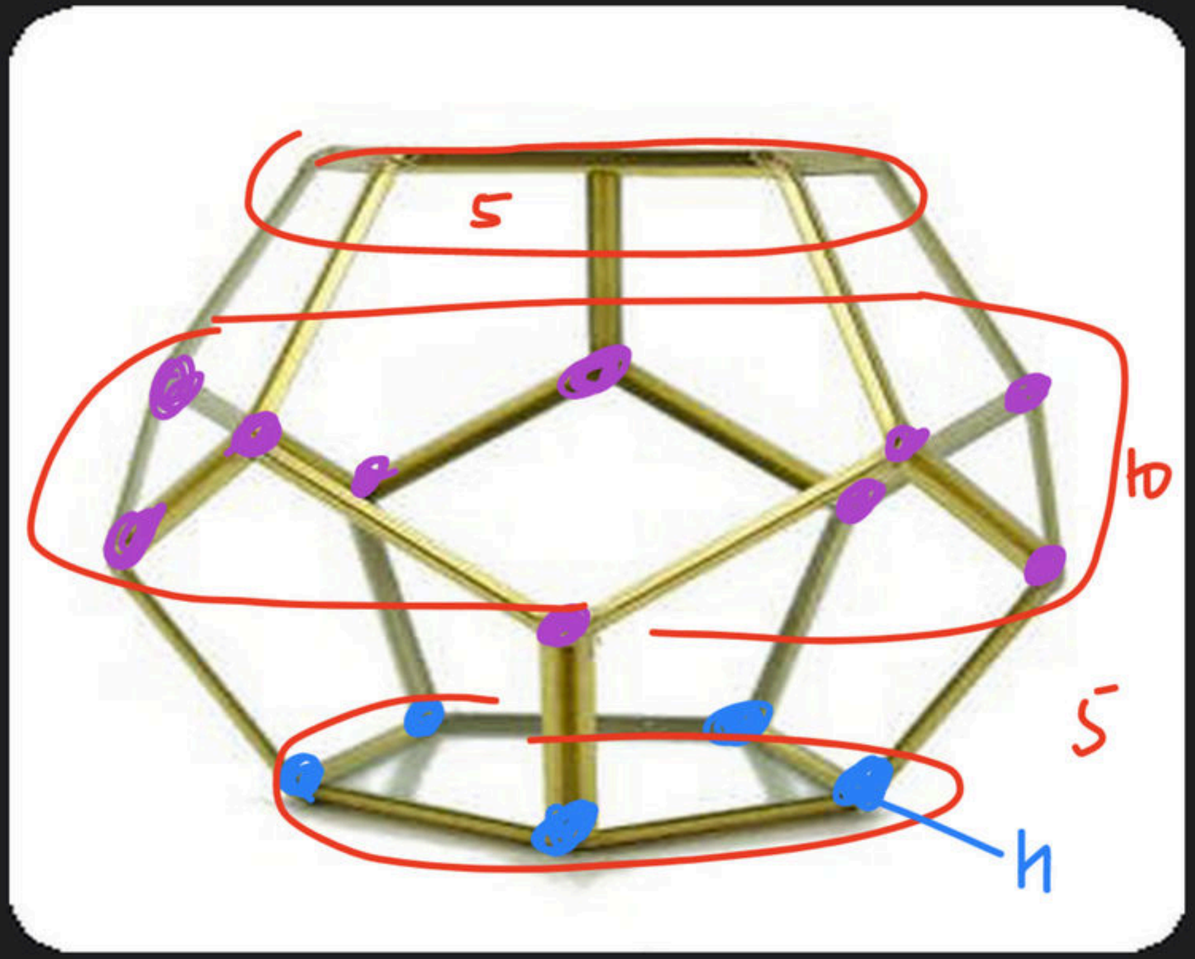
$C_{10}H_{10}$

$\Delta n_H = 12$

IHD = 6

Question
from Anamika Anand

Lotus 3D



$C_{20}H_{42}$
$C_{20}H_{20}$

$\Delta H_H = 22$

$IHD = 11$

(36) $C_6H_2Cl_2Br_2$ / C_6H_6 / C_6H_{14} / $\Delta n_H = 8$ / IHD = 4

(37) $C_6FClBrI$ DT / C_6H_6 / IHD = ④

(38) $C_4H_2Cl_6$ / C_4H_8 / C_4H_{10} / $\Delta n_H = 2$ / IHD = 1

(39) $C_6H_6Cl_6$ / C_6H_{12} / C_6H_{14} — — — IHD = 1

(40) $C_8Cl_4Br_2I_2$ / C_8H_8 / C_8H_{18} / $\Delta n_H = 10$ / IHD = 5

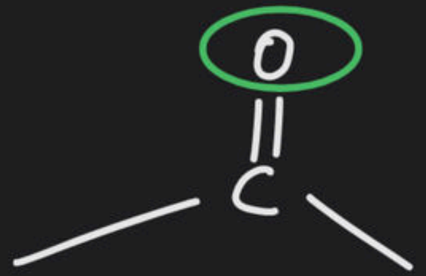
(41) 16

(42) 61

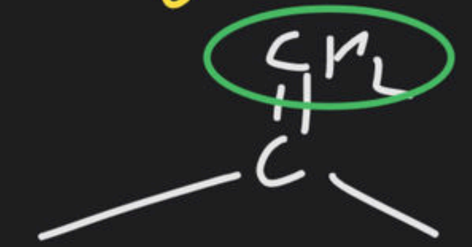
(43) $x+1$

(45) $(2x+2-y)/2$

Case (ii) :- In case of Bivalent atom ($-O-$, $-S-$ etc) either replace these atoms By CH_2 or neglect it.

(46) 

DBE = 1

(47) 

1

(48) CO_2 —

$O \rightarrow (CH_2)$ → $C(CH_2)_2$ / C_3H_4 / C_3H_8 / $\Delta n_H = 4$ / DBE = 2

$O \rightarrow$ Nyclchi → C_1H_0 / CH_4 / $\Delta n_H = 4$ / DBE = 2

Struche → $O=C=O$ DBE = 2

(49) C_3O_2

(50) $C_2H_4O_2$

(51) C_xO_y

(52) $C_6H_3Cl_3O_3$

(53) $C_0FClD_2I_2O_2 \Rightarrow C_8H_6 / C_8H_{10}$ (C_nH_{2n+2}) $/ \Delta n_H = 12 / \Sigma HD = 6$

(54) $C_xH_yO_z$

(55) $C_nH_{2n-4}O_{2n}$

(56) C_2H_4O

(57) C_6H_6O

(#) Case(iii): In Case of Trivalent atom like (-N- -P-)

Neglect these atoms with same no. of monovalent atom or replace it (-NH) ⇒ $-CH_2$.

(58) $C_3H_3F_2O_2N$

$\Rightarrow C_3H_2F_2(NH)$

$\Rightarrow C_3H_2H_2$

$\Rightarrow C_3H_4 / C_3H_8$

$\Delta n_H = 4$

$IHD = 2$

(59) $N_2H_2 \Rightarrow (NH)_2 \Rightarrow C_0H_0 \,/\, C_0H_2 \,/\, \Delta n_H = 2 \,/\, IHD = 1$

$\Rightarrow (NH)_2 \rightleftharpoons (CH_2)_2 \,|\, C_2H_4 \,|\, C_2H_6 \,|\, \Delta n_H = 2 \,/\, IHD = 1$

$\Rightarrow H-N=N-H \quad (IHD = 1)$

(60) C_3H_7N

(61) CN_2H_4O

(62) C_6H_8FN

(63) $C_xH_yO_zN_p$

(64) $C_xN_y \Rightarrow C_xH_{-y}(NH)_y \,/\, C_xH_{-y}$

C_xH_{2x+2}

$\Delta n_H = 2x+2+y$

$IHD = \left(\frac{2x+2-y}{2}\right)$

Case(iv) In case of tetravalent atom (Si - - - - - -) then consider it like Carbon.

$$IHD = \left[\frac{\Delta n_H}{2}\right]$$

(65) $C_2H_3O_2^-$ Anion $\left[CH_3-\overset{\overset{O}{\|}}{C}-O^-\right]$

(66) C_3H_5 Cation $\left[CH_2=CH-\overset{\oplus}{C}H_2\right]$

(67) A Compound containing 3 IHD. Correct statement is

(A) It may be tricyclic

(B) it may be doubly bonded Bicyclic

(C) It may be Triene

(D) All of above

C=C + 2 Ring

1 2

Functional Group

⇒ A Segment of a compound which is Responsible for its function / chemical Reactivity / chemical property is known as functional group.

Alkane $\xrightarrow[+\text{ group}]{-H}$ Compound with functional group.

C_nH_{2n+2} $\xrightarrow[+(OH)]{-H}$ $C_nH_{2n+1}(OH)$ $(n \geq 1)$

$(n \geq 1)$

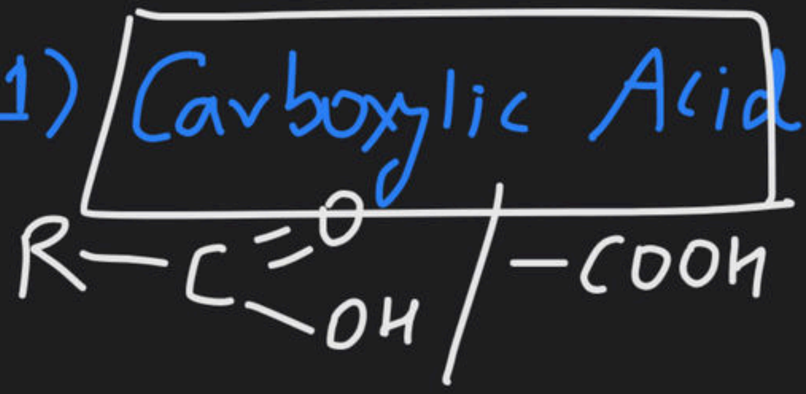
⇒ CH_3-OH

⇒ CH_3-CH_2-OH (C_2H_5-OH)

Functional group

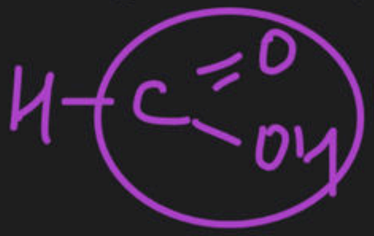
Prefix	Suffix	Suffix*

(1) Carboxylic Acid

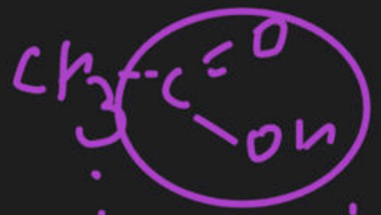


R = -H, $-CH_3$, $-CH_2CH_3$ - - - ...

Ex:

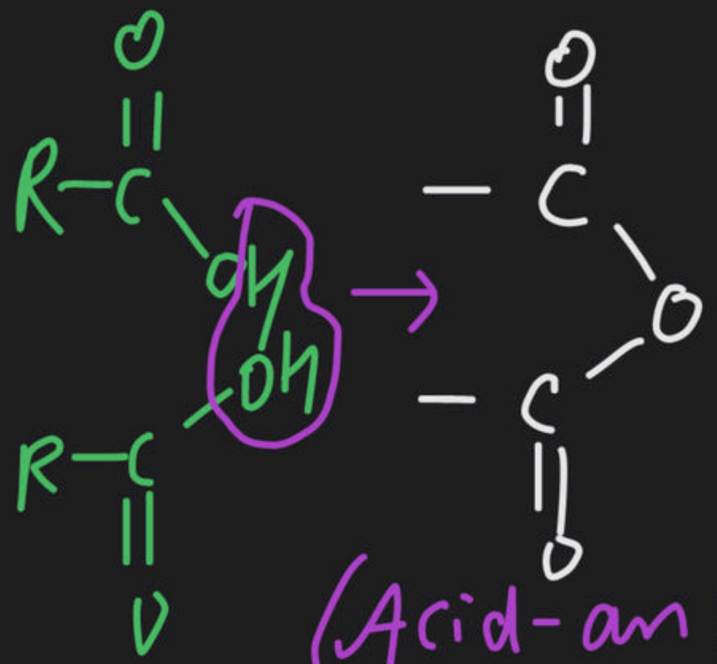


Formic Acid
or
Ant Acid



Acetic Acid
or
(Vinegar)

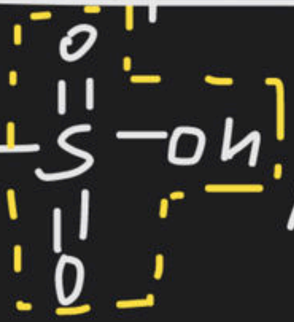
(2) Acid-anhydride



(Acid-anhydride)

Ex:

(3) Sulphonic Acid



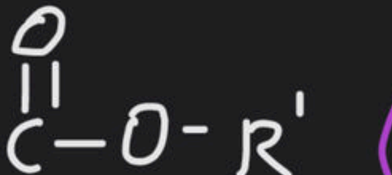
$R-SO_3H$

Amitash

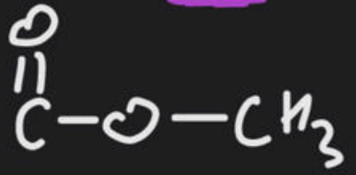
$R \neq H$

Ex:- CH_3-SO_3H

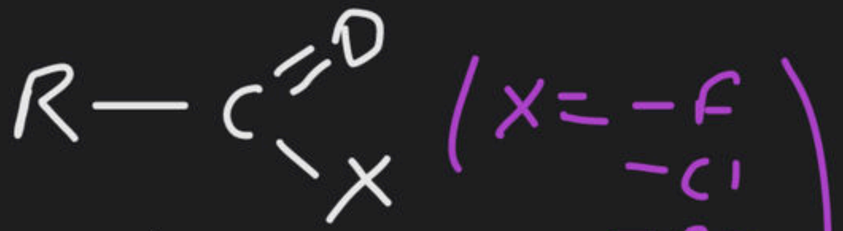
(4) Ester (fruity smell)



$(R' \neq H)$

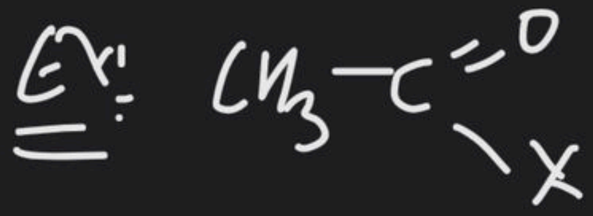
Ex:- 

(5) Acid Halide



(X = −F, −Cl, −Br, −I)

(R ≠ H)

Ex: 

QUIZ - 1

1. Chemical name of willow bark is.

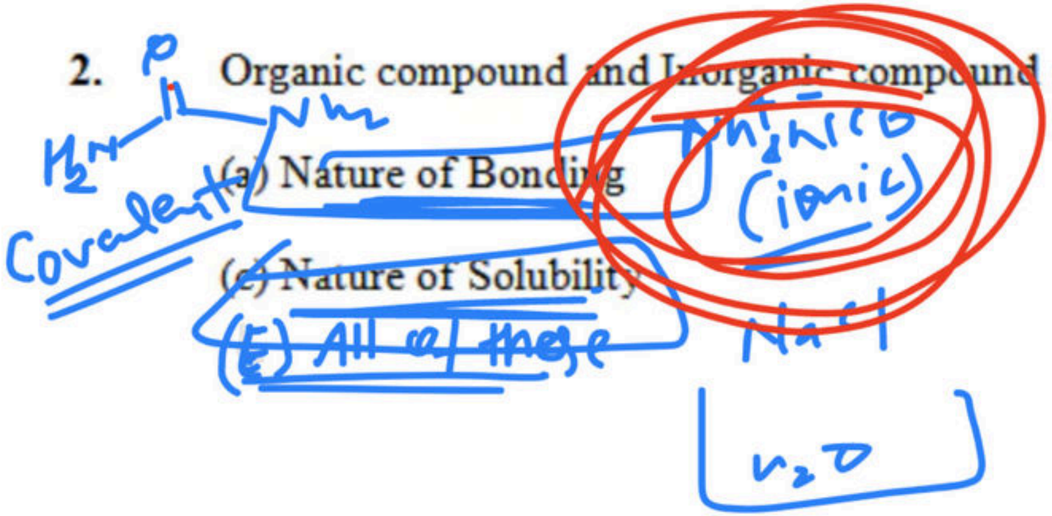
(a) Asperine (b) Dispirine (c) Paracetamol (d) Demorphine

2. Organic compound and Inorganic compound can be differentiated by:

(a) Nature of Bonding (b) Nature of Preparation

(c) Nature of Solubility (d) Nature of melting & boiling point

(e) All of these



3. The first organic compound formed in laboratory accidently was:-

(a) NH_4CNO (b) $CH_3–COOH$ (c) $H_2N–\overset{\overset{O}{\|}}{C}–NH_2$ (d) CH_4

4. Ammonium cynate and urea can be differ by

(a) Molecular formula (b) Empirical formula

(c) Type of bonding (d) All of these

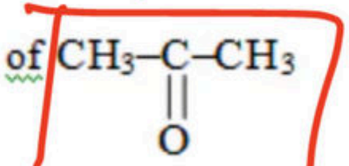
5. Which of the following correct if isomers is

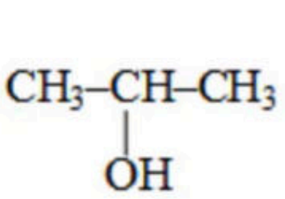
(a) Same molecular formula

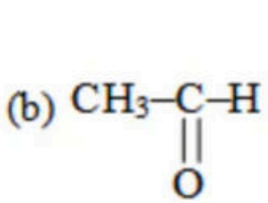
(b) Same physical properties

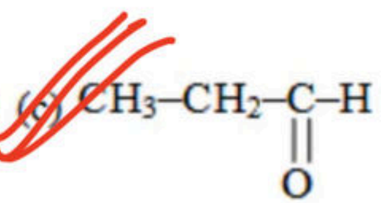
(c) Same empirical formula

(d) Both (a) and (c) are correct

6. Which among the following compound is isomer of 

(a) 

(b) 

(c) 

(d)